MIHAJLO KOVACIC

CTO TOOLBOX

SECOND EDITION

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CORONARY CHRONIC TOTAL OCCLUSION PCI DEVICES

CONSTRUCTION
PURPOSE
TIPS & TRICKS

Cakovec - Croatia
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Čakovec, 2022

To Maša, Mura and Fran

CTO TOOLBOX

TO SHARE KNOWLEDGE AND EXPERIENCE AMONG CTO COMMUNITY

When a skilled operator knows exactly what has to be done in the procedure, with the best material for that particular step, due to advanced knowledge of the construction and purpose of the devices...
The complex procedure will be done with a high rate of success and a small chance for complication, even if the very procedure was never done before by the operator.

This book contains pictures and text describing today's interventional devices dedicated mainly for coronary chronic total occlusion percutaneous interventions.

Pages have a similar design, including a device picture/illustration with a design and construction overview. Also, a more detailed purpose for each device with some tips&tricks is added in the second edition. The book includes crosstables for every group of devices for easier comparison.

The statements made in this book are for the account of the author only and were not reviewed by the intellectual property holders of the products quoted in the book.

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PTCA GUIDE WIRES

PTCA GUIDE WIRES

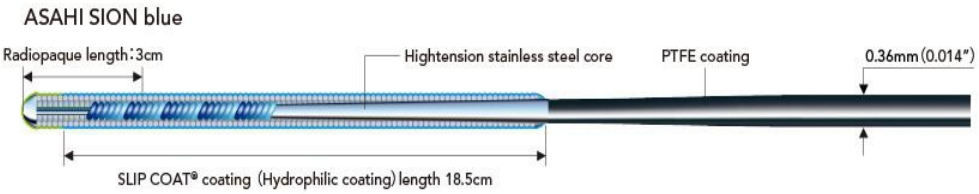
	CORE	TIP LOAD	COATING	POLYMER	RADIOPAQUE SEG.
Sion Blue	Sion Tecc	0.5 g	Silicone tip 1.5 cm Hydrophilic 18.5 cm	No	3 cm
Sion	Sion Tecc	0.7 g	Hydrophilic 28 cm	No	3 cm
Sion black	Sion tecc	0.8 g	Hydrophilic 40 cm	Yes 20 cm	3 cm
Fielder XT-A	Sion Tecc	1.0 g	Hydrophilic 17 cm	Yes 17 cm	16 cm
Fielder XT-R	Sion Tecc	0.6 g	Hydrophilic 17 cm	Yes 17 cm	16 cm
Gaia First Gaia Second Gaia Third	Sion Tecc	1.7 g 3.5 g 4.5 g	Microcone tip uncoated Hydrophilic 40 cm	No	15 cm
Gaia NEXT 1 Gaia NEXT 2 Gaia NEXT 3	Sion Tecc XTRAND coil	2.0 g 4.0 g 6.0 g	Microcone tip uncoated Hydrophilic 40 cm	No	15 cm
Gladius EX	Sion Tecc	3.0 g	Hydrophilic 50 cm	Yes 40 cm	3 cm
Gladius Mongo Gladius Mongo ES	Sion Tecc	3.0 g	Hydrophilic 41 cm	Yes 41/10 cm	3 cm
Suoh03	Sion Tecc	0.3 g	Hydrophilic 52 cm	No	3 cm
HI-TORQUE Pilot 200	Stainless steel Core to tip	4.1	Hydrophilic	Yes	3 cm
Fielder FC	Stainless steel Core to tip	0.8 g	Hydrophilic 20 cm	Yes 20 cm	3 cm
ULTIMATEbros 3	Stainless steel Core to tip	3.0 g	Uncoated tip Hydrophilic 40 cm	no	11 cm
CONFIANZA PRO CONFIANZA PRO 12	Stainless steel Core to tip	9.0 g 12.0 g	Uncoated tip Hydrophilic 20 cm	No	20 cm
HI-TORQUE INFILTRAC / INFILTRAC PLUS	Stainless steel Core to tip	11.0 g 14.0 g	Hydrophilic Uncoated distal tip	No	3 cm
MIRACLEbros 3, 4.5, 6, 12	Stainless steel Core to tip	3.0, 4.5 6.0, 12.0 g	Silicone Hydrophobic 11 cm	No	11 cm
Samurai	Stainless steel Inner coil	0.5 g	1 cm tip reduced hydro. Hydrophilic 19 cm	No	4 cm
Samurai RC	Stainless steel Inner coil	1.2 gr	Hydrophilic 20 cm	No	4 cm
Marvel	Stainless steel Core to tip	0.9 g	Hydrophilic 17 cm	No	3 cm
Judo 1, Judo 2, Judo 3	Stainless steel Core to tip	1.0, 3.0 6.0 g	Hydrophilic 15 cm	No	3.5 cm
Fighter	Stainless steel Core to tip	1.5 g	Hydrophilic 18 cm	Yes 18 cm	3.5 cm
Hornet 10 Hornet 14	Stainless steel Core to tip	10.0 g 14.0 g	Hydrophilic 15 cm	No	3.5 cm
Bandit	Stainless steel Core to tip	0.8 g	Hydrophilic 17 cm	Yes 17 cm	10 cm
Raider	Stainless steel Core to tip	4.0 g	Hydrophilic 30 cm	Yes 30 cm	10 cm
Warrior	Stainless steel Core to tip	14.0 g	Hydrophilic 20 cm	No	2.5 cm

PTCA GUIDE WIRES

Grand Slam	Stainless steel Core to tip	0.7 g	Silicone hydrophobic 4 cm	No	4 cm
Sion Blue ES	Sion Tecc	0.5 g	Silicone tip 1.5 cm Hydrophilic	No	3 cm
RG3	Stainless steel Core to tip	3.0 g	Hydrophilic distal 170 cm Silicone proximal 160 cm	No	3 cm
R350	Nitinol Core to tip	3.0 g	Hydrophilic distal 200 cm	No	5 cm
Minamo	ACT ONE + Ni-Ti (hybrid)	0.5 g	Silicone tip 1.5 cm Hydrophilic 18.5 cm	No	3 cm
HI-TORQUE BMW UII	Nitinol Shaping ribbon	0.7 g	Hydrophilic – TURBOCOAT 3 cm tip uncoated	no	3 cm (+ single marker 4.5 cm from the tip)
Runthrough NS Extra floppy Runthrough NS	Stainless steel + Nitinol	0.6 g 1.0 g	Silicone 2 mm tip Hydrophilic 24.8 cm	no	3 cm

SION BLUE

ASAHI INTECC



CONSTRUCTION

PTCA guide wire 0.014", (SION TECC core) - Stainless steel core + Composite core (ACT ONE rope coil, round core, twist wire)

20 cm spring coil

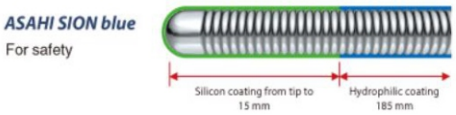
TIP LOAD: 0.5 g

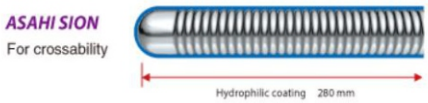
COATING: 15 mm tip cover hydrophobic silicone coating, 18.5 cm hydrophilic SLIP- COAT

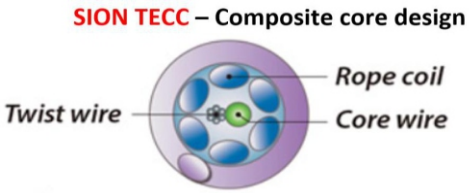
RADIOPAQUE SEGMENT: 3 cm

180 and 300 cm available, straight and J.

Unique dark blue shaft color - PTFE Coating







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PURPOSE

First choice guidewire/frontline guidewire (a modern alternative to BMW UII, Runthrough NS), similar current options are Samurai (Boston Scientific), Spectre (Teleflex), Minamo (Asahi).

Routinely used for PCI, acute coronary syndromes, bifurcations, wire in complex PCI, for example after trapping of the microcatheter and wire exchange (today alternative Sion blue ES or other supportive wire-like Grand Slam).

Composite core (SION TECC) with great tip flexibility, durable tip for treating multiple lesions. Good support for a safer procedure up to the stent delivery.

1.5 cm silicone hydrophobic coating from the tip for a safer procedure, softer tip with reduced lubricity. Hydrophilic proximal coating (SLIP-COAT) for better deliverability.

First choice for getting microcatheter to the desired location/inside collaterals or in front of the cap.

It can serve for septal collaterals probing. Sometimes easily crosses CC2 collaterals.

TIPS & TRICKS

Durable tip, but caution is needed when forming the tip curvature, easy deformation/fracture of the distal end in the twist and core wire parts. The most optimal technique is through insertion needle with small to-and-fro movements and slight pressure on the tip.

Can easily be manipulated without torquer device. Easy knuckle formation safe knuckle positioning in the distal vessel.

Dark blue shaft for easy recognition when working with more wires. Most other Asahi wires have a green shaft.

Safe with better support when parked in small side branches.

MISCELLANEOUS

Durable tip, but prone to enter in small side branches when navigating through the vessel. It can easily stuck on calcified lesions with knuckle formation.

Very low possibility for distal vessel perforation. Enough support for most procedures.

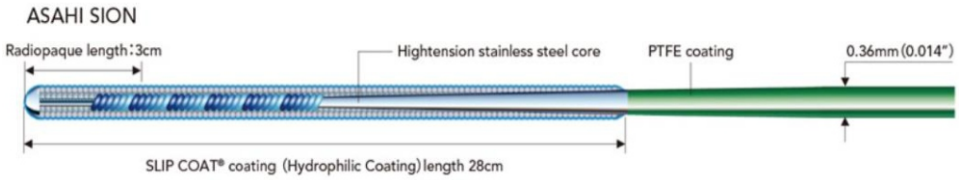
Durable materials, slight chance of wire fracture.

Safe for trapping behind stent struts, safe withdrawal of the trapped wire.

Caution when using OPN balloons at high pressures, easy stuck on the balloon shaft due to suboptimal coating (SLIP-COAT) compatibility with some balloon shafts internal layers. With OPN balloons better to use Grand Slam wire.

SION

ASAHI INTECC



CONSTRUCTION

PTCA guide wire 0.014", (SION TECC core) - Stainless steel core + Composite core (ACT ONE rope coil, round core, twist wire)

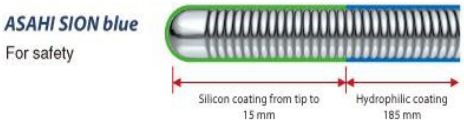
28 cm spring coil

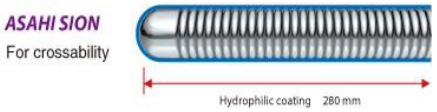
TIP LOAD: 0.7 g

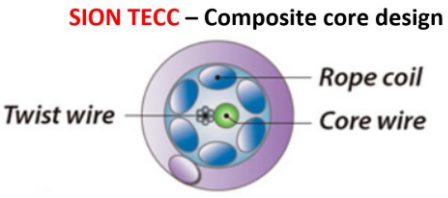
COATING: full hydrophilic coating SLIP- COAT, 28 cm

RADIOPAQUE SEGMENT: 3 cm

180 and 300 cm available, straight and J, green shaft color - PTFE Coating







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PURPOSE

First choice guidewire with composite core construction for excellent tip durability and torque performance in tight anatomy.

Recommended for tight and tortuous vessels and side branches.

AWE, RWE, parallel wire techniques, sliding, drilling.

Retrograde CTO, navigating septal collaterals. One of the main wires for septal collaterals crossing (with Sion black, Fielder XT-R/A, and Suoh03).

It can be the first choice for crossing the invisible channel, also in more simple CTO (J-CTO 0,1).

In acute bends and extremely tortuosity replaced with Suoh03.

TIPS & TRICKS

Advancing with push and rotation.

It can easily be manipulated without a torquer device. Flexible shaft.

A typical 1 mm CTO bend is recommended in CTO procedures like AWE, secondary bend regarding anatomy.

With the Microcatheter parked at the CTO cap, a wire can be modified with manipulation for more penetrative force and control.

Durable tip and, in practice, harder tactile feedback tip in comparison to Sion blue, less prone to tip fracture. The most optimal technique is through insertion needle with small to-and-fro movements and slight pressure on the tip.

Caution when using OPN balloons at high pressures, easy stuck on the balloon shaft due to suboptimal coating (SLIP-COAT) compatibility with some balloon shafts internal layers. With OPN balloons better to use Grand Slam wire.

In most cases, wire to start within septal surfing techniques and septal controlled crossing. Slower rotations, a sliding technique in septals.

MISCELLANEOUS

Composite core (SION TECC) with great tip flexibility, durable tip for treating multiple lesions. Good support for a safer procedure up to the stent delivery.

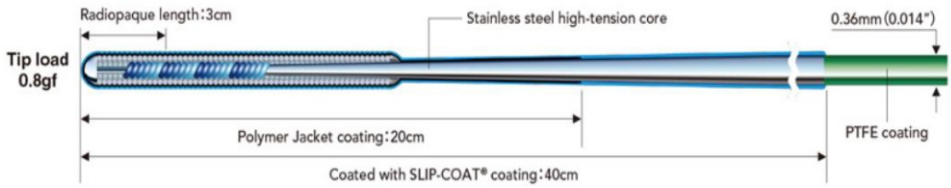
Torque control and in-vessel maneuvering are similar to Sion blue. Full hydrophilic coating, lower support than Sion blue

Low possibility for distal vessel perforation.

Caution when using OPN balloons at high pressures, easy stuck on the balloon shaft due to suboptimal coating (SLIP-COAT) compatibility with some balloon shafts internal layers. With OPN balloons better to use Grand Slam wire.

SION BLACK

ASAHI INTECC



CONSTRUCTION

PTCA guide wire 0.014", (SION TECC core) - Stainless steel core + Composite core (ACT ONE rope coil, round core, twist wire)

12 cm spring coil

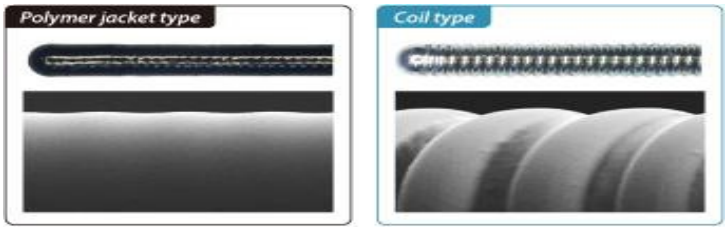
TIP LOAD: 0.8 g

COVER: 20 cm polymer jacket

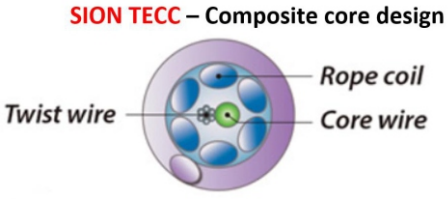
COATING: 40 cm hydrophilic coating

RADIOPAQUE SEGMENT: 3 cm

190 and 300 cm available, straight and J, Greenshaft color - PTFE Coating



The polymer fills the irregularities of the coils and reduces the contact resistance.
The slippery property is enhanced by applying a hydrophilic coating on the polymer.



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PURPOSE

Frontline guidewire with a polymer jacket and flexible tip designed to retain flexibility while crossing high resistance stenosis.

Tortuous anatomy and crossability of high resistance stenosis.

Long calcified lesions.

Collateral channel tracking with sliding performance.

One of the main wires for septal collaterals crossing (with Sion, Fielder XT-R/A, and Suoh03).

Can serve as knuckle wire.

TIPS & TRICKS

Advancing with push and rotation, sliding technique.

Septal surfing technique, controlled with the tip of the microcatheter.

It can easily be manipulated without a torquer device.

At the intraplaque course, especially in long or calcified lesions, resistance when advancing the wire is present, with visualized buckling of the wire body and specific tactile feedback.

Careful advancement is needed. Polymerjacket wires can go subintimal and sometimes feel like intimal, sliding without free tip movement/knuckle formation. When subintimal, in most situations the wire is not „fixed, "and behavior is different than in the above described intraplaque course.

First choice wire described in AFR (anterograde fenestration and re-entry technique) used for re-entry with 2-mm 45° bend (in AFR recommended are low tip-load polymer jacket wires – other than Sion black: Fielder Family, Fighter, Bandit)

With the Microcatheter parked at the CTO cap, a wire can be modified with manipulation for more penetrative force, drilling technique probe in some lesions can be successful for crossing (RWE)

MISCELLANEOUS

Composite core (SION TECC) with great tip flexibility, durable tip.

Hydrophilic proximal coating (SLIP-COAT) 40 cm, polymer jacketdistal 20 cm

Tactile information/feedback from the tip is less accurate because insulation of the polymer jacket.

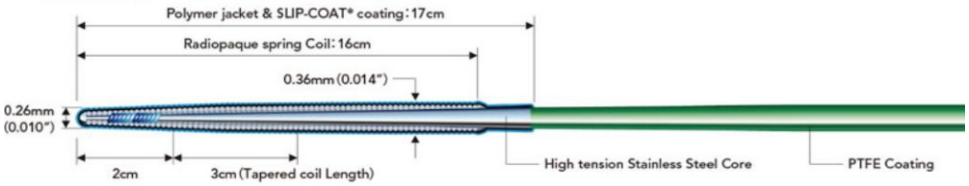
Durable tip with excellent sliding performance suited for treating multiple lesions. Easy preshaping due to polymer jacket. Slight chance for wire fracture.

A wire is hardly affected by the curve, and plaque retains control after passing heavy stenosis and tortuosity.

Very flexible compared with Fielder FC, similar to spring coil type wires.

FIELDER XT-A

ASAHI INTECC



CONSTRUCTION

PTCA guide wire 0.014", 0.010" tapered tip (2 cm), (tapering part 3 cm), (SION TECC core) - Stainless steel core + Composite core (ACT ONE rope coil, round core)

16 cm spring coil

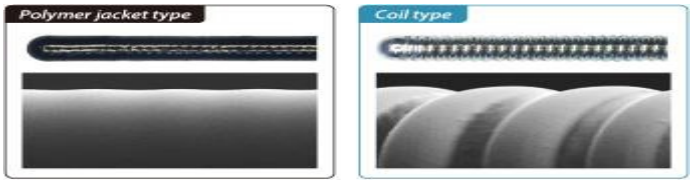
TIP LOAD: 1.0 g, (regular older Fielder XT 0.8 g)

COVER: 17 cm polymer jacket

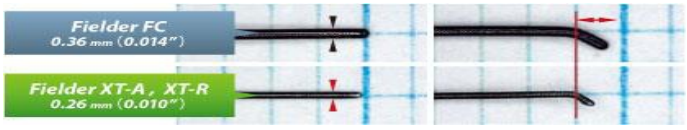
COATING: 17 cm hydrophilic coating (SLIP-COAT)

RADIOPAQUE SEGMENT: 16 cm

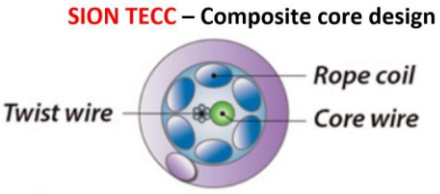
190 and 300 cm available, straight tip, green shaft color - PTFE Coating



The polymer fills the irregularities of the coils and reduces the contact resistance.
The slippery property is enhanced by applying a hydrophilic coating on the polymer.



Small tip shapability for potential loose tissue and collateral channel tracking



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PURPOSE

Soft polymer jacket guidewire with a flexible tapering tip. Higher tip load than Fielder XT-R, designed for facilitating entry into the chronic occluded lesion (CTO)

Controlled loose tissue tracking by a small curve (<1 mm)

For the occluded lesions without a stump.

Often the first choice wire in AWE, RWE, parallel wire techniques.

Even in more complex CTO cases, a short „probe" with Fielder XT-A (or Fighter, Bandit...) wires is a good option and sometimes successful.

It can serve as a knuckle wire (when the vessel course is unknown, the CTO segment is long, if the artery is calcified...). Safe maneuver with a low chance for perforation.

TIPS & TRICKS

In many cases, the first choice in AWE, RWE

Great sliding and drilling performance with fast rotation.

The best advancement is with slight constant push and rotation for sliding and drilling techniques. If the wire direction and tactile feedback are inappropriate, starting from the beginning can sometimes help to make another pathway.

Even with a polymer jacket and tapered tip, the operator can easily feel a lack of penetration power. Then in similar anatomy, escalation to stronger polymer jacket wires is appropriate (Gladius, Pilot 200, Raider)

In comparison to Fielder XT-R is less flexible but has more push transmission. The primary focus is crossability, while XT-R is focused on trackability in narrow channels.

Durable tip, easy preshaping due to polymer jacket. Small chance for wire fracture.

Beware of the wire course. Even with a low tip load, small distal coronary perforations (type V perforations) can develop. Often treated conservatively, but follow-up with echocardiography is needed.

MISCELLANEOUS

Durable and flexible tip with Composite core (SION TECC), excellent sliding performance suited for treating multiple lesions. Good torque transmission.

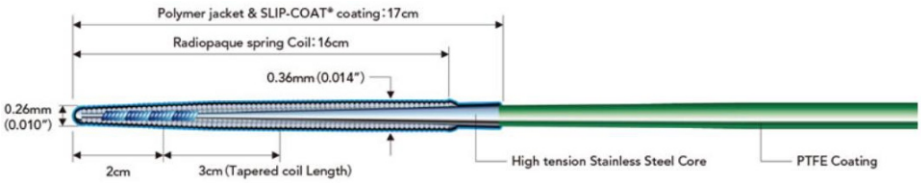
Tactile information/feedback from the tip is less accurate because insulation of the polymer jacket and hydrophilic coating.

A wire is hardly affected by the curve, and plaque retains control after passing heavy stenosis and tortuosity.

Limitations: poor penetration force, delayed initial torque response, and weak torque response in hard plaque.

FIELDER XT-R

ASAHI INTECC



CONSTRUCTION

PTCA guide wire 0.014", 0.010" tapered tip (2 cm), (tapering part 3 cm), (SION TECC core) - Stainless steel core + Composite core (ACT ONE rope coil, round core)

16 cm spring coil

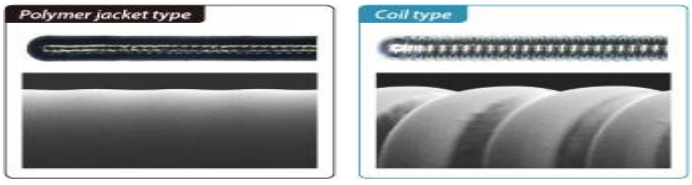
TIP LOAD: 0.6 g, (regular older Fielder XT 0.8 g)

COVER: 17 cm polymer jacket

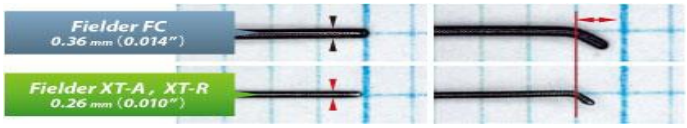
COATING: 17 cm hydrophilic coating (SLIP-COAT)

RADIOPAQUE SEGMENT: 16 cm

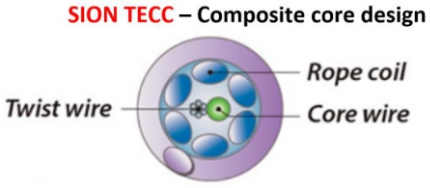
190 and 300 cm available, straight tip, green shaft color - PTFE Coating



The polymer fills the irregularities of the coils and reduces the contact resistance.
The slippery property is enhanced by applying a hydrophilic coating on the polymer.



Small tip shapability for potential loose tissue and collateral channel tracking



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PURPOSE

Guidewire with flexible tapering soft tip and high lubricity polymer cover.

Control narrow channel tracking.

Subtotal occlusions (99%) and long diffused lesions, microchannels.

One of the main wires for septal collaterals crossing (with Sion, Sion black, and Suoh03).

Potential for loose tissue tracking and collateral channel by small curve (<1 mm).

Can serve as knuckle wire.

Option for Side branch navigation through stent struts.

TIPS & TRICKS

Sometimes the first choice is for easy CTO (J-CTO 0) when microchannel is visible or suspected.

Great sliding and drilling performance with fast rotation

In the septal surfing techniques, forward and backward movement with slight pressure and slow rotation are needed to find a connecting channel.

Durable tip, easy preshaping due to polymer jacket. Small chance for wire fracture.

Beware of the wire course. Even with a low tip load, small distal coronary perforations (type V perforations) can develop. Often treated conservatively, but follow-up with echocardiography is needed.

MISCELLANEOUS

Durable and flexible tip with Composite core (SION TECC), excellent sliding performance suited for treating multiple lesions.

The soft tip decreases penetration forces and increases the trackability of the wire inside the vessel.

In comparison to Fielder XT-A, more flexible but has less push transmission. A primary focus is trackability, while XT-A is focused on crossability.

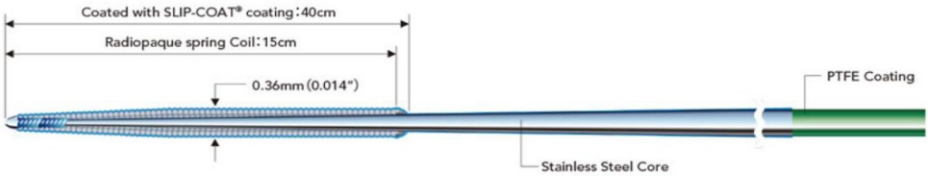
Tactile information/feedback from the tip is less accurate because insulation of the polymer jacket and hydrophilic coating.

A wire is hardly affected by the curve, and plaque retains control after passing heavy stenosis and tortuosity.

Limitations: poor penetration force, delayed initial torque response, and weak torque response in hard plaque.

GAIA Family

ASAHI INTECC



CONSTRUCTION

PTCA guide wire 0.014", (SION TECC core) - Stainless steel Composite core (ACT ONE rope coil, round core) 15 cm spring coil, tapered tip. GAIA micro cone tip, 1 mm preshaped

Three models with tapering tip: GAIA FIRST to 0.010", GAIA SECOND to 0.011", GAIA THIRD to 0.012. "

TIP LOAD: Gaia first 1.7 g, Gaia second 3.5g, Gaia third 4.5g (first and second without a stump, third for hard plaque)

TORQUE: 1:1

COATING: 40 cm hydrophilic coating, uncoated microcone tip.

RADIOPAQUE SEGMENT: 15 cm

190 and 300 cm available, 1 mm preshaped, green shaft PTFE Coating

ASAHI Gaia micro-cone tip

Conventional guide wire ball tip

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PURPOSE

Specialty guidewire with high maneuverability in the CTO lesion. Almost real 1:1 in vivo torque.

The intermediate tip weight of this family of wires combines good flexibility with increased penetration force from the conically tapered tip shape (modified penetration force). Balanced core wire flexibility for deflection.

DEFLECTION CONTROL / DIRECTIONAL CONTROL CONCEPT

AWE, RWE - when vessel course is known. Focus on precise control and navigation. Can make knuckle. Gaia third is often used for re-entry in R-CART.

Gaia first and second – controlled visible CTO navigation (deflection control)

Gaia third – controlled CTO penetration.

TIPS & TRICKS

Directional control - changing the course of the wire by rotating the tip to control the direction.

Deflection control - deflection to track the wire as intended inside the lesion.

The operator has to do precise and controlled wire movement with slow tourqer rotation in that concept. The wire moves forward slowly when the vessel course is known, tracking lumen. With tactile feedback, slight withdrawal is needed when stuck on hard tissue, then precise rotation and deflection to the other direction into a less stiff part of the plaque for more distal advancement.

Focus on precise control and navigation – a combination of direction and deflection with precise rotation. No fast rotating of the wire with the torquer like in classic sliding and drilling techniques.

With precise directional/deflection control, many anterograde procedures can be done with AWE only, and no need for other techniques like ADR. Also, parallel wire techniques with double lumen MC and Gaia are very successful with precise anterograde controlling and re-entry techniques.

Even the strong penetrative force of Gaia is prone to deflect thanks to its medium tip load in plaque architecture, not going straight like conventional stiff wires.

Precise navigation is needed. Gaia wires easily go into subintimal tracking with hematoma creating. With uncontrolled maneuvering, many tears of the intima are possible; after that is harder to re-enter from subintimal space into lumen again. When that happens, changing wires into a polymer jacket like Gladius makes propagation into the true distal lumen easier.

Gaia third is often used for re-entry in R-CART.

Don't use Gaia wires when the CTO course is unknown.

MISCELLANEOUS

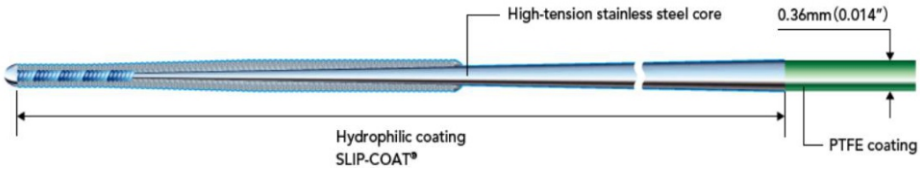
Great penetration efficacy. Gaia micro cone tip enables easy creation of an entry route into the hard tissue and fibrous cap (CTO). Classic ball tip tends to slip.

Good shaping memory with excellent 1 mm pre-shaped tip retention – hard to change/destroy pre-shaped 1 mm curvature.

Tapering tip and micro cone tip design - improved penetrability while remaining flexible. Because of the micro cone design, the real penetrative force is much higher than in wires with conventional ball tip. Examples of Penetrative force (kg/inch2): Ultimate 3 - 19.5, Miracle 12 – 78.0, Gaia second – 123.8, Conquest Pro - 141.5, Gaia third – 159.2, Conquest Pro 12 – 188.7, Gaia Next 3 – 212.3

GAIA NEXT Family

ASAHI INTECC



CONSTRUCTION

PTCA guide wire 0.014" with tapering tip 0.011-0.012", (SION TECC core) – high tension stainless steel core + Composite core (ACT ONE rope coil, round core wire), + XTRAND coil (one coil string made from 7 smaller wires), 15 cm spring coil, tapered tip. GAIA micro cone tip, 1 mm preshaped. Gaia NEXT 4 doesn't include ACT ONE rope coil inner coil.

XTRAND coil: anti-trapping power and lower risk for wire damage for much more safety and wire durability, with much better control and torque response

Tapering tip: GAIA NEXT 1 to 0.011", GAIA NEXT 2 to 0.012", GAIA NEXT 3 to 0.012", GAIA NEXT 4 to 0.013"

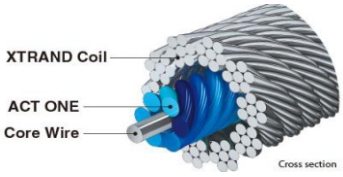
TIP LOAD: GAIA NEXT 1 2.0 g, GAIA NEXT 2 4.0 g, GAIA NEXT 3 6.0 g, GAIA NEXT 4 10.0 g

TORQUE: Close to ideal 1:1 torque response inside occluded lesions

COATING: 40 cm hydrophilic coating, uncoated microcone tip

RADIOPAQUE SEGMENT: 15 cm radiopaque segment

190 and 300 cm available, 1 mm preshaped, green shaft PTFE Coating



ASAHI Gaia micro-cone tip

Conventional guide wire ball tip

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PURPOSE

Specialty guidewire with high maneuverability in the CTO lesion. Close to ideal 1:1 torque response inside occluded lesions

Gaia NEXT with Improved Deflection control and Directional control in comparison to Gaia family. Even more torquable intraplaque for more precise control.

DEFLECTION CONTROL / DIRECTIONAL CONTROL CONCEPT

AWE, RWE - when vessel course is known, parallel wire technique with a focus on precise control and navigation.

Gaia NEXT 1 – controlled visible CTO navigation, flexible design to take advantage of deflection control

Gaia NEXT 2 – controlled CTO penetration, design for more penetration and torque force

Gaia NEXT 3 – higher penetration power, controlled penetration

Gaia NEXT 4 – very high penetration power with tip orientation control

TIPS & TRICKS

Directional control - changing the course of the wire by rotating the tip to control the direction.

Deflection control - using deflection to track the wire as intended inside the lesion.

The operator must do precise and controlled wire movement with slow tourqer rotation. The wire moves forward slowly when the vessel course is known, trying to track the lumen. With tactile feedback, slight withdrawal is needed when stuck on hard tissue, then precise rotation and deflection to the other direction into a less stiff part of the plaque for more distal advancement.

Focus on precise control and navigation - a combination of direction and deflection with precise rotation. No fast rotating of the wire with the torquer like in classic sliding and drilling techniques.

Gaia micro cone tip enables easy creation of an entry route into the hard tissue and fibrous cap (CTO). Because of micro cone penetrability and Gaia steerability, multiple pathways can be achieved inside the vessel. Classic ball tip tends to slip.

Counterclockwise rotation: „lock coil" for stronger torque, clockwise rotation: open coil. 2x pulling strength and resistance comparing single wire coil while maintaining the flexibility required for the deflection control, the tear-resistant design improves durability in hard tissues

Do not use when the CTO course is unknown.

MISCELLANEOUS

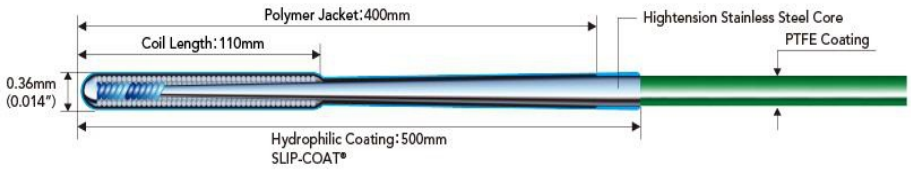
XTRAND coil: hollow coil composed of ropes made from multiple wires. Anti-damage feature - One coil string made from 7 smaller wires with increased anti-trapping power and lower risk for wire damage. Almost double wire strength against pulling in comparison to single coil wires. The increased radiopacity of the coil.

Excellent 1 mm pre-shaped tip retention – hard to change/destroy pre-shaped 1 mm curvature

Tapering tip and MICRO CONE tip design - improved penetrability while remaining flexible. Because of the micro cone design, real penetrative force is much higher than in wires with a conventional ball tip. Examples of Penetrative force (kg/inch2): Gaia first - 54, Miracle 12 - 76, Gaia NEXT 1 - 64, Conquest Pro - 118, Gaia NEXT 2 - 128, Conquest Pro 12 - 157, Gaia third - 144, Gaia Next 3 - 234

GLADIUS EX

ASAHI INTECC



CONSTRUCTION

PTCA guide wire 0.014" (0.36 mm), high-tension stainless steel core – core to tip design (SION TECC core) Stainless steel + Composite core (ACT ONE rope coil, round core)

11 cm spring coil length

TIP LOAD: 3.0 g

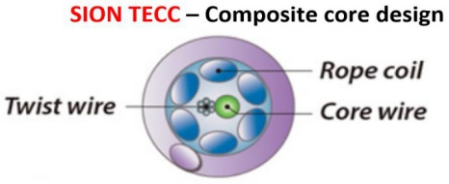
COVER: polymer jacket 40 cm

COATING: hydrophilic coating 50 cm (SLIP-COAT)

RADIOPAQUE SEGMENT: 3 cm

200 and 300 cm available, pre-shaped tip and straight, green shaft color - PTFE Coating

The polymer fills the irregularities of the coils and reduces the contact resistance. The slippery property is enhanced by applying a hydrophilic coating on the polymer.



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PURPOSE

New generation and standard middle-weight, non-tapered polymer jacket guide wire for long and tortuous occluded segments and ambiguous route CTO.

AWE, RWE, parallel

CTO with ambiguous route - controlled loose tissue tracking/sliding/drilling when the course of occluded vessel is unknown

In-stent CTO drilling and sliding

Knuckle wire, the STAR technique

Re-entry: LAST or through ReCross and other DLC. Can serve as„Swap" wire in Stingray technique

Longest Polymerjacket coating 40 cm, and Hydrophilic proximal coating (SLIP-COAT) 50 cm for smoothly pass through a long stenotic lesion

TIPS & TRICKS

Optimal tip stiffness to negotiate and track CTO with sliding and drilling techniques.

Navigates long segments with relatively low risk of perforation but high risk of subintimal tracking.

At the intraplaque course, especially in long or calcified lesions, resistance when advancing the wire is present, with visualized buckling of the wire body and specific tactile feedback.

Careful advancement is needed. Polymerjacket wires can go subintimal and sometimes feel like intimal, sliding without free tip movement/knuckle formation. When subintimal, in most situations the wire is not„fixed, "and behavior is different than in the above described intraplaque course.

With created knuckle due to long hydrophilic segment, ability to be advanced further than most competitors. Higher tip and shaft rigidity enabling more push and torque control with better push transmission and trackability

Durable tip, easy preshaping due to polymer jacket. Slight chance of wire fracture.

Beware of the wire course. When in side branches or distal branches, type V coronary perforations can develop. Often treated conservatively, but follow-up with echocardiography is needed.

A good option for de-escalation from Gaia second/third... With uncontrolled Gaia wires maneuvering, many tears of the intima are created; after that is harder to re-enter from subintimal space into lumen again. When that happens, changing wires into a polymer jacket like Gladius makes propagation into the true distal lumen easier.

MISCELLANEOUS

Composite core (SION TECC) with great tip flexibility, durable tip for treating multiple lesions.

1 mm pre-shaped non-tapered tip can be retained inside the lesion compared to the hand-made shape – easier tip control.

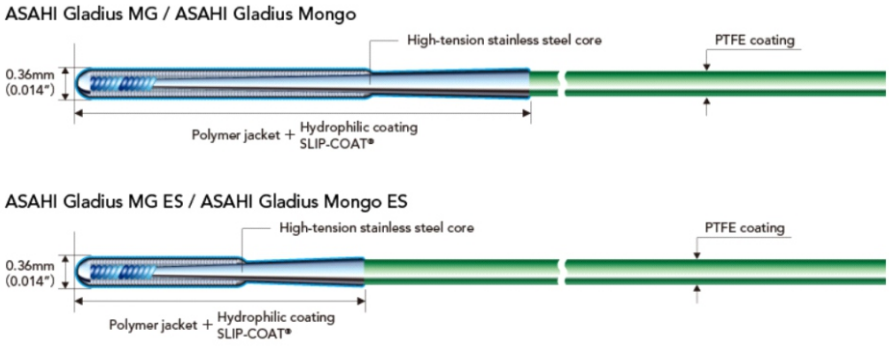
The wire is hardly affected by the curve, and plaque retains control after passing heavy stenosis and tortuosity.

Gladius peripheral: (GLADIUS 0.014" peripheral – coil length 11 cm, tip load 3 gr, 50 cm hydrophilic coating, 40 cm polymer jacket, usable length 200/235/300 cm)

(GLADIUS 0.018" peripheral – coil length 5 cm, tip load 4 gr, 10 cm hydrophilic coating, 10 cm polymer jacket, usable length 200/235/300 cm)

GLADIUS MG (MONGO)/ES

ASAHI INTECC



CONSTRUCTION

PTCA guide wire 0.014" (0.36 mm), high-tension stainless steel core – core to tip design, (SION TECC core) - Stainless steel Composite core (ACT ONE rope coil, round core). Gladius MG - MICRO-GAP modified core and shaft for narrow loop maintenance

GLADIUS MG 8.5 cm spring coil, GLADIUS MG ES 3.0 cm spring coil

TIP LOAD: 3.0 g

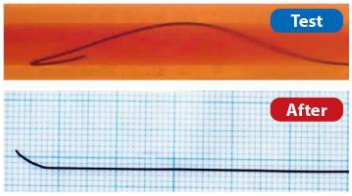
COVER: polymer jacket 41 cm (10 cm on MONGO ES)

COATING: hydrophilic coating (SLIP-COAT)

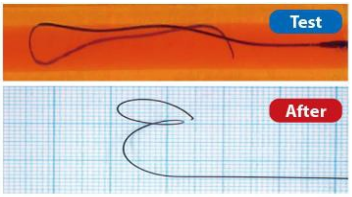
RADIOPAQUE SEGMENT: 3 cm

190 and 300 cm available, straight and pre-shaped, green shaft color - PTFE Coating

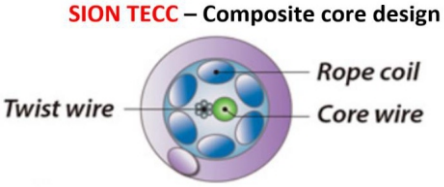
Narrow loop



ASAHI Gladius MG



Competitor A



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PURPOSE

New generation and standard middle-weight, non-tapered polymer jacket guidewire.

AWE, RWE, parallel, ADR techniques due to narrow loop properties

Controlled CTO drilling, loose tissue tracking/sliding when the course of occluded vessel is unknown

In-stent CTO drilling and sliding

Micro Gap: modified distal core and shaft design with acute core tapering („knuckle point") for predicted wire knuckling location. Narrow loop wire – minimizing the length and diameter of the loop with the subintimal knuckle technique prevents from expanding the subintimal space.

TIPS & TRICKS

MICRO-GAP (MG) modified core and shaft for narrow loop maintenance

Thanks to the modified distal core balance (Micro Gap), the Gladius MG wire keeps a narrow loop when advanced in a knuckle fashion. After being looped, it can be retracted to come back to the original straight configuration, which increases the chance of re-entry using the same guidewire.

Easy knuckle formation with narrow loop. When a controlled small curve/knuckle is formed, a small subintimal space is created with a much better chance for successful ADR (Stingray or Recross based)

Optimal tip stiffness to negotiate and track CTO with sliding and drilling techniques.

With created knuckle due to long hydrophilic segment, ability to be advanced further than most competitors. Higher tip and shaft rigidity enables more push and torque control with better push transmission and trackability.

The strong shaft provides more support and the wire can serve for Stingray LP delivery.

MISCELLANEOUS

Composite core (SION TECC) with great tip flexibility, torque response, and durable tip for treating multiple lesions. A narrow loop prevents wire deformation.

High lubricity with smooth manipulation. Follow micro-channels if available. Will cross over into the subintimal space in fibrocalcific CTO-s without microchannels.

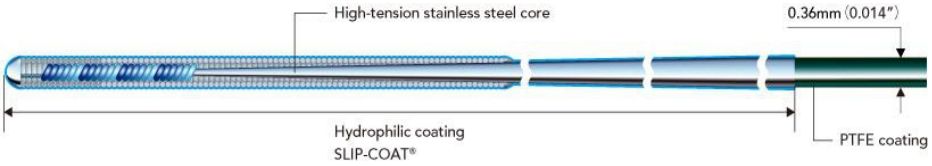
Wire with 1 mm pre-shaped non-tapered tip can be retained inside the lesion compared to the hand-made shape - easier tip control.

The wire is hardly affected by the curve, and plaque retains control after passing heavy stenosis and tortuosity.

Tactile information/feedback from the tip is less accurate because insulation of the polymer jacket and hydrophilic coating.

SUOH 03

ASAHI INTECC



CONSTRUCTION

PTCA guide wire 0.014", high tension stainless steel core, Composite core - SION TECC (ACT ONE + twist wire (7 wires) – connected to tip, proximal single wire coil (1 wire) + distal wire rope coil (4 wires)

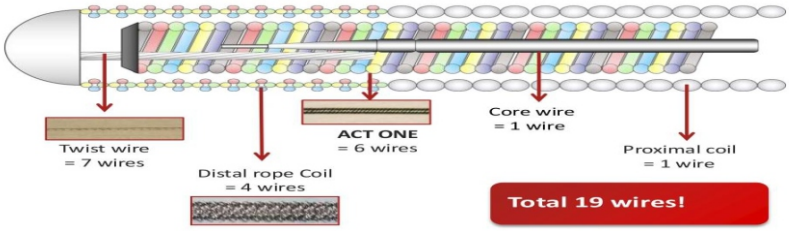
Spring coil 19 cm

TIP LOAD: 0.3 g (softest available tip load)

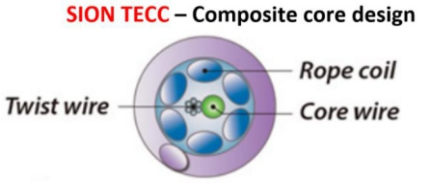
COATING: 52 cm Hydrophilic Coating SLIP-COAT (coated with SLIP-COAT coating)

RADIOPAQUE SEGMENT: 3 cm radiopaque segment

190 and 300 cm available, pre-shaped mini 1 mm tip and straight, green shaft PTFE coating



Min pre-shaped tip optional



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PURPOSE

Guidewire with nontapering tip and softest available tip load at 0.3 g. Revolutionized possibilities to pass tortuous anatomy.

Designed for extremely tortuous vessels – collaterals (epicardial>septal) with a lower risk of injury due to the highly flexible tip. Acute bends and continuous tortuosity

With excellent flexibility, trackability, and crossability due to complex design – 19 wires total (4 wires distal rope coil, twist wire made from 7 wires, connected to tip) suitable in a situation where other wires may have failed.

Septal navigation, tortuous septal surfing

First choice for tortuous epicardial collateral crossing.

The best and safest wire for delivery and navigation in cases of spontaneous coronary dissection (SCAD).

TIPS & TRICKS

Push, pull, rotate: push by rotate, pull by rotating.

Advance slowly through tortuous anatomy with slight rotation in both directions. Do not torque like in classic sliding and drilling maneuvers. In epicardial collaterals crossing, surfing-like maneuvers can sometimes help.

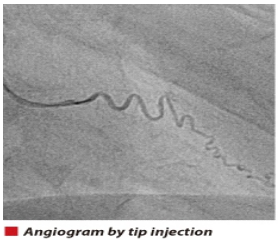
Sometimes the wire is advanced passively with heart action and contracting vessels, with a slight push only from the operator.

Interaction between wire and microcatheter is crucial to passing collaterals. Always keep a safe distance (at least 5-10 mm) between the tip of the wire and the tip of the MC.

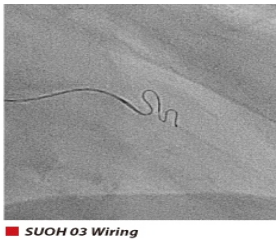
If the wire is stuck in tortuous collateral, consider extremely gentle pushing the microcatheter while very gently torquing the wire to find a new path and advance by passive movement.

Visually control more the tip of the microcatheter (this is the one that may perforate) than the tip of the wire itself.

In tortuous epicardial collaterals, when a loop is present when crossed with the microcatheter, closely check loop size and behavior because of the fragility of the collaterals, prone to perforation. Be ready for coiling from both sides.



Angiogram by tip injection



SUOH 03 Wiring

MISCELLANEOUS

Very safe wire due to softest tip load (0.3 g) and flexible tip design. In complex anatomy, like tortuous epicardial collaterals, the wire will break before harm to the vessel is made (perforation, dissection...)

Improved shaft design allows superb trackability and crossability in severely tortuous vessels.

Meager support for devices like microcatheters. When collaterals are passed with MC, often need to change the wire.

HI-TORQUE PILOT 200

ABBOTT

CONSTRUCTION

PTCA guide wire 0.014", DURASTEEL Stainless Steel, core to tip design, parabolic core grind technology

TIP LOAD: 4.1 g

COVER: full hydrophilic polymer cover

COATING: Hydrophilic coating

RADIOPAQUE SEGMENT: 3 cm radiopaque segment, gold marker located 4.5 cm from the tip

190 and 300 cm available, straight and J-tip

The polymer fills the irregularities of the coils and reduces the contact resistance. The slippery property is enhanced by applying a hydrophilic coating on the polymer.

Also available - PILOT 50 with tip load 1.5 g
PILOT 150 with tip load 2.7 g

PURPOSE

Non-tapered, mid-tip load, polymer jacket guide wire for long and tortuous occluded segments and ambiguous route CTO.

AWE, RWE, parallel. Navigating long and tortuous occluded segments, controlled drilling. Follows micro-channels if available with sometimes successful true-to-true crossing.

CTO with ambiguous route - controlled loose tissue tracking/sliding/drilling when the course of occluded vessel is unknown

In-stent CTO drilling and sliding

Knuckle wire, STAR technique

Re-entry: LAST or through ReCross, other DLC. Can serve as„Swap" wire in Stingray technique

TIPS & TRICKS

Optimal tip stiffness to negotiate and track CTO with sliding and drilling techniques.

Often used in AWE, RWE (Fielder XT-A/Bandit/Fighter > UB/Judo > Pilot 200/Raider/Gladius...)

Navigates long segments with relatively low risk of perforation but high risk of subintimal tracking.

Due to transitionless core, less likely to prolapse into side branches and less likely to easily create knuckle. Because of property, useful to form knuckle when previous knuckle wires continue to track side branches.

It tends to form a larger, wider knuckle that could cause a more extensive subintimal hematoma.

When re-entry from subintimal space is hard (AWE, parallel), many tears of the intima occur with wires manipulation (for example, Gaia). Sometimes changing wire into mid-tip load polymer jacket wires like Pilot 200/ Raider/Gladius makes re-entry into the true distal lumen easier.

Durable tip, easy preshaping due to polymer jacket. Slight chance for wire fracture.

A not good option for heavily calcified lesions. Polymer cover and wire tip can easily break when drilling in calcified lesions.

Beware of the wire course. When in side-branches or distal branches, type V coronary perforations can develop. Often treated conservatively, but follow-up with echocardiography is needed.

Gold radiopaque 2 mm marker placed 4.5 cm from the tip (1.5 cm from the radiopaque segment) for easy lesion length determination.

MISCELLANEOUS

Similar wires – Gladius EX (Asahi), Raider (Teleflex). Tactile information/feedback from the tip is less accurate because insulation of the polymer jacket and hydrophilic coating.

Follows micro-channels if available. Crossing into subintimal space in fibrocalcific CTO-s without microchannels. Manages tortuosity well.

FIELDER FC

ASAHI INTECC

- Tip load .....0.8 gf
- Tip radiopacity .....3 cm
- Polymer jacket length ..... 20 cm
- SLIP-COAT® coating over the polymer jacket

Fine control over challenging tortuous vessels and highly stenosed lesions. Polymer jacket provides advanced slip performance with superior torque and support.

CONSTRUCTION

CONSTRUCTION

PTCA guide wire 0.014" stainless steel core without tapering, core to tip design

11 cm spring coil

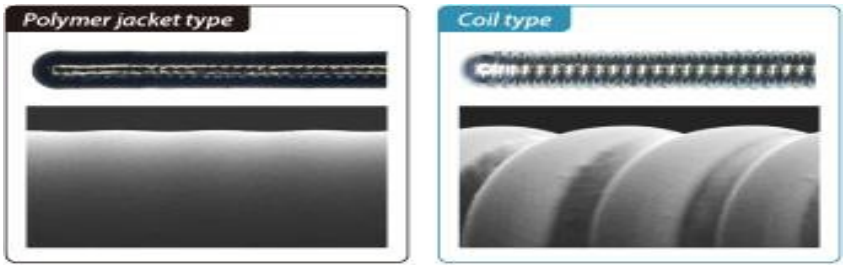
TIP LOAD: 0.8 g (Fielder 1.0 g)

COVER: 20 cm polymer jacket

COATING: 20 cm hydrophilic coating (SLIP-COAT)

RADIOPAQUE SEGMENT: 3 cm

180 and 300 cm available, straight and J-tip, PTFE Coating shaft



The polymer fills the irregularities of the coils and reduces the contact resistance. The slippery property is enhanced by applying a hydrophilic coating on the polymer.

FIELDER FC

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PURPOSE

Guidewire with non tapering soft tip and polymer jacket cover.

Older generation wire for Challenging tortuous vessels and highly stenosed lesions. Can track microchannels.

Side branch navigation through stent struts

Can serve as knuckle wire

AWE, parallel wire techniques. Previously used for septal surfing.

TIPS & TRICKS

Great sliding and drilling performance with fast rotation.

Durable tip, easy preshaping due to polymer jacket. Small chance of wire fracture.

At the intraplaque course, especially in long or calcified lesions, resistance when advancing the wire is present, with visualized buckling of the wire body and specific tactile feedback.

Polymerjacket wires can go subintimal and sometimes feel like intimal, sliding without free tip movement/knuckle formation. When subintimal, in most situations the wire is not „fixed, "and behavior is different than in the above described intraplaque course.

Less likely to go into subintimal space and cause dissection compared to Fielder XT family, Fighter, or Bandit.

MISCELLANEOUS

Durable and flexible tip. A wire is hardly affected by the curve, and plaque retains control after passing heavy stenosis and tortuosity.

Because of polymer jacket and old core technology limited torque transmission.

Slightly more lateral support than older workhorse PCI wires like BMW or RunThrough

Previously primary wire used in the retrograde technique of recanalization of CTO (collaterals tracking) (replaced with a new generation of the wires like Sion, Sion black, Fielder XT-R, and SUOH 03)

ULTIMATEbros 3

ASAHI INTECC

- Tip load .....3.0 gf
- Tip radiopacity .....11 cm
- SLIP-COAT® coating over the spring coil until the middle of the shaft / without tip

Long hydrophilic coating maintains high maneuverability, allowing for improved wire manipulation in heavy stenosed lesions.
Fine shaping improves vessel selectivity and reduces the risk of false lumen expansion.

CONSTRUCTION

PTCA guide wire 0.014", stainless steel core, core to tip design

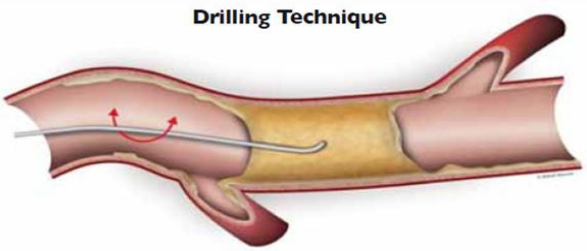
11 cm spring coil

TIP LOAD: 3.0 g

COATING: 40 hydrophilic coating SLIP- COAT, hydrophobic tip (non-coated)

RADIOPAQUE SEGMENT: 11 cm

180 and 300 cm available, straight, green shaft color - PTFE Coating



ASAHI Miracle NEO 3: updated wire with SION TECC core, 3.0 g tip load, 40 cm hydrophilic coating SLIP-COAT, 1 mm non-coated blunted tip (trapezoidal ball chip) to easy transmit the feel of the lesion, and to suppress the entry to the lesion tissue for the easy feel of the resistance, mini pre-shaped tip, 10 cm tip radiopacity)

PURPOSE

Ambiguous CTO drilling when the course of occluded vessel is unknown

Good choice for controlled drilling in the mixed morphology lesions.

AWE, RWE, parallel wire techniques.

A very good option when the intraplaque course is needed.

"Wire to stay in architecture."

TIPS & TRICKS

Controlled drilling. Advancement with fast-spinning safe.

Often an option in the AWE technique (Sion>Fielder XT-A/Fighter/Bandit>UB3)

When multiple small bridging collaterals at the CTO cap have a smaller chance to follow those bridges than with low tip load polymer jacket wires.

When advancing, there is a smaller chance of going out of the vessel trajectory.

A good option for CTOs with the unknown course due to the uncoated hydrophobic tip. It remains in the vessel architecture, with a tendency to stay intraplaque.„True-to-true" wire.

The strong shaft which provides a lot of support for the microcatheter.

With the Microcatheter parked at the CTO cap, a wire can be modified with manipulation for more penetrative force and control.

MISCELLANEOUS

Excellent tactile feedback thanks to medium tip load, bare coils and uncoated hydrophobic tip.

Long hydrophilic coating maintains high trackability, improving wire manipulation in heavy stenosed lesions.

Fine shaping improves vessel selectivity and reduces the risk of false lumen expansion.

SLIP-COAT hydrophilic coating over the spring coil until the middle of the shaft.

Better deflection control with Gaia wires, better slipperiness with Gladius EX.

CONFIANZA PRO/Conquest pro

ASAHI INTECC

- Tip load ..... 9.0 / 12.0 / 20.0 gf
- Tip radiopacity ..... 20 cm (8-20 17 cm)
- SLIP-COAT® coating over the spring coil, excluding the tip
- Tip outer diameter

Tapered guide wire for crossing complex lesion with heavy calcification or tough fibrous tissues.

CONSTRUCTION

PTCA guide wire 0.014", Conquest Pro and Pro 12 tapered tip 0.009", Conquest Pro 8-20 tapered to 0.008", stainless steel core, core to tip design

20 cm spring coil

CONFIANZA PRO, CONFIANZA PRO 12

TIP LOAD: 9.0 g, 12.0 g

COATING: 20 cm hydrophilic coating (SLIP- COAT) on spring coil, non coated distal tip

RADIOPAQUE SEGMENT: 20 cm

180 straight, green shaft color - PTFE Coating

OTHER PENETRATION WIRES (Peripheral): similar design to Confianza Pro (0.014" for regular coronary microcatheters):

ASTATO XS 20: guide wire 0.014", tapered tip to 0.008", tip load 20 g, radiopaque segment 17 cm, coil length 17 cm, hydrophilic coating with non coated distal tip.

ASTATO XS 40: guide wire 0.014", tapered tip to 0.009", tip load 40 g, radiopaque segment 17 cm, coil length 17 cm, hydrophilic coating with non coated distal tip. (When CP12, Hornet 14 fail)

PURPOSE

Penetration CTO wires with 9 and 12 gr tip load. Construction and purpose are similar to Hornet 10 and 14 wire, Warrior, but uncoated tip.

High tip load tapered guidewire for crossing complex lesions with heavy calcification or dense fibrous tissue. For penetration of calcification and proximal or distal thick, fibrous caps.

AWE, RWE, parallel wire techniques, parallel wire Seesaw method

ADR techniques, Re-entry from subintimal space, easier with Stingray or Recross

When a course of the vessel is well understood.

TIPS & TRICKS

Controlled penetration technique.

Slow advancement with a small amount of constant pressure to the wire or „tap technique. " Slight rotation of the tip less than 90° for advancement through the lesion.

Precise direction control, small 1-1.5 mm tip curve of about 15-30° with the gentle second curve. For more tortuous occlusions, the second curve should be more bend. Control of the wire tip orientation is crucial for success. For re-entering the true lumen from the subintima, the tip curve has to be much larger, up to almost 90°.

When used as penetration wire with Stingray LP (Stick and drive), shape tip with 30-45° bend at the distal 2-3 mm. A wire is more steerable than Stingray wire.

In curvature thick shaft does not deflect easily and has a tendency to go straight.

It can be useful for penetration when the CTO cap is located adjacent to a large side branch, and lower tip-load wires keep deflection in the side branch.

Penetration power is exponentially increased with the microcatheter closer to the wire tip.

After penetration, step-down wiring can be considered due to safety (escalation/de-escalation)

MISCELLANEOUS

Similar to Hornet 10 and 14 wires, Warrior and Infiltrac and Infiltrac Plus.

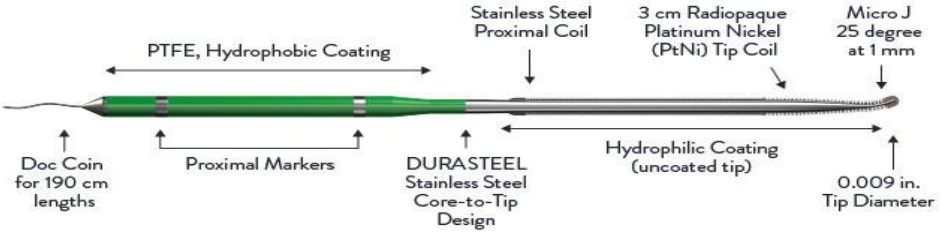
Hydrophilic coating over the entire length of the spring coil for better crossability, device deliverability, and trackability in challenging anatomy. Good torque transmission and support due to the thick core design.

The distal tip is not coated to allow it to catch on the entry point of the lesion. Good tactile information/feedback from the tip.

Shorter (180 cm) than other similar wires (Warrior 200 cm, Hornet 190 cm, Infiltrac 190 cm)

HI-TORQUE INFILTRAC
INFILTRAC PLUS

ABBOTT



CONSTRUCTION

PTCA guide wire 0.014", tapered pre-shaped tip to 0.009", DURASTEEL stainless steel, parabolic core grind, core to tip design. Pre-formed 1-mm Micro-J tip with 25° angulation, special tip technology with unique Micro-Texture design. Platinum Nickel tapered tip coil. Proximal markers on the shaft, 90 cm, and 100 cm.

TIP LOAD: INFILTRAC 11 g, INFILTRAC PLUS 14 g

COATING: hydrophilic coating on the spring coil, uncoated distal tip for tactile feedback

RADIOPAQUE SEGMENT: 3 cm

190 cm and 300 cm available, green shaft color - PTFE hydrophobic Coating

Illustration of the Micro-Texture tip design

Illustration of Pre-Shaped Micro-J Tip

PURPOSE

New CTO angioplasty guidewire with high penetration power. Unique MICROTEXTURE tip design for safety and better tactile feedback.

High tip load tapered guidewire for crossing complex lesions with heavy calcification or dense fibrous tissues. For penetration of calcification and proximal or distal thick, fibrous caps.

AWE, RWE, parallel wire technique

ADR techniques, Re-entry from subintimal space with Stingray or Recross

When a course of the vessel is well understood.

TIPS & TRICKS

Controlled penetration technique.

AWE in cases with a proximal capsule resistant to penetration.

Microtexture designed uncoated tip has better „grip" at the cap/lesion, with the smaller chance go outside vessel architecture. Provides great traction.

Slow advancement with a small amount of constant pressure to the wire or „tap technique". Slight rotation of the tip less than 90° for advancement through the lesion.

Precise direction control. For more tortuous occlusions, the second curve should be more bend. Control of the wire tip orientation is crucial for success.

It can be useful for penetration when the CTO cap is located adjacent to a large side branch, and lower tip-load wires keep deflecting into the side branch.

Penetration power is exponentially increased with the microcatheter closer to the wire tip.

After penetration, step-down wiring can be considered due to safety (escalation/de-escalation)

MISCELLANEOUS

Great steerability and easier access to the occlusion without causing prolapse due to pre-formed 1-mm Micro-J tip with 25° angulation

Micro-texture - unique design of the uncoated tip has great penetration power, providing greater traction and feedback with safety during procedures.

Excellent torque response due to parabolic core grind.

Two tip loads and penetration powers: Hi-Torque Infiltrac, at 11 g and 167 kg/in2, and Hi-Torque Infiltrac Plus, at 14 g and 224 kg/in^2

Similar purpose to Confianza Pro 9-12, Hornet 10 and 14 wires, Warrior. (uncoated tip like at Confianza)

Older Abbott penetration wires with parabolic Core grind: Progress 140T (tapered tip to 0.0105", polymer cover, tip load 15.5 g), Progress 200T (tapered tip to 0.009", polymer cover, tip load 13.5 g), Progress 40 (polymer cover, tip load 5.0 g), Progress 80 (polymer cover, tip load 11.5 g), Progress 120 (polymer cover, tip load 17.5 g)

MIRACLE Family

ASAHI INTECC

- Tip load .....3.0 / 6.0 / 12.0 gf
- Tip radiopacity .....11 cm
- Silicone coating over the spring coil

Guide wire with good tactile feed back which maintains torqueability through the occlusion.

CONSTRUCTION

PTCA guide wire 0.014", stainless steel core, core to tip design

11 cm spring coil

MIRACLEbros 3, MIRACLEbros 4.5, MIRACLEbros 6, MIRACLEbros 12

TIP LOAD: 3.0 g, 4.5g, 6.0 g, and 12.0 g.

COATING: 11 cm hydrophobic coating over spring coil

RADIOPAQUE SEGMENT: 11 cm

180 cm straight, green shaft color - PTFE Coating

PURPOSE

The older generation, full hydrophobic coating guidewire. It was introduced in 1995.

Good choice for controlled drilling into complex lesions.

AWE, RWE, parallel wire techniques, controlled drilling

MIRACLEbros 3 was previously the first choice wire for drilling PCI CTO technique

MIRACLEbros 6 higher driving force against tight lesions

MIRACLEbros 12 for penetration technique in CTO cases with thick, hard, fibrous caps and calcifications

When strong support and deliverability of devices is needed.

TIPS & TRICKS

Controlled drilling.

Safe with a smaller chance to go out of the vessel trajectory due to full hydrophobic coating.

With the Microcatheter parked at the CTO cap, a wire can be modified with manipulation for more penetrative force and control.

Excellent choice guidewires for delivering equipment to CTO segment or subintimal space, due to hydrophobic coating, and smaller chance to slip out of place.

Miraclebros 6-12 are a good option for Stingray ballon delivering. CrossBoss technique – advancing subintimal and then retracting Crossboss leaving the guidewire past the occlusion. Then advance the Stingray balloon on Miracle to the desired location.

Excellent tactile feedback when navigating through the occlusion

Overrotation in calcified lesions can result with tip fracture and separation

A good option for using with OPN NC balloons.

MISCELLANEOUS

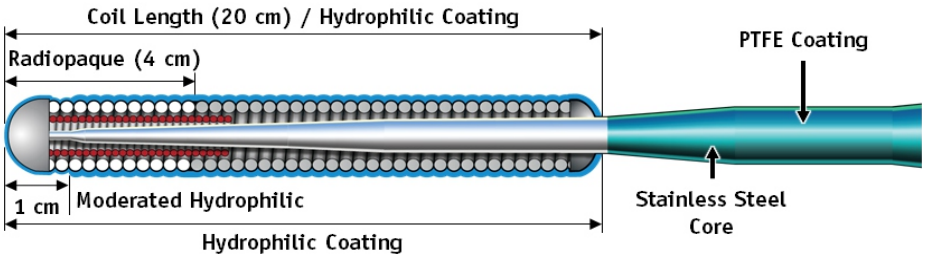
Designed to resist great force, thus lowering the chances of getting trapped in a lesion

Older generation wires. Design without the composite core. (before were the first choice for CTO). Today in most cases, replaced with composite core wires, Gaia family, stronger polymer jacket wires...

Lower possibility for distal vessel perforation.

SENTAI SAMURAI

BOSTON SCIENTIFIC



CONSTRUCTION

PTCA guide wire 0.014", Compound-Taper Stainless Steel Core - core to tip design, Inner core technology

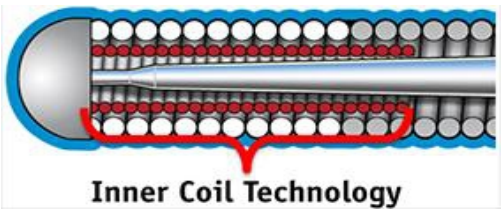
20 cm spring coil

TIP LOAD: 0.5 g

COATING: full-length hydrophilic coating, distal 1 cm reduced hydrophilic coating

RADIOPAQUE SEGMENT: 4 cm radiopaque segment

190 and 300 cm, straight and J tip, PTFE coating shaft.



Inner Coil Technology (ICT) - A stainless steel inner coil affixed directly to the distal portion of the stainless steel core for better shape retention and durability of the distal tip with reduced whipping, and better torqueability.

PURPOSE

First choice workhorse/frontline guidewire.

Similar modern options are Sion blue (Asahi), Spectre (Teleflex), Minamo (Asahi)

Routinely used for PCI, acute coronary syndromes, bifurcations.

Can serve as the first choice for getting the microcatheter to the desired location/inside collaterals or in front of the cap.

It can serve for septal collaterals probing. Sometimes easily crosses CC2 collaterals.

TIPS & TRICKS

Advancing with push and to-and-fro rotations

It can easily be manipulated without a torquer device. Safe positioning in the distal vessel.

Safe with better support when parked in small side branches.

Easy shaping with good shape retention, excellent operability during a side branch approach

Low possibility for distal vessel perforation. Enough support for most procedures.

Radiopaque segment 4 cm compared to 3 cm at Sion blue and most other workhorse wires.

MISCELLANEOUS

Inner Coil Technology (ICT) - A stainless steel inner coil affixed directly to the distal portion of the stainless steel core for better distal tip shape retention and durability

Balanced tip strength/flexibility and reduced whipping. Similar behavior to Sion blue.

Durable materials, slight chance of wire fracture.

Safe for trapping behind stent struts, safe withdrawal of the trapped wire.

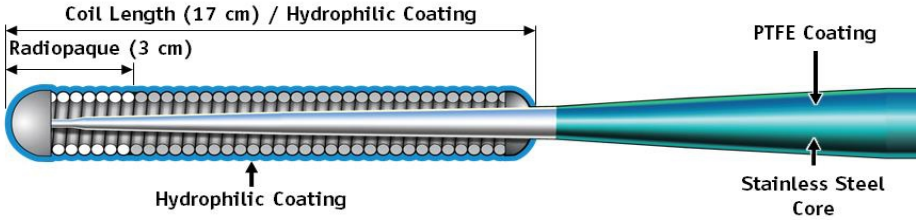
The reduced hydrophilic coating on the distal 1 cm – better tactile feedback, safety, with better crossability through calcified lesions

Hydrophilic coating over the rest of the spring coil for better trackability and device deliverability.

SAMURAI RC (tip load 1.2 g, 24 cm spring coil, full hydrophilic coating – excellent trackability through extremely tight and tortuous anatomy)

SENTAI MARVEL

BOSTON SCIENTIFIC



CONSTRUCTION

PTCA guide wire 0.014", Compound-Taper Stainless Steel Core – core to tip design

17 cm spring coil

TIP LOAD: 0.9 g

COATING: full-length hydrophilic coating

RADIOPAQUE SEGMENT: 3 cm

190 and 300 cm, straight and J tip, PTFE coating shaft.

PURPOSE

Workhorse/frontline guidewire in tight anatomy.

Recommended for tight and tortuous vessels and side branches

Can serve as the first option/probe in AWE, RWE, parallel wire techniques. Sliding, drilling techniques

Retrograde CTO, navigating septal collaterals.

Can be the first choice for crossing the invisible channel, also in a more simple CTO (J-CTO 0). A typical 1 mm CTO bend is recommended in CTO procedures like AWE, secondary bend regarding anatomy.

TIPS & TRICKS

Advancing with push and rotation

Can easily be manipulated without a torquer device.

Lower possibility for distal vessel perforation. Enough support for most procedures.

Radiopaque segment 3 cm like at most other workhorse wires. Samurai has 4 cm radiopaque segment.

With the Microcatheter parked at the CTO cap, a wire can be modified with manipulation for more penetrative force and control.

MISCELLANEOUS

Hydrophilic coating for easy crossability with good trackability and device deliverability

Similar wire construction and purpose to Sion

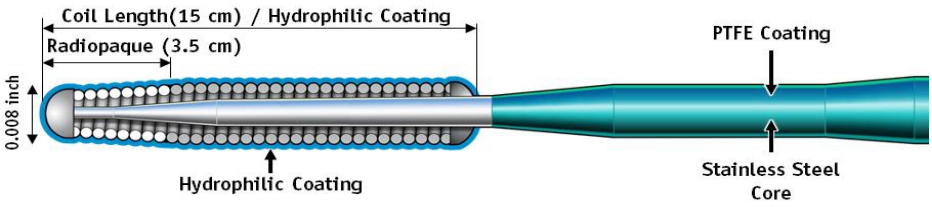
Durable materials, small chance of wire fracture.

Compound-Taper Stainless Steel Core - provides 1:1 torque response, outstanding trackability, and rail support for device delivery.

Safe for trapping behind stent struts, safe withdrawal of the trapped wire.

SENTAI JUDO Family

BOSTON SCIENTIFIC



CONSTRUCTION

PTCA guide wire 0.014", tapered tip 0.008", Compound-Taper one-piece Stainless Steel Core - core to tip design, Micro EMT technology: exactly matches the taper of the core and coil

15 cm spring coil

TIP LOAD: JUDO 1 - 1.0 g, JUDO 3 - 3.0g, JUDO 6 - 6.0 g

COATING: full lengthhydrophilic coating

RADIOPAQUE SEGMENT: 3.5 cm

190 and 300 cm, straight, PTFE coating shaft.

Penetration force: JUDO 1 - 31 gf/mm2, JUDO 3 – 93 gf/mm2, JUDO 6 – 185 gf/mm2.

6 cm long tapering from 0.014" to 0.008" with Micro EMT technology

PURPOSE

Tapered, hydrophilic specialty guidewires designed for complex CTO cases allow maintained direct tactile feedback of the hardness of the plaque

Precise intraluminal crossing, when the vessel course is known (like at Gaia family wires)

JUDO 1 - Soft intraluminal crossing wire for antegrade microchannels.

JUDO 3 - Intermediate intraluminal crossing wire for fibro-calcific lesions.

JUDO 6 - Extra penetration with excellent steerability in tight calcific lesions.

Can serve as first choice wire in AWE, RWE, parallel wire techniques when vessel course is known.

TIPS & TRICKS

The best advancement is with the slight push and slow rotation for sliding and precise intraluminal navigation.

Similar principle to Gaia directional control.

If the wire direction and tactile feedback are inappropriate, starting from the beginning can sometimes help make another pathway.

Don't use Judo 3, and especially Judo 6 when the CTO course is unknown.

Due to the Micro EMT design, wires avoid exit into the subintimal space; the flexibility of the distal portion along with the precise torque enables effective intraplaque recanalization.

MISCELLANEOUS

Micro EMT: technology that exactly matches the taper core and coil

Entry - with the smallest tip on the market (0.008" – 0.20 mm) and the long taper (6 cm) easy lesion entry in the complex lesion is facilitated.

Maneuverability - flexible distal shaft for precise intraluminal navigation and a smaller risk of perforation

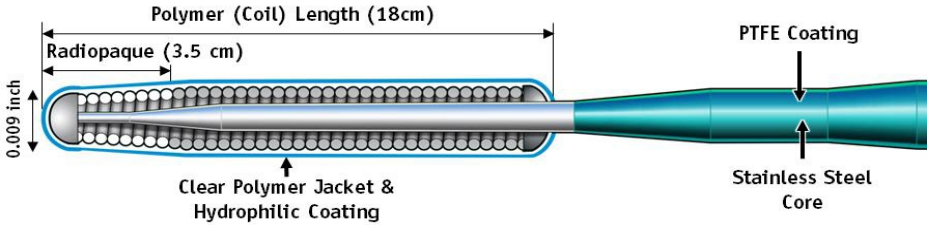
Torque - the core and coils move as one object due to exactly matched tapers, with eliminated whip and enables more precise steerability.

A combination of an effective penetration force, flexibility, and precise torque control makes them one of the best crossing guidewires particularly for an intraluminal crossing of occlusions.

Compound-Taper Stainless Steel Core - The unique design of HORNET's stainless steel core for outstanding trackability and 1:1 torque response

SENTAI FIGHTER

BOSTON SCIENTIFIC



CONSTRUCTION

PTCA guide wire 0.014", tapered tip 0.009", Taper Stainless Steel Core - core to tip design. Micro-Stamped core

18 cm spring coil

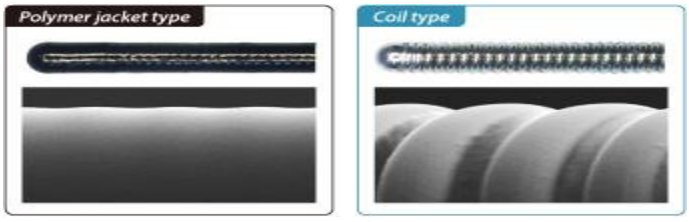
TIP LOAD: 1.5 g

COVER: polymer jacket 18 cm

COATING: full-length hydrophilic coating

RADIOPAQUE SEGMENT: 3.5 cm

190 and 300 cm, straight, PTFE coating shaft.



The polymer fills the irregularities of the coils and reduces the contact resistance. The slippery property is enhanced by applying a hydrophilic coating on the polymer.

PURPOSE

Soft polymer jacket guidewire with a tapering tip.

Often the first choice wire in AWE, RWE, parallel wire techniques.

For the occluded lesions without a stump.

Controlled loose tissue tracking by small curve (<1 mm)

Even in more complex CTO cases, a short„probe" with Fighter (or Fielder XT-A, Bandit...) wires is a good option and sometimes successful.

Can serve as knuckle wire (when the vessel course is unknown, CTO segment is long, if the artery is calcified...). Safe maneuver with a low chance for perforation.

TIPS & TRICKS

In many cases can serve as the first choice in AWE, RWE

Great sliding and drilling performance with fast rotation.

The best advancement is with slight constant push and rotation for sliding and drilling techniques. If the wire direction and tactile feedback are inappropriate, starting from the beginning can sometimes help make another pathway.

Due to the short radiopaque segment of 3.5 cm, there is better visualization of small single marker CTO balloons when needed in cases of microcatheter uncrossable lesions. In comparison, radiopaque segment is 16 cm long in Fielder XT-A and 10 cm long in Bandit.

Even with a polymer jacket and tapered tip, the operator can easily feel a lack of penetration power. Then in similar anatomy, escalation to stronger polymer jacket wires is appropriate (Gladius, Pilot 200, Raider)

Beware of the wire course. Even with a lower tip load, small distal coronary perforations (type V perforations) can develop. Often treated conservatively, but follow-up with echocardiography is needed.

MISCELLANEOUS

Tapered 0.009" Core-To-Tip Design with 1:1 torque response for navigating through challenging lesions.

Due to the Micro-Stamped Core, the wire facilitates a small, controlled prolapse and retains that shape.

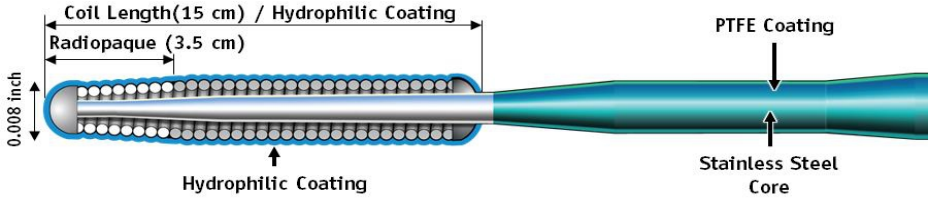
Tactile information/feedback from the tip is less accurate because insulation of the polymer jacket and hydrophilic coating.

A wire is hardly affected by the curve, and plaque retains control after passing heavy stenosis and tortuosity.

Limitations: poor penetration force, delayed initial torque response, and weak torque response in hard plaque.

SENTAI HORNET Family

BOSTON SCIENTIFIC



CONSTRUCTION

PTCA guide wire 0.014", tapered tip 0.008", Compound-Taper Stainless Steel Core - core to tip design

15 cm spring coil

TIP LOAD: HORNET 10 - 10 g, HORNET 14 - 14 g

COATING: full-length hydrophilic coating coil length 15 cm

RADIOPAQUE SEGMENT: 3.5 cm

190 and 300 cm, straight, PTFE coating shaft.

Penetration force 432 gf/mm2. „Most dangerous" coronary wire due to 14 gr tip load and 0.008" tip profile.

PURPOSE

Penetration CTO wires with 10 and 14 gr tip load. Construction and purpose are similar to the Confianza family, Warrior, and Infiltrac.

High tip load tapered guidewire for crossing complex lesions with heavy calcification or dense fibrous tissues. For penetration of calcification and proximal or distal thick, fibrous caps.

AWE, RWE, parallel wire techniques, parallel wire Seesaw method, when vessel course is known.

ADR techniques, wire re-entry techniques, Re-entry from subintimal space with Stingray or Recross

When a course of the vessel is well understood.

TIPS & TRICKS

Controlled penetration technique.

Slow advancement with a small amount of constant pressure to the wire or „tap technique". Slight rotation of the tip less than 90° for advancement through the lesion.

Precise direction control, small 1-1.5 mm tip curve with the gentle second curve. For more tortuous occlusions, the second curve should be more bend. Control of the wire tip orientation is crucial for success.

For penetration technique, small 1-1.5 mm tip curve of about 15-30°. For re-entering to the true lumen from the subintima, the tip curve has to be much larger, up to almost 90°.

When used as penetration wire with Stingray LP (Stick and drive), shape tip with 30-45° bend at the distal 2-3 mm. A wire is more steerable than Stingray wire.

In curvature, the thick shaft does not deflect easily and has a tendency to go straight.

It can be helpful for penetration when the CTO cap is located adjacent to a large side branch, and lower tip-load wires keep deflecting into the side branch.

Penetration power is exponentially increased with the microcatheter closer to the wire tip.

The distal tip is coated; careful advancement is needed to avoid perforation. (Confianza family and Infiltrac don't have coated tip)

After penetration, step-down wiring can be considered due to safety (escalation/de-escalation)

MISCELLANEOUS

Similar to Confianza family wires, Warrior and Infiltrac and Infiltrac Plus.

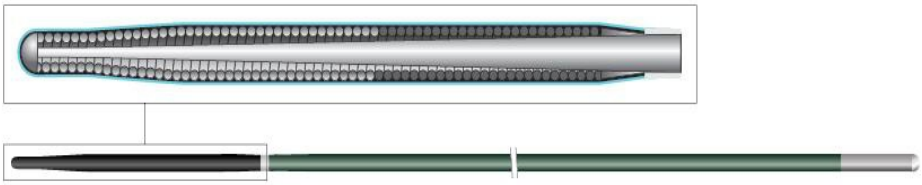
The smallest tip profile of any coronary guidewire – Tapered to 0.008" with outstanding ability to cross the most challenging lesions.

Hydrophilic coating over the entire length of the spring coil for better crossability, device deliverability, and trackability in challenging anatomy.

Good tactile information/feedback from the tip.

BANDIT

TELEFLEX



CONSTRUCTION

PTCA guide wire 0.014", 0.008" tapered tip, Stainless steel core-to-tip design, polymer jacket wire 16 cm spring coil

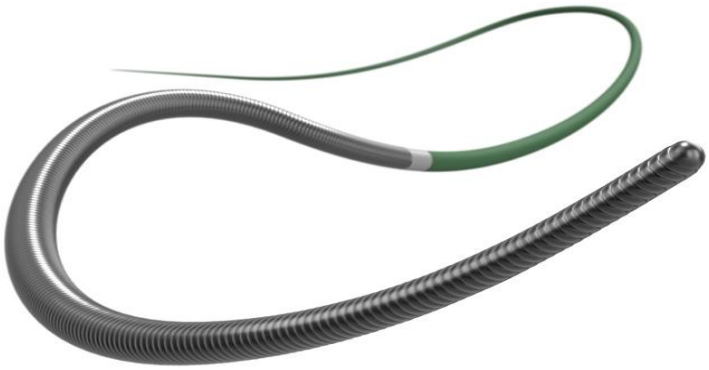
TIP LOAD: 0.8 g

COVER: 17 cm polymer jacket

COATING: 17 cm hydrophilic coating

RADIOPAQUE SEGMENT: 10 cm

200 and 300 cm available, straight tip



The polymer fills the irregularities of the coils and reduces the contact resistance. The slippery property is enhanced by applying a hydrophilic coating on the polymer.

PURPOSE

Low-tip load, tapered, polymer-jacketed specialty wire designed for precise wire techniques and serves as a frontline guidewire when navigating complex lesions.

Controlled loose tissue tracking by small curve (<1 mm)

(alternative for Fielder XT family or Sentai Fighter). For the occluded lesions without a stump.

Can serve as first choice wire in AWE, RWE, parallel wire techniques

Even in more complex CTO cases, a short „probe" with Bandit (or Fighter, Fielder XT-A...) wires is a good option and sometimes successful.

Can serve as knuckle wire (when the vessel course is unknown, CTO segment is long, if the artery is calcified...). Safe maneuver with a low chance for perforation.

TIPS & TRICKS

In many cases, the first choice in AWE, RWE.

The best advancement is with slight constant push and rotation for sliding and drilling techniques. If the wire direction and tactile feedback are inappropriate, starting from the beginning can sometimes help make another pathway.

At the intraplaque course, especially in long or calcified lesions, resistance when advancing the wire is present, with visualized buckling of the wire body and specific tactile feedback.

Careful advancement is needed. Polymerjacket wires can go subintimal and sometimes feel like intimal, sliding without free tip movement/knuckle formation. When subintimal, in most situations the wire is not„fixed, "and behavior is different than in the above described intraplaque course.

Even with a polymer jacket and tapered tip, the operator can easily feel a lack of penetration power. Then in similar anatomy, escalation to stronger polymer jacket wires is appropriate (Raider, Gladius, Pilot 200...)

ETL concept – tip load of the wire, can be modified with the position of the microcatheter from the wire tip. In the range of 12 mm to 2 mm from the microcatheter tip, some wires have a tip load range of almost 20 gr.

Effective tip load range (ETL) - Bandit tip load can be modified with microcatheter support from 0.8 gr to almost 4.0 gr. Better with strong microcatheters like Turnpike, Corsair Pro, Turnpike LP

MISCELLANEOUS

Tactile information/feedback from the tip is less accurate because insulation of the polymer jacket and hydrophilic coating.

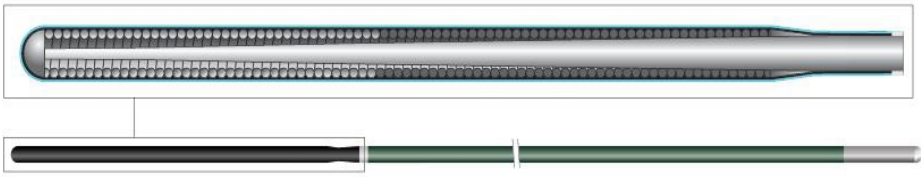
From the bench test, more hydrophilic and more lubricious than the Fielder XT. More durable than Fielder XT.

Compared to Fielder Family and Fighter, Bandit is 200 cm long (others are 190 cm) for easier manipulation, trapping, etc.

Limitations: poor penetration force, delayed initial torque response, and weak torque response in hard plaque.

RAIDER

TELEFLEX



CONSTRUCTION

PTCA guide wire 0.014", non-tapered tip, Stainless steel core-to-tip design
25 cm spring coil

TIP LOAD: 4.0 g

COVER: 30 cm polymer jacket

COATING: 30 cm hydrophilic coating, coated ball tip

RADIOPAQUE SEGMENT: 10 cm

200 and 300 cm available, straight tip

PURPOSE

Mid-tip load, non-tapered, polymer jacketed specialty wire. Construction and purpose are similar to Pilot 200 wire. Long spring coil. The main goal is to stay inside the architecture of the vessel.

AWE, RWE, parallel. Navigating long and tortuous occluded segments, controlled drilling.

CTO with ambiguous route - controlled loose tissue tracking/sliding when the course of occluded vessel is unknown

In-stent CTO drilling and sliding

It can serve as Knuckle wire.

Can serve as „Swap" wire in Stingray technique

TIPS & TRICKS

Sliding and drilling technique. Often used in AWE, RWE (Fielder XT-A/Bandit/Fighter > UB/Judo > Raider/Gladius...)

The best advancement is with slight constant push and rotation for sliding and drilling techniques. Fast rotations with the torquer device in alternating directions are possible.

Careful advancement is needed. Polymerjacket wires can go subintimal and sometimes feel like intimal, sliding without free tip movement/knuckle formation.

Navigates long segments with relatively low risk of perforation but high risk of subintimal tracking.

ETL concept – tip load of the wire, can be modified with the position of the microcatheter from the wire tip. In the range of 12 mm to 2 mm from the microcatheter tip, some wires have a tip load range of almost 20 gr.

Effective tip load range (ETL) - Raider tip load can be modified with microcatheter support from 4.0 gr to almost 14.0 gr. The best with microcatheters Turnpike and Turnpike LP because of microcatheter tip construction. With Corsair Pro ETL tip load range is 4.0 to up to 10.0 gr.

When re-entry from subintimal space is hard (AWE, parallel), many tears of the intima occur with wires manipulation (for example, Gaia). Sometimes changing wire into mid-tip load polymer jacket wires like Raider/Gladius/Pilot 200 makes re-entry into the true distal lumen easier.

A not good option for heavily calcified lesions. Polymer cover and wire tip can easily break when drilling in calcified lesions.

MISCELLANEOUS

Similar to Pilot 200 wire. Follow micro-channels if available. Crossing into subintimal space in fibrocalcific CTO-s without microchannels. 200 cm long (not standard 190 cm like Pilot 200) (Gladius EX is also 200 cm long)

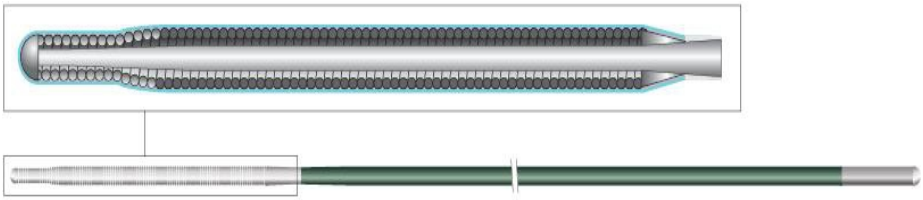
Tactile information/feedback from the tip is less accurate because insulation of the polymer jacket and hydrophilic coating.

The wire is hardly affected by the curve, and plaque retains control after passing heavy stenosis and tortuosity. Durable coating. Easy preshaping due to polymer jacket. Slight chance for wire fracture.

Guidewire's extended radiopaque tip length (10 cm vs. 3 cm on Pilot 200) is designed to promote precise positioning under fluoroscopy. Penetration power is 12% % higher than with Pilot 200 (54.1 g/mm2 vs 48.5 g/mm2). Support profile is the same as Pilot 200.

WARRIOR

TELEFLEX



CONSTRUCTION

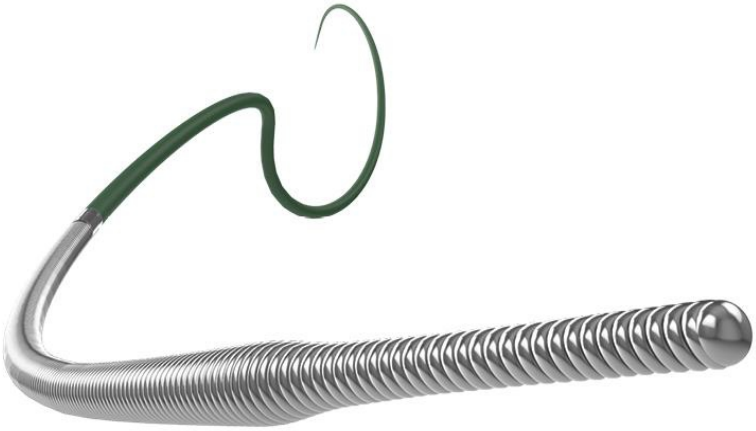
PTCA guide wire 0.014" to 0.009" tapered tip, Stainless steel core-to-tip design 20 cm spring coil

TIP LOAD: 14.0 g

COATING: 20 cm hydrophilic coating, coated ball tip

RADIOPAQUE SEGMENT: 2.5 cm

200 and 300 cm available, straight tip



PURPOSE

Penetration CTO wire with 14 gr tip-load. Construction and purpose are similar to Hornet 14 wire. (Confianza/Conquest). High torque response and high penetration power.

For penetration of calcification and proximal or distal thick, fibrous caps.

AWE, RWE, parallel wire techniques

ADR techniques, Re-entry from subintimal space with Stingray or Recross

When the course of the vessel is well understood.

TIPS & TRICKS

Controlled penetration technique.

Slow advancement with a small amount of constant pressure to the wire or „tap technique". Slight rotation of the tip less than 90° for advancement through the lesion.

Precise direction control. For more tortuous occlusions, the second curve should be more bend. Control of the wire tip orientation is crucial for success.

It can be useful for penetration when the CTO cap is located adjacent to a large side branch, and lower tip-load wires keep deflecting into the side branch.

After penetration, step-down wiring can be considered due to safety (escalation/de-escalation)

When used as penetration wire with Stingray LP (Stick and drive), shape tip with 30-45° bend at the distal 2-3 mm. A wire is more steerable than Stingray wire.

ETL concept – tip load of the wire, can be modified with the position of the microcatheter from the wire tip. In the range of 12 mm to 2 mm from the microcatheter tip, some wires have a tip load range of almost 20 gr.

Effective tip load range (ETL) - Warrior tip load can be modified with microcatheter support from 14.0 gr to almost 34.0 gr. The best with microcatheter Turnpike. With Turnpike LP and Corsair Pro ETL tip load range is 14.0 to up 25.0 – 30.0 gr.

MISCELLANEOUS

Similar to Hornet 14 wire (0.008" tip), Conquest/Confianza Pro 12, Infiltrac Plus (uncoated tip)

Hydrophilic coating over the entire length of the spring coil for better crossability, device deliverability, and trackability in challenging anatomy.

Good tactile information/feedback from the tip.

GRAND SLAM

ASAHI INTECC

- Tip load .....0.7 gf
- Tip radiopacity .....4 cm
- Silicone coating over the spring coil

Stiff wire shaft provides extra support for delivery of interventional devices in extreme cases.

CONSTRUCTION

PTCA guide wire 0.014", stainless steel core, core to tip design

4 cm spring coil

TIP LOAD: 0.7 g

COATING: 4 cm Hydrophobic Silicone coating on the spring coil

RADIOPAQUE SEGMENT: 4 cm

180 and 300 cm available, straight and J-shape, green shaft color, PTFE coating

Other support wires - ASAHI Sion blue ES, Abbott Iron Man, Boston Scientific Mailman...

PURPOSE

Highly supportive guide wire offering stress-free delivery (SUPPORT)

Stiff wire shaft for extra stability and support - delivery of interventional devices in extreme cases. Strongest wire support on the market.

Ideal wire for exchange inside microcatheter after crossing the CTO segment.

A good option for interventions where OPN NC ultrahigh-pressure balloons are needed.

TIPS & TRICKS

For extra stability and support in extreme cases.

After crossing the lesion with CTO wire and microcatheter, the Grand slam wire is the ideal wire to exchange inside the microcatheter and proceed with the intervention regularly. Trapping or Asahi extension wires are needed for microcatheter removal.

When navigating through the vessel without an OTW device, due to the short spring coil and flexible low tip load, the distal end of the wire is prone very easy to damage.

The wire stuck easily on calcified lesions. When the coil is deformed, an Rx balloon can be used to straighten the tip of the wire for easier navigation through the vessel.

Because of the properties mentioned above, the best way to navigate through the vessel is slowly advancing with fast about 180° rotations in both directions.

The radiopaque segment for distal measurements is 4 cm, opposite of 3 cm like at many other wires.

An ideal choice for usage with OPN NC ultra high-pressure balloons. There is less chance for monorail/OTW devices "sticking" on the shaft with high-pressure inflations than Sion (SLIP-COAT coated) wires.

MISCELLANEOUS

Hard passing through the vessel (narrow, calcified lesions) because of the fragile and hydrophobic tip.

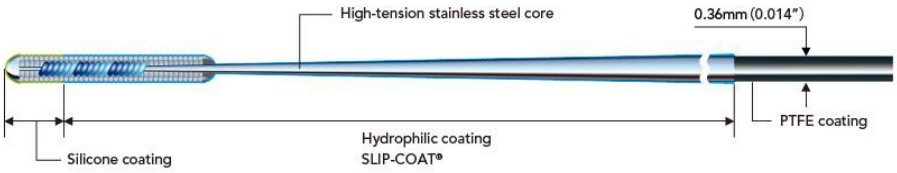
One of the most supportive wires on the market. Better support than Sion blue Extra support, but much worse trackability and deliverability.

Very low possibility for distal vessel perforation. Silicone hydrophobic coating on 4 cm long spring coil.

Because of the strong and thick shaft and short spring coil, the wire straightens tortuous segments of the vessels. Sometimes concertina effect (coronary pseudolesion) is visualized.

SION BLUE ES

ASAHI INTECC



CONSTRUCTION

PTCA guide wire 0.014", (SION TECC core) - Stainless steel core + Composite core (ACT ONE rope coil, round core, twist wire), Round core with balanced support shaft.

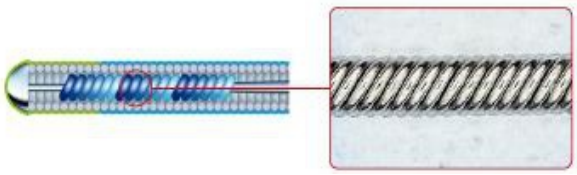
8.5 cm spring coil

TIP LOAD: 0.5 g

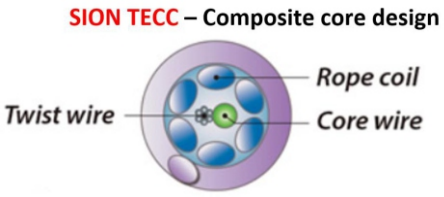
COATING: Hydrophilic coating SLIP- COAT, 15 mm tip cover - hydrophobic silicone coating

RADIOPAQUE SEGMENT: 3 cm

190 and 300 cm available, straight and J, Unique dark blue shaft color - PTFE Coating



15 mm distal tip silicone hydrophobic coating, ASAHI brand rope coil



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PURPOSE

Highly supportive guide wire offering stress-free delivery (SUPPORT). Thicker high tension stainless steel core, shorter spring coil segment.

Usable as a frontline guidewire with easy control for branch selection in more complex scenarios

Tip from the standard Sion blue with Composite core (SION TECC), great tip flexibility, durable tip for treating multiple lesions.

1.5 cm silicone hydrophobic coating from the tip for a safer procedure, softer tip with reduced lubricity.

TIPS & TRICKS

Maneuvering is similar to standard workhorse wires like Sion blue.

Durable tip, but caution is needed when forming the tip curvature, easy deformation/fracture of the distal end in the twist and core wire parts.

It can easily be manipulated without a torquer device. Minimal loss of steerability on tortuous vessels. Superior torque response

Tip trackability is similar to standard Sion blue. Overall deliverability is not good as Sion blue.

Dark blue shaft for easy recognition when working with more wires. Most other Asahi wires have a green shaft.

MISCELLANEOUS

Well balanced reinforced shaft enhances/stabilizes guiding catheter

Durable tip, but prone to enter in small side branches when navigating through the vessel. The tip is the same, but the trackability and steerability of the wire through the vessel are harder than with Sion blue because of the short spring coil and thicker shaft. Wire breaks easier than Sion blue.

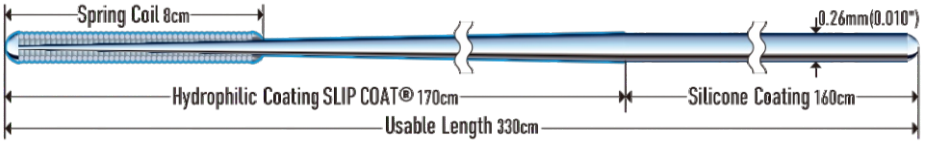
Much easier manipulation of the wire when negotiating vessel and lesion than Grand slam, though less support provided than Grand slam wire.

Very low possibility for distal vessel perforation.

Caution when using OPN balloons at high pressures, easy stuck on the balloon shaft due to suboptimal coating (SLIP-COAT) compatibility with some balloon shafts internal layers. With OPN balloons better to use Grand Slam wire.

RG3

ASAHI INTECC



CONSTRUCTION

PTCA guide wire 0.010", 0.26 mm, stainless steel core – core to tip design

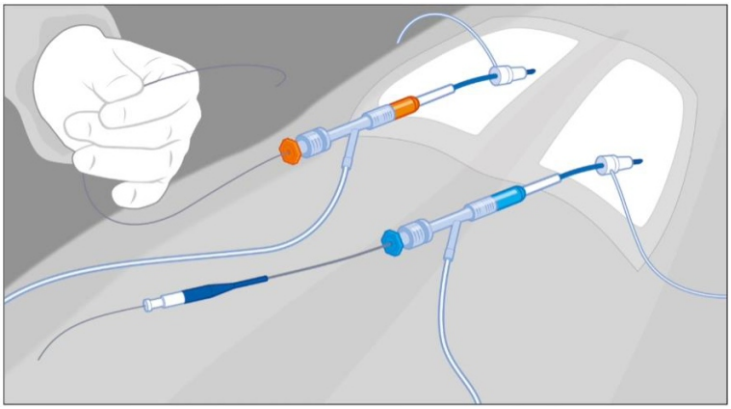
8 cm spring coil

TIP LOAD: 3.0 g

COATING: 170 cm distal hydrophilic coating, 160 cm proximal hydrophobic (silicon) coating

RADIOPAQUE SEGMENT: 3 cm

330 cm, straight, rounded hydrophilic tip



Similar wire: R350 (Teleflex) 0.013" nitinol 350 cm long wire, 5 cm radiopaque tip, 5 cm coil length, tip load 3 gr, straight tip, distal 200 cm hydrophilic coating

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Source: https://medical.asahi-intecc.com/en/products-coronary/asahi-rg3.html

PURPOSE

0.010" Guidewire externalization only in retrograde CTO PCI.
Externalised RG3 provides excellent support rail for anterograde delivery of devices
Optimal wire strength, hydrophilic coating 0.010" shaft - superior inside-microcatheter pushability. Minimized risk of complications, reduced inner wall damage possibility. Gentle to coronary arteries.

TIPS & TRICKS

EXTERNALIZATION PROCESS

1. In the retrograde procedure, position a CTO frontline wire inside antegrade guide catheter then advance retrograde microcatheter inside antegrade guide catheter (direct, extension catheter facilitated...)
2. When retrograde MC is inside antegrade guide catheter, exchange CTO frontline retrograde wire with RG3 wire (spring coil part hydrophilic of the wire)
3. Advance RG3 wire via retrograde microcatheter down the antegrade guide catheter to the hemostatic valve
4. When the wire is near the hemostatic valve or visible, remove the hemostatic valve.
5. Place the introducer needle into the hemostatic valve
6. Advance RG3 out of the anterograde guide catheter
7. Thread RG3 wire through the introducer needle
8. Reconnect the hemostatic valve with the guide catheter
9. Advance the RG3 wire through the introducer needle
10. Remove introducer needle
11. Retract retrograde microcatheter to the distal part of the diseased vessel (distally from the distal CTO cap, protecting collaterals with microcatheter in place. Be careful when pulling retrograde microcatheter back as It may cause retrograde guide catheter to advance, causing dissection of the donor's vessel. The best way is to disengage the retrograde microcatheter out of the ostium of the main vessel into the aorta when performing the maneuver.
12. Secure the RG3 wire with a torquer device at the retrograde microcatheter entrance to prevent losing the distal end of the wire.
13. Externalisation is complete! Advance devices over the RG3 wire on the soft spring coil part via the antegrade guiding catheter

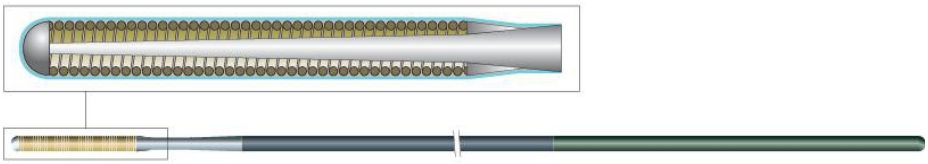
Avoid wire kinking due to much harder deliverability through retrograde microcatheter.
After externalization, within anterograde intervention over the externalized wire, park retrograde microcatheter in safe position inside the distal true lumen, across the collaterals – protection of the collaterals with the microcatheter.
Do not allow anterograde balloons or microcatheters to meet retrograde microcatheter on the same externalized wire. Can cause gear entrapment.
When wire externalized, avoid pulling back on equipment without watching for the potential injury at vessel ostium due to guide movement. Pushing is harmless in most cases.
Do not remove RG3 through the collaterals without a microcatheter. Cutting phenomenon can occur with perforation/dissection of collaterals. When removing retrograde gear, the safest method is to disengage guiding from the coronary ostium, leave wire across the collaterals to check them, drive MC back inside collaterals at least in the first part, and remove the wire and finally the microcatheter.
When MC is destroyed with excessive manipulations, sometimes RG3 can go inside, to help replace MC with the new one, rather than taking everything out and beginning from the start.

MISCELLANEOUS

In most cases, good deliverability and smooth passage inside most microcatheter. Sometimes high friction at multiple bendings, sharp angles, complex collateral anatomy. In that cases, R350 can be used because of the thicker design with more support.
The wire is gentle to the coronary arteries and easy to manipulate.

R350

TELEFLEX



CONSTRUCTION

PTCA guide wire 0.013", nitinol core – core to tip design

5 cm spring coil

TIP LOAD: 3.0 g

COATING: 200 cm distal hydrophilic coating

RADIOPAQUE SEGMENT: gold-plated tungsten coil 5 cm

350 cm, straight, rounded hydrophilic tip

PURPOSE

For guide wire externalization only.
Combines 350 cm length for externalization and nitinol core for flexibility and kink resistance - excellent deliverability through tortuous vessels.
Durable, hydrophilic coating on distal 200 cm for lubricity

TIPS & TRICKS

EXTERNALIZATION PROCESS

1. In the retrograde procedure, position a CTO frontline wire inside antegrade guide catheter, then advance retrograde microcatheter inside antegrade guide catheter (direct, extension catheter facilitated...)
2. When retrograde MC is inside antegrade guide catheter, exchange CTO frontline retrograde wire with R350 wire (spring coil part hydrophilic of the wire)
3. Advance R350 wire via retrograde microcatheter down the antegrade guide catheter to the hemostatic valve
4. When wiring near the hemostatic valve or visible, remove the hemostatic valve.
5. Place the introducer needle into the hemostatic valve
6. Advance R350 out of the anterograde guide catheter
7. Thread R350 wire through the introducer needle
8. Reconnect the hemostatic valve with the guide catheter
9. Advance the R350 wire through the introducer needle
10. Remove introducer needle
11. Retract retrograde microcatheter to the distal part of the diseased vessel (distally from the distal CTO cap, protecting collaterals with microcatheter in place. Be careful when pulling retrograde microcatheter back as It may cause retrograde guide catheter to advance, causing dissection of the donor's vessel. The best way is to disengage the retrograde microcatheter out of the ostium of the main vessel into the aorta when performing the maneuver.
12. Secure the R350 wire with a torquer device at the retrograde microcatheter entrance to prevent losing the distal end of the wire.
13. Externalisation is complete! Advance devices over the R350 wire on the soft spring coil part via the antegrade guiding catheter

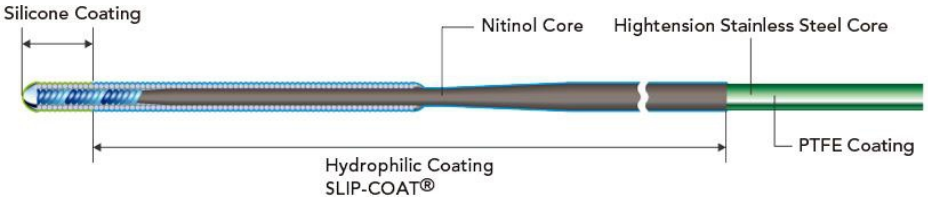
After externalization, within anterograde intervention over the externalized wire, park retrograde microcatheter in safe position inside the distal true lumen, across the collaterals – protection of the collaterals with the microcatheter.
When wire externalized, avoid pulling back on equipment without watching for the potential injury at vessel ostium due to guide movement. Pushing is harmless in most cases.
Do not allow anterograde balloons or microcatheters to meet retrograde microcatheter on the same externalized wire. Can cause gear entrapment.
Do not remove R350 through the collaterals without a microcatheter. Cutting phenomenon can occur with perforation/dissection of collaterals.
When removing retrograde gear, the safest method is to disengage guiding from the coronary ostium, leave wire across the collaterals to check them, drive MC back inside collaterals at least in the first part, and remove the wire and finally the microcatheter.

MISCELLANEOUS

In most cases, good deliverability and smooth passage inside most microcatheter. Higher OD in comparison to RG3 (0.013") with better support. 20 longer than RG3 is sometimes beneficial at long retrograde routes.

MINAMO

ASAHI INTECC



CONSTRUCTION

PTCA guide wire 0.014" (0.36 mm), Hybrid guidewire - 3 pieces coaxial core - high tension stainless steel + Nitinol core + SUS round press core with ACT ONE at the tip

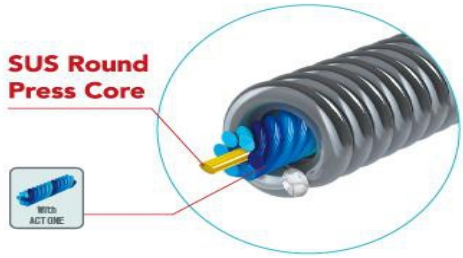
20 cm spring coil (3 cm platinum coil at the tip + 17 cm stainless steel coil)

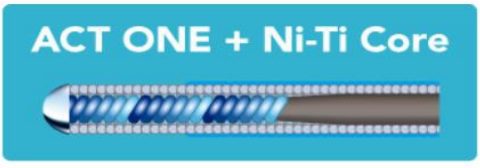
TIP LOAD: 0.5 g

COATING: tip silicone coating 25 mm + hydrophilic coating SLIP-COAT

RADIOPAQUE SEGMENT: 3 cm

190 and 300 cm available, straight, J-shape, and preshaped, PTFE Coating





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PURPOSE

Frontline/workhorse guidewire. Fusion of technologies for the next-gen hybrid guidewire. ROUND PRESS CORE for better torque response, durability (3D), easy shape/reshape

Routinely used for PCI, acute coronary syndromes, bifurcations, wire in complex PCI, for example after trapping of the microcatheter and wire exchange.

It can serve as the first choice for getting the microcatheter to the desired location/inside collaterals or in front of the cap.

CC2 and Septal collaterals probing.

TIPS & TRICKS

Advancement with pushing and rotation.

Tip shape acts as an indicator for shaping direction. A new shaping needle attached, enables easier shaping.

Can easily be manipulated without a torquer device.

Caution when using OPN balloons at high pressures, easy stuck on the balloon shaft due to suboptimal coating (SLIP-COAT) compatibility with some balloon shafts internal layers. With OPN balloons better to use Grand Slam wire.

Safe for trapping behind stent struts, safe withdrawal of the trapped wire.

MISCELLANEOUS

Very low possibility for distal vessel perforation. Enough support for most procedures.

Easy to shape/reshape (close to that of a flat core, prevents 3D shaping).

More durable than most competitors in sliding friction situations or when getting stuck with other devices.

Excellent durability because of including ACT ONE in a Ni-Ti Core. Wire can maintain shape even under long procedure time and quick movement.

Ni-Ti Core at the tip - quick initial response / excellent controllability by the SUS Round Press Core and ACT ONE

Silicone hydrophobic coating from the tip for a safer procedure, softer tip with reduced lubricity.

Similar Hybrid design wire with Nitinol and stainless core: RUNTHROUGH NS (Terumo)

HI-TORQUE BALANCE MIDDLEWEIGHT UNIVERSAL II

ABBOTT

CONSTRUCTION

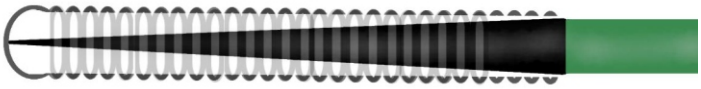
PTCA guide wire 0.014", Elastine NITINOL core, DURASTEEL shaping ribbon design

TIP LOAD: 0.7 g

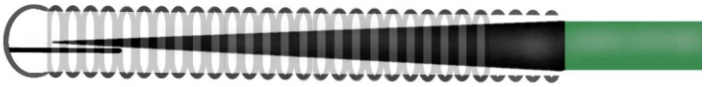
COATING: Hydrophilic coating, TURBOCOAT (intermediate polymer sleeve and hydrophilic coating), distal 3 cm non-coated

RADIOPAQUE SEGMENT: 3 cm radiopaque segment (non coated radiopaque coils). Single marker 4.5 cm from the tip

190 and 300 cm available, straight and J, SMOOTHGLIDE shaft coating



Core to tip design



Shaping ribbon design

(HT BMW U – without SMOOTHGLIDE, tip load 0.6 g.)

(HT BMW – without TURBOCOAT and SMOOTHGLIDE, tip load 0.6 g, hydrophilic or hydrophobic)

PURPOSE

Frontline (workhorse) guidewire - the balance of support and flexibility, rapid, uncomplicated interventions.

Routinely used for reular PCI, acute coronary syndromes, bifurcations..

A frontline wire can serve as the First choice for getting the microcatheter to the desired location/inside collaterals or in front of the cap.

It can serve for septal collaterals probing. Sometimes easily crosses CC2 collaterals.

TIPS & TRICKS

Regular pushing and rotating for advancement

The use of Torquer is advised; the wire is moderately torquable but has minimal friction due to light hydrophilic coating.

Dye injection may also be helpful to propagate distal advancement.

Single marker placed 4.5 cm from the tip (1.5 cm from the radiopaque segment) for easy lesion length determination.

The tip is suitable for bending in a J configuration for advancement into the distal vessel with minimal trauma. Nitinol core is more flexible and durable but stores torque more and has more fracture risk.

Safe with better support when parked in small side branches.

MISCELLANEOUS

Less torquable and steerable than Asahi Sion Tecc composite core wires like Sion blue. But has better shape retention due to shaping ribbon design.

Low risk to cause dissections/distal perforations, support - low to moderate

Safe for trapping behind stent struts, safe withdrawal of the trapped wire.

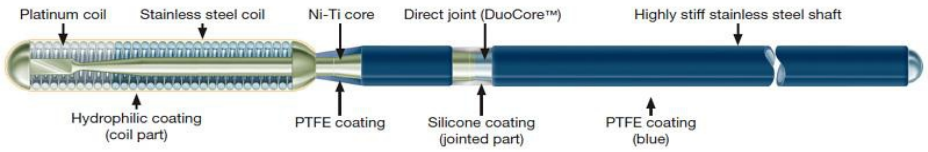
Shape retention is relatively poor - J configuration tends to become magnified during the procedure, which produces a loss in steerability.

TURBOCOAT – intermediate polymer sleeve with hydrophilic coating – maintain distal wire lubricity in long cases

SMOOTHGLIDE - proximal hydrophobic shaft coating facilitates device movement over the proximal section of the wire

RUNTHROUGH NS Extra Floppy

TERUMO



CONSTRUCTION

PTCA guide wire 0.014", Hybrid design guidewire. Direct Joint (Duo Core) Nitinol and Stainless steel core design - core to tip, platinum coil + stainless steel coil, highly stiff stainless steel shaft

The distal 40 cm of the wire is a one-piece tapered nitinol core with the distal tip overlayed with a spring coil. Nitinol one-peace design for shape maintaining after going through the coronary lumen

25 cm spring coil - platinum coil distal 3 cm and stainless steel coil proximal 22 cm

TIP LOAD: 0.6 g, 10 mm tip shaping part, rail extra support

COATING: distal tip 2 mm silicone coating, hydrophilic coating (coil part, M-coat) over distal 24.8 cm.

RADIOPAQUE SEGMENT: 3 cm

180 cm and 300 cm, straight, proximal PTFE coating shaft

+ RUNTHROUGH NS (1 gr tip load) – hydrophilic, 2 mm silicone coating tip
+ RUNTHROUGH NS Hypercoat (1 gr) – enhanced hydrophilic for crossing complex lesions
+ RUNTHROUGH Intermediate (3.6 gr) – hydrophilic, 2 mm silicone coating tip

PURPOSE

Workhorse guidewire with a soft, atraumatic, low tip load wire for everyday and complex lesions.

Routinely used for reular PCI, acute coronary syndromes, bifurcations..

A frontline wire can serve as the First choice for getting the microcatheter to the desired location/inside collaterals or in front of the cap.

It can serve for septal collaterals probing. Sometimes easily crosses CC2 collaterals.

Runthrough Hypercoat can serve for microchannels crossing.

TIPS & TRICKS

Regular pushing and rotating for advancement. Make standard „J" distal shape for workhorse purposes.

Dye injection may also be helpful to propagate distal advancement.

Compared to Ruthrough Floppy, Runthrough Extra Floppy has a stronger rail for better support.

Low risk to cause dissections/distal perforations

Relatively safe for trapping behind stent struts, safe withdrawal of the trapped wire.

Safe with better support when parked in small side branches.

MISCELLANEOUS

Excellent tip shape retention (durable shaping memory) due to Nitinol alloy core-to-tip design. This is a unique advantage over most wires that utilize a stainless core to tip or shaping ribbon design

A single wire can be used for multiple vessels.

Less steerable than Asahi Sion Tecc composite core wires.

Direct Joint – Duo Core™ Technology - enables the connection of two different metal characteristics with almost 1:1 torque response for better steerability and trackability.

"M-coat" technology hydrophilic coating over the distal 24.8 cm of the distal tip enables smooth trackability in the tortuous anatomy.

Silicone tip on the distal 2 mm provides safety, tactile feedback, and system support for device delivery.

New wire on the market with Similar Hybrid Nitinol and stainless core design + ACT ONE: MINAMO (Asahi Intecc)

2

MICROCATHETERS

MICROCATHETERS

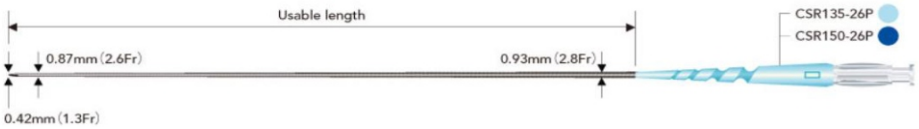
	CONSTRUCTION	TIP ENTRY PROFILE	OUTER DIAMETER SHAFT DISTAL PROXIMAL	TORQUEABLE Y/N	COATING	USABLE LENGTH
Corsair Pro	SHINKA shaft Spiral coil 10 wire	1.3 Fr (0.42 mm)	2.6 Fr (0.87 mm) 2.8 Fr (0.93 mm)	Y counterclockwise clockwise	Hydrophilic 60 cm	135 / 150 cm
Corsair Pro XS	Stainless spiral coil 14 braided wire	1.3 Fr (0.44 mm)	2.1 Fr (0.71 mm) 2.9 fr (0.95 mm)	Y counterclockwise clockwise	Hydrophilic	135 / 150 cm
Caravel	Braided shaft	1.4 Fr (0.48 mm)	1.9 Fr (0.62 mm) 2.6 Fr (0.85 mm)	N slight rotation	Hydrophilic 70/85 cm	135 / 150 cm
Finecross MG	Braided stainlees steel shaft	1.8 Fr (0.60 mm)	1.8 Fr (0.60 mm) 2.6 Fr (0.87 mm)	N slight rotation	Hydrophilic 70/90 cm	130/ 150 cm
Turnpike	5 layer composite shaft	1.6 Fr (0.53 mm)	2.6 Fr (0.86 mm) 2.9 fr (0.97 mm)	Y clockwise counterclockwise	Hydrophilic 60 cm	135 / 150 cm
Turnpike LP	5 layer composite shaft	1.6 Fr (0.53 mm)	2.2 Fr (0.74 mm) 2.9 Fr (0.97 mm)	Y clockwise counterclockwise	Hydrophilic 60 cm	135 / 150 cm
Turnpike Spiral	5 layer composite shaft	1.6 Fr (0.53 mm)	2.9 Fr (0.97 mm) 2.9 Fr (0.97 mm)	Y clockwise to advance counter to remove	Hydrophilic 60 cm	135 / 150 cm
Turnpike Gold	5 layer composite shaft	2.1 Fr (0.71 mm)	2.9 Fr (0.97 mm) 2.9 Fr (0.97 mm)	Y clockwise to advance counter to remove	Hydrophilic 60 cm	135 / 150 cm
Supercross (straight tip)	Braided shaft	1.8 Fr (0.61 mm)	1.8 Fr (0.61 mm) 2.5 Fr (0.84 mm)	N slight rotation	Hydrophilic 40 cm	130 / 150 cm
Supercross (angled tip)	Dual coil Platinum/tungsten	2.4 Fr (0.79 mm)	2.4 Fr (0.79 mm) 3.2 Fr (1.07 mm)	Y clockwise counterclockwise	Hydrophilic 80 cm	130 / 150 cm
Tornus	Stainless steel coil 8 wires	1.8 Fr (0.61 mm)	2.1 Fr (0.71 mm) 3.3 Fr (1.10 m)	Y counterclockwise	Hydrophobic	135 cm
Mamba	Tapered coil 3 zones	1.4 Fr (0.48 mm)	2.4 Fr (0.74 mm) 2.9 Fr (0.95 mm)	Y clockwise counterclockwise	Hydrophilic 60 cm	135 cm
Mamba Flex	Tapered coil 5 zones	1.4 Fr (0.48 mm)	2.1 Fr (0.71 mm) 2.9 Fr (0.95 mm)	Y clockwise counterclockwise	Hydrophilic 60 cm	135 / 150 cm
Nhancer Pro X	Braided shaft	1.5 Fr (0.46 mm)	2.3 Fr (0.76 mm) 2.6 Fr (0.86 mm)	N slight rotation	Hydrophilic 25/60 cm	135 / 155 cm
Teleport	HYBRACOIL	1.4 Fr (0.48 mm)	2.0 Fr (0.66 mm) 2.6 Fr (0.85 mm)	Y clockwise counterclockwise	Hydrophilic 60 mm	135 / 150 cm
Teleport Control	HYBRACOIL	1.4 Fr (0.48 mm)	2.1 Fr (0.69 mm) 2.7 Fr (0.89 mm)	Y clockwise counterclockwise	Hydrophilic 60 mm	135 / 150 cm
MicroCross 14	Braided shaft Variable-pitch	1.6 Fr (0.52 mm)	1.6 Fr (0.52 mm) 2.5 Fr (0.83 mm)	N/Y slight rotation	Hydrophilic Serene	135 / 155 cm
M-cath	Hybrid braided shaft	1.6 Fr (0.52 mm)	2.25 Fr (0.75 mm) 3.3 Fr (1.10 mm)	N careful slight rotation	Hydrophilic 43 cm	135 cm

MICROCATHETERS

	CONSTRUCTION	TIP ENTRY PROFILE	OUTER DIAMETER SHAFT DISTAL PROXIMAL	TORQUEABLE Y/N	COATING	USABLE LENGTH
M-Cath Flexy	Braided balanced tapered shaft	1.65 Fr (0.52 mm)	2.46 Fr (0.82 mm) 2.79 Fr (0.93 mm)	N slight rotation	Hydrophilic	135 / 150 cm
Telemark	Xtreme mixed braided mesh	1.4 Fr (0.47 mm)	1.9 Fr (0.63 mm) 2.6 Fr (0.87 mm)	N slight rotation	Pristyne hydrophilic	135 / 150 cm

CORSAIR PRO

ASAHI INTECC



CONSTRUCTION

SHINKA-Shaft – Stainless spiral coil shaft with 10 braided wires, 8 thin and 2 larger wires

TIP ENTRY PROFILE: 1.3 Fr (0.42 mm)

OUTER DIAMETER: DISTAL SHAFT 2.6 Fr (0.87 mm), Proximal SHAFT 2.8 Fr (0.93 mm)

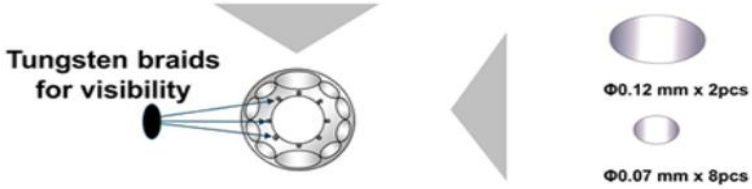
INNER DIAMETER: TIP 0.38 mm (0.015"), SHAFT 0.45 mm (0.018")

COATING: Hydrophilic coating 60 cm

0.014" (0.36 mm) guidewire compatible

USABLE LENGTH: 135 cm for the anterograde approach and 150 cm for the retrograde approach

ADVANCEMENT: push with counterclockwise or clockwise rotation. (Rotation limited up to 10 times towards each direction), pushing + rotation (Caution in very calcified lesion – over-rotation may cause wire and device entrapment



SHINKA - Shaft

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PURPOSE

Uniquely designed all-purpose torqueable microcatheter is highly useful in chronic total occlusion and complex PCI procedures. Provides support to facilitate the placement of guidewires in the coronary arteries, easy wires exchange, easy trapping.

„Gold standard" microcatheter, Corsair was introduced in 2010 as microcatheter and channel dilator. For the first time, retrograde procedures and R-CART were possible.

Anterograde and retrograde procedures.

Septal collaterals. Selective contrast injection. For retrograde procedures, today, in most cases replaced with smaller profile microcatheters like Corsair Pro XS, which is also used for epicardial collaterals.

TIPS & TRICKS

Pushing in less complex anatomy, an excellent sliding performance due to hydrophilic coating. The main advancement is the possibility of rotation for much better propagation through complex anatomy.

Rotate the catheter with both hands while gentle pushing and stabilizing the guidewire position by„locking" it with a small finger. Counterclockwise primarily, also clockwise rotation possible. Rotation limited up to 10 times towards each direction). NOT OVER-ROTATE.

If stuck or stop at the vessel bends, complex anatomy, the wait is needed to relax material forces and overrotation. After about 30 seconds, repeat rotation and slight pushing maneuver for further MC propagation. If microcatheter doesn't advance, replace It with thinner, softer MC (Corsair Pro XS, Turnpike LP, Mamba Flex, Teleport, Caravel)

Caution in the very calcified lesion and complex anatomy – microcatheter may be stuck. Always check that the tip is„free" and not over-rotate because the device can be destroyed.

Do not push hard against strong resistance; always check that tip is moving back or forward.

If extensive rotation is applied with the MC, always test if the wire is still free inside the MC. Overtorque may lead to kinking of the MC with blockage of the wire inside it.

For better/modified wire penetration force, park Corsair Pro at the proximal cap.

Interaction between wire and microcatheter is crucial to passing collaterals. Always keep a safe distance (at least 5-10 mm) between the tip of the wire and the tip of the MC.

After externalization, the tip of antegrade equipment (balloons, stents, microcatheters) should never come in contact with the tip of retrograde Corsair over the same guidewire to prevent equipment entrapment due to possible device interlocking.

MISCELLANEOUS

SHINKA-Shaft: (Stainless spiral coil shaft with 10 braided wires). ASAHI brand's proprietary braiding pattern preserves high push and enables rotating manipulation. (Rotation limited up to 10 times towards each direction). Balanced joint design, spiral protector.

Tapered soft tungsten polyurethane tip, tapering to 0.42 mm, with an increase in visibility under fluoroscopy, distal 5 mm loaded with tungsten powder (entire tip visible)

High visibility at the lesion part, High tracking ability into the lesion. Very good active-backup. Very good performance in subintimal. Power knuckle may cause prolapse.

Increased trackability compared to Corsair due to removal of distal platinum marker. Tracks 90°bends on the wire via rotational force. New kink-resistant spiral-designed hub design increases torque transmission.

CORSAIR PRO XS

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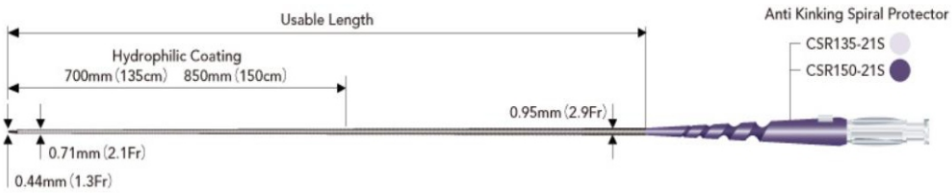


CONSTRUCTION

Stainless coil ACT ONE shaft with 14 wires braiding, inner braiding. Wire diameter in the braid decreases toward the tip for a more flexible tip. Short weld of ACTO ONE in the tip for higher trackability

TIP ENTRY PROFILE: 1.3 Fr (0.44 mm)

OUTER DIAMETER: DISTAL SHAFT 2.1 Fr (0.71 mm), Proximal SHAFT 2.9 Fr (0.95 mm)

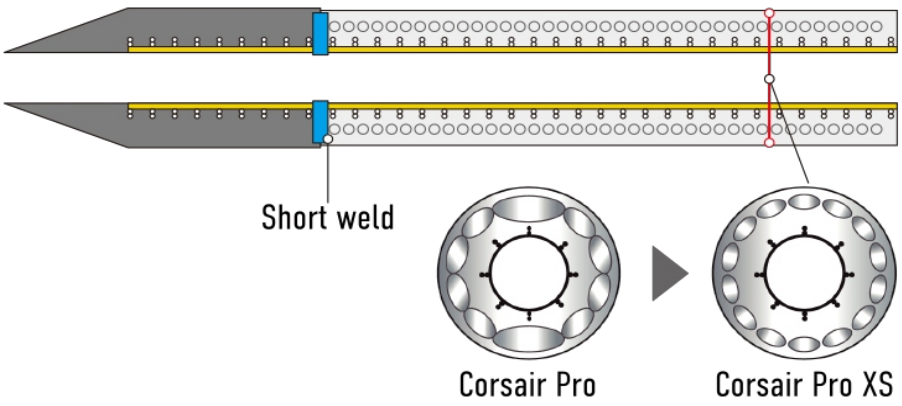
INNER DIAMETER: TIP 0.38 mm (0.015"), SHAFT 0.48 mm (0.018")

COATING: Hydrophilic coating 70 cm and 85 cm at the 135 and 150 cm respectively

0.014" (0.36 mm) guidewire compatible

USABLE LENGTH: 135 cm for the anterograde approach and 150 cm for the retrograde approach

ADVANCEMENT: counterclockwise or clockwise rotation. (Rotation limited up to 10 times towards each direction), pushing + rotation (caution in very calcified lesion – may be stuck)



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PURPOSE

Designed to be the lower profile torqueable microcatheter useful in complex PCI and CTO procedures, especially retrograde CTO cases.

Increased performance in retrograde approach - thinner distal shaft outer diameter compared to Corsair Pro with modified shaft construction with superior pushability. Improved flexibility and trackability.

Anterograde and RETROGRADE procedures.

Septal collaterals, epicardial collaterals (CC2 collaterals). Can replace Caravel for epicardial collaterals crossing, but Caravel or Finecross safer for CC1 epicardial collaterals.

TIPS & TRICKS

Pushing in less complex anatomy, an excellent sliding performance due to hydrophilic coating. The thin tip portion can be rotated during the procedure, enhancing crossability in complex lesions.

Rotate the catheter with both hands while gentle pushing and stabilizing the guidewire position by „locking" it with a small finger. Counterclockwise mostly, also clockwise rotation is possible because of the symmetrical design of the modified shaft. Process limited up to 10 times towards each direction. NOT OVER-ROTATE.

For better/modified wire penetration force, park Corsair Pro at the proximal cap.

Autotrapping with a conventional angioplasty balloon can increase the back up force for more aggressive proximal cap penetration.

Caution in the very calcified lesion and complex anatomy – microcatheter may be stuck. Always check that the tip is „free" the wire still slides without friction and does not over-rotate because the device can cause wire entrapment.

Do not push hard against strong resistance; always check that tip is moving back or forward. Corsair Pro XS is prone to stick/lock on the wire if a lot of torque is applied.

If stuck or stop at the vessel bends and complex anatomies, the patient is needed, to wait and relax material forces and resolve potential overrotation. After about 30 seconds, repeat rotation and slight pushing maneuver for further MC propagation.

If extensive rotation is applied, always test if the wire is still free inside the microcatheter. Overtorque may lead to kinking of the microcatheter with blockage of the wire inside it. This needs to be avoided; otherwise, the only solution is to remove everything (wire and MC) and start again from the beginning.

Shaft rotation toward tip rotation is not 1:1 exactly. Tip rotations are delayed. When the operator rotates the shaft 5-10 times, a tip is rotated 1-2 times.

Interaction between wire and microcatheter is crucial to passing collaterals. Always keep a safe distance (at least 5-10 mm) between the tip of the wire and the tip of the MC.

After externalization, the tip of antegrade equipment (balloons, stents, microcatheters) should never come in contact with the tip of retrograde Corsair over the same guidewire to prevent equipment entrapment due to possible device interlocking.

MISCELLANEOUS

New shaft design: (Stainless coil shaft with 14 braided wire). ASAHI brand's proprietary braiding pattern preserves high push and enables rotating manipulation. Unique design – wire diameter in the braid decreases toward the tip for a more flexible tip.

Tapered soft tungsten polyurethane low profile tip, tapering to 0.44 mm (1.3 Fr) (in comparison Turnpike LP tapered tip to 1.6 Fr)

High visibility at the lesion part. Higher tracking ability into the lesion than Corsair Pro. Can track into more than 90° vessel bends. Kink-resistant hub design increases torque transmission.

CARAVEL

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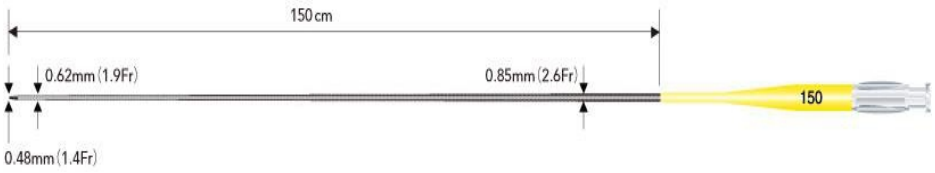


CONSTRUCTION

Braided shaft, ACTO ONE precision braiding

TIP ENTRY PROFILE: 1.4 Fr (0.48 mm, 0.019")

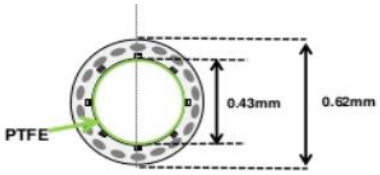
OUTER DIAMETER: DISTAL SHAFT 1.9 Fr (0.62 mm), Proximal SHAFT 2.6 Fr (0.85 mm)

INNER DIAMETER: TIP 0.40 mm (0.016"), SHAFT 0.55 mm (0.022")

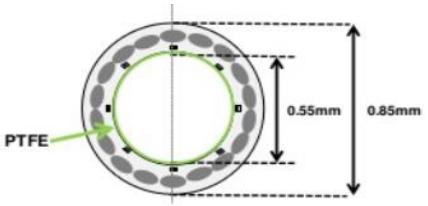
COATING: Hydrophilic coating (70 cm CARAVEL 135, 85 cm CARAVEL 150 cm)

0.014" (0.36 mm) guidewire compatible

USABLE LENGTH: 135 cm for the anterograde approach, and 150 cm for the retrograde approach



Caravel Dis.



Caravel Prox.

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PURPOSE

Low-profile microcatheter with exceptional tip flexibility. Small crossing profile 1.9 Fr

Anterograde and retrograde procedures.

Septal collaterals, epicardial collaterals.

Safest for CC1 epicardial collaterals crossing (with Finecross, Supercross straight..). Due to ACT ONE braiding, the inner lumen diameter is preserved and not depressed at the acute bends, with easier propagation of the wires. First choice for very tortuous epicardial collaterals in combination with Suoh03.

Microchannels crossing. Selective contrast injection. Rotawire exchange.

TIPS & TRICKS

Advancement with pushing. It can be slightly rotated (less than 360° in one direction) for better crossability on more supportive wires.

Very good torque response! Rotation for 360° of the shaft rotates the tip in the same manner. When the tip is stuck in calcified lesions, with further rotation, the tip can be easily detached.

Pushing ant slight rotation up to 180 ° in epicardial and noncalcified vessels for better trackability.

Interaction between wire and microcatheter is crucial to passing collaterals. Always keep a safe distance (at least 5-10 mm) between the tip of the wire and the tip of the MC.

A good option for TIP-IN (retrograde wire into anterograde microcatheter in anterograde guiding) and RENDEZVOUS (anterograde wire into retrograde microcatheter at the anterograde guiding) techniques

The tip of the catheter is fragile and can be destroyed (fracture, avulsion...) in complex anatomy, especially when pushed through the calcified CTO body.

Not compatible with 0.018" Terumo Azur Cx coils due to tapered tip with the inner lumen of 0.016" (Finecross is compatible with Azur Cx 0.018" coils)

After externalization, the tip of antegrade equipment (balloons, stents, microcatheters) should never come in contact with the tip of retrograde Caravel over the same guidewire to prevent equipment entrapment due to possible device interlocking.

Easier and safer selective contrast tip injection due to the larger inner lumen

MISCELLANEOUS

ACT ONE precision braided shaft - resistance to kinking in tortuous anatomy.

Compression resistant shaft – less prone to collapse at the lesion site or acute bend, maintains inner lumen—best in class flexibility.

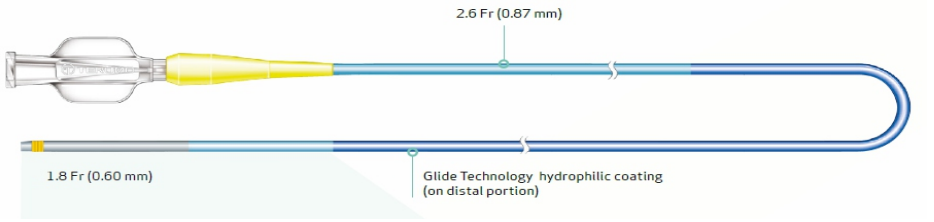
Smoothly tracks into tortuous anatomy. When the tip is stuck in complex anatomy, with rotation of the shaft, it can be easily destroyed – tip avulsion, etc.

Less support and crossability than with coiled microcatheters with strong rotation possibility. In most cases not the first option for complex CTO procedures.

2 Caravels fit in a 6Fr guide catheter. Can use Caravel and IVUS in 7 Fr. guiding

FINECROSS MG

TERUMO



CONSTRUCTION

Braided stainless steel – SUS, Gold marker 0.7 mm located 0.6 mm from the tip

TIP ENTRY PROFILE: 1.8 Fr (0.60 mm)

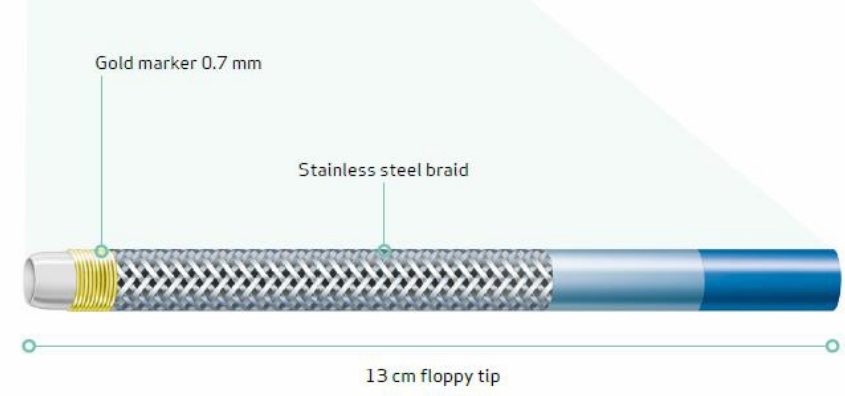
OUTER DIAMETER: DISTAL SHAFT 1.8 Fr (0.60 mm), Proximal SHAFT 2.6 Fr (0.87 mm)

INNER DIAMETER: TIP 0.45 mm (0.018"), SHAFT 0.55 mm (0.021")

COATING: Hydrophilic coating (70 cm on Finecross 130, 90 cm on Finecross 150)

0.014" (0.36 mm) guidewire compatible, PTFE inner layer

USABLE LENGTH: 130 cm for the anterograde approach and 150 cm for the retrograde approach



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PURPOSE

Low profile non-torqueable microcatheter with crossing profile 1.8 Fr and hydrophilic coating and flexible/floppy distal 13 cm.

Anterograde and retrograde procedures.

Septal collaterals, epicardial collaterals. Safest for CC1 epicardial collaterals crossing (with Caravel)

A good option when the progression of the initial microcatheter is unsuccessful inside the CTO body.

Selective contrast injection. Rotawire exchange.

TIPS & TRICKS

Advancement with pushing.

It can be slightly rotated for better crossability on more supportive wires.

The tubular non-tapered tip is the best option for TIP-IN (retrograde wire into anterograde microcatheter in anterograde guiding) and RENDEZVOUS (anterograde wire into retrograde microcatheter at the anterograde guiding) techniques.

Finecross is compatible with AZUR CX (Terumo) 0.018" embolization coils. No need for Progreat or other microcatheters. Azur Cx coils easy deployable through Finecross MG due to 0.018" inner tip diameter (Finecross MG inner diameter: TIP 0.018", SHAFT 0.021"). Azur Cx cannot be deployed through tapered tip microcatheters like Corsair Pro or Turnpike LP.

Due to bigger inner diameter, easy retrieval of the microcatheter with Nanto technique (continuous saline injection through a syringe connected to microcatheter hub for microcatheter retrieval without classic trapping technique)

Very good feedback on the wire tip due to low resistance in the MC. Low active-backup. In calcification and tortuosity, crossing success depends on guiding backup force. Requires good guiding backup. Less support than with thicker and coiled microcatheters (Corsair Pro...)

2 Finecross MG fit in a 6Fr guide catheter

MISCELLANEOUS

Tubular tip entry profile (no tapered tip). Tapered inner and outer diameters, from 2.6Fr to 1.8 Fr over the entire length.

Hydrophilic coating and flexible/floppy distal 13 cm – easy advancement and access through tortuous distal vessels, epicardial collaterals.

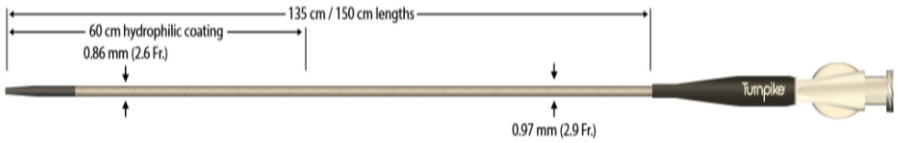
Less support and lower crossability than with coiled torqueable microcatheters. In most cases not the first option for complex CTO procedures.

Fully stainless-steel braided shaft for strength responsiveness, reinforcing lumen integrity, and improving pushability.

Polytetrafluoroethylene (PTFE) inner layer for smooth guidewire passing with less resistance and easier exchange wire during complex procedures.

TURNPIKE

TELEFLEX



CONSTRUCTION

5 layer shaft (PTFE liner, Braid, Dual-layer bidirectional coils, Polymer outer layer)

TIP ENTRY PROFILE: 1.6 Fr (0.53 mm)

OUTER DIAMETER: DISTAL SHAFT 2.6 Fr (0.86 mm), Proximal SHAFT 2.9 Fr (0.97 mm)

COATING: Hydrophilic coating 60 cm

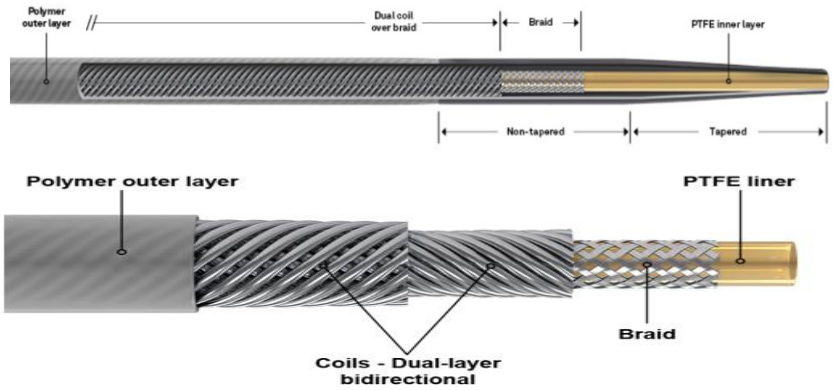
0.014" (0.36 mm) guidewire compatible, 5Fr and above guide catheter compatible

USABLE LENGTH: 135 cm for the anterograde approach, and 150 cm for the retrograde approach

ADVANCEMENT: pushing, clockwise primary, and counterclockwise rotation. (Rotation limited up to 10 times towards each direction), pushing + rotation (Caution in very calcified lesion – may be stuck)

Clockwise rotation - outer coil contracts while inner coil expands, creating a gear-like mechanism for effective torque transmission. For better crossability and torque transmission through complex anatomy.

Counterclockwise rotation – inner coil contracts onto braid, creating better longitudinal push and serving as a support structure to maintain guidewire lumen integrity. For better guidewire support



PURPOSE

Anterograde procedures in most cases when strong support is needed, retrograde procedures in SEPTAL collaterals

Ideal for excellent trackability in tortuous vessels due to long, flexible, tapered tip.

TIPS & TRICKS

Strong torquable microcatheter. Advancement with pushing and rotation.

Clockwise rotation - outer coil contracts while inner coil expands, creating a gear-like mechanism for effective torque transmission. For better crossability and torque transmission through complex anatomy.

Counterclockwise rotation – inner coil contracts onto braid, creating better longitudinal push and serving as a support structure to maintain guidewire lumen integrity. For better guidewire support

The best is to limit rotation up to 10 times towards each direction to prevent„material fatigue" and destruction. Do not rotate the catheter more than two consecutive 360° rotations in either direction if the distal tip is not also rotating and advancing, as it may result in separation of the catheter, damage to the catheter, or vessel injury.

Caution in the very calcified lesion and complex anatomy – microcatheter may be stuck. Always check that the tip is„free" and not over-rotate because the device can be destroyed.

Do not push hard against strong resistance; always check that tip is moving back or forward inside the vessel.

If the microcatheter doesn't follow vessel bends and a complex anatomy, wait to relax material forces and torque build-up in the catheter shaft. Alternating direction of rotation (clockwise change into counterclockwise) can help for more successful deliverability.

If extensive rotation is applied, always test if the wire is still free inside the microcatheter. Overtorque may lead to kinking of the microcatheter with blockage of the wire inside it. This needs to be avoided otherwise, the only solution is to remove everything (wire and MC) and start again.

Effective tip load range (ETL) concept – tip load of the wire can be modified with the position of the microcatheter from the wire tip.

MISCELLANEOUS

5-layer composite shaft and dual-layer bidirectional coils to facilitate torque transmission when rotating the catheter in both a clockwise and counterclockwise fashion.

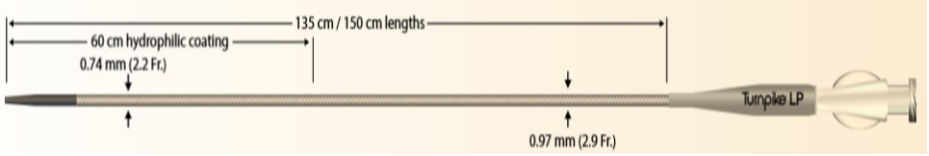
Tip entry profile is the same as Turnpike LP. In most cases, smooth catheter delivery is due to a quality outer polymer layer paired with a 60 cm distal hydrophilic coating. Same long, flexible, tapered tip as the Turnpike LP and Turnpike Spiral and a smooth distal shaft for rotation in either direction.

Compared to Turnpike LP, a bigger distal shaft profile (2.6 Fr vs. 2.2 Fr) has more support for anterograde procedures.

With Turnpike best ETL concept results (for examples, Bandit wire tip load can be modified with microcatheter support from 0.8 gr to almost 4.0 gr / Raider wire tip load can be modified with microcatheter support from 4.0 gr to nearly 14.0 gr / Warrior wire tip load can be modified with microcatheter support from 14.0 gr to almost 34.0 gr)

TURNPIKE LP

TELEFLEX



CONSTRUCTION

5 layer shaft (PTFE liner, Braid, Dual-layer bidirectional coils, Polymer outer layer)

Dual coil tapers down to a single coil 21 cm from the distal tip for increased flexibility

TIP ENTRY PROFILE: 1.6 Fr (0.53 mm)

OUTER DIAMETER: DISTAL SHAFT 2.2 Fr (0.74 mm), Proximal SHAFT 2.9 Fr (0.97 mm)

COATING: Hydrophilic coating 60 cm

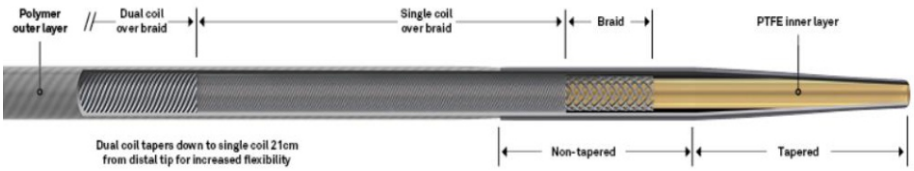
0.014" (0.36 mm) guidewire compatible, 5Fr and above guide catheter compatible

USABLE LENGTH: 135 cm for the anterograde approach and 150 cm for the retrograde approach

ADVANCEMENT: pushing, clockwise primary, and counterclockwise rotation. (Rotation limited up to 10 times towards each direction), pushing + rotation (Caution in very calcified lesion – may be stuck)

Clockwise rotation - outer coil contracts while inner coil expands, creating a gear-like mechanism for effective torque transmission. For better crossability and torque transmission through complex anatomy.

Counterclockwise rotation – inner coil contracts onto braid, creating better longitudinal push and serving as a support structure to maintain guidewire lumen integrity. For better guidewire support



PURPOSE

Low profile torqueable microcatheter designed for complex CTO procedures, especially retrograde CTO cases.

Anterograde and RETROGRADE procedures

150 cm ideal for navigating small and tortuous retrograde collateral vessels – SEPTAL, EPICARDIAL

TIPS & TRICKS

Low-profile torquable microcatheter. Advancement with pushing and rotation.

Clockwise rotation primary with stronger torque response, counterclockwise rotation possible because of dual-layer bidirectional coils. Counterclockwise for the better support structure

The best is to limit rotation up to 10 times towards each direction to prevent„material fatigue" and destruction.

Do not rotate the catheter more than two (2) consecutive 360° rotations in either direction if the distal tip is not also rotating and advancing, as it may result in separation of the catheter, damage to the catheter, or vessel injury.

When Turnpike LP with distal 21 cm single-coil is over-rotated, it can be destroyed easier than Turnpike which has continuous dual-layer bidirectional coils.

Caution in the very calcified lesion and complex anatomy – microcatheter may be stuck. Always check that the tip is „free" the wire still slides without friction and does not over-rotate because the device can cause wire entrapment.

Do not push hard against strong resistance; always check that tip is moving back or forward.

Autotrapping with a conventional angioplasty balloon can increase the back up force for more aggressive proximal cap penetration.

If the microcatheter doesn't follow vessel bends and a complex anatomy, wait to relax material forces and torque build-up in the catheter shaft. Alternating direction of rotation (clockwise change into counterclockwise) can help for more successful deliverability.

If extensive rotation is applied, always test if the wire is still free inside the microcatheter. Overtorque may lead to kinking of the microcatheter with blockage of the wire inside it. This needs to be avoided; otherwise, the only solution is to remove everything (wire and MC) and start again.

Effective tip load range (ETL) concept – tip load of the wire can be modified with the position of the microcatheter from the wire tip.

MISCELLANEOUS

Increased performance in retrograde approach – with 5-layer composite shaft. Dual coil tapers down to a single-coil 21 cm from the distal tip for increased flexibility.

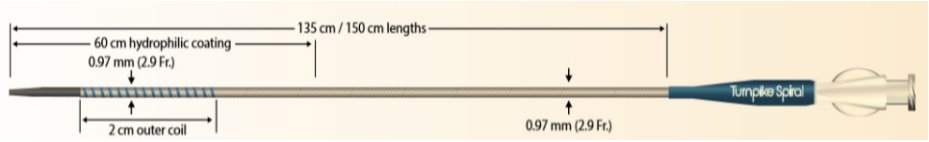
Tip entry profile bigger than Corsair Pro XS (1.6 Fr vs. 1.3 Fr). Overall performance in septal collaterals similar to Corsair Pro XS.

In most cases, smooth catheter delivery is due to a quality outer polymer layer paired with a 60 cm distal hydrophilic coating. Similar to the standard Turnpike Catheter, but with a lower distal shaft profile and increased flexibility on the distal shaft and tip.

Same long, flexible, tapered tip as the standard Turnpike Catheter and Turnpike Spiral Catheter and a smooth distal shaft for rotation in either direction during advancement. A tip can be destroyed with over-rotation in complex anatomy and calcifications.

TURNPIKE SPIRAL

TELEFLEX



CONSTRUCTION

5 layer shaft, dual-layer coil over braid with the addition of an outer nylon coil attached to the distal 2 cm of the catheter shaft. Tungsten loaded soft tip for flexibility with excellent radiopacity

TIP ENTRY PROFILE: 1.6 Fr (0.53 mm)

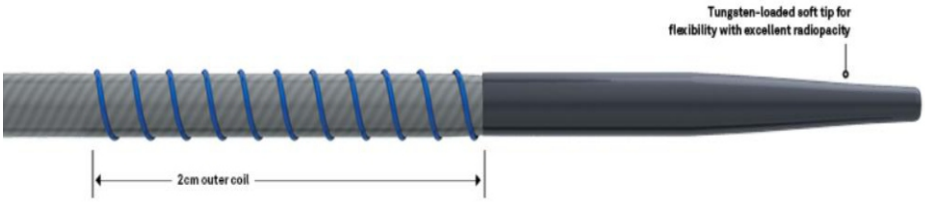
OUTER DIAMETER: DISTAL SHAFT 2.9 Fr (0.97 mm), Proximal SHAFT 2.9 Fr (0.97 mm)

COATING: Hydrophilic coating 60 cm

0.014" (0.36 mm) guidewire compatible, 5Fr and above guide catheter compatible

USABLE LENGTH: 135 cm for anterograde approach, and 150 cm

ADVANCEMENT: clockwise rotation for advance, counterclockwise for removal. Over-rotation may cause device entrapment



PURPOSE

Coronary torqueable microcatheter with 5-layer composite shaft with the addition of an outer nylon coil attached to the distal 2 cm of the catheter shaft, which provides additional rotational advancement when it is rotated in a clockwise direction.

Complex ANTEROGRADE intervention. Best active-backup support due to external nylon coils

Excellent backup in subintimal space.

Excellent in fibrotic tissues, like in-stent-occlusion

TIPS & TRICKS

CLOCKWISE rotation for advancement, COUNTERCLOCKWISE rotation for removal.

Nylon external coils at the distal 2 cm provide excellent active-backup intraplaque because external coils cut and attach themself to the vessel wall, with a tip of the microcatheter inside the plaque. Even with the guiding catheter disengaged from the coronary ostia, the microcatheter stays on-site when dug to the vessel wall, providing excellent backup for the wire.

When a guiding catheter doesn't provide enough support, Turnpike Spiral is an excellent choice because of the active backup of the microcatheter.

Good choice for in-stent CTO's, which are fibrotic tissues in most cases.

Always check that the tip is „free" and not over-rotate because the device can be destroyed. Do not push hard against strong resistance; always check that tip is moving back or forward.

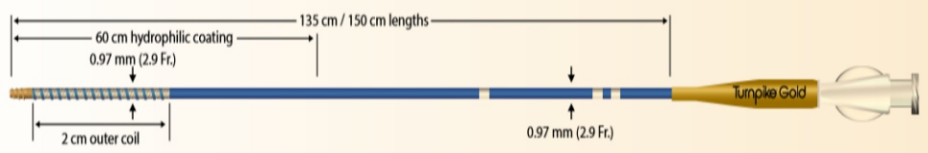
Effective tip load range (ETL) concept – tip load of the wire can be modified with the position of the microcatheter from the wire tip. In the range of 12 mm to 2 mm from the microcatheter tip, some wires have a tip load range of almost 20 gr. (for examples, Bandit wire tip load can be modified with microcatheter support from 0.8 gr to nearly 4.0 gr)

MISCELLANEOUS

Although the Turnpike Spiral Catheter is available in both 135 cm and 150 cm lengths, it is contraindicated for use in vessels with an effective diameter smaller than 1 mm. Therefore, it is not intended to be used as a retrograde coronary device.

TURNPIKE GOLD

TELEFLEX



CONSTRUCTION

5 layer shaft, dual-layer coil over braid. Soft polymer tip replaced with a gold-plated, stainless steel tip for added rotational advancement through resistant lesions

TIP ENTRY PROFILE: 2.1 Fr (0.71 mm)

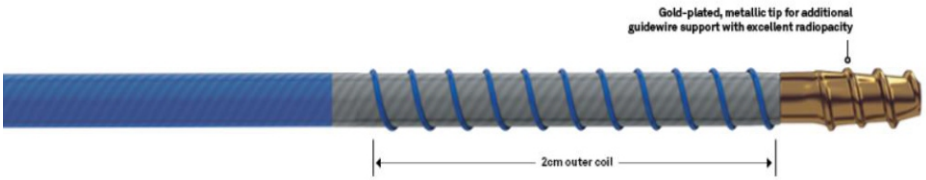
OUTER DIAMETER: DISTAL SHAFT 2.9 Fr (0.97 mm), Proximal SHAFT 2.9 Fr (0.97 mm)

COATING: Hydrophilic coating 60 cm

0.014" (0.36 mm) guidewire compatible, 5Fr and above guide catheter compatible

USABLE LENGTH: 135 cm for anterograde approach, and 150 cm

ADVANCEMENT: clockwise rotation for advance, counterclockwise for removal.



PURPOSE

Coronary torqueable microcatheter with 5-layer composite shaft with gold-plated tip combined with an outer nylon coil attached to the distal 2 cm of the catheter shaft provides additional rotational advancement when the catheter is rotated in a clockwise direction.

(combination of the Turnpike Spiral concept and very hard corkscrew tip)

Complex ANTEROGRADE intervention. Rotational advancement with visibility under fluoroscopy

Antegrade escalation device for resistant lesions

TIPS & TRICKS

CLOCKWISE rotation for advancement, COUNTERCLOCKWISE rotation for removal.

Threaded distal tip provides even more rotational advancement like a corkscrew.

„Uncrossable lesions" can be modified and negotiated with the hard metallic screwing tip, and If needed, the microcatheter can be replaced with a less bulky device later in the procedure.

Nylon external coils at the distal 2 cm provide excellent active-backup intraplaque because external coils cut and attach themself to the vessel wall, with a tip of the microcatheter inside the plaque.

When the guiding catheter doesn't provide enough support, Turnpike Goldis an excellent choice because of the active backup of the microcatheter.

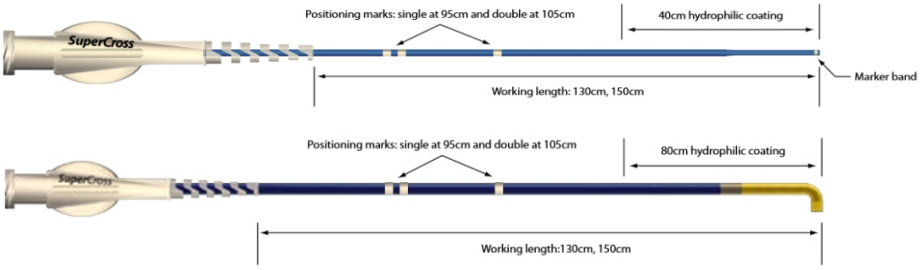
MISCELLANEOUS

Although the Turnpike Gold Catheter is available in both 135 cm and 150 cm lengths, it is contraindicated for use in vessels with an effective diameter smaller than 1 mm. Therefore, it is not intended to be used as a retrograde coronary device.

Good deliverability with rotation, polymer outer layer, and hydrophilic coating the distal 60 cm

SUPERCROSS FAMILY

TELEFLEX



CONSTRUCTION

ANGLED TIP embedded platinum/tungsten dual coil design - Multiple tip options: Straight, Flexible (FT), 45°, 90°, 120°, 90° XT (extended tip)

STRAIGHT TIP – braided (+FT version)

OUTER DIAMETER: ANGLED TIP DISTAL SHAFT 2.4 Fr (0.79 mm), Proximal SHAFT 3.2 Fr (1.07 mm)

STRAIGHT TIP DISTAL SHAFT 1.8 Fr (0.61 mm) Proximal SHAFT 2.5 Fr (0.84 mm)

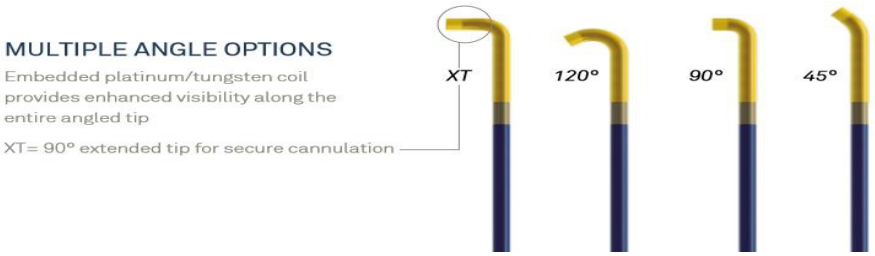
INNER DIAMETER: angled tip 0.017" (0.43 mm) distal, straight tip 0.017" (0.43 mm) distal

COATING: Hydrophilic coating distal 80 cm anglet tip, distal 40 cm straight tip

0.014" (0.36 mm) guidewire compatible

USABLE LENGTH: 130 cm for the anterograde approach, and 150 cm for the retrograde approach

ADVANCEMENT: pushing, slight rotation for the straight tip



PURPOSE

ANGLED TIP - Dual coil design provides excellent torque response, pushability, and kink resistance. Embedded platinum/tungsten coil for enhanced visibility along the entire angled tip. Multiple tip options: Straight, Flexible (FT), 45°, 90°, 120°, 90° XT (extended tip)

Support in tortuous anatomy/navigating bifurcated vessels

Navigating reverse angles, reverse collaterals access

Blunt angulated CTO stumps penetration

STRAIGHT TIP - Low profile non-torquable microcatheter with crossing profile 1.8 Fr and distal 40 cm hydrophilic coating. Similar to Finecross.

Anterograde and retrograde procedures.

Septal collaterals, epicardial collaterals. Selective contrast injection. Rotawire exchange.

TIPS & TRICKS

STRAIGHT TIP - advancement with pushing. It can be slightly rotated for better crossability on more supportive wires. Less support and lower crossability than with coiled microcatheters.

The tubular non-tapered tip is the best option for TIP-IN (retrograde wire into anterograde microcatheter in anterograde guiding) and RENDEZVOUS (anterograde wire into retrograde microcatheter at the anterograde guiding) techniques.

In calcifications and tortuosity, crossing success depends on guiding backup force. Requires good guiding backup. Less support than with thicker and coiled microcatheters (Corsair Pro...)

2 Supercross straight fit in a 6Fr guide catheter

ANGLED TIP – pushing and at the bifurcation/site of the interest, then slow rotation for selective tip orientation. Use at least two projections.

MISCELLANEOUS

Supercross straight has good feedback on the wire tip due to low resistance in the MC but has low active-backup.

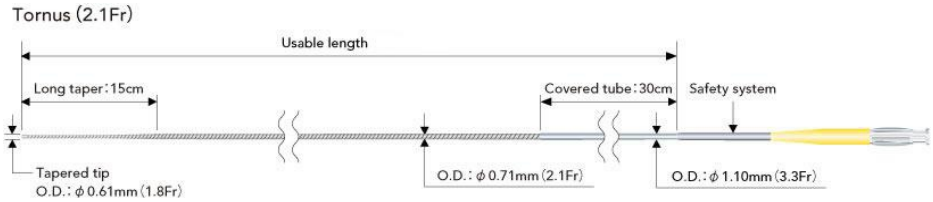
Requires good guiding backup. Less support than with thicker and coiled microcatheters (Corsair Pro...) Similar performance to Finecross MG.

Some complex anatomy cases can be solved only with angulated microcatheters.

The SuperCross microcatheter is contraindicated for high-pressure injections and use in the cerebral vasculature.

TORNUS

ASAHI INTECC



CONSTRUCTION

Stainless steel coil shaft made of 8 wires braided into the spiral structure, long taper 15 cm, covered tube 30 cm, safety system 5 cm

TIP ENTRY PROFILE: 1.8 Fr (0.61 mm)

OUTER DIAMETER: DISTAL SHAFT 2.1 Fr (0.71 mm), covered tube proximal – 3.3 Fr (1.10 mm)

INNER DIAMETER: TIP 0.41 mm (0.016")

COATING: Hydrophobic coating

0.014" (0.36 mm) guidewire compatible

USABLE LENGTH: 135 cm for the anterograde approach

ADVANCEMENT: counterclockwise rotation (not exceed 20 rotations in the same direction when the catheter is trapped by the lesion). Clockwise to withdraw

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PURPOSE

Coronary torqueable microcatheter with Stainless steel coil shaft made of 8 wires braided into the spiral structure.

Plaque modification microcatheter.

Complex ANTEROGRADE intervention.

Enables guidewires crossing of highly stenosed and calcified lesions.

„Uncrossable CTO" when the wire crosses, but balloon or other microcatheter don't cross.

Provides additional rotational advancement and active crossability when the catheter is rotated in a counterclockwise direction

Antegrade escalation device for resistant lesions

TIPS & TRICKS

COUNTERCLOCKWISE rotation for advancement, CLOCKWISE rotation for removal.

„Uncrossable lesions" can be modified and negotiated with the hard metallic spiral structure. If needed, the microcatheter can be replaced with a less bulky device later in the procedure.

Excellent support device when parked in front of the proximal cap due to stainless steel design to the tip.

When the guiding catheter doesn't provide enough support, Tornus can serve as an excellent choice because of the active backup of the microcatheter.

Do not exceed 20 rotations in the same direction to prevent the risk of fracture/breakage of the shaft at the distal part, which could lead to the system blocking the artery.

MISCELLANEOUS

Stainless steel coil shaft for outstanding support, pushability, and torque performance shaft structure enables rotation of the catheter, providing excellent crossability.

Platinum distal radiopaque marker for easy visualization of the tip.

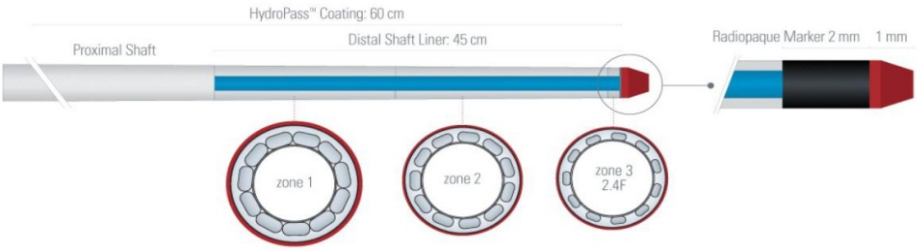
Covered tube 30 cm prevents blood leakage.

Safety system 5 cm identifies any catheter breakage due to over-rotation

Also available TORNUS 88 Flex - tip 2.1 Fr, crossing profile/distal shaft 2.6 Fr, proximal shaft 3.0 Fr, 135 cm, taper 5 cm, then straight 8 cm to the tip) – bigger coils, extra support, pushability, green hub

MAMBA

BOSTON SCIENTIFIC



CONSTRUCTION

Tapered coil, 3 coil taper zones, constructed from 11 individually tapered filars that extend from hub to tip, Integrated tip, distal shaft inner liner 45 cm, 2 mm radiopaque marker 1 mm from the tip, 1 mm long red tip with 0.75 mm long tapered part

The unique integrated tip is engineered with a Tapered Coil to within less than 1 mm of the distal tip - a metal backbone for maximum durability, deliverability, and very good guidewire support.

TIP ENTRY PROFILE: 1.4 Fr

OUTER DIAMETER: DISTAL SHAFT 2.4 Fr (0.74 mm), PROXIMAL SHAFT 2.9 Fr (0.95 mm)

COATING: HydroPass Hydrophilic coating 60 cm

0.014" (0.36 mm) guidewire compatible, 5Fr and above guide catheter compatible

USABLE LENGTH: 135 cm for the anterograde approach

ADVANCEMENT: clockwise rotation, counterclockwise rotation, pushing

PURPOSE

Highly pushable and torqueable microcatheter. Single piece architecture (tapered filars) with 1:1 torque.

Impressive push and support. The tapered coil is constructed from 11 individually tapered filars from hub to tip - a flexible distal shaft as the filars taper and continuous metal backbone.

Anterograde procedures. When strong support is needed.

TIPS & TRICKS

Clockwise mainly, and Counterclockwise rotation with pushing. About 10 clockwise fast rotations with pushing in standard technique (two hands: right hand rotating while the wire is trapped with a small finger, left-hand advancing/pushing)

Another technique is slow rotations with minimal or no pushing („slow boss technique"), microcatheter with non welded filars advances slowly through the vessel.

It can be rotated more than 10 times in one direction if the tip advances without problem because of the microcatheter design.

When advancing under resistance, rotate in either a clockwise or counterclockwise (not both) direction while gently pushing.

If the distal tip is not rotating or advancing, do not rotate the microcatheter more than 5 consecutive rotations in either direction.

Do not push hard against strong resistance; always check that tip is moving back or forward.

Alternating direction of rotation (clockwise change into counterclockwise) can help for more successful deliverability.

If extensive rotation is applied, always test if the wire is still free inside the microcatheter. Overtorque may lead to kinking of the microcatheter with blockage of the wire inside it. This needs to be avoided otherwise, the only solution is to remove everything (wire and MC) and start again.

With a „half hexagon" tip shape, sometimes TIP-IN and RENDEZVOUS maneuvers can be more difficult than with tubular or tapered tip microcatheters.

MISCELLANEOUS

Tip rotates completely with the shaft because of the integrated tip design. The distal part cannot be destroyed easily because It is coil supported up to 1 mm from the tip. Can be used in some lesions like Crossboss.

Before removing the microcatheter from the carrier hoop, flush the carrier with saline to activate hydrophilic coating.

Great support for the wire, good pushability. Tip designed to have support puncture force.

2x Mamba can fit in a 7 Fr guiding catheter.

Inner 45 cm distal shaft liner reduces friction from wire interaction.

MAMBA FLEX

BOSTON SCIENTIFIC

CONSTRUCTION

Tapered coil, 5 coil taper zones, constructed from 11 individually tapered filars that extend from hub to tip, Integrated tip, distal shaft inner liner 45 cm, 2 mm radiopaque marker 1 mm from the tip, 1 mm long red tip with 0.75 mm long tapered part

A unique integrated tip is engineered with a Tapered Coil to within less than 1 mm of the distal tip - a metal backbone for maximum durability, deliverability, and very good guidewire support.

TIP ENTRY PROFILE: 1.4 Fr

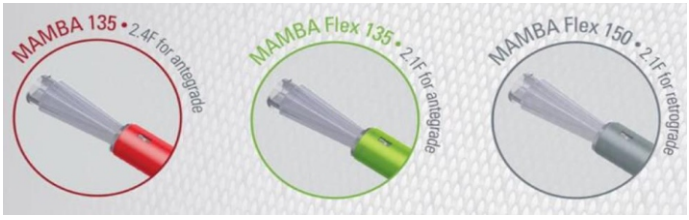
OUTER DIAMETER: DISTAL SHAFT 2.1 Fr (0.71 mm), PROXIMAL SHAFT 2.9 Fr (0.95 mm)

COATING: HydroPass Hydrophilic coating 60 cm

0.014" (0.36 mm) guidewire compatible, 5Fr and above guide catheter compatible

USABLE LENGTH: 135 cm for anterograde approach (green colored hub), 150 cm for retrograde approach (grey colored hub)

ADVANCEMENT: clockwise rotation, counterclockwise rotation, pushing



PURPOSE

Low profile highly pushable and torqueable microcatheter for deliverability through tortuous anatomy. Useful in complex PCI and CTO procedures. Retrograde CTO cases.

Anterograde tortuous segments (Mamba Flex 135) and retrograde procedures (Mamba Flex 150)

Septal collaterals, epicardial collaterals (CC2 collaterals). Can replace Caravel for epicardial collaterals crossing, but Caravel or Finecross safer for CC1 epicardial collaterals.

TIPS & TRICKS

Clockwise mainly, and Counterclockwise rotation with pushing. About 10 clockwise fast rotations with pushing in standard technique (two hands: right hand rotating while the wire is trapped with a small finger, left-hand advancing/pushing)

Another technique is slow rotations with minimal or no pushing („slow boss technique"), microcatheter with non welded filars advances slowly through the vessel.

Good performance in less demanding retrograde collaterals. Due to the microcatheter design can be rotated more than 10 times in one direction if the tip advances without a problem.

When advancing under resistance, complex collaterals, rotate in either a clockwise or counterclockwise (not both) direction slowly while gently pushing. Because of that maneuverability, sometimes crossing takes longer.

If the distal tip is not rotating or advancing, do not rotate the microcatheter more than 5 consecutive rotations in either direction.

Do not push hard against strong resistance; always check that tip is moving back or forward.

If extensive rotation is applied, always test if the wire is still free inside the microcatheter. Overtorque may lead to kinking of the microcatheter with blockage of the wire inside it. This needs to be avoided; otherwise the only solution is to remove everything (wire and MC) and start again.

If stuck or stop at the vessel bends and complex anatomy, wait to relax material forces and over-rotation. After about 30 seconds, repeat rotation and slight pushing maneuver for further MC propagation. Alternating direction of rotation (clockwise change into counterclockwise) can help for more successful deliverability.

If the entrance of the collateral is extremely angulated, Mamba flex is not the best choice as its tip is stiffer than some other MC, and it would not follow the wire easily.

With a „half hexagon" tip shape, sometimes TIP-IN and RENDEZVOUS maneuvers can be more difficult than with tubular or tapered tip microcatheters.

MISCELLANEOUS

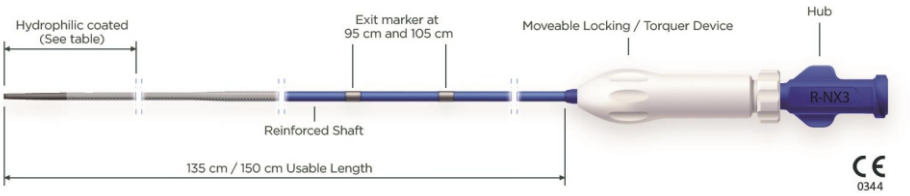
Can make the feeling of over-torque, and when torque force is released, Mamba often spins back.

Tip rotates completely with the shaft because of the integrated tip design. The distal part cannot be destroyed easily because It is coil supported up to 1 mm from the tip.

2x Mamba Flex can fit in a 7 Fr guiding catheter. Inner 45 cm distal shaft liner reduces friction from wire interaction.

NHANCER PRO X

IMDS



CONSTRUCTION

Dual braided reinforced shaft + core wire technology, Hub with strain relief, Torquer for wire locking and maneuverability. 2-layer tip design for improved tracking

TIP types – SOFT TAPERED TIP (NX3) and LARGE LUMEN MOSQUITO TIP (NX6), flexible radiopaque

OUTER DIAMETER NX3: DISTAL SHAFT 2.0 Fr (0.67 mm), Proximal SHAFT 3.0 Fr (1 mm)

OUTER DIAMETER NX6: DISTAL SHAFT 2.3 Fr (0.76 mm), Proximal SHAFT 2.6 Fr (0.86 mm)

INNER DIAMETER: PROXIMAL SHAFT 0.52 mm, DISTAL SHAFT 0.45 mm

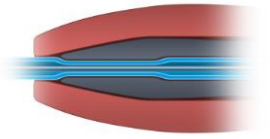
COATING: Hydrophilic coating, NDurance 25 cm on 135 cm catheter, 60 cm and 155 cm catheter

0.014" (0.36 mm) guidewire compatible

USABLE LENGTH: 135 cm (A-NX3, A-NX6) and 155 cm (R-NX3, R-NX6)

ADVANCEMENT: pushing, slight rotation up to 180 degrees in both directions

UNIQUE HYBRID GW-SHAFT LOCK



IMPROVES PRIMARY WIRING AND PROCEDURAL SUCCESS RATES [1]

NX31413525 & NX31415560

PRO X CROSS WITH SOFT HIGH PENETRATION TIP

NX61413525 & NX61415560

PRO X MOSQUITO TIP WORKHORSE MICRO CATHETER

PURPOSE

Low-profile microcatheter with uniquely designed torquer on a compressible shaft.

Anterograde and retrograde CTO procedures. Septal and epicardial collaterals.

Tortuous coronary vessel tracking.

NX3 has an excellent balance of deliverability/flexibility and support in retrograde procedures, septal collaterals, high performance, and safety for epicardial collaterals crossing. Safe also for CC1 epicardial collaterals crossing (options also Caravel, Finecross, Supercross straight..)

Selective contrast injection. RotaWire exchange.

TIPS & TRICKS

Advancement with pushing. It can be slightly rotated for better crossability on more supportive wires.

Pushing and slight rotation up to 180 ° in epicardial and noncalcified vessels for better trackability.

1:1 torque from the hub to the tip.

The device provides a torquer for optimal maneuverability with the compressible shaft, and any commercial 0.014" guidewire and the microcatheter can be transiently locked in combination. When locked with the torquer, the guidewire and the NHancer Pro X act as one integral device that can increase the penetration power of the wire.

Dynamic alterations of the guidewire characteristics are available - By locking close to the guidewire tip (within 2-4 mm), wire penetration can be markedly increased in a controlled manner. Alternatively, locking further from the guidewire tip (10-20 mm) will primarily enhance wire torque and steering characteristics to facilitate navigation of tortuous or complex anatomy.

NX3 is a good option for TIP-IN (retrograde wire into anterograde microcatheter in anterograde guiding) and RENDEZVOUS (anterograde wire into retrograde microcatheter at the anterograde guiding) techniques

Longest microcatheter option available, supporting extreme length in retrograde procedures when needed - 155 cm

MISCELLANEOUS

Less support than with coiled torquable microcatheters. More friction inside microcatheter with Asahi wires than in Corsair/Turnpike. Overall performance in complex scenarios is average.

Good trackability in tortuous coronary vessels. Can advance in angulated vessels, sometimes crosses multiple angulations. In comparison to torquable microcatheters, in some situations worse trackability

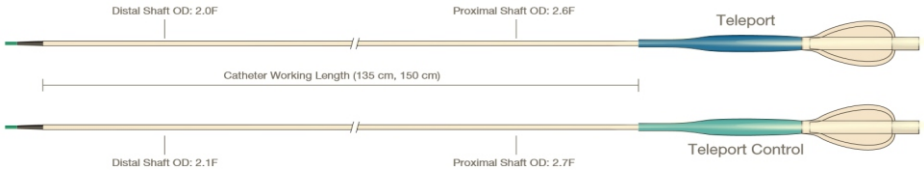
Improved for better pushability and crossability compared to an older version on NHancer ProX. Less fragile tip than Caravel tip.

Unique hybrid GW-Shaft lock provides directional catheter torque control with stronger guidewire advancement across CTO cap or body. Re-inforced shaft with dual braid and core wire for the efficient push. The strain relief for avoiding of kinking of the shaft.

On the shaft, depth markings (95 and 105 cm) - indicate that the distal tip of the catheter is at the level of the distal tip of the guiding catheter.

TELEPORT®
TELEPORT®CONTROL

ORBUSNEICH®



CONSTRUCTION

HYBRACOIL – Hybrid BRAiding – 14 flat wires and 2 round wires + 1 Coil construction, DURA – Dual-layer RAdiopaque tapered tip 6 mm, Polymer jacket outside, PTFE layer lumen

TIP ENTRY PROFILE: 0.0190", 1.4 Fr (0.48 mm), 6 mm long – tapered (Tungsten + Pebax)

OUTER DIAMETER: TELEPORT DISTAL SHAFT 2.0 Fr (0.66 mm), Proximal SHAFT 2.6 Fr (0.85 mm),

TELEPORT CONTROL DISTAL SHAFT 2.1 Fr (0.69 mm),
Proximal SHAFT 2.7 Fr (0.89 mm)

INNER DIAMETER: TIP (0.0157"), SHAFT (0.017" TELEPORT), SHAFT 0.0175" TELEPORT CONTROL)

COATING: Hydrophilic coating 60 cm including tip

0.014" (0.36 mm) guidewire compatible, 5Fr guiding compatible

USABLE LENGTH: 135 cm for the anterograde approach and 150 cm for the retrograde approach

ADVANCEMENT: rotation + pushing

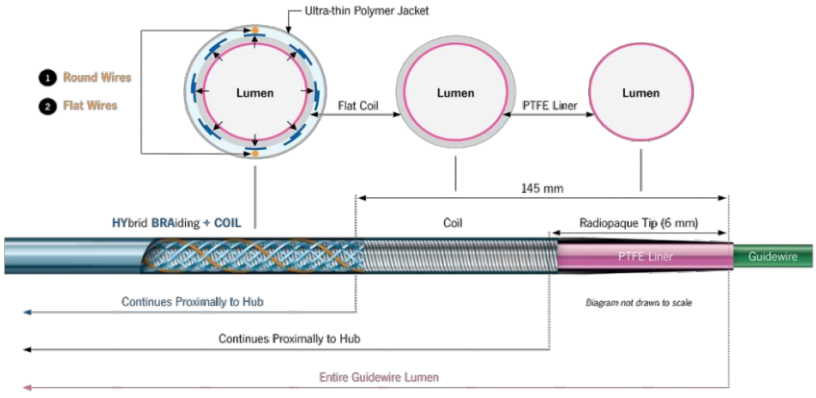


Image used courtesy of OrbusNeich Medical Company Ltd (source: https://orbusneich.com/products/teleport-coronary/)

PURPOSE

Ultra-Low profile torquable microcatheter is useful in complex PCI and CTO procedures. For navigation inside lesion and microchannels

Two available versions. TELEPORT for better penetration and TELEPORT CONTROL for better torquability

Anterograde and RETROGRADE procedures.

Tortuous anatomy

Septal collaterals, epicardial collaterals (CC2 collaterals). Can replace Caravel for epicardial collaterals crossing, but Caravel or Finecross safer for CC1 epicardial collaterals.

TIPS & TRICKS

Pushing in less complex anatomy, an excellent sliding performance due to 60 cm distal hydrophilic coating including tip.

Rotation in either direction during the procedure, enhancing crossability in complex lesions. Good transmission of the torque from the hub to the tip. When constantly rotating, keeping the catheter in forward motion helps reduce friction and resistance.

If stuck or stop at the vessel bends and complex anatomy, wait to relax material forces and over-rotation. After about 30 seconds, repeat rotation and slight pushing maneuver for further MC propagation.

Do not push hard against strong resistance; always check that tip is moving back or forward.

Always check that the tip is „free" the wire still slides without friction and does not over-rotate because the device can cause wire entrapment.

Alternating direction of rotation (clockwise change into counterclockwise) can help for more successful deliverability.

For better/modified wire penetration force, park the Teleport at the proximal cap.

Autotrapping with a conventional angioplasty balloon can increase the back up force for more aggressive proximal cap penetration.

If extensive rotation is applied, always test if the wire is still free inside the microcatheter. Overtorque may lead to kinking of the microcatheter with blockage of the wire inside it. This needs to be avoided; otherwise, the only solution is to remove everything (wire and MC) and start again from the beginning.

2x Teleport can fit in a 7 Fr guiding catheter.

MISCELLANEOUS

HYBRACOIL construction – the balance of catheter control, trackability, kink resistance, and flexibility from hub to tip Good balance of deliverability and support.

Unique, robust tip design with great visibility due to DUal-Layer RAdiopaque (DURA) tapering technology

More durable tip than at Caravel microcatheter.

MICROCROSS 14
MICROCROSS 14ES

BTG

CONSTRUCTION

Variable-pitch stainless steel braided shaft, tapered tip, radiopaque marker on the distal tip

MicroCross 14 (Blue), MicroCross 14ES (Purple) – enhanced distal 4 cm for more support

TIP ENTRY PROFILE: 1.6 Fr (0.52 mm)

OUTER DIAMETER: DISTAL SHAFT 1.6 Fr (0.52 mm), BODY SHAFT 2.5 Fr (0.83 mm)

INNER DIAMETER: TIP 0.38 mm (0.015")

COATING: Lubricious state-of-the-art Serene™ coating provides low friction force and a Teflon-lined inner core for smooth guidewire control

0.014" (0.36 mm) guidewire compatible, min. Guide catheter 5 Fr, Compatible with CenterCross

USABLE LENGTH: 135 cm and 155 cm

ADVANCEMENT: pushing, slight rotation

Variable-pitch stainless steel braided shaft

PURPOSE

Ultra-low profile non-torquable microcatheter with tapered tip. Smallest distal crossing profile of 1.6 Fr. and proximal shaft of 2.5 Fr.

Designed to rack through complex, tortuous, and narrow anatomy to the lesion.

Anterograde and retrograde procedures.

Septal collaterals, epicardial collaterals. Selective contrast injection. Rotawire exchange.

TIPS & TRICKS

Advancement with pushing. It can be slightly rotated for better crossability on more supportive wires.

Longest microcatheter option available (with NHancer NX3 155), supporting extreme length in retrograde procedures when needed - 155 cm

A good option to try when other microcatheters fail to cross due to the smallest distal crossing profile.

2 Microcross fit in a 6Fr guide catheter

MISCELLANEOUS

Ultra-low diameter profile, a state-of-the-art hydrophilic coating, and a unique variable-pitch braided shaft, Micro14 and Micro18 can track through highly demanding lesions, where traditional microcatheters fall short.

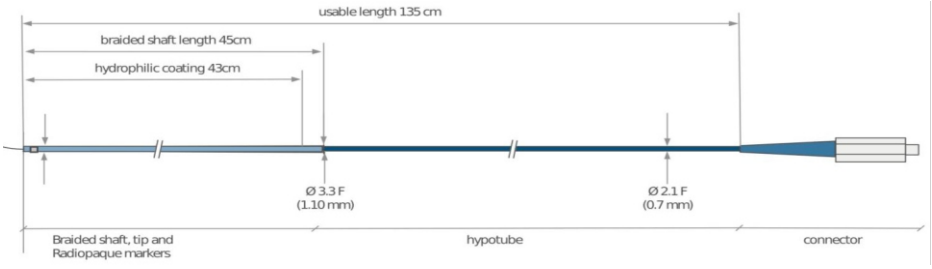
Variable pitch braiding optimizes stiffness at the proximal end and flexibility at the distal end - high torqueability without kinking.

Compatible with CenterCross® and will fit into 0.035" lumen catheters. Combining with CenterCross for much stronger crossability

Also available MicroCross 18 (Gray) Tip entry profile 1.9 Fr, Distal shaft 2.4 Fr, Proximal shaft 2.9 Fr, 0.018" guidewire compatible, usable length 90, 135, and 155 cm. (For peripheral interventions)

M-CATH

ACROSTAK



CONSTRUCTION

Hybrid braided shaft, tip, and radiopaque markers, 45 cm braided shaft from the tip, from 2.25 Fr to 3.3 Fr, hypotube 2.1 Fr to the hub

TIP ENTRY PROFILE: 1.6 Fr, tapered and robust tip material

OUTER DIAMETER: DISTAL SHAFT 2.25 Fr (0.75 mm) to 3.3 Fr (1.10 m), PROXIMAL SHAFT 2.1 Fr (0.7 mm)

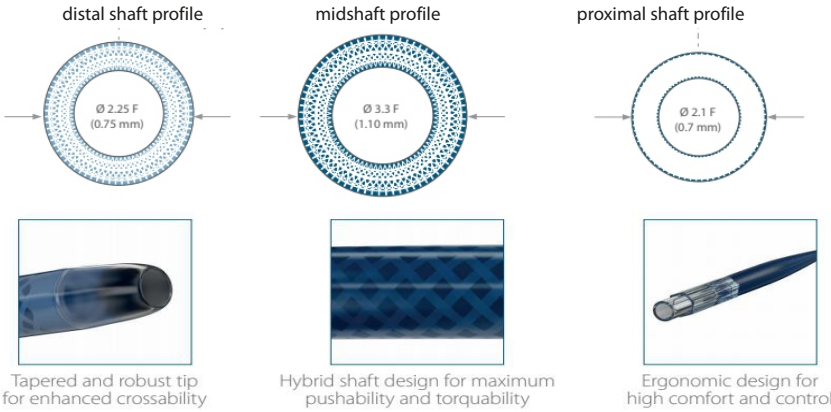
INNER DIAMETER: distal 0.016", proximal 0.018"

COATING: Hydrophilic coating 43 cm

0.014" (0.36 mm) guidewire compatible

USABLE LENGTH: 135 cm for anterograde approach

ADVANCEMENT: pushing in hard lesions rotate with caution. Do not turn the catheter in the same direction, either clockwise or counterclockwise, for more than 3 consecutive times.



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PURPOSE

Low profile non-torqueable microcatheter with 1.6 Fr entry profile, focused on crossability.

Anterograde procedures.

The approach in„uncrossable, "calcified and fibrotic challenging lesions

When a solid supportive shaft and maximal pushability are needed.

In complex calcified subtotal occlusion, uncrossable for low profile balloons and most other microcatheters

Not for tortuous vessels.

TIPS & TRICKS

Advancement with pushing. It can be slightly rotated for better crossability on more supportive wires. Intense pushing possible with well-preserved trackability.

The robust proximal shaft is very supportive for calcified CTOs

Suitable for microinjection, due to robust and stable tip good for Carlino technique

In complex calcific subtotal occlusions uncrossable for conventional low profile balloons, M-Cath with superior pushability can facilitate crossing and bail out rotablation/laser.

Not to be used in patients with tortuous vessels.

Do not turn the catheter in the same direction, either clockwise or counterclockwise, for more than 3 consecutive times.

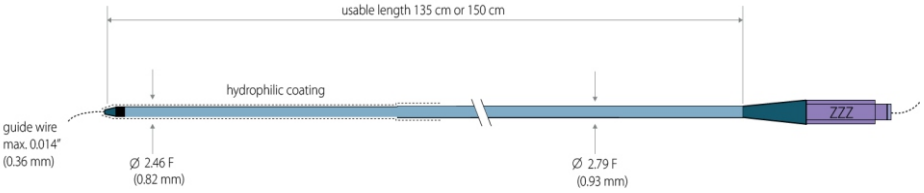
MISCELLANEOUS

Unique hybrid braided hypotube shaft design with maximal pushability and torqueability. With intense pushing, It doesn't lose trackability.

Tapered and robust tip for less deformation and enhanced crossability. Designed for special complex cases.

M-CATH Flexy

ACROSTAK



CONSTRUCTION

Tapered balanced braided shaft with enhanced torsional capacity, reinforced tip, tapered shaft from 2.79 Fr to 2.46

TIP ENTRY PROFILE: 1.65 Fr, tapered reinforced tip

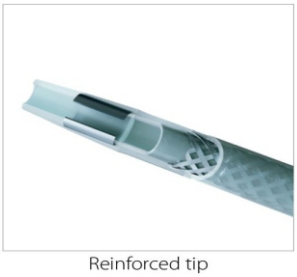
OUTER DIAMETER: DISTAL SHAFT 2.46 Fr (0.82 mm), PROXIMAL SHAFT 2.79 Fr (0.93 mm)

INNER DIAMETER: distal 0.016", proximal 0.018. "

COATING: Hydrophilic coating

0.014" (0.36 mm) guidewire compatible

USABLE LENGTH: 135 cm for anterograde approach, 150 cm for the retrograde approach



Reinforced tip

Great flexibility

Comfortable handling

PURPOSE

Low profile microcatheter with reinforced tip, designed for superior flexibility with enhanced torsional capacity

Anterograde and retrograde procedures.

Good support due to reinforced tip for tortuous anterograde procedures

Retrograde septal collaterals.

TIPS & TRICKS

Advancement with pushing and slight rotation.

Suitable for microinjection, due to reinforced tip good for Carlino technique

Always check that the tip is„free" when negotiating the vessel.

Do not rotate for more than 3 consecutive times.

Do not push hard against strong resistance; always check that tip is moving back or forward.

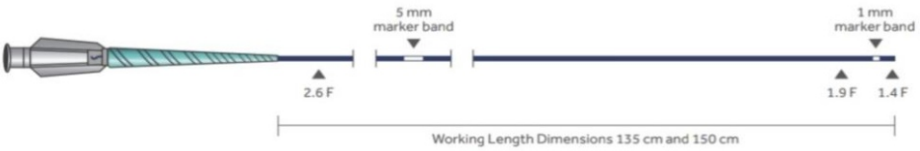
MISCELLANEOUS

Unique hybrid braided hypotube shaft design with maximal pushability and torqueability. With intense pushing, It doesn't lose trackability.

Tapered and robust tip for less deformation and enhanced crossability. Designed for special complex cases.

TELEMARK

SURMODICS



CONSTRUCTION

XtremeTM technology braided - mixed (flat and round) braided mesh with a 1 mm marker band at the tip.

TIP ENTRY PROFILE: 1.4 Fr (0.47 mm)

OUTER DIAMETER: DISTAL SHAFT 1.9 Fr (0.63 mm), Proximal SHAFT 2.6 Fr (0.87 mm)

INNER DIAMETER: TIP 0.38 mm (0.015"), SHAFT 0.53 mm (0.021")

COATING: Pristyine Hydrophilic coating, distal 75 cm

0.014" (0.36 mm) guidewire compatible

USABLE LENGTH: 130 cm for the anterograde approach and 150 cm for the retrograde approach

ADVANCEMENT: pushing, slight rotating

PURPOSE

Low profile non-torqueable microcatheter with small crossing profile from the distal shaft to the tip – from 1.9 Fr to 1.4 Fr.

Anterograde and retrograde procedures.

Septal collaterals, epicardial collaterals. Safe for CC1 epicardial collaterals crossing (with Caravel or Finecross)

Can serve as workhorse microcatheter in more straightforward CTO procedures.

A good option when other microcatheters fail to cross due to excellent crossability, deliverability, and lubricity.

Selective contrast injection. Rotawire exchange.

TIPS & TRICKS

Advancement with pushing and slight rotation

It can be slightly rotated for better crossability on more supportive wires.

Good torque response from the hub to the tip, without much rotation delay.

Pushing and slight rotation up to 180 ° in epicardial and noncalcified vessels for better trackability.

Lower active-backup. In calcification and tortuosity, crossing success depends on guiding backup force. Less support than with thicker and coiled microcatheters (Corsair Pro...)

2 Telemark fit in a 6Fr guide catheter

MISCELLANEOUS

Small tapered tip from 1.9 Fr to 1.4 Fr. Crossing profile of the distal shaft and the tip like Caravel, but without long„rubbery" tip. The tip of the Telemark is more robust like at Finecross but slightly tapered (Finecross has a tubular nontapered tip of 1.8 Fr - Telemark has tapered tip to 1.4 Fr)

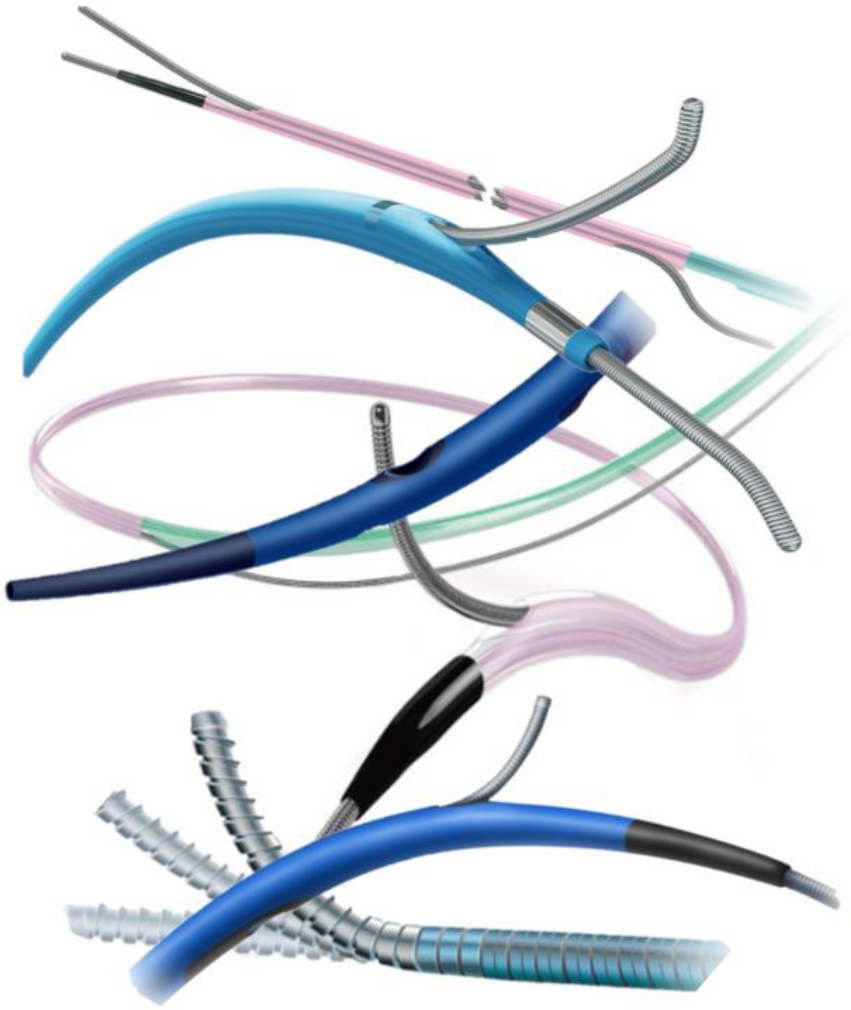
„Hybrid of Caravel and Finecross"

Superior crossability due to enhanced push force transmission with the XtremeTM mixed braided shaft design.

Superior trackability, navigation in highly stenosed, complex lesions, and tortuous distal vessels due to advanced lubricity of the PristyneTM hydrophilic coating. Kink resistant.

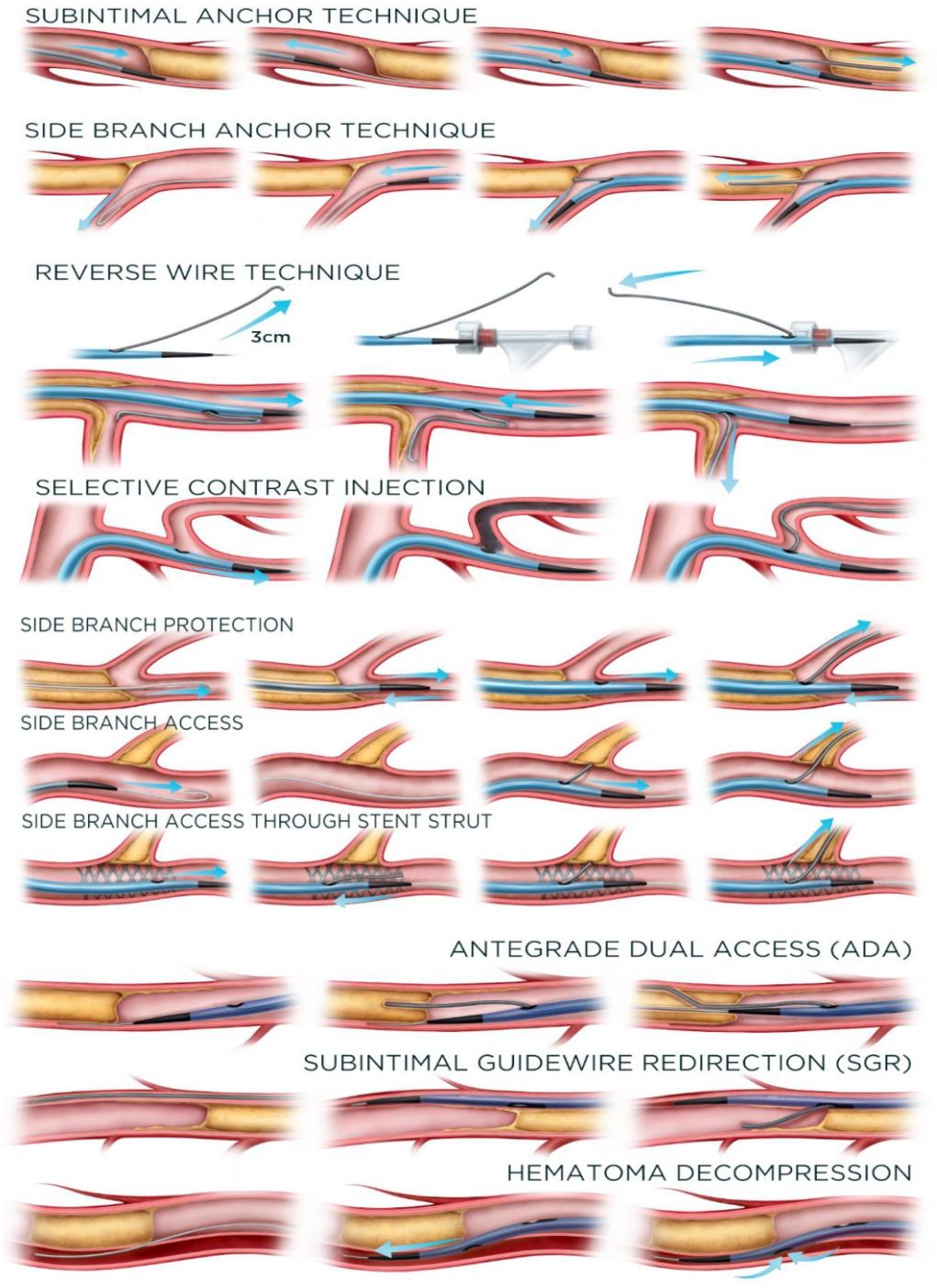
Less support than with coiled torqueable microcatheters. In most cases not the first option for complex CTO procedures.

3



DOUBLE LUMEN, SPECIAL CATHETERS

DOUBLE LUMEN MICROCATHETERS TECHNIQUES

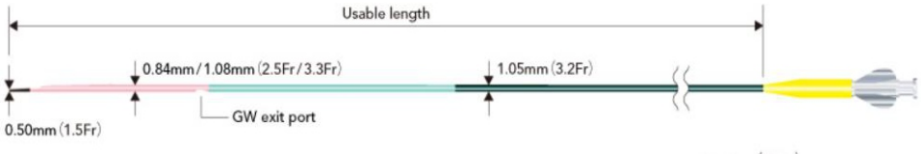


DOUBLE LUMEN, SPECIAL CATHETERS

	CONSTRUCTION	TIP ENTRY PROFILE	OUTER DIAMETER SHAFT DISTAL PROXIMAL	COATING	USABLE LENGTH
Sasuke	Double lumen oval MC Double stainless steel core	1.5 Fr (0.50 mm)	2.5 Fr (0.84 mm)/3.3 Fr (1.08 mm) 3.2 Fr (1.05 mm)	Hydrophilic 38 cm	145 cm
FineDuo	Double lumen round MC	1.3 Fr (0.43 mm)	2.9 Fr (0.97 mm) 3.1-3.2 Fr (1.07 mm)	Hydrophilic	140 cm
Crusade	Double lumen round MC	1.3 Fr (0.43 mm)	2.9 Fr (0.97 mm) 3.1 Fr (1.03 mm)	Hydrophilic	140
Twin-Pass Torque	Double lumen round MC Stainless steel braided shaft	2.1 Fr (0.71 mm)	3.5 Fr (1.15 mm)	Hydrophilic 25 cm	135 cm
Twin-Pass	Double lumen oval MC Stainless steel rod	2.0 Fr (0.66 mm)	2.7 Fr (0.89 mm)/3.4 Fr (1.12 mm)	Hydrophilic 18 cm	135 cm
Recross	Double lumen, double OTW oval MC, braided shaft	1.5 Fr (0.50 mm)	2.3 Fr (0.75 mm)/3.3 Fr (1.08 mm) 2.6 Fr (0.85 mm)/3.4 Fr (1.12 mm)	Hydrophilic NDurance	140 cm
Nhancer RX	Double lumen oval MC Braided shaft	1.5 Fr (0.50 mm)	2.3 Fr (0.75 mm)/3.3 Fr (1.08 mm) 2.6 Fr (0.85 mm)	Hydrophilic NDurance	135 cm
Venture	Deflectable 90° tip MC RX and OTW	2.27 Fr (0.75 mm)	2.27 Fr (0.75 mm) to 4.1 Fr (1.37 mm)	Hydrophilic 24/45 cm	144.5 cm RX 139.5 cm OTW
Swiftninja	Deflectable tip 180° MC	2.4 Fr 0.79 mm)	2.4 Fr (0.80 mm) to 2.9 Fr (0.97 mm)	Hydrophilic 80 cm	125 cm

SASUKE

ASAHI INTECC



CONSTRUCTION

Double lumen oval MC with double stainless steel core in the proximal shaft, the same tapered soft tip used in Corsair Pro and Caravel to maintain trackability in tortuous vessels

1 RX lumen exit port in the tip, 1 OTW lumen exit port 6.5 mm from the tip, 4 mm radiopaque tip length

TIP ENTRY PROFILE: 1.5 Fr (0.50 mm), 4 mm tip length

OUTER DIAMETER: OVAL DESIGN, DISTAL SHAFT 2.5 Fr (0.84 mm)/3.3 Fr (1.08 mm), Proximal SHAFT 3.2 Fr (1.05 mm)

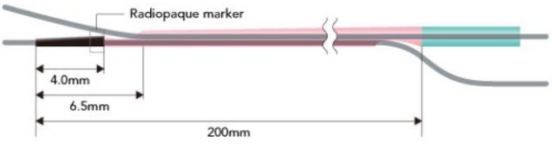
INNER DIMAETER: tip 0.40 mm (0.016"), shaft 0.43 mm (0.017")

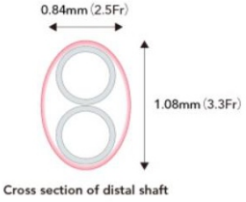
COATING: Hydrophilic coating 38 cm (L3 coat)

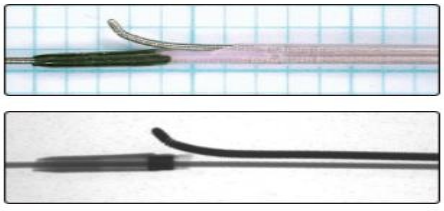
0.014" (0.36 mm) guidewire compatible, 5Fr and above guide catheter compatible

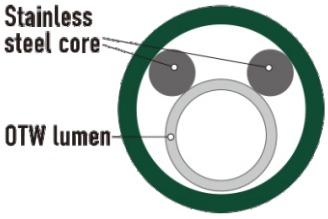
USABLE LENGTH: 145 cm (longest among dual lumen microcatheters)

ADVANCEMENT: pushing, minimal rotation









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PURPOSE

Double lumen microcatheter with double stainless steel core in the proximal shaft for kink resistance. OTW lumen 6.5 mm from the tip having a 20-degree deflection, RX lumen on the tip.

Anterograde and retrograde approach

DOUBLE LUMEN MC TECHNIQUES

Subintimal anchor technique (paraller wire technique)

Sidebranch anchor technique (major side branch near the proximal CTO CAP)

Retrograde sidebranch anchor technique

Reverse wire technique, sidebranch access / through stent

Selective engagement of angulated collaterals

Access to side branch at the distal occlusion cap

Retrograde tip injection and access

Selective contrast injection

Protection of side branch

TIPS & TRICKS

Pushing to advance, better over supportive wires.

Slight minimal degree rotation can propagate advancement sometimes

Due to hydrophilic coating, low profile, and length of 145 cm, it can be used for retrograde procedures through septal collaterals.

Trapping possible in 6 Fr guiding catheter with TrapIt or Trapper (Not possible in average guiding with standard 2.0 balloons due to proximal shaft diameter of 3.2 Fr)

MISCELLANEOUS

Because of the oval design unable to fully rotate (similar to Recross, NHancer RX). It can be used for retrograde approach through septal collaterals.

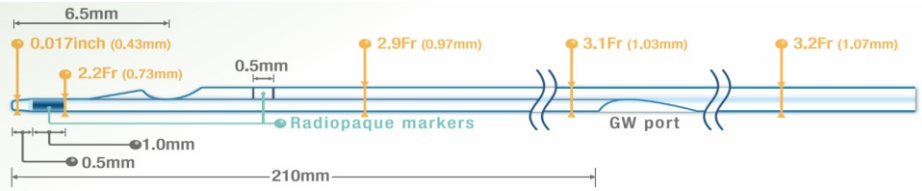
The longest length of the dual lumen microcatheters – 145 cm.

The same tapered soft tip used in Corsair Pro and Caravel, therefore good trackability in tortuous vessels, possibility to retrograde septal collaterals passing

L3 coat: in bench testing retains the same lubricity even after 50 times.

FINEDUO

TERUMO



CONSTRUCTION

Double lumen round MC. 1 RX lumen exit port in the tip, 1 OTW lumen exit port 6.5 mm from the tip, 2 radiopaque markers – 1 mm marker 0.5 mm from the tip and 0.5 mm marker on the OTW lumen. RX length 21 cm

TIP ENTRY PROFILE: 0.017", 1.3 Fr (0.43 mm), distal marker area 2.2 Fr (0.73 mm), tapered flex tip

OUTER DIAMETER: ROUND DESIGN, DISTAL SHAFT 2.9 Fr (0.97 mm), Proximal SHAFT 3.1 - 3.2 Fr (1.07 mm)

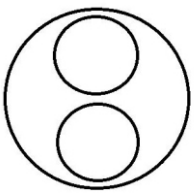
INNER DIMAETER: tip 0.40 mm (0.016"), shaft 0.43 mm (0.017")

COATING: Hydrophilic coating distal 21 cm

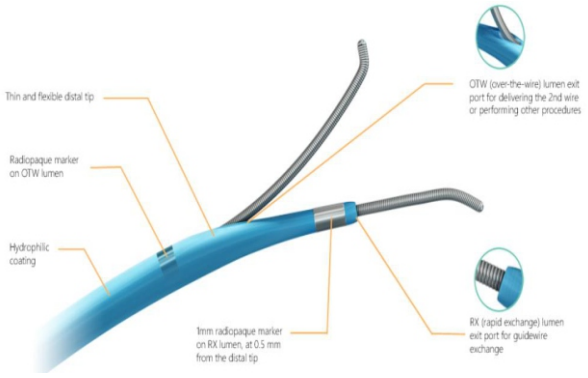
0.014" (0.36 mm) guidewire compatible, minimal guiding catheter inner diameter 0.056" (1.44 mm)

USABLE LENGTH: 140 cm

ADVANCEMENT: pushing



Round shaft
Crossing profile
0.97 mm (2.9 Fr)



PURPOSE

Double lumen round microcatheter with one 1 RX lumen exit port in the tip and 1 OTW lumen exit port 6.5 mm from the tip.

Anterograde approach

DOUBLE LUMEN MC TECHNIQUES

Subintimal anchor technique (paraller wire technique)

Sidebranch anchor technique (major side branch near the proximal CTO cap)

Retrograde sidebranch anchor technique

Reverse wire technique

Sidebranch access / through stent

Selective engagement of angulated collaterals

Access to side branch at the distal occlusion cap

Retrograde tip injection and access

Selective contrast injection

Protection of side branch

TIPS & TRICKS

Pushing to advance, better over supportive wires.

Slight rotation can propagate advancement.

For easy trapping, 7 Fr guiding catheter is needed. In 6 Fr possible with TrapIt and Trapper

Easy double lumen MC techniques because of precise OTW port positioning due to visible 0.5 mm radiopaque marker.

3-4 degree guidewire exit angle, with the „bump" on the exit port for greater rotation range of

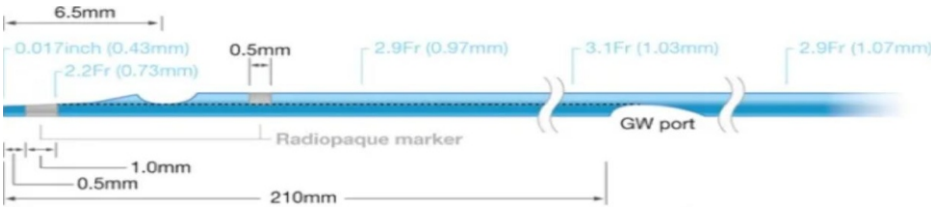
MISCELLANEOUS

Double radiopaque markers for accurate placement - 1 mm marker on RX lumen for clear visualization of the distal tip. 0.5 mm radiopaque marker on the OTW lumen area.

Low profile, tapered flex tip with hydrophilic coating and strong backup force - superior trackability and crossability.

CRUSADE

KANEKA



CONSTRUCTION

double-lumen round MC with supportive low crossing profile, RX tip lumen, OTW exit port 6.5 mm from the tip, radiopaque markers: 1 mm marker 0.5 mm from the tip and 0.5 mm marker at the exit port

TIP ENTRY PROFILE: 0.017", 1.3 Fr (0.43 mm), tip shaft 2.2 Fr (0.73 mm)

OUTER DIAMETER: ROUND DESIGN, DISTAL SHAFT 2.9 Fr (0.97 mm), Proximal SHAFT 3.1 Fr (1.03 mm)

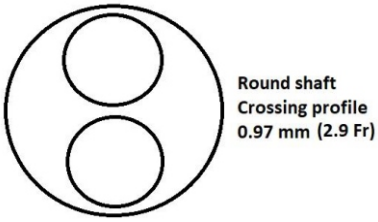
INNER DIAMETER: 2x 0.48 mm

COATING: Hydrophilic coating distal 21 cm

0.014" (0.36 mm) guidewire compatible, 5Fr and above guide catheter compatible

USABLE LENGTH: 140 cm

ADVANCEMENT: pushing.



+CRUSADE Hard: tip shaft profile 2.4 Fr, DISTAL SHAFT 3.2 Fr
+CRUSADE Multi-Marker: multipole radiopaque markers, 0.5, 13, 18, 23, 28, and 33 mm from the tip)

PURPOSE

Double lumen round microcatheter with one 1 RX lumen exit port in the tip and 1 OTW lumen exit port 6.5 mm from the tip. Flexible distal shaft. Sturdy proximal shaft.

Anterograde approach

DOUBLE LUMEN MC TECHNIQUES

Subintimal anchor technique (paraller wire technique)

Sidebranch anchor technique (major side branch near the proximal CTO cap)

Retrograde sidebranch anchor technique

Reverse wire technique

Sidebranch access / through stent

Selective engagement of angulated collaterals

Access to side branch at the distal occlusion cap

Retrograde tip injection and access

Selective contrast injection

Protection of side branch

TIPS & TRICKS

Pushing to advance, better over supportive wires.

Slight rotation can propagate advancement.

For easy trapping, 7 Fr guiding catheter is needed. In 6 Fr possible with TrapIt and Trapper

Easy double-lumen MC techniques because of precise OTW port positioning due to visible 0.5 mm radiopaque marker.

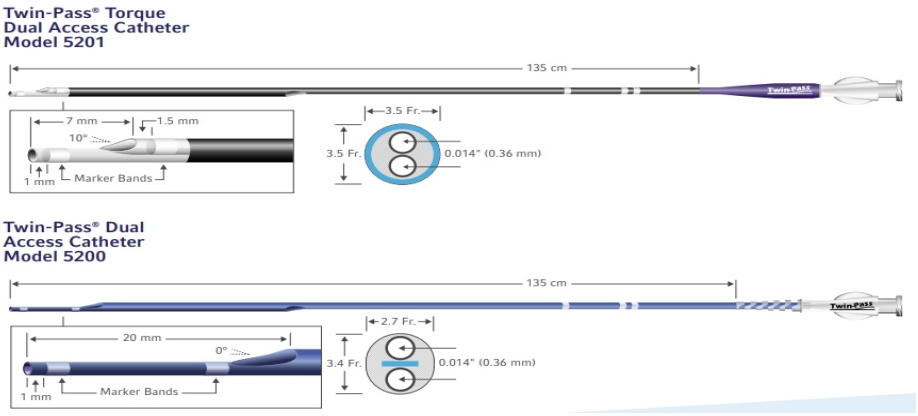
MISCELLANEOUS

A "double layer lumen" allows superior GW movement. Two radiopaque markers on the RX lumen make it easy to estimate the length of the lesion.

Low profile, tapered flex tip with hydrophilic coating and strong backup force - superior trackability and crossability.

TWIN-PASS TORQUE & TWIN-PASS

TELEFLEX



CONSTRUCTION

2 designs - stainless steel braided shaft and stainless steel rod, Rx and OTW lumen,

TWIN-PASS TORQUE Model 5201: stainless steel braided shaft, RX tip lumen, and OTW side exit port at 7 mm from the tip, distal tip length 7 mm, RX lumen length 22 cm

TWIN-PASS Model 5200: proximal embedded stainless steel rod for support and pushability. RX tip lumen and OTW side exit port at 20 mm from the tip, distal tip length 20 mm, RX lumen length 21 cm

TIP ENTRY PROFILE: 2.1 Fr (0.71 mm) Model 5201, 2 Fr (0.66 mm) Model 5200

OUTER DIAMETER: ROUND DESIGN for 5201 DISTAL SHAFT 3.5 Fr (1.15 mm), OVAL DESIGN for 5200 DISTAL SHAFT 2.7 Fr (0.89 mm)/3.4 Fr (1.12 mm), Proximal SHAFT 2.6 Fr (0.85 mm)

INNER DIAMETER: 2x 0.36 mm

COATING: Hydrophilic distal 25 cm for Model 5201, and 18 cm for Model 5200

0.014" (0.36 mm) guidewire compatible, 5Fr and above guide catheter compatible

USABLE LENGTH: 135 cm

PURPOSE

TWIN-PASS TORQUE 5201: ROUND design double lumen requiring procedures with torque response for precise alignment into side branches. 10° OTW lumen exit port deflection angle. Distal tip length 7 mm.

TWIN-PASS 5200: OVAL design double lumen requiring procedures for conventional fluid delivery or a second guidewire in the main vessel. 0° OTW lumen exit port deflection angle. Distal tip length 20 mm.

Anterograde approach

DOUBLE LUMEN MC TECHNIQUES

Subintimal anchor technique (paraller wire technique)

Sidebranch anchor technique (major side branch near the proximal CTO CAP)

Retrograde sidebranch anchor technique

Reverse wire technique

Sidebranch access / through stent

Selective engagement of angulated collaterals

Access to side branch at the distal occlusion cap

Retrograde tip injection and access, Selective contrast injection, Protection of side branch

TIPS & TRICKS

Advancement: Twin-Pass pushing, Twin-Pass torque pushing, and rotating.

Because of its oval design Twin-Pass, Model 5200 is unable to rotate.

Rotation while advancement with Twin-Pass Torque Model 5201. With rotation, precise alignment into side branches is possible due to the excentric marker at the exit port, with easier visualization if the wire goes up or down. 10° OTW exit port deflection angle for easier wire exiting into the side-branch or other double-lumen MC techniques with better wire support.

The Twin-Pass 5200 catheter is contraindicated for high-pressure injections and use in the cerebral vasculature

Position marks on shaft 95 cm single and 105 cm double from the distal tip to indicate that the distal tip of the catheter is at the level of the distal tip of the guiding catheter.

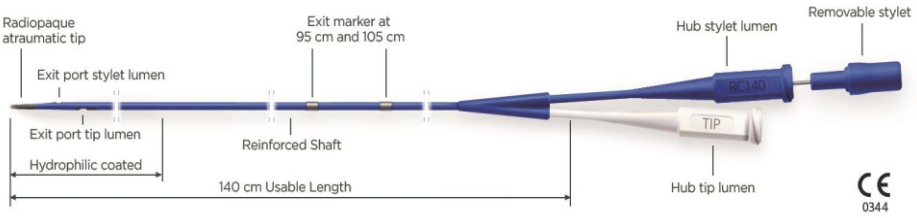
MISCELLANEOUS

Precise OTW port positioning due to 2 radiopaque markers, 1 mm from the tip, and at the OTW exit lumen

For trapping 7 Fr, guiding is needed.

RECROSS

IMDS



CONSTRUCTION

double lumen OTW oval MC with the reinforced braided shaft, 2x OTW, TIP hub with tip exit port and another exit port 12 mm from the tip, Stylet lumen hub with exit port 8 mm from the tip, removable stylet. Two side exit ports are 180° in opposite directions

TIP ENTRY PROFILE: 1.5 Fr (0.50 mm)

OUTER DIAMETER: OVAL DESIGN, DISTAL SHAFT 2.3 Fr (0.75 mm)/3.3 Fr (1.08 mm), Proximal SHAFT 2.6 Fr (0.85 mm)/3.4 Fr (1.12 mm)

INNER DIAMETER: 2x 0.48 mm

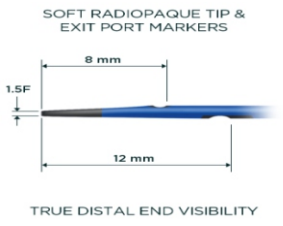
COATING: Hydrophilic NDurance distal 25 cm

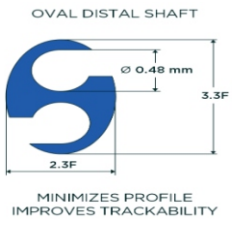
0.014" (0.36 mm) guidewire compatible, 5Fr and above guide catheter compatible

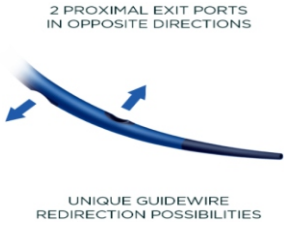
USABLE LENGTH: 140 cm

ADVANCEMENT: pushing

TIP HUB (white) - tip exit port and additional exit port 12 mm from the tip
STYLET HUB (blue) - exit port 8 mm from the tip, 180° opposite direction from 12 mm exit port.







PURPOSE

Unique DOUBLE LUMEN DOUBLE OTW versatile microcatheter with an oval design.

Multiple approaches in CTO PCI

1.anterograde single access MC (AWE) through tip port

2. anterograde dual access MC (all double-lumen MC properties like wire redirection and parallel wiring techniques, subintimal anchor, side branch anchor, reverse wire, side branch access…)

3.subintimal guidewire redirection (SGR), anterograde wire re-entry / ReCross based ADR

4.subintimal hematoma decompression (straw)

5.selective contrast injection

TIPS & TRICKS

Always advance ReCross with wire exiting from the distal tip, not from the side ports.

Radiopaque tip and 2 radiopaque markers at side exit lumens (thin or thick markers under fluoro, depending on MC orientation – 2.3 Fr or 3.3 Fr profile). In flatline view, the wire goes from side ports parallel with the ReCross. In railroad track view, wires go from side ports lateral to the ReCross (red lines in fig. 1 and fig. 2 below)

The best fluoroscopic alignment of the Recross for ADR (SGR) technique is „railroad view" parallel to vessel wall). Wires are coming out through side ports lateral to the ReCross at 180° in opposite directions. After alignment on the vessel wall, a side port for wire re-entry is chosen depending on the vessel lumen position. Fluoroscopic orientation can be remembered as opposite to the Stingray technique, where wire re-entry is done when markers are thin/aligned parallel to the vessel wall. (Stingray „flatline view")

Trapping of Recross is possible with Trap-IT or Trapper in a 6F guiding.

Fig. 1 Thin markers „flatline"
(3.3 Fr profile)

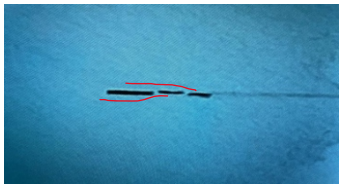
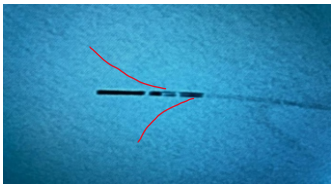


Fig.2 Thick markers „railroad tracks" (for SGR)
(2.3 Fr profile)



MISCELLANEOUS

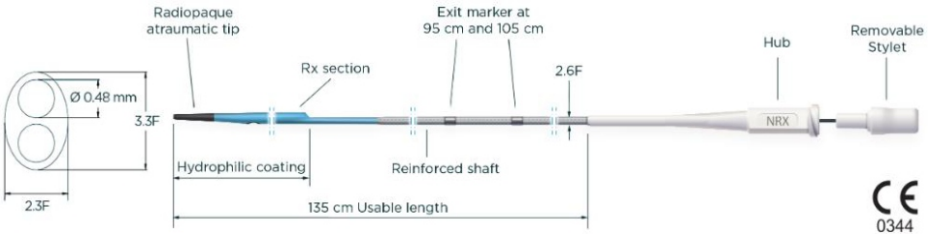
Versatile, unique device for CTO PCI. Distal shaft profile like NHancer RX. Lesion crossability is harder than with standard microcatheter; small balloon dilatations are often needed.

Because of its oval design unable to fully rotate (similar to NHancer RX, Sasuke…), slow rotation is allowed but the max for one turn in each direction. Support and deliverability enhanced with a stylet. After flushing the stylet port, return the stylet for much better support.

Higher friction with some wires (like Asahi SLIP-COAT coated wires) inside ReCross lumen compared to some other microcatheters. When 2 wires inside ReCross, after trapping in guiding catheter, the strong pull force is needed to take out Recross (one may have felt that the Recross is trapped)

NHANCER RX

IMDS



CONSTRUCTION

double lumen oval MC with reinforced braided shaft, hub, removable stylet, 1 RX lumen exit port in the tip, RX lumen length 18 cm, 1 OTW lumen exit port 6.5 mm from the tip, radiopaque atraumatic tip, and radiopaque marker at the distal end of the OTW lumen.

TIP ENTRY PROFILE: 1.5 Fr (0.50 mm), a tapering tip from 2.1 Fr to 1.5 Fr

OUTER DIAMETER: OVAL DESIGN, DISTAL SHAFT 2.3 Fr (0.75 mm)/3.3 Fr (1.08 mm), Proximal SHAFT 2.6 Fr (0.85 mm)

INNER DIAMETER: 2x 0.48 mm

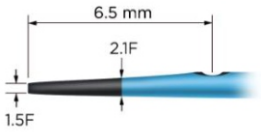
COATING: Hydrophilic NDurance distal 18 cm

0.014" (0.36 mm) guidewire compatible, 5Fr and above guide catheter compatible

USABLE LENGTH: 135 cm

ADVANCEMENT: pushing

DISTAL SECTION

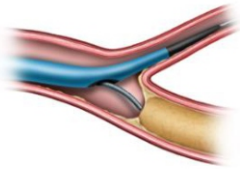


DIMENSIONAL DETAILS

FULL-LENGTH VARIABLE BRAID

POSITIONING AND TORQUE CONTROL

SOFT TAPERED TIP



TRUE VISUALISATION
ON BOTH EXIT PORTS

PURPOSE

Double lumen microcatheter with the reinforced braided shaft, removable stylet for support, 1 OTW lumen exit port 6.5 mm from the tip, RX lumen on the tip.

NHancer Rx has a radiopaque marker, identifying the distal end of the catheter, and a second radiopaque marker identifying the distal end of the OTW lumen.

DOUBLE LUMEN MC TECHNIQUES

Subintimal anchor technique (paraller wire technique)

Sidebranch anchor technique (major side branch near the proximal CTO CAP)

Retrograde sidebranch anchor technique

Reverse wire technique

Sidebranch access / through stent

Selective engagement of angulated collaterals

Access to side branch at the distal occlusion cap

Retrograde tip injection and access

Selective contrast injection

Protection of side branch

TIPS & TRICKS

Use removable stylet in the OTW lumen to facilitate advancement

The NHancer Rx has two depth markings located at 95 cm and 105 cm from the distal tip to indicate that the distal tip of the catheter is at the level of the distal tip of the guiding catheter.

Because its oval design is unable to rotate (similar to Recross, Sasuke), it can be used for a retrograde approach through septal collaterals.

Possible trapping inside 6 Fr guiding due to oval design and smaller crossing profile of 2.3 Fr. (also possible with Recross but not Sasuke due to thicker proximal shaft of 3.2 Fr)

MISCELLANEOUS

Excellent performance among double lumen microcatheters, deliverability enhanced with stylet, similar to Sasuke double lumen microcatheter.

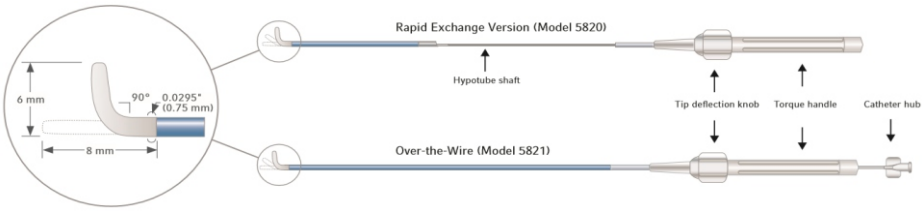
Excellent visibility inside the vessel due to the two tungsten radiopaque markers at the distal end of the OTW lumen.

Smallest distal shaft profile on the marker with ReCross (2.3x3.3 Fr). Smallest crossing profile dual lumen microcatheter (proximal shaft crossing profile 2.6 Fr)

Higher friction with some wires inside OTW lumen.

VENTURE 0.014"

TELEFLEX



CONSTRUCTION

Deflectable tip microcatheter, plus torquable shaft. Multi-layered coiled shaft construction. 8 mm distal tip platinum construction for radiopacity, 6 mm of the distal tip deflectable with 2.5 mm bend radius

Catheter hub, torque handle, tip deflection knob.

6 Fr guide catheter compatibility

Model 5820 - RX and Model 5821 - OTW

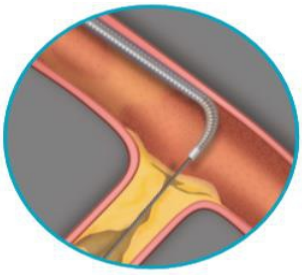
OUTER DIAMETER: DEFLECTABLE TIP 2.27 Fr, 0.0295" (0.75 mm), Maximal SHAFT 4.1 Fr (1.37 mm) for RX and 4 Fr (1.32 mm) for OTW

INNER DIMAETER: SHAFT 0.38 mm (0.015"), 0.014" guidewire compatibility.

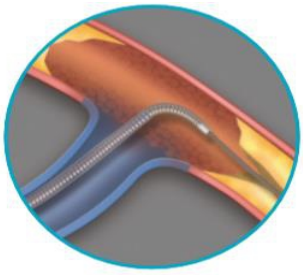
COATING: Hydrophilic coating on distal 24 (RX) and 45 cm (OTW) model

USABLE LENGTH: 144.5 cm for RX model and 139.5 cm for OTW model (RX segment length 30 cm)

ADVANCEMENT: pushing, torquing, selective rotation up to 90°



Directed backup support for crossing ostial lesions



Angulated take offs and tortuous anatomy

PURPOSE

Deflectable tip microcatheter indicated for directing, steering, controlling, and supporting a guidewire to access discrete regions of the coronary and peripheral vasculature.

The OTW version may also be used for manual delivery of saline solution or diagnostic contrast agents.

Tortuous anatomy access, side branches access, steep angulated vessels access, ostial lesions crossing with directed backup support, preventing the guidewire from prolapsing into a side branch in cases of difficult CTO penetration.

TIPS & TRICKS

A tip can be deflected up to 90° to precisely direct guidewires around bends and tortuosity during complex cases. 8 mm tip length, deflected tip length 6 mm.

Tip deflection angle control: using fingertip rotation on the deflection knob of the proximal handle allows for control of tip deflection angle.

HOW TO USE VENTURE

1. Backload the tip of the Venture on the guidewire positioned inside the vasculature

2. Track Venture over the wire through the hemostatic valve inside the guide catheter (supplied „loading tool" can be used to load Venture and the guidewire inside the hemostatic valve and guiding catheter together as a system. Peel of the loading tool away after the proximal shaft of the Venture is loaded through the hemostatic valve)

3. Under fluoroscopy, advance Ventrue to the target location inside the coronary arteries. RX model can be advanced beyond the guiding catheter maximum of 10 cm inside the vessel

4. Retract the guidewire inside Venture in a position that the wire tip is inside the Venture tip

5 Partially activate the deflectable tip by rotating the deflection knob to visualize the position of the catheter

6. Turn the catheter handle to position the catheter tip

7. Turn the deflection knob clockwise to activate (lock) the tip at the desired orientation.

8. Push the guidewire through the tip for distal advancement into CTO / side branch

9. Deactivate Venture deflectable tip with counterclockwise rotation of the deflection knob prior to tracking over the guidewire to prevent potential vessel injury

10. When tip deactivated, retract the Venture catheter

6 Fr guide catheter compatible. Removal of the Ventrue using the trapping balloon technique requires 8 Fr guiding.

MISCELLANEOUS

Multi-layered coiled shaft construction for better torque transmission from handle to tip, kink resistance, and superb guidewire support

Excellent deliverability and lubricity due to Hydrophilic coating on the distal 24 cm (RX) or 45 cm (OTW)

Excellent visibility Under Fluoroscopy due to 8 mm distal tip platinum construction

Minimal vessel diameter 1.5 mm

SWIFTNINJA

MERIT MEDICAL

Illustration of SwiftNinja catheter. © Merit Medical, Reprinted by Permission.

CONSTRUCTION

Tungsten braided shaft, steering dual mechanism, steering lock, soft atraumatic tip, 2 radiopaque markers – the distance between 13.5 mm

TIP ENTRY PROFILE: straight soft atraumatic tip 2.4 Fr, 2 radiopaque markers - 0.5 mm mm from the tip, and 13.5 mm between two markers, distal tip deflection

OUTER DIAMETER: DISTAL SHAFT 2.4 Fr (0.80 mm), Proximal SHAFT 2.9 Fr (0.97 mm)

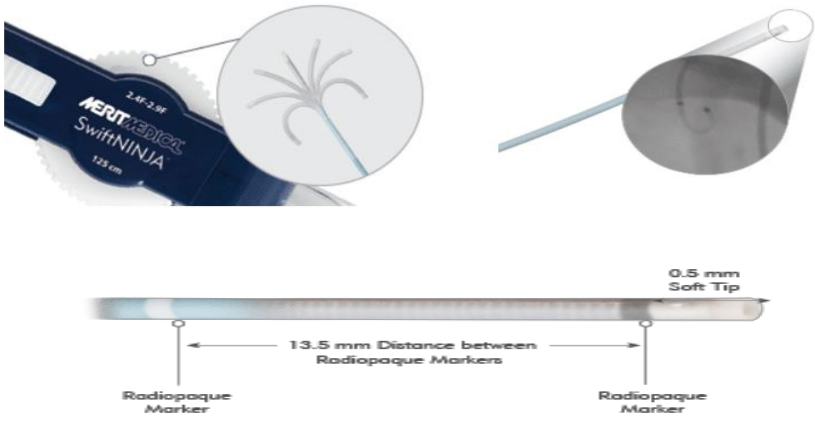
INNER DIMAETER: SHAFT 0.54 mm (0.021")

COATING: Hydrophilic coating on distal 80 cm

0.018" (0.46 mm) guidewire compatible, Cath vol. 0.49 mL, max injection pressure 1000 psi (6900 kPa)

USABLE LENGTH: 125 cm

ADVANCEMENT: pushing, selective steering with a mechanism



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PURPOSE

180° articulating coronary and peripheral vascular microcatheter. Braided shaft enhances shaft support and provides pushability.

Innovative microtechnology designed to articulate from straight in opposing directions up to 180° for navigating the most challenging vascular anatomy. Provides In Vivo steering control.

Once shaped, the tip can be locked in position.

TIPS & TRICKS

HOW TO USE SWIFTNINJA

1. Remove from packing, attach sterile syringe with heparinized saline into luer lock of the microcatheter, fill the whole MC with saline top activate hydrophilic coating.

2. Position steering dial back into lock position (clicking sound)

3. After precise access, used for selective contrast injection and deliverability of diagnostic and therapeutic materials (wires, coils…)

4. Do not operate with dial while the guidewire is distal to the microcatheter tip (vascular damage, breaking of the wire, or the MC tip)

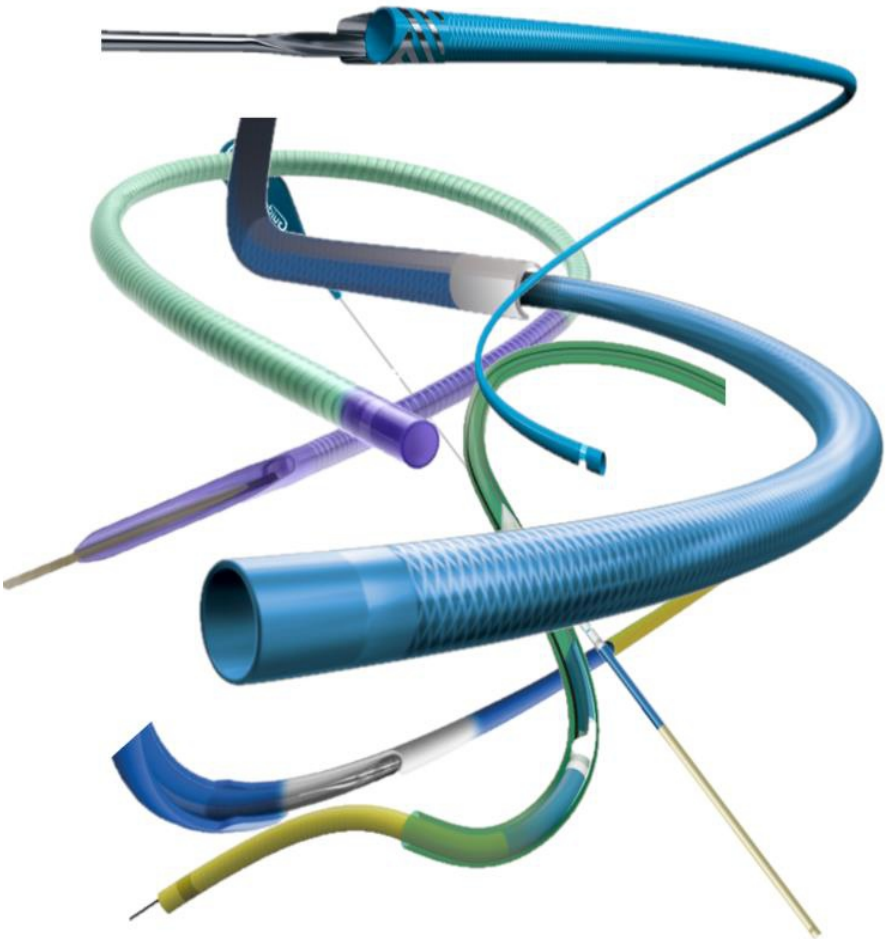
5. Once the tip is positioned at desired location, push the locking mechanism toward the luer connector for the locked shape of the microcatheter. When locked, do not turn the steering dial.

MISCELLANEOUS

Coronary and peripheral system.

It is contraindicated in cerebral vessels.

4



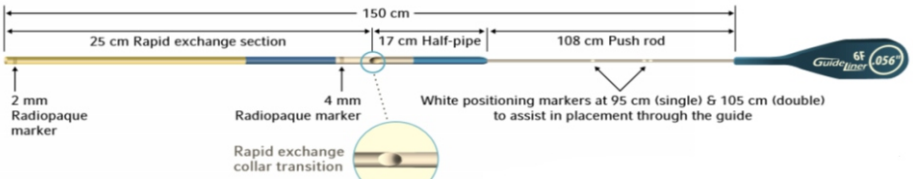
GUIDE EXTENSION CATHETERS

GUIDE EXTENSION CATHETERS

	CONSTRUCTION	SIZES	INTERNAL DIAMETER	COATING	TOTAL LENGTH	DYSTAL CYLINDER LENGTH
Guideliner V3	Coiled stainless braid	5 Fr 5.5 Fr 6 Fr 7 Fr 8 Fr	0.046" (1.17 mm) 0.051" (1.30 mm) 0.056" (1.42 mm) 0.062" (1.57 mm) 0.071" (1.80 mm)	Silicone wipe Inner PTFE	150 cm Colar transition 17 cm	25 cm XL: 40 cm
Trapliner	Coiled stainless braid Trapping balloon 3.15x11	6 Fr 7 Fr 8 Fr	0.056" (1.42 mm) 0.062" (1.57 mm) 0.071" (1.80 mm)	Hydrophilic	150 cm Colar transition 3 cm	13 cm
Guidezilla II	Stainless steel hypotube Braided	6 Fr 7 Fr 8 Fr	0.057" (1.45 mm) 0.062" (1.60 mm) 0.071" (1.83 mm)	Hydrophilic Z-Glide 25 cm	145 cm Hypotube transition 6 mm	25 cm Long 6 Fr: 40 cm
Guidion	Braided distal tubing	5 Fr 6 Fr 7 Fr 8 Fr	0.041" (1.04 mm) 0.056" (1.4 2 mm) 0.062" (1.57 mm) 0.071" (1.80 mm)	Hydrophilic distal 10 cm	150 cm	25 cm
Telescope	Coil-reinforced distal segment TRUEFLEX soft tip	6 Fr 7 Fr	0.056" (1.42 mm) 0.062" (1.57 mm)	Hydrophilic distal 21 cm	150 cm on-ramp 4 cm	25 cm
Boosting (QXMedical)	Coil-reinforced multi-stiffness shaft Patented dual wire prox shaft	5.5 Fr 6 Fr 7 Fr 8 Fr	0.052" (1.32 mm) 0.057" (1.45 mm) 0.063" (1.60 mm) 0.072" (1.82 mm)	Low particulate next-gen Hydrophilic	150	25 cm
LiquID (Seigla Medical)	Bi-metal coil, full 15 cm length radiopaque extension	6 Fr 7 Fr LARGEST INNER DIAMETER	0.061" (1.54 mm) 0.071" (1.80 mm) wall thickness 0.0030"		150 cm	15 cm

GUIDELINER V3

TELEFLEX



CONSTRUCTION

Polyether block amide, Coiled stainless braid, 108 cm stainless steel ribbon wire push rod O.D 0.30 mm (only for 5 Fr is 0.25 mm), 17 cm half-pipe technology.

SIZE and (COMPATIBLE GUIDE I.D.): 5 Fr (1.43 mm), 5.5 Fr (1.58 m), 6 Fr (1.78 mm), 7 Fr (1.98 mm), 8 Fr (2.24 mm)

DISTAL GUIDE LENGHT: 25 cm

INNER DIAMETER: 5 Fr 0.046" (1.17 mm), 5.5 Fr 0.051" (1.29 mm), 6 Fr 0.056" (1.42 mm), 7 Fr 0.062" (1.57 mm), 8 Fr 0.071" (1.80 mm)

OUTER DIAMETER: 5.5 Fr 0.63" (1.60 mm), 6 Fr 0.067" (1.70 mm), 7 Fr 0.075" (1.90 mm), 8 Fr 0.085" (2.16 mm)

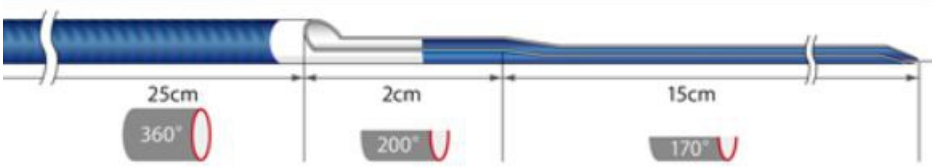
COATING: Silicone Wipe, inner PTFE

COLAR TYPE: Half-pipe transition, all-polymer

COLAR TRANSITION: 17 cm (15 cm 170°angle, and 2 cm 200°angle)

MARKER BAND: radiopaque marker 2 mm from the tip and 4 mm from the rapid exchange collar transition

WORKING LENGTH: 150 cm



PURPOSE

Guide extension catheter with Coil-reinforcement for excellent flexibility and kink resistance. The half-pipe channel - designed to minimize device/collar interaction by directing and aligning devices through the collar transition - smooth device entry and delivery.

Coaxial alignment & BACKUP SUPPORT, active support in complex lesions, calcium, tortuous vessels, and distal lesions. („mother in child")

Distal device/equipment delivery (stents, cover stents, balloon uncrossable lesions).

Facilitating coronary engagement (in anomalous ostia etc.)

Guide extension facilitated R-CART, Guide extension facilitatedexternalisation, ADR.

Selective delivery of contrast for better visualization of selective coronary anatomy.

Thrombectomy, Creating„homemade" snare – KAMsnare.

TIPS & TRICKS

Advancement with pushing over the guidewire. Protect pushrod under a towel to prevent wire wrapping with a push rod.

Advancement may be easier by partially inflated small balloon halfway inside the cylinder over the standard guidewire to minimize the risk of vessel dissection or edge plaque disruption.

Dedicated dilator - Guideliner Navigation catheter - can facilitate guide extension catheter advancement through the vessel.

Advance guide extension up to 20 cm inside the vessel

GBAT – balloon-assisted tracking („inchworming"): insert small ballon usually 2.0x15 halfway out of the guide extension tube, inflate at low 6-8 atm, deflate, while deflating advance guide-extension over the ballon distally. Maneuver for the advancement of the guide extension in the complex anatomy

Mother – Daughter – Granddaughter double Guideliner technique for device deliverability in extremely complex anatomy

Avoid using another guidewire when the guide extension catheter is smaller than the guide catheter as the wire easily can advance between the guide extension cylinder and guide catheter wall.

Trapping of the devices can be difficult, and balloon inflation has to be proximal to the proximal collar. Easier with Trapliner.

MISCELLANEOUS

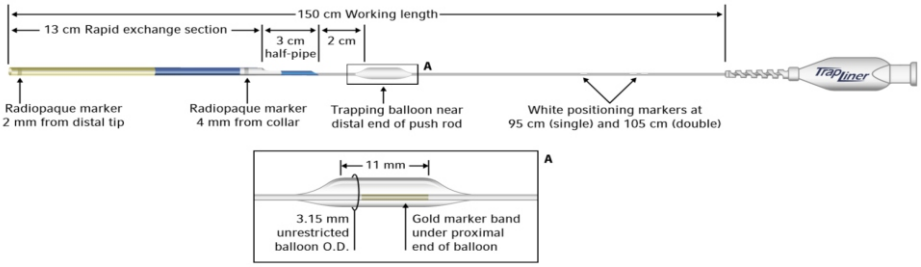
Available in 5 Fr size, smallest on the market with Gidion (IMDS)

Possible Complications: equipment deformation (stents, guidewires.. today smaller chance with new-gen of guide extension catheters), vessel dissection, contrast barotrauma to the vessel, thrombus formation, fracture of the tube, longitudinal stent deformation, distal migration

The GuideLiner catheters are contraindicated in vessels less than 2.5mm in diameter and vessels in the neurovasculature or the venous system!

TRAPLINER

TELEFLEX



CONSTRUCTION

Coiled stainless braid, guide extension catheter that combines balloon 2 cm proximal to the half-pipe channel, with the ability to trap a 0.0014" wire against the inner wall of a guide catheter.

3 cm half-pipe technology designed to minimize device/collar interaction by directing and aligning devices through the collar transition hypotube push rod.

SIZE and (COMPATIBLE GUIDE I.D.): 6 Fr (1.78 mm), 7 Fr (1.98 mm), 8 Fr (2.24 mm)

DISTAL GUIDE LENGHT: 13 cm

INNER DIAMETER: 6 Fr 0.056" (1.42 mm), 7 Fr 0.062" (1.57 mm), 8 Fr 0.071" (1.80 mm)

OUTER DIAMETER: 6 Fr 0.067" (1.70 mm), 7 Fr 0.075" (1.90 mm), 8 Fr 0.085" (2.16 mm)

TRAPPING BALLOON: 3.15x11 m with gold marker band under proximal end of the balloon

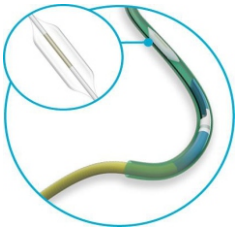
COATING: Hydrophilic

COLAR TYPE: Halfpipe transition, all-polymer

COLAR TRANSITION: 3 cm

MARKER BAND: radiopaque marker 2 mm from the tip and 4 mm from the rapid exchange collar transition

WORKING LENGTH: 150 cm



PURPOSE

Guide extension catheter that combines trapping balloon 2 cm proximal to the half-pipe channel.

Coaxial alignment & BACKUP SUPPORT, active support in complex lesions, calcium, tortuous vessels, and distal lesions. („mother in child")

Distal device/equipment delivery (stents, cover stents, balloon uncrossable lesions).

Facilitating coronary engagement (in anomalous Ostia etc.)

Guide extension facilitated R-CART, Guide extension facilitated externalization, ADR.

Selective delivery of contrast for better visualization of selective coronary anatomy.

Thrombectomy, Creating „homemade " snare - KAMsnare

TIPS & TRICKS

Advancement with pushing. Protect pushrod under a towel to prevent wire wrapping with a push rod. Advance guide extension up to 10 cm inside the vessel (regular Guideliner can sit much deeper)

Trapping balloon 3.15x11 mm, combines the ability to provide backup support with the ability to trap a 0.014" guidewire. Helps prevent the loss of guidewire position /unintentional guidewire advancement during catheter exchange.

Eliminates the need for alternative catheter exchange techniques (classic trapping with additional balloon, extension wire usage od Nanto technique). Can trap all devices even in 6 Fr guide.

ADR is possible and easier through 6 Fr. Can serve as an inflow occluder during ADR to prevent bigger hematoma forming. Can serve as inflow occluder in vessel perforation for safer complication management

GBAT – balloon-assisted tracking („inchworming"): insert small ballon usually 2.0x15 halfway out of the guide-extension tube, inflate at low 6-8 atm, deflate while deflating advance guide-extension over the ballon distally

It is nonoptimal to use the Trapliner in anterograde guidings for retrograde procedures, as it cannot trap a microcatheter over a wire that crossed the collaterals, and also there is harder to trap retrograde wire. The trapping balloon of the Trapliner is just too proximal to trap the retrograde gear, especially the microcatheter if needed.

Avoid using another guidewire when the guide extension catheter is smaller than the guide catheter as the wire easily can advance between the guide extension cylinder and guide catheter wall.

MISCELLANEOUS

Easy and quick exchange of longer OTW equipment like microcatheter over shorter guidewires while maintaining guidewire position. Reduces the risk of running out of wire on the proximal end. Reduces the risk of losing wire position or accidentally advancing the guidewire distally.

Possible Complications: equipment deformation (stents, guidewires.. today smaller chance with new-gen of guide extension catheters), vessel dissection, contrast barotrauma to the vessel, thrombus formation, fracture of the tube, longitudinal stent deformation, distal migration.

The TrapLiner catheter is contraindicated in vessels smaller than its outer tip diameter and in the neurovasculature!

GUIDEZILLA II

BOSTON SCIENTIFIC

CONSTRUCTION

Stainless steel Hypotube shaft 120 cm, hypotube transition 6 mm, radiopaque helical collar, Z-Glide Hydrophilic coating. 3 sizes – 6, 7, and 8 Fr.

SIZE and (COMPATIBLE GUIDE I.D.): 6 Fr (1.78 mm), 7 Fr (1.98 m), 8 Fr (2.24 mm)

DISTAL GUIDE LENGHT: 25 cm (40 cm for 6 Fr Long)

INNER DIAMETER: 6 Fr 0.057" (1.45 mm), 7 Fr 0.063" (1.60 mm), 8 Fr 0.072" (1.83 mm)

OUTER DIAMETER: 6 Fr 0.067" (1.71 mm), 7 Fr 0.073" (1.85 mm), 8 Fr 0.082" (2.11 mm)

COATING: hydrophilic (Z-Glide)

COLAR TYPE: radiopaque platinum-iridium helical collar

COLAR TRANSITION: hypotube transition 6 mm

MARKER BAND: distal marker band and radiopaque collar

WORKING LENGTH: 150 cm

Ergonomic and easily identifiable Hub design

PURPOSE

Guide extension catheter with Stainless steel Hypotube shaft 120 cm, hypotube transition 6 mm, radiopaque helical collar, Z-Glide Hydrophilic coating.

Coaxial alignment & BACKUP SUPPORT, active support in complex lesions, calcium, tortuous vessels, and distal lesions. („mother in child")

Distal device/equipment delivery (stents, cover stents, balloon uncrossable lesions).

Facilitating coronary engagement (in anomalous coronary ostia etc.)

Guide extension facilitated R-CART, Guide extension facilitated externalization, ADR.

Selective delivery of contrast for better visualization of selective coronary anatomy.

Thrombectomy, Creating„homemade" snare – KAMsnare.

TIPS & TRICKS

Advancement with pushing over the guidewire. Protect push rod under a towel to prevent wire wrapping with the push rod.

Advancement may be easier by partially inflated small balloon halfway inside the cylinder over the standard guidewire to minimize the risk of vessel dissection or edge plaque disruption.

GBAT – balloon-assisted tracking („inchworming"): insert small ballon usually 2.0x15 halfway out of the guide extension tube, inflate at low 6-8 atm, deflate, while deflating advance guide-extension over the ballon distally. Maneuver for the advancement of the guide extension in the complex anatomy

Avoid using another guidewire when the guide extension catheter is smaller than the guide catheter as the wire easily can advance between the guide extension cylinder and guide catheter wall.

Trapping of the devices can be difficult, and balloon inflation has to be proximal to the proximal collar.

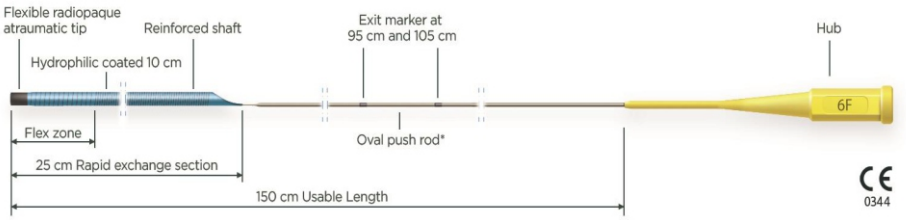
MISCELLANEOUS

Ergonomic hub design. With 6 mm hypotube transition in practice, reduced device interaction.

Possible Complications: equipment deformation (stents, wires.. today smaller chance with new-gen of guide extension catheters), vessel dissection, contrast barotrauma to the vessel, thrombus formation, fracture of the tube, longitudinal stent deformation, distal migration

GUIDION

IMDS



CONSTRUCTION

Braided distal tubing, soft distal atraumatic tip, 10 cm distal tubing with a hydrophilic coating, a radiopaque distal end with 13 mm distal Flex zone, 2 depth markers at 95 cm and 105 cm from the distal tip.

SIZE and (COMPATIBLE GUIDE I.D.): 5 Fr (1.42 mm), 6 Fr (1.78 mm), 7 Fr (1.98 mm), 8 Fr (2.24 mm)

DISTAL GUIDE LENGHT: 25 cm

INNER DIAMETER: 5 Fr 0.041" (1.04 mm), 6 Fr 0.056" (1.42 mm), 7 Fr 0.062" (1.57 mm), 8 Fr 0.071" (1.80 mm)

COATING: Hydrophilic distal 10 cm

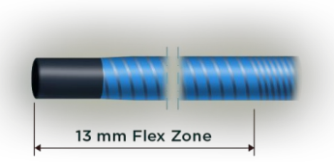
COLAR TYPE: metal/polymer

COLAR TRANSITION: rapid exchange transition

MARKER BAND: radiopaque marker at the soft atraumatic tip.

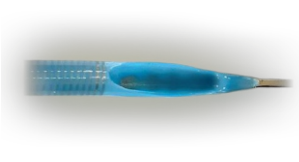
WORKING LENGTH: 150 cm

SOFT RADIOPAQUE TIP



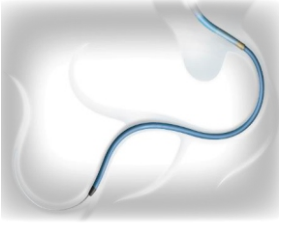
ATRAUMATIC AND VISIBLE

OPTIMISED



RAPID EXCHANGE TRANSITION

FLEXIBLE AND HYDROPHILIC



OUTSTANDING NAVIGATION

FLOWGUIDE - new guide extension catheter with 15 cm rapid exchange section length (distal guide length), 9 perfusion openings on the rapid exchange section for increased perfusion during deep intubation, inner diameter 0.056" (0.42 mm) (like 6 Fr Guidion, requires 6 Fr guiding catheter), usable length 150 cm, atraumatic flexible radiopaque tip, easy trapping due to shorter rapid exchange section with better deliverability, designed for transradial approach.

PURPOSE

Guide extension catheter with braided distal tubing with a hydrophilic coating, soft distal atraumatic tip – distal 13 mm„Flex zone" with low-density coiling

Coaxial alignment & BACKUP SUPPORT, active support in complex lesions, calcium, tortuous vessels, and distal lesions. („mother in child")

Distal device/equipment delivery (stents, cover stents, balloon uncrossable lesions).

Facilitating coronary engagement (in anomalous coronary ostia etc.)

Guide extension facilitated R-CART, Guide extension facilitated externalization, ADR.

Selective delivery of contrast for better visualization of selective coronary anatomy.

Thrombectomy, Creating„homemade" snare – KAMsnare

TIPS & TRICKS

Advancement with pushing over the wire.

Protect pushrod under a towel to prevent wire wrapping with a push rod.

Advancement may be easier by partially inflated small balloon halfway inside the cylinder over the standard guidewire to minimize the risk of vessel dissection or edge plaque disruption.

Able to extend maximal 15 cm from a guiding catheter.

For easy use in guiding catheters of 90 and 100 cm length, two depth markers at 95 cm and 105 cm from the distal tip.

GBAT – balloon-assisted tracking („inchworming"): insert small ballon usually 2.0x15 halfway out of the guide extension tube, inflate at low 6-8 atm, deflate, while deflating advance guide-extension over the ballon distally. Maneuver for the advancement of the guide extension in the complex anatomy

Avoid using another guidewire when the guide extension catheter is smaller than the guide catheter as the wire easily can advance between the guide extension cylinder and guide catheter wall.

Trapping of the devices can be difficult, and balloon inflation has to be proximal to the proximal collar.

MISCELLANEOUS

Available in 5 Fr size, smallest on the market with Guideliner V3 (Teleflex)

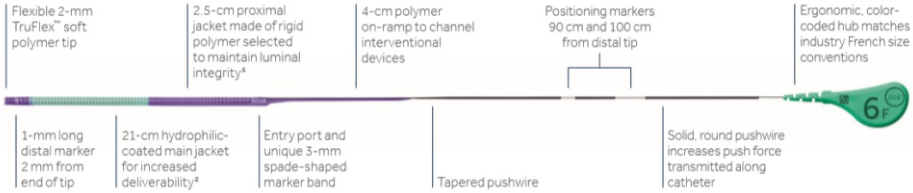
Proximal shaft change from round to oval for better device crossability inside guiding catheter. Transition zone improvement to perfect gradual, controlled transition.

Possible Complications: equipment deformation (stents, wires.. today smaller chance with new-gen of guide extension catheters), vessel dissection, contrast barotrauma to the vessel, thrombus formation, fracture of the tube, longitudinal stent deformation, distal migration

Similar device - BOOSTING CATHETER (QXMedical) (flared prox. entry design, 5.5 Fr, 6 Fr, 7 Fr, 8 Fr available)

TELESCOPE

MEDTRONIC



CONSTRUCTION

strong push wire and a coil-reinforced distal segment, 2 mm TRUFLEX soft polymer tip with easy deflection possibility, 21 cm hydrophilic distal part, 2.5 cm proximal jacket made of rigid polymer, entry point, and unique 3 mm spade-shaped marker band, short 4 cm polymer on-ramp, 10 cm tapered distal push wire portion, 125 cm solid round strong push wire, position markers 90 and 100 cm from the distal tip

SIZE and (COMPATIBLE GUIDE I.D.): 6 Fr (1.78 mm), 7 Fr (1.98 mm),

DISTAL GUIDE LENGHT: 25 cm

INNER DIAMETER: 6 Fr 0.056" (1.42 mm), 7 Fr 0.062" (1.57 mm)

OUTER DIAMETER: 6 Fr 0.067" (1.70 mm), 7 Fr 0.75" (1.90 mm)

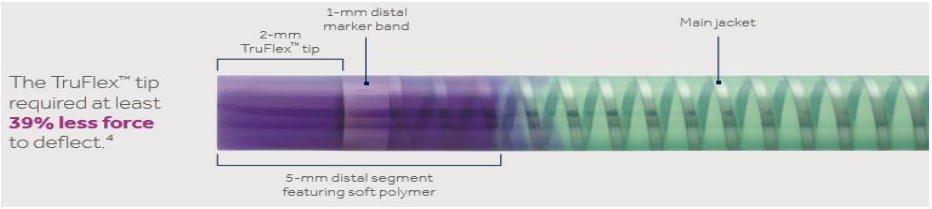
COATING: Hydrophilic distal 21 cm

COLAR TYPE: nylon-based polymer, 4 cm on-ramp length

COLAR TRANSITION: rapid exchange entry point and unique 3 mm spade-shaped marker band

MARKER BAND: platinum/iridium 1 mm long, 2 mm from the distal tip, and 3 mm long, spade shape at the entry point

WORKING LENGTH: 150 cm



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PURPOSE

Guide extension catheter with coil-reinforced and hydrophilic coated distal segment and 2 mm TRUFLEX soft polymer tip

Coaxial alignment & BACKUP SUPPORT, active support in complex lesions, calcium, tortuous vessels, and distal lesions. („mother in child")

Distal device/equipment delivery (stents, cover stents, balloon uncrossable lesions).

Facilitating coronary engagement (in anomalous coronary ostia etc.)

Guide extension facilitated R-CART, Guide extension facilitated externalization, ADR.

Selective delivery of contrast for better visualization of selective coronary anatomy.

Thrombectomy, Creating„homemade" snare – KAMsnare

TIPS & TRICKS

Advancement with pushing over the guidewire. Protect pushrod under a towel to prevent wire wrapping with a push rod.

Advancement may be easier by partially inflated small balloon halfway inside the cylinder over the standard guidewire to minimize the risk of vessel dissection or edge plaque disruption.

Good deliverability due to 21 hydrophilic coating, in some cases the best in class deliverability.

GBAT – balloon-assisted tracking („inchworming"): insert small ballon usually 2.0x15 halfway out of the guide extension tube, inflate at low 6-8 atm, deflate, while deflating advance guide-extension over the ballon distally. Maneuver for the advancement of the guide extension in the complex anatomy

Avoid using another guidewire when the guide extension catheter is smaller than the guide catheter as the wire easily can advance between the guide extension cylinder and guide catheter wall.

Trapping of the devices can be difficult, and balloon inflation has to be proximal to the proximal collar.

Caution is needed in tortuous and calcified vessels. If Telescope is aggressively manipulated, the tip can stuck in calcium and break/disconnect from the main jacket tube.

MISCELLANEOUS

Excellent deliverability and pushability, hydrophilic distal tube part featuring a soft polymer

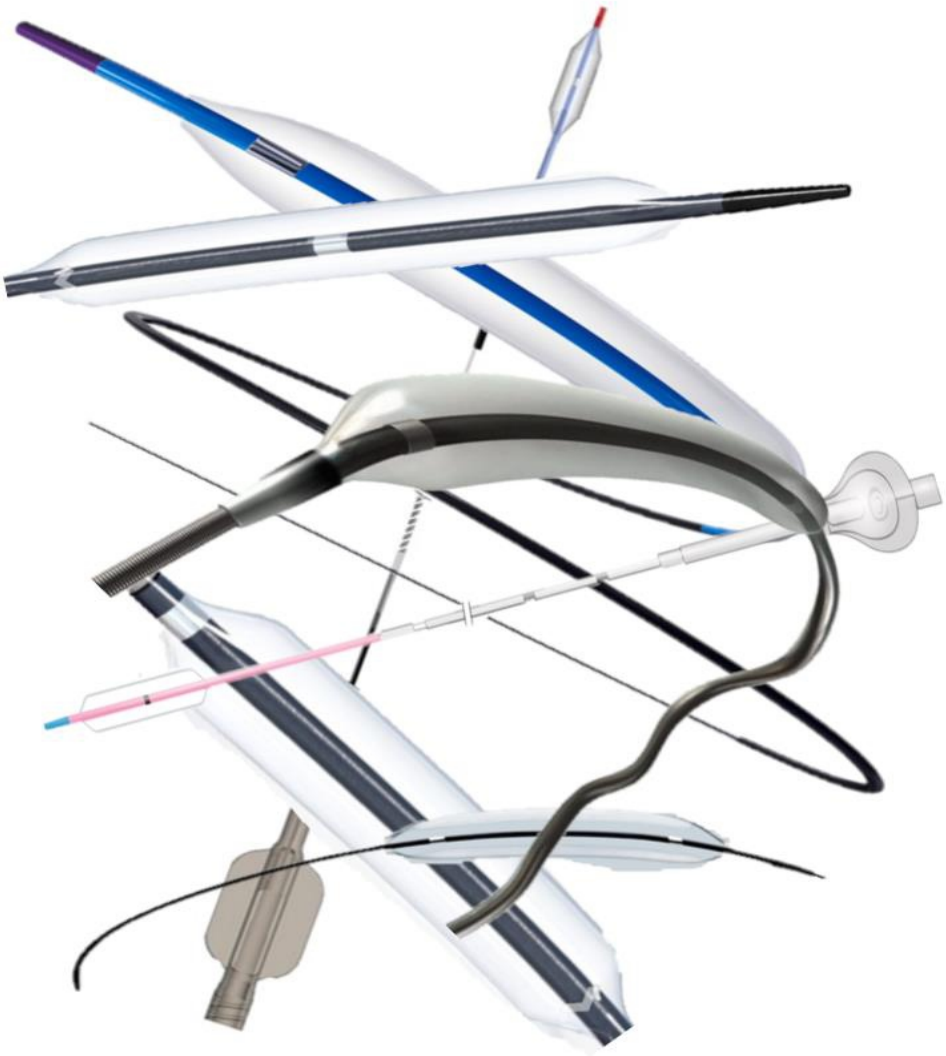
Atraumatic soft tip (TruFlex 2 mm tip) requires less force to deflect, safe to the vessel wall.

Smoothpass technology - easy delivery of stents, balloons due to tapered distal push wire section, short 4 cm polymer on-ramp, end big entry point.

Easy visibility of ramp entry point due to the spade-shaped marker band

Possible Complications: equipment deformation (stents, guidewires.. today smaller chance with new-gen of guide extension catheters), vessel dissection, contrast barotrauma to the vessel, thrombus formation, fracture of the tube, longitudinal stent deformation, distal migration

5



LOW-PROFILE, SPECIAL BALLOONS

LOW-PROFILE, SPECIAL BALLOONS

	TIP ENTRY PROFILE	CROSSING PROFILE	DIAMETER	LENGTH	COATING	MARKER	CATHETER DESIGN
NIC Nano Hydro	0.016“	0.0195“ (0.495 mm)	0.85 mm	6, 10, 15 mm	Hydrophilic	Single / proximal	RX
NIC 1.1. Hydro	0.016“	0.0205“ (0.52 mm)	1.1 mm	6, 10 ,15, 20 mm	Hydrophilic	Single / central	RX
Across CTO RX	0.016“	0.021“ (0.53 mm)	1.1, 1.5, 2.0 mm	10, 15, 20 mm	Hydrolubric	Single / central	RX
Across CTO ST	0.016“	0.021“ (0.53 mm)	1.1 mm	5, 10, 15, 20 mm	Hydrolubric	Single / at the tip	RX
Across CTO OTW	0.016“	0.021“ (0.53 mm)	1.1 mm	10, 15, 20 mm	Hydrolubric	Single / central	OTW
Grip TT	0.017“	/	2.5, 3.0, 3.5, 4,0 mm	8, 12, 16 mm	/	Two	RX
Blimp	N/A	0.0195“ 0.495 mm)	0.6 mm	5 mm	Hydrophilic distal 20 cm	Single / central	RX
Sapphire II PRO 1.0-1.5	0.016“	0.022“ (0.55 mm)	1.0 -1.5 mm	5, 8, 10, 15, 20 mm	Hydro-X coating	Single / central	RX
Sapphire 3	0.0159“	0.0208“	0.85, 1.0, 1.25 mm	5, 8 ,10, 15 mm	Hydrophilic	Single / central	RX
Ikazuchi ZERO 1.0	0.016“	0.023“ (0.58 mm)	1.0	6, 8 mm	Hydrophilic	Single / central	RX
Ryurei 1.0-1.5	0.016“	0.023“ (0.58 mm)	1.0, 1.25, 1.50	5, 10, 15, 20 mm	Hydrophilic M-Coat	Single / central	RX
Threader	0.017“	0.024“ (0.43 mm)	1.2 mm	12 mm	Hydrophilic	single / central	RX, OTW
Emerge 1.2	0.017“	0.026“ (0.67 mm)	1.2 mm	8, 12, 15, 20	Hydrophilic ZGlide	Single / central	RX, OTW
Mini Trek 1.2	0.018“	0.026“ (0.66 mm)	1.2 mm	6, 8, 12, 15, 20 mm	Hydrophilic	Single / central	RX, OTW
AlveoHP 0.75	0.0156“	0.0203“ (0.51 mm)	0.75, 1.0, 1.25, 1.5, 1.75, 2.0 mm	5, 8, 10, 12 ,15, 20, 25, 30	Hydrophilic Slider™ Eel™	Single/ central	RX
OPN NC	0.016“	0.028“ (0.71 mm)	1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5 mm	10, 15, 20 mm	Hydrophilic	Two	RX

NIC NANO HYDRO

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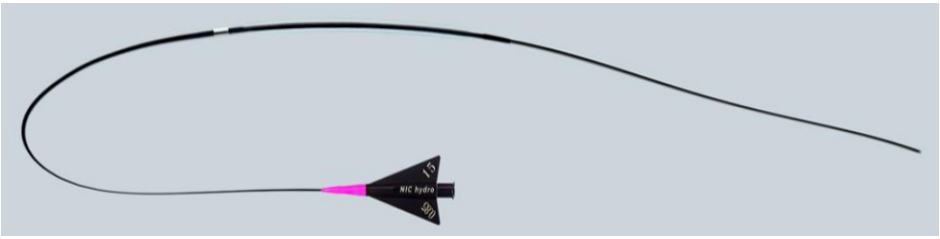

CONSTRUCTION

TIP ENTRY PROFILE: 0.016"

CROSSING PROFILE: 0.0195" (0.495 mm). Smallest crossing profile on the market

DIAMETER: 0.85 mm

LENGTH: 6, 10, 15 mm

RBP 21 atm

USABLE SHAFT LENGTH: 140 cm

SHAFT DIAMETER: 2.45 Fr (0.82 mm)

MARKER: single/proximal

COATING: hydrophilic on a ballon and distal shaft

GUIDEWIRE COMPATIBLE: 0.014"

MIN. GUIDE: 5 Fr

CATHETER DESIGN: RX

OVERVIEW

Ultralow profile balloon with smallest crossing profile on the market 0.0195" (0.495 mm)

Superior crossing of subtotal and total occlusions (CTO's).

Excellent trackability with hydrophilic coating for the treatment of tightest lesions.

The balloon of choice prior to the use of a rotablator. Re-crossing of overstented side branches.

Proximal single marker position for better crossability of stent struts and total occlusions. It can be wedged inside the lesion easier because of the soft proximal part without a marker, then inflated to open the CTO cap.

HUB/Luer design - better handling and easy identification of balloon type, diameter, and length.

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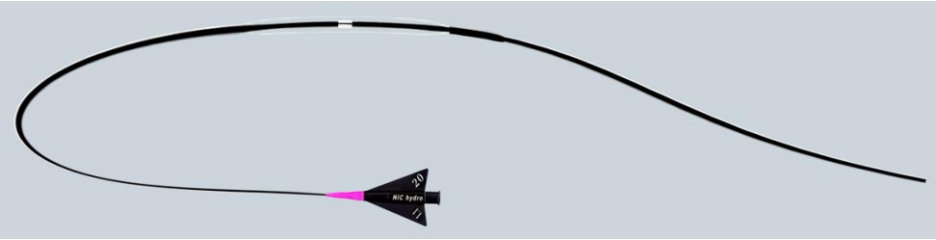
NIC 1.1 HYDRO



CONSTRUCTION

TIP ENTRY PROFILE: 0.016", unique tapered tip

CROSSING PROFILE: 0.0205" (0.52 mm)

DIAMETER: 1.1 mm

LENGTH: 6, 10, 15, 20 mm

RBP 21 atm

USABLE SHAFT LENGTH: 140 cm

SHAFT DIAMETER: 2.45 Fr (0.82 mm)

MARKER: single/central

COATING: Hydrophilic coating on the balloon and distal shaft

GUIDEWIRE COMPATIBLE: 0.014"

MIN. GUIDE: 5 Fr

CATHETER DESIGN: RX

OVERVIEW

Ultralow profile balloon. Successful treatment of CTO's. Excellent pre-dilation of tightest lesions subtotal occlusions.

Low compliance and high-pressure resistance for successful pre-dilation of calcified lesions where force and safety is needed

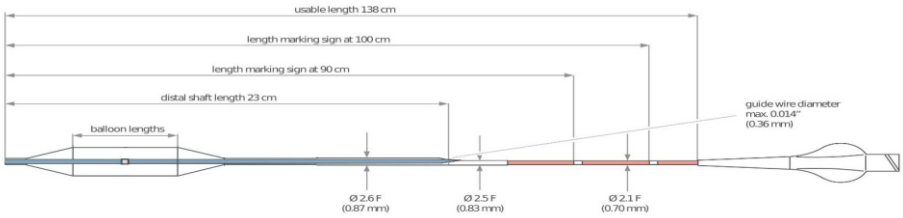
For overstented sidebranches. For expanding stent cells.

Hydrophilic coating provides excellent crossability in the tightest lesions

HUB/Luer design - better handling + easy identification of balloon type, diameter, and length

ACROSS CTO RX

ACROSTAK



CONSTRUCTION

TIP ENTRY PROFILE: 0.016" (0.40 mm), 4 mm tapering tip
CROSSING PROFILE: 0.021", (0.53 mm)
DIAMETER: 1.1, 1.5 and 2.0 mm
LENGTH: 10, 15, 20 mm
RBP 20 atm
USABLE SHAFT LENGTH: 138 cm
SHAFT DIAMETER: distal 2.25 Fr (0.74 mm), mid-distal 2.6 Fr (0.87 mm), mid 2.5 Fr (0.83 mm), proximal 2.1 Fr (0.70 mm)
CATHETER WORKING LENGTH: distal shaft length 23 cm
MARKER: single/central.
COATING: hydrofluoric coating
GUIDEWIRE COMPATIBLE: 0.014"
MIN. GUIDE: 5 Fr
CATHETER DESIGN: RX, 2 shaft markers at 100 and 90 cm.

OVERVIEW

Specialty low profile CTO balloon. Good performance in highly tortuous anatomies and severely calcified lesions. Semi-compliant (SC) polyamide

Composite shaft design and hydrolubric coating enhance lubrication, pushability, and trackability.

Burst-resistant balloon material. Ultra-resistant to puncture. Robust balloon material for dilating heavily calcified CTO lesions. Easy multiple dilatations due to the great capability of rewrapping.

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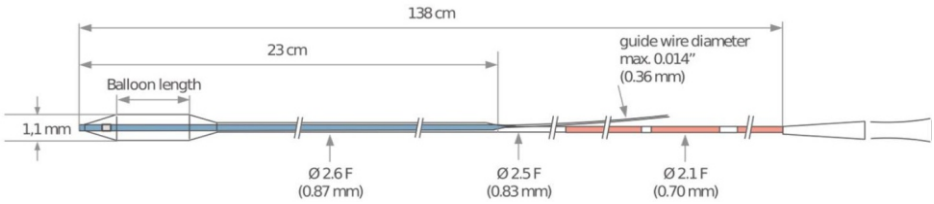
ACROSS CTO ST



CONSTRUCTION

TIP ENTRY PROFILE: 0.016", 1 mm robust tapering tip (ST – sort robust tip)

CROSSING PROFILE: 0.021", (0.53 mm)

DIAMETER: 1.1 mm

LENGTH: 5, 10, 15, 20 mm

RBP 17 atm

USABLE SHAFT LENGTH: 138 cm

SHAFT DIAMETER: distal 2.25 Fr (0.74 mm), mid-distal 2.6 Fr (0.87 mm), mid 2.5 Fr (0.83 mm), proximal 2.1 Fr (0.70 mm)

CATHETER WORKING LENGTH: distal shaft length 23 cm

MARKER: single at the tip.

COATING: hydrolubric coating

GUIDEWIRE COMPATIBLE: 0.014"

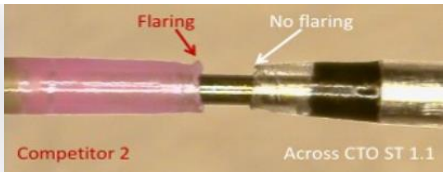
MIN. GUIDE: 5 Fr

CATHETER DESIGN: RX

OVERVIEW

Unique short, robust tip made of a more rigid material, for tough CTOs and heavily stenotic and calcified lesions. It can be pushed with much force inside the CTO segment. Semi-compliant (SC) polyamide. Composite shaft design

Burst-resistant balloon material. Ultra-resistant to puncture. Robust balloon material for dilating heavily calcified CTO lesions. Easy multiple dilatations due to the great capability of rewrapping.



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ACROSS CTO OTW

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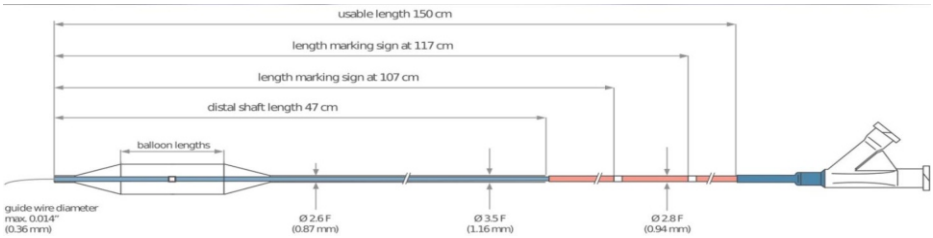

CONSTRUCTION

TIP ENTRY PROFILE: 0.016", 4 mm tapering tip
CROSSING PROFILE: 0.021", (0.53 mm)
DIAMETER: 1.1 mm
LENGTH: 10, 15, 20 mm
RBP 17 atm
USABLE SHAFT LENGTH: 150 cm
SHAFT DIAMETER: distal 2.6 Fr (0.87 mm), mid 3.5 Fr (1.16 mm), proximal 2.8 Fr (0.94 mm)
CATHETER WORKING LENGTH: distal shaft length 47 cm
MARKER: single/central
COATING: hydrolubric coating
GUIDEWIRE COMPATIBLE: 0.014"
MIN. GUIDE: 5 Fr
CATHETER DESIGN: OTW

OVERVIEW

Specialty CTO crossing balloon, semi-compliant (SC) polyamide.

Over-The-Wire - improved force application and push. High pushability.

Composite shaft design and hydrolubric coating enhance lubrication, pushability, and trackability.

Burst-resistant balloon material. Ultra-resistant to puncture. 2 shaft markers at 117 and 107 cm. Robust balloon material for dilating heavily calcified CTO lesions

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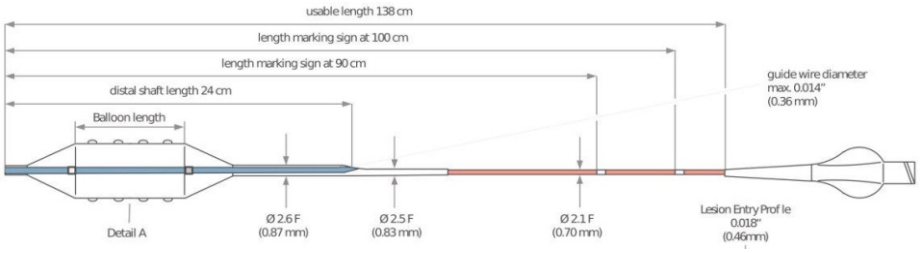
GRIP TT



CONSTRUCTION

TIP ENTRY PROFILE: 0.017", 4 mm tapering tip, four lines of 16 knobs total fixed on a strong balloon surface.

DIAMETER: 2.5, 3.0, 3.5 and 2.0 mm

LENGTH: 8, 12, 16 mm

RBP 18-21 atm, NOM 11 atm

USABLE SHAFT LENGTH: 138 cm

SHAFT DIAMETER: distal 2.25 Fr (0.74 mm), mid-distal 2.6 Fr (0.87 mm), mid 2.5 Fr (0.83 mm), proximal 2.1 Fr (0.70 mm)

CATHETER WORKING LENGTH: distal shaft length 24 cm

MARKER: two markers

GUIDEWIRE COMPATIBLE: 0.014"

MIN. GUIDE: 5 Fr

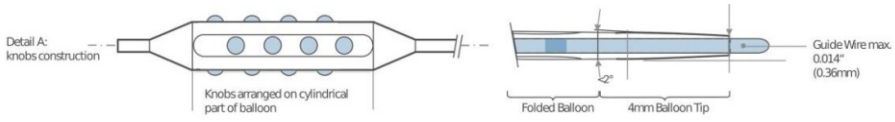
CATHETER DESIGN: RX, 2 shaft markers at 100 and 90 cm.

OVERVIEW

Specialty cracking/scoring balloon with knobs arranged on the cylindrical part of the balloon. Designed to crack heavily calcified lesions and prevent slippage. Unsurpassed stability with reduced risk of dissection

In-stent restenosis (ISR) puncturing and„opening" neointima for better drug delivery from drug-coated balloons. Excellent performance in high stenotic and fibrotic slippery lesions.

Burst-resistant balloon material. Ultra-resistant to puncture. Robust balloon material for dilating heavily calcified lesions. Tapered 4 mm long, highly guidable tip.



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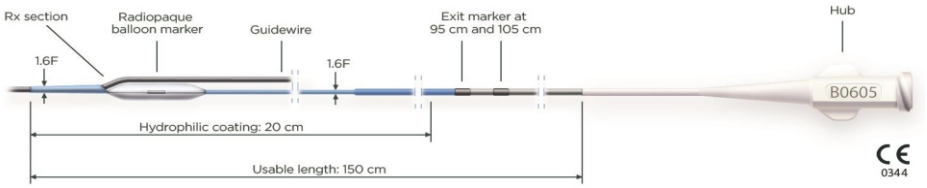
BLIMP

IMDS



CONSTRUCTION

Ultra low profile ballon (1.5 Fr – 0.495 mm) with very short rapid exchange section between tip and balloon. Scoring design: short Rx section, guidewire used as scoring element. High pushable shaft. 95 cm and 105 cm exit markers

CROSSING PROFILE: 0.0195" (0.495 mm). 1.5 Fr

DIAMETER: 0.6 mm

LENGTH: 5 mm

RBP 30 atm, Nominal 25 atm

USABLE SHAFT LENGTH: 150 cm

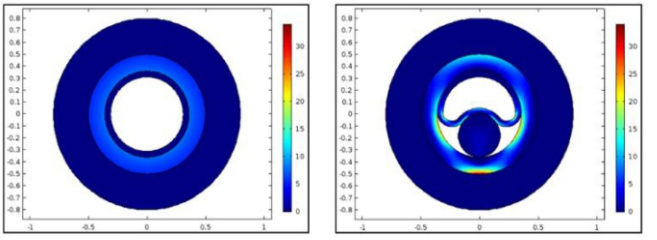
SHAFT DIAMETER: proximal 2.1 Fr, distal 1.5 Fr - Best in class shaft profile

MARKER: single/central

COATING: Hydrophilic distal 20 cm.

GUIDEWIRE COMPATIBLE: 0.014"

CATHETER DESIGN: RX



Conventional Balloon at 30 atm

Blimp CTO Scoring Balloon at 30 atm

Nominal Pressure 25 atm

Rated Burst Pressure 30 atm

Guidewire scoring element increases stress x4 compared to conventional balloon design. Blimp creates principle stress 8x at 30 atm compared to a 16 atm standard balloon catheter.

PURPOSE

SCORING CTO balloon catheter with ultra-low profile tip and balloon. The smallest balloon diameter of 0.6 mm.

Intended to create an initial opening of heavy calcified/fibrotic occlusions where the primary crossing is the issue.

High CTO penetration capability. Scoring element for highly calcified lesions„Uncrossable lesions"

Septal collateral crossing device in the situations when microcatheter doesn't cross. Dottering effect, without inflation inside septals.

TIPS & TRICKS

HOW TO USE BLIMP

1. Take the device carefully from the hoop to prevent kinking, a distal section of the catheter is fragile, also with a short Rx monorail segment.

2. Connect and apply negative pressure with an in deflator. This will remove potential air from the balloon. The balloon is very small, and it is hard to see any infltion/deflation.

3. Activate hydrophilic coating with saline inside the hoop, or wet the device outside the hoop with saline. The short lumen can be flushed with a syringe.

4. Advance the Blimp over the guidewire with care to prevent kinking. Hold the short monorail section, guide the Blimp end keep It parallel to the guidewire. Push smoothly into guiding.

5. Bring Blimp to the lesion with pushing, no rotation possible.

6. At the lesion, hold forward tension for 15 – 30 s. Due to heartbeats' movements, forward tension will advance the device to the cap. After long enough tension, inflate to 30 atm, deflate and maintain tension during deflation. Repeat inflations and deflations with constant forward tension and slow device advancement. (inflate-deflate-advance)

7. With the guidewire as a scoring element, focal stress in the calcified plaque will result in cracks, creating an initial opening. Inflation forces can be 4x higher than regular balloons. Deflate balloon for an easier further crossing of the lesion.

8. After crossing the lesion, retract Blimp slowly, especially in the first part, when inside coronaries. To fast removal may cause entanglement with the guidewire. Retract guidewire for several millimeters if entanglement happens

The balloon marker has to be parallel to the guidewire. Lateral balloon deflection reduces Blimp lesion penetration forces. Guide extension catheter can help in that situation.

Blimp is prone more to lateral deflection in tortuous vessels due to very short monorail design.

Do not use Blimp in epicardial collaterals.

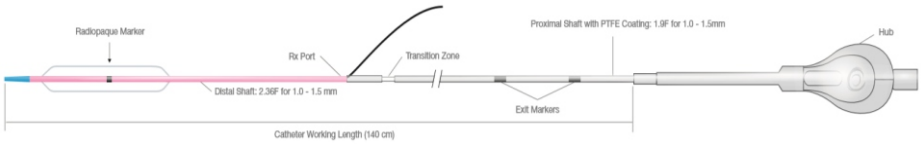
MISCELLANEOUS

Thin hypo tube proximal shaft/polymer distal shaft in decreasing diameter to aid in entering small vessels. Balloon at the distal end of the shaft with a single central radiopaque marker. The most distal end and distal from the balloon contains the Rapid Exchange (Rx) section for the guidewire, making the scoring element.

Very high rated burst pressure with scoring element as an excellent option for initial opening of the calcified and uncrossable proximal cap.

ORBUSNEICH®

SAPPHIRE® II PRO 1.0-1.5 mm



CONSTRUCTION

TIP ENTRY PROFILE: 0.016" (1.0 mm balloon), 1.5 mm tapering tip, the nylon balloon material

CROSSING PROFILE: 0.022" (0.55 mm) (1.0 mm balloon)

DIAMETER: 1.0 - 1.5 mm

LENGTH: 5, 8, 10, 15, 20 mm

RBP 16 atm (nominal 6 atm)

USABLE SHAFT LENGTH: 140 cm

SHAFT DIAMETER: distal 2.36 Fr, proximal 1.9 Fr

CATHETER WORKING LENGTH: 140 cm

MARKER: single/central

COATING: Hydro-X coating from tip to wire exit port. Inner lumen coated with Invio hydrophobic coating.

GUIDEWIRE COMPATIBLE: 0.014"

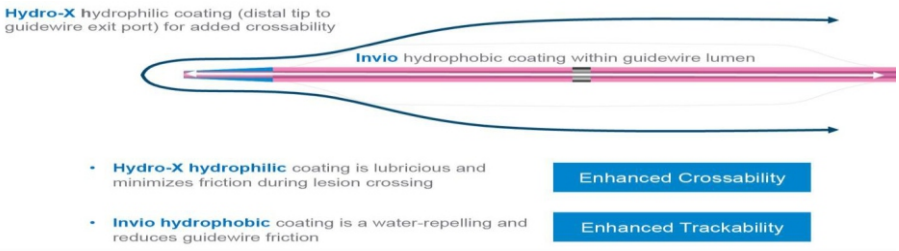
GUIDING COMPATIBLE: 5 Fr

CATHETER DESIGN: RX

OVERVIEW

Specialty low profile CTO balloon. Single material tip enables very low entry point for excellent crossability.

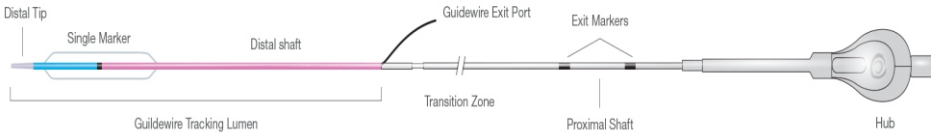
Hydrophilic very slipper coating in distal shaft and balloon for improved crossability. Hydrophobic invio coating at the inner lumen for better trackability and reduction of guidewire friction.



Images used courtesy of OrbusNeich Medical Company Ltd
(source: https://orbusneich.com/products/sapphire-ii-pro-1-0/

ORBUSNEICH®

SAPPHIRE® 3



CONSTRUCTION

TIP ENTRY PROFILE: 0.0159" (1.0 mm balloon), sub-zero Flex Tip, Balloon nylon material with 2 folds

CROSSING PROFILE: 0.0208" (0.85 mm balloon), and 0.0212" (1.0 mm balloon)

DIAMETER: 0.85, 1.0 and 1.25 mm

LENGTH: 5, 8, 10, 15 mm

RBP 16 atm (nominal 6 atm)

SHAFT DIAMETER: distal 2.36 Fr, proximal 1.9 Fr,

CATHETER WORKING LENGTH: 145 cm

MARKER: single/central

COATING: hydrophilic (tip to guidewire exit port), hydrophobic (guidewire lumen)

GUIDEWIRE COMPATIBLE: 0.014"

GUIDING COMPATIBLE: 5 Fr

CATHETER DESIGN: RX

OVERVIEW

Specialty low-profile CTO balloon with excellent crossability. Available 0.85 mm balloon diameter.

Sub-Zero Flex Tip - tapered tip with „zero guidewire transition."

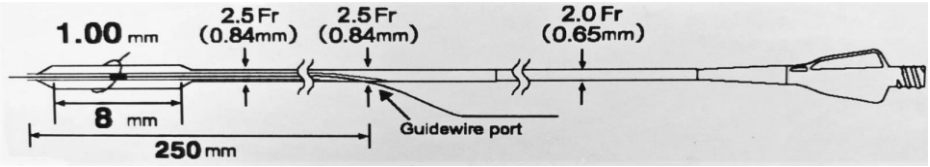
Spiral-cut hypotube - excellent force transmission from proximal shaft to the distal tip while maintaining overall flexibility

Extended guidewire RX tracking lumen to 30 cm
for enhanced deliverability, better support, and trackability

Images used courtesy of OrbusNeich Medical Company Ltd
(source: https://orbusneich.com/products/sapphire-3-0-85-1-0mm//)

IKAZUCHI ZERO

KANEKA



CONSTRUCTION

TIP ENTRY PROFILE: 0.016" (0.40 mm)

CROSSING PROFILE: 1.7 Fr, 0.023" (0.585 mm)

DIAMETER: 1.0 mm (IKAZUCHI Zero available also 1.2, 1.5, 2.0, 2.25, 2.50, 2.75, 3.0, 3.25, 3.5, 3.75, 4.0 mm)

LENGTH: 6, 8 mm

RBP 14 atm, NP 6 atm

USABLE SHAFT LENGTH: 146 cm

SHAFT DIAMETER: distal 2.5 Fr (0.84 mm), proximal 2.0 Fr (0.65 mm)

MARKER: single / central (above 2.0 mm – 2 markers)

COATING: hydrophilic (next-gen TR2 hydrophilic coating)

GUIDEWIRE COMPATIBLE: 0.014"

MIN. GUIDE: 5 Fr

CATHETER DESIGN: RX (Rx length 250 mm for 1.0, 1.5 and 3.0, Rx length for 2.0 to 2.75 mm)

OVERVIEW

Low profile balloon with minimized entry

Excellent crossability in CTO or calcified lesions. A good option for microcatheter uncrossable lesions

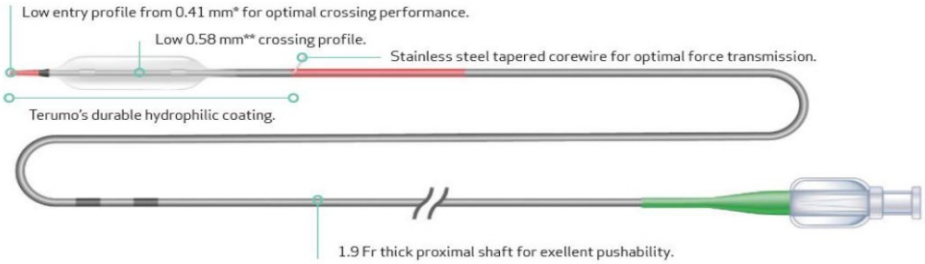
A good option when other similar balloons fail.

Next-gen TR2 hydrophilic coating for improved lubricity with resistance reducing

Unique two or three-fold wrapping technique

TERUMO

RYUREI



CONSTRUCTION

TIP ENTRY PROFILE: 0.016" (0.41 mm) (1.0 and 1.50 mm)

CROSSING PROFILE: 1.7 Fr, 0.023" (0.58 mm)

DIAMETER: 1.0, 1.25, 1.50 (also available 2.0, 2.25, 2.50, 2.75, 3.0, 3.25, 3.5, 2.75 and 4.0 mm)

LENGTH: 5, 10, 15, 20, 30, 40 mm (1.0 only 5 mm length, 1.25 and 1.50 – 5, 10, 15, 20 mm length)

RBP 14 atm, NP 6 atm

USABLE SHAFT LENGTH: 145 cm

SHAFT DIAMETER: distal 2.7 Fr (0.89 mm), mid 2.5 Fr (0.84 mm), proximal 1.9 Fr (0.64 mm)

MARKER: single / central (above 2.0 mm – 2 markers)

COATING: hydrophilic (M-coat)

GUIDEWIRE COMPATIBLE: 0.014"

MIN. GUIDE: 5 Fr

CATHETER DESIGN: RX

OVERVIEW

Low profile balloon.

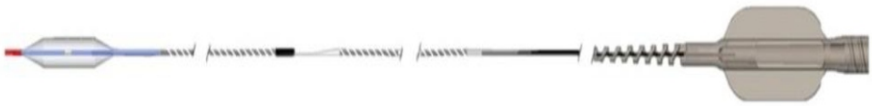
Excellent crossability in CTO or calcified lesions (M coat – Terumo's durable hydrophilic coating)

Excellent pushability - stainless steel tapered core wire. Stiff and durable middle and distal shaft

Enhanced trackability - optimal tip design/improved balloon bonding - tortuous anatomy and difficult to navigate vessels

THREADER

BOSTON SCIENTIFIC



CONSTRUCTION

MICRO-DILATATION Catheter, combined balloon and microcatheter device with PowerCoil technology

TIP ENTRY PROFILE: 0.017" (0.43 mm)

CROSSING PROFILE: 0.024" (0.61 mm)

DIAMETER: 1.2 mm

LENGTH: 12 mm

RBP 14 atm, NOM 6 atm

USABLE SHAFT LENGTH: 150 cm

SHAFT DIAMETER: distal 2.1 Fr (0.70 mm), mid- shaft 2.7 Fr (0.90 mm) (for RX model and 3.3 Fr OTW)

MARKER: single/central

COATING: hydrophilic coating

GUIDEWIRE COMPATIBLE: 0.014"

MIN. GUIDE: 5 Fr

CATHETER DESIGN: RX and OTW

OVERVIEW

Small profile balloon. Combination of balloon and microcatheter with excellent penetration capacity, and easy to use.

Good crossability in tight, calcified lesions and CTO.„Balloon uncrossable" lesions. A good option for BAM (balloon-assisted microdissection) or grenadoplasty.

Rx is preferred as It has more penetrating capacity due to the stiffer shaft. OTW allows easy wire exchange and selective contrast injection.

PowerCoil technology – unique shaft composition for improved deliverability, which is kink resistant and very supportive for the guidewire.

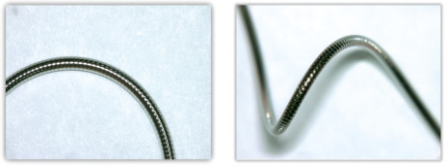


Illustration of the Power Coil

Images provided courtesy of Boston Scientific.

BOSTON SCIENTIFIC

EMERGE 1.2 mm

CONSTRUCTION

TIP ENTRY PROFILE: 0.017" (0.43 mm)

CROSSING PROFILE: 2.0 Fr, 0.0263" (0.67 mm)

DIAMETER: 1.2 mm (Emerge available also 1.5, 2.0, 2.25, 2.50, 2.75, 3.0, 3.25, 3.50, 3.75, 4.0 mm)

LENGTH: 8, 12, 15, 20 mm

RBP 18 atm

USABLE SHAFT LENGTH: 145 cm

SHAFT DIAMETER: distal 2.3 Fr (0.78 mm), proximal 2.6 Fr (0.91 mm) (for RX model)

MARKER: single platinum marker band / central

COATING: hydrophilic coating, ZGlide

GUIDEWIRE COMPATIBLE: 0.014"

MIN. GUIDE: 5 Fr

CATHETER DESIGN: RX and OTW

OVERVIEW

Small profile balloon, with good crossability in tight, calcified lesions and CTO.

Two shaft options: Single-segment inner shaft design for strong pushability and Bi-Segment for maximum deliverability

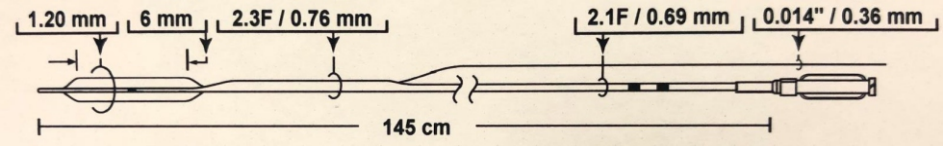
Simultaneous use: 2 Rx in 6 Fr guide, and 2 OTW in 8 Fr guide

Unique over-the-inner tip design. Hydrophilic ZGlide coating.

Images provided courtesy of Boston Scientific.

MINI TREK 1.2 mm

ABBOTT



CONSTRUCTION

TIP ENTRY PROFILE: 0.018" (0.45 mm)

CROSSING PROFILE: 2.0 Fr, 0.026" (0.66 mm)

DIAMETER: 1.2 mm (Mini Trek available also 1.5 and 2.0 mm)

LENGTH: 6, 8, 12, 15, 20 mm

RBP 14 atm

USABLE SHAFT LENGTH: 145 cm

SHAFT DIAMETER: distal 2.3 Fr (0.76 mm), proximal 2.1 Fr (0.69 mm)

MARKER: single/central

COATING: hydrophilic

GUIDEWIRE COMPATIBLE: 0.014"

MIN. GUIDE: 5 Fr

CATHETER DESIGN: RX and OTW

OVERVIEW

Low profile balloon, indicated for CTO

A good option for microcatheter uncrossable lesions

Excellent performance and crossability in tight lesions and subtotal stenosis. Sometimes crosses when smaller profile balloons fail.

Good tactile feedback. Transitionless tip. Hypotube and flexible distal shaft.

Flexible tungsten single central marker.

Very durable tip, less prone to damage in tight lesions with better crossability

BROSMED MEDICAL

ALVEO HP 0.75

CONSTRUCTION

TIP ENTRY PROFILE: 0.0156" (0.39 mm)

CROSSING PROFILE: 0.0193" (0.49 mm), folded balloon profile 0.0203" (0.51 mm)

DIAMETER: 0.75 mm (available also 1.0, 1.25, 1.50, 1.75, 2.0 mm)

LENGTH: 5, 8, 10, 12, 15, 20, 25, 30 mm

RBP 20 atm (average burst pressure >28 atm), NOM 10 atm

USABLE SHAFT LENGTH: 140 cm

SHAFT DIAMETER: distal 2.2 Fr (0.73 mm) for 0.75 - 1.0 mm balloons

MARKER: single marker / central

COATING: SliderTM hydrophilic external surface coating from tip to adjacent guidewire port. EelTM hydrophobic coating inside guidewire lumen

GUIDEWIRE COMPATIBLE: 0.014"

MIN. GUIDE: 5 Fr

CATHETER DESIGN: RX

OVERVIEW

Ultra low profile high-pressure balloon, designed for crossing complex lesions and Chronic Total Occlusions (CTO) and tracking tortuous anatomy.

Smallest balloon diameter of 0.75 mm

Ultra-low tip profile of 0.0156" for easy entry into complex lesions and CTOs. Ultra-low crossing profile of the distal balloon part 0.193". Very similar crossing profiles to NIC Nano Hydro (SIS Medical)

Robust RBP of 20 atm is ideal for severely calcified lesions

Proprietary distal laser welding technology eliminates hardness and maintains distal tip flexibility

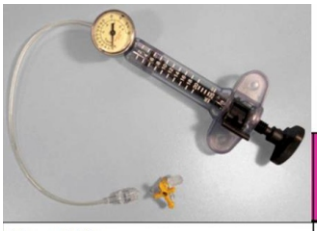
Image source: https://www.brosmed.com/en/Products/alveo-hp/

OPN NC

SIS MEDICAL

CONSTRUCTION

TIP ENTRY PROFILE: 0.016", long tapered tip
CROSSING PROFILE: 0.028" (0.71 mm). (DOUBLE LAYER balloon construction)
DIAMETER: 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5 mm
LENGTH: 10, 15, 20 mm
RBP 35 atm (each tested to 42 atm), linear compliance curve to over 40 atm
SHAFT DIAMETER: 2.45 Fr (0.82 mm)
MARKER: two platinum markers
COATING: un-coated
GUIDEWIRE COMPATIBLE: 0.014"
MIN. GUIDE: 6 Fr (7 Fr for 4.0 and 4.5 balloon diameter)
CATHETER DESIGN: RX.



	SIS MEDICAL 40atm Inflation Device	SIS MEDICAL 55atm Inflation Device
Description	For standard and high pressure PTCA up to 40 atm	For super high pressure PTCA up to 55 atm

Images reproduced with permission of SIS Medical

PURPOSE

Super High Pressure PTCA Balloon with unique twin-layer construction. Requires high pressure indeflator (SIS Medical)

Plaque Modification in moderate to severely calcified lesions / Un-dilatable lesions

Successful treatment of in-stent-restenosis with strong predilatation and compressing of the neointima before final treatment with DCB. In-stent restenosis CTO

In some cases replacing cutting and scoring balloons with low rates of dissections/perforations

Stent postdilatation, correcting malapposition/under expansion due to severe calcification. In cases with two layers of DES in combination with DEB

TIPS & TRICKS

Advancing on the extra support wire coaxially to the vessel trajectory. Lower deliverability due to twin-layer bulky design.

Good guide support and Extra support wires are recommended

Grand Slam wire (Asahi) is ideal for usage with OPN NC balloons due to its excellent support with a short spring coil and full hydrophobic coating.

For Pre Dilatation of DES ISR, use a 0.5 mm lesser diameter balloon than the Reference Vessel Diameter. For Post Dilatation 1:1 Balloon to Vessel ratio is recommended.

Slow increment of pressures (above 20 atm, increase progressively, approx. 5 atm/ 10-20 sec) for adequate luminal gain. Sometimes, an operator can feel a quick pressure drop when the lesion is cracked.

With hydrophilic coating (SLIP-COAT) on many Asahi wires, OPN NC can easily stick to the wire due to suboptimal compatibility with balloon inner shaft material and SLIP-COAT hydrophilic coating. Also, long spring coil wires with this coating stuck more easily on OPN. Therefore, OPN NC is not recommended with the workhorse Sion blue wire. Sion blue ES is better due to the shorter spring coil but not optimal. After high-pressure inflations (above 25-30 atm), the wire often comes out „en bloc" within balloon withdrawal.

If perforation of the balloon happens intracoronary, forces are distributed between the two layers of the balloon. There is a very low possibility for hydraulic vessel perforation/rupture with that property.

OPN NC should be used with SIS medical Inflation Device with a working limit of 55 ATM for optimum utilization of the device

MISCELLANEOUS

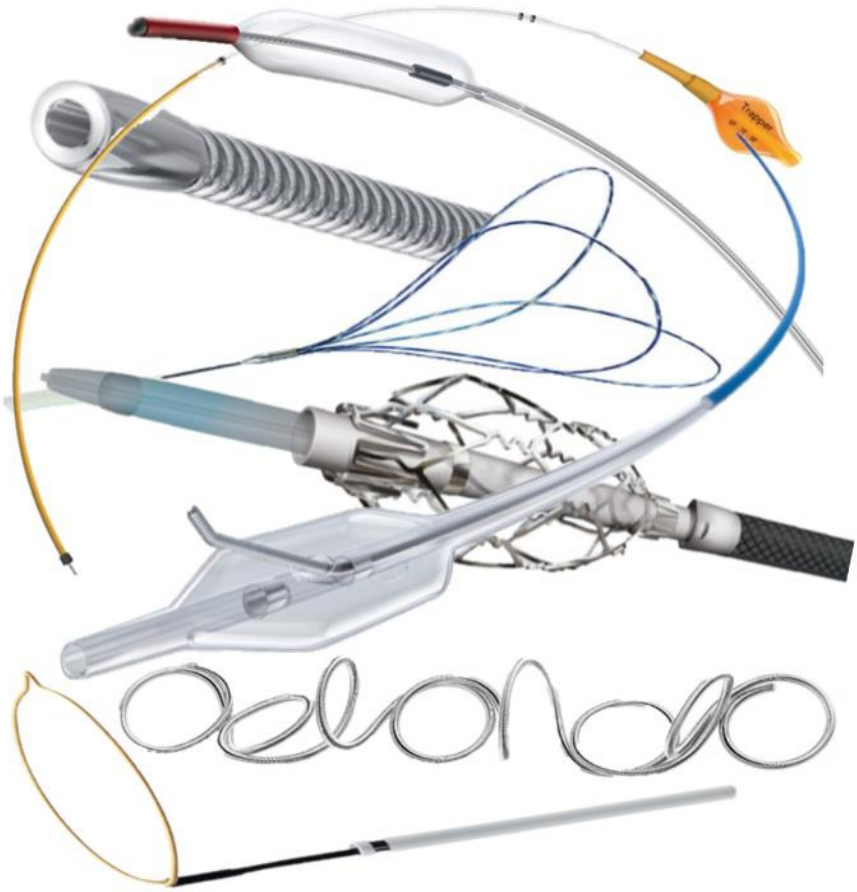
TWIN LAYER balloon construction – providing RBP of 35 atm with virtually zero dog - boning effect. Linear compliance curve. Dual folding in small vessel diameters, tri-folding in mid vessel diameters

Long tapered tip design for a better crossability

Better crossing profile (0.028" 2.0mm) than scoring- and cutting balloons. 1.5 mm smallest non-compliant balloon for severely calcified coronary arteries

Low rate of dissections, minimal chance for vessel perforation

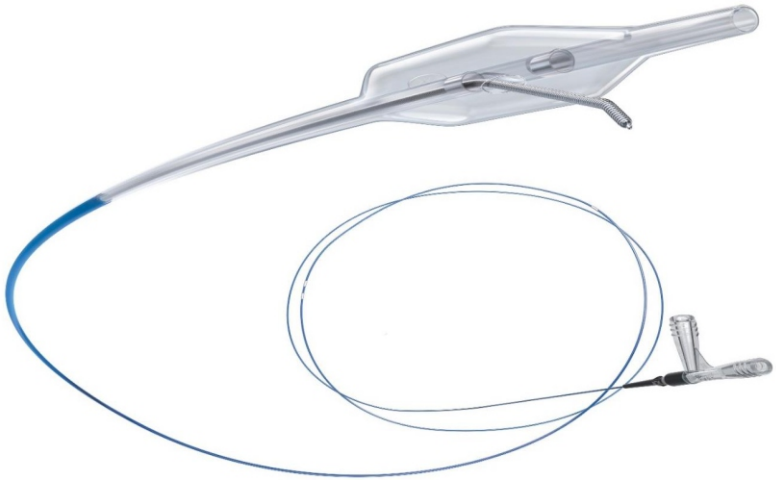
6



OTHER DEVICES

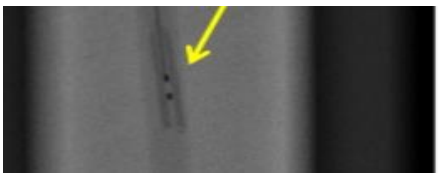
STINGRAY LP

BOSTON SCIENTIFIC

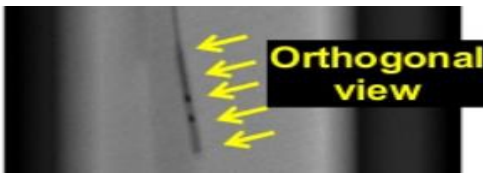


CONSTRUCTION

CORONARY CTO BALLOON CATHETER OTW, RE-ENTRY SYSTEM –controlled ADR
DIAMETER: 2.5 x 1.0 mm (at dilatation)
LENGTH: 10 mm
RBP 6 atm (inflation up to 2-4 atm)
USABLE SHAFT LENGTH: 135 cm
SHAFT DIAMETER: distal 2.7 Fr (0.92 mm), proximal 3.2 Fr (1.07 mm)
MARKER: 2 radiopaque marker bands at the proximal and distal exit port
COATING: Hydrophilic on balloon shaft
GUIDEWIRE COMPATIBLE: 0.014" (0.36 mm) and 0.018" (0.46 mm)
MIN. GUIDE: 6 Fr (2.0 mm). Trapping possible in 7 fr, a STRAW technique in 8 Fr guide catheter
CATHETER DESIGN: OTW



„railroad tracks view"



optimal „flatline" view

PURPOSE

Specialty CTO coronary flat self-orienting balloon OTW catheter designed for controlled re-entry technique. In two Orthogonal views allows predictable and reproducible re-entry with stiff wires into the true lumen distally.

ADR - anterograde dissection and reentry. A technique that utilizes the subintimal space to advance past the CTO in a controlled fashion. The best when the proximal CTO cap is unambiguous is when CTO is longer than 20 mm when the distal cap is not at an important bifurcation. Need to have a good„landing zone."

Stick and drive/stick and swap techniques. (STICK - Stingray wire or other high tip load penetration wires like Conquest Pro 12, Gaia second/third, Hornet 14, Astato, Warrior, Infiltrac Plus… SWAP - best option polymer jacket wires like Pilot 200, Gladius, Raider..)

TIPS & TRICKS

Meticulous preparation of the Stingray balloon needed for filling of the Stingray wings with pure contrast for best visibility and proper orthogonal view alignment.

PREPARATION OF THE STINGRAY BALLOON: Connect the high-pressure stopcock to the balloon hub and make 3-4x maneuvers of the negative pressure with a 20 cc syringe. Then connect a small syringe with pure contrast, flush contrast outside the free port of the stopcock to eliminate air, then open stopcock toward Stingray balloon. Need to see rapid emptying of a small amount of the contrast inside the Stingray ballon to fill the wings. Let syringe with contrast attached, flush wire exit port with saline. Once you connect the indeflator to the Stingray (all filled with pure contrast), do not put the indeflator in a vacuum. Intracoronary at a desirable location, inflate connected Stingray up to 2-4 atm.

The Stingray balloon has two side exit ports on 180° diametrically opposite balloon surfaces immediately proximal to two radiopaque markers. The flat shape of the balloon orients one exit port automatically toward the vessel's true lumen upon low-pressure inflation (2–4 atm).

Stick and drive / Stick and swap: at the optimal orthogonal view („flatline view"not„railroad tracks view"), stick with the wire facing the lumen of the vessel. Stiff wires cannot track into the diffusely diseased vessel – the better option is stick and swap (after pathway created with a stiff wire, replacing the wire with polymer jacket wire-like Pilot 200 for the drive into a distal vessel with contralateral contrast injection check.

Stick with fast movement (like intramuscular injection shot), not slow pushing of the wire

Multi Stick and swap technique - sometimes, the result is better when the stick is made several times. Push penetrative wire back in and out of the same stick point 3–5 times with spinning rotation on the last stick, or retrieve the wire with a 180-degree rotation. This creates a slightly bigger "hole" or multiple holes and generates a larger tear in the reentry point. This maneuver can make the swap easier.

STRAW technique Subintimal TRAnscatheter Withdrawal – in the case of subintimal hematoma and compromised landing zone. With the Stingray balloon in place, a second wire is advanced into the vessel extra plaque, and OTW 1:1-sized balloon is delivered and inflated, blocking any inflow to the vessel. A syringe is then used to aspirate hematoma via the tip of the OTW balloon, and puncture re-attempted after the distal vessel reconstitutes. (8 Fr guiding needed)

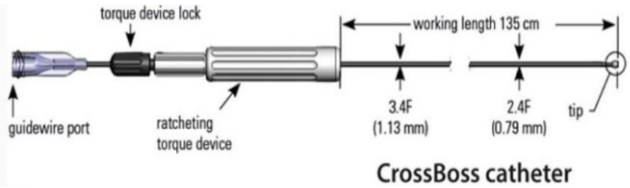
MISCELLANEOUS

Not great crossability. Subintimal route preparation with Crossboss is the best option (please see CrossBoss page in the book), knuckle (better small knuckle like with Gladius Mongo). Sometimes predilatation with a 1.0 – 1.5 balloon is needed.

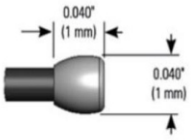
After removing the Stingray system, resistance is often faced when crossing the stick site with a microcatheter over the wire.

CROSSBOSS

BOSTON SCIENTIFIC



CrossBoss catheter



CONSTRUCTION

CORONARY CTO CROSSING OTW CATHETER

Multi-wire coiled shaft with a precise turn-for-turn response. Ratcheting torque device with locking mechanism. Blunt atraumatic tip 1 mm diameter (3 Fr)

TIP DIAMETER: 1.0 x 1.0 mm (0.040")

USABLE WORKING LENGTH: 135 cm

SHAFT DIAMETER: distal 2.4 Fr (0.79 mm), proximal 3.4 Fr (1.13 mm)

COATING: Hydrophilic

GUIDEWIRE COMPATIBLE: 0.014" (0.36 mm)

MIN. GUIDE: 6 Fr (2.0 mm)

CATHETER DESIGN: OTW

Blunt atraumatic tip

Torquer device

PURPOSE

Multi-wire coiled shaft device with moveable proximal torquer and blunt atraumatic tip 1 mm diameter.

Designed for blunt dissection.

ADR - anterograde dissection and re-entry coronary system. (CrossBoss + Stingray system).

In stent restenosis CTO.

TIPS & TRICKS

HOW TO USE CROSSBOSS

1. Advance workhorse wire at the proximal cap, then advance Crossboss over this wire

2. Withdraw guidewire inside CrossBoss catheter (advancing the device without guidewire from the tip)

3. Secure torquing device approx 4-5 cm from the Y-valve. This is a safety measure if CrossBoss jumps across the lesion distally, the ratcheting torque device will prevent rapid distal movement of the Crossboss and potential perforation of the vessel.

4. Rapid rotation manually with torquer system using „fast spin technique" in either direction to advance blunt atraumatic tip (1 mm) ahead of the coronary guidewire into the lesion allow crossing of the occlusion. Use „10% push - 90% spin" technique

5. After advancing the Crossboss catheter subintimal to the desired position (landing zone), retract It leaving the supportive guidewire past the occlusion (best option wires are Miraclebros 6-12). After that, bring the prepared Stingray balloon to the desired location.

CrossBoss remains within the vessel architecture (creating a controlled subintimal track). Other possibilities are: stuck at the proximal cap, goes intraplaque into the true distal lumen, goes into side branches. It can make perforation of the side branches.

Check the CrossBoss movement under fluoro in at least two orthogonal views to prevent crossing into side branches. Use two orthogonal views to confirm the CrossBoss distal position.

Limitations: requires a major backup guiding catheter. Unable to perforate fibrocalcific cap (needs a wire), not applicable if ambiguous cap, trends to follow all branches along the convexity of the vessel

If the CrossBoss goes into side branches, an operator can use stiff wire for redirection or knuckle wire from the beginning for the redirection.

Longer duration in-stent restenosis CTO is likely due to neoatherosclerosis with calcifications, which may impede CrossBoss crossing. The proximal and distal cap being inside the stent favors Crossboss ISR crossing.

MISCELLANEOUS

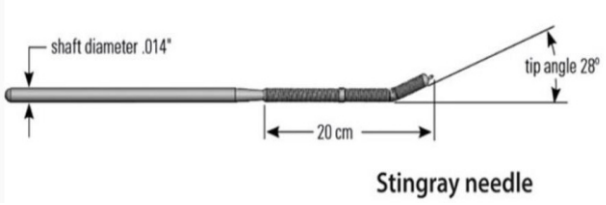
Designed to quickly and safely deliver a guidewire via the true lumen or subintimal pathways. Reduced risk of perforation with atraumatic, rounded tip reduces the risk of perforation.

Fast-Spin torque device allows rapid rotation of the catheter to facilitate crossing. Ratcheting torque device with a locking mechanism that controls the distance the device can move forward

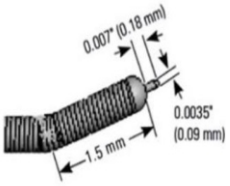
Extraplaque hematoma at the landing zone is a common failure mode of ADR. Using the CrossBoss helps reduce hematoma formation. Also, using the Guide extension catheter within the proximal CTO cap to prevent inflow reduces hematoma formation possibility.

STINGRAY WIRE

BOSTON SCIENTIFIC



Stingray needle



CONSTRUCTION

PTCA guide wire 0.014", 0.009" tapered 1.5 mm long preshaped distal tip at 28°, Distal probe - needle 0.0035" (0.09 mm) thick and 0.007" (0.18 mm) long

20 cm spring coil

TIP LOAD: 12.0 g

COATING: hydrophilic

RADIOPAQUE SEGMENT: 20 cm

185 and 300 cm available

PURPOSE

ADR - anterograde dissection and reentry coronary system. (CrossBoss + Stingray system).

„Stick" wire in Stingray technique.

The Stingray guidewire is a stiff guidewire with a 20 cm distal radiopaque segment and a 0.009" tapered tip with a 0.0035" distal taper – a small micro barb at the tip. The Stingray guidewire can be directed towards one of the two side ports of the Stingray balloon under fluoroscopic guidance to re-enter the distal true lumen.

The guidewire's angled tip and distal probe for facilitated re-entry into the true lumen.

TIPS & TRICKS

Stick at the optimal orthogonal view of the prepared Stingray balloon („flatline view" and not „railroad tracks view"). Direct toward 1 of the two side ports of the Stingray balloon under fluoroscopic guidance to reenter the distal true lumen.

Stick with fast movement (like intramuscular injection shot), not slow pushing of the wire.

STICK AND DRIVE: stick and progress with the Stingray wire (when large distal lumen, good visualization with contralateral injection, small hematoma, disease-free distal lumen)

STICK AND SWAP: after stick, change wire for Gladius, Pilot 200, Sion black...

MULTI STICK AND SWAP: sometimes, the result is better when the stick is made several times. Push the Stingray wire back in and out of the same stick point 3–5 times with spinning rotation on the last stick, or retrieve the wire with a 180-degree rotation. This creates a slightly bigger "hole" or multiple holes and generates a larger tear in the reentry point. This maneuver can make the swap easier.

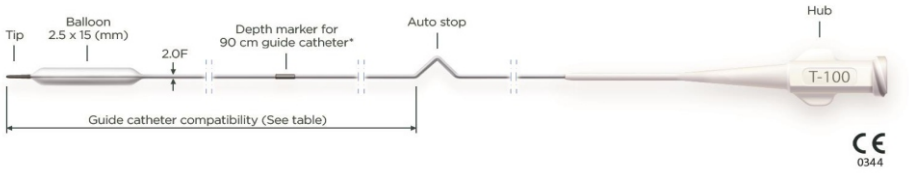
MISCELLANEOUS

Alternative wires for Stingray LP stick: Gaia third, Gaia Next 3, Conquest 12, Warrior, Infiltrac Plus, Hornet 14, Astato 20 or 40

Unique design with a micro barb at the tip. This is helpful for precise re-entry when the balloon is close to a healthy distal landing zone. However, in the presence of a large burden of atheroma between the balloon and lumen, It may be less effective. In this circumstance, try a tapered penetration wire (Confianza Pro, Warrior, Hornet 14, Astato 20...). After re-entry to the distal true lumen and removing the Stingray LP, the penetration wire is exchanged for a workhorse wire (Grand slam, Sion blue ES...) via a microcatheter to safely complete the procedure.

TRAPIT

IMDS



CONSTRUCTION

TRAPPING BALLOON CATHETER

Hub with strain relief, highly pushable shaft, balloon positioned close to the distal tip. Radiopaque marker in the distal tip. No guidewire lumen.

Unique auto-stop

Two guiding catheter length compatibility - 90 and 100 cm.

DIAMETER: 2.5 mm

LENGTH: 15 mm

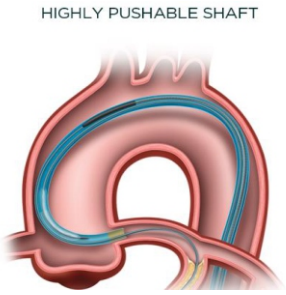
RBP 12 atm, Nominal 8 atm

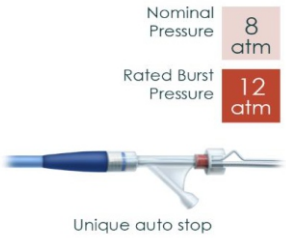
SHAFT DIAMETER: 2.0 Fr (0.66 mm)

MARKER: the distal tip of the catheter.

COATING: none

GUIDEWIRE COMPATIBLE: 0.014"





Images reproduced with permission of IMDS.

PURPOSE

Dedicated trapping balloon with the unique auto-stop patented shaft bend mechanism.

Designed to trap the guidewire at low inflation pressure in a 6F, 7F, or 8F guide catheter.

To facilitate interventional device exchange while maintaining wire position in patients undergoing PCI procedures.

TIPS & TRICKS

Advance TrapIT inside Y-hemostatic valve along with the present device, microcatheter, or guidewire shaft.

Push TrapIT balloon in a guide catheter. To aid in positioning the balloon in a guide catheter, the unique tactile feedback bend mechanism (Auto-stop) is integrated into the shaft at 90 or 100 cm from the balloon tip at the respective specific length for the user guide catheter.

To exchange the angioplasty device (microcatheter), the TrapIT has to be positioned more distally in the guide catheter than the microcatheter tip. The balloon is inflated, which fixates the guidewire in the guide catheter, then the microcatheter can be removed while the guidewire is held in position by the TrapIT. Watch fixed distal wire position on fluoroscopy when removing the microcatheter. A new (OTW) angioplasty device can be again introduced by back-loading the fixated guide wire in the distal tip of the angioplasty device.

No fluoroscopy is needed to advance the traping balloon to the ideal location for traping inside the guide catheter. The Auto-stop part cannot go inside the Y-hemostatic valve and guiding catheter.

Use 90 cm TrapIT with 90 cm long guide catheters. If 100 cm compatible TrapIT is used with a 90 cm guiding catheter, observe a 90 cm depth marker on the TrapIT shaft for safe positioning and not the Auto-stop kinging.

Microcatheters are easily trapped inside the 6 Fr guiding catheter. TrapIT distal shaft is 2.0 Fr in diameter, and the regular balloon shaft is 2.5 Fr in diameter. Therefore, much more space is available inside the 6 Fr guiding catheter for easier devices compatibility.

MISCELLANEOUS

The TrapIT Balloon Catheter is not intended for use outside of the guide catheter.

The TrapIT is not designed for usage over a guidewire and has thus no guidewire lumen.

An uncoated balloon enables better grip and robust trapping performance at low inflation pressures.

For use with a 90 cm guiding catheter, the shaft of the 100 cm compatible TrapIT is provided with a depth marking to indicate that the distal tip of the catheter is at the level of the distal tip of the guiding catheter.

Comparison with TRAPPER (Boston scientific): No trapping mechanism setup required, free insertion and retraction of devices into guiding catheter. Two products codes guiding catheter length specific. Unique auto-stop patented shaft bend mechanism.

TRAPPER

BOSTON SCIENTIFIC

CONSTRUCTION

TRAPPING BALLOON CATHETER

Core wire from hub to the tip, NC ballon 6-8 Fr compatible, 2.4 mm at nominal pressure, low profile 2 Fr shaft, Telescopic high profile (10 Fr) shaft stop mechanism – compatible with 90 and 100 cm guiding catheters.

DIAMETER: 2.4 mm (at nominal)

LENGTH: 10 mm

RBP 20 atm

SHAFT DIAMETER: 2.0 Fr (0.66 mm)

MARKER: 1 mm marker band at the tip and a 2 mm marker band at the proximal balloon edge

COATING: none

GUIDE CATHETER COMPATIBILITY: 90 and 100 cm.

If using 100 cm guiding, adjust Trapper by moving the orange-colored Telescope to the 100 cm marker proximally on the hub until the stop is locked between two black lines.

PURPOSE

Dedicated trapping balloon with Telescopic high profile (10 Fr) shaft stop mechanism. Needs adjustment for different guide catheter lengths (90 and 100 cm).

A fixed wire catheter with a 10 mm balloon near the distal tip is designed to secure a 0.014" wire within a 6F - 8F guide catheter when inflated to 12 atm.

To facilitate interventional device exchange while maintaining wire position in patients undergoing PCI procedures.

TIPS & TRICKS

Set the Telescope first. The Trapper comes out of the package preset for the 90 cm guide catheter. If using 100 cm guiding, adjust Trapper by moving the orange-colored Telescope to the 100 cm marker proximally on the hub until the stop is locked between two black lines.

Insert Trapper inside Y-hemostatic valve along with the present device, microcatheter, or guidewire shaft.

Advance Trapper inside the guiding catheter to the stop position. Do not position the stop Telescope mechanism up to the Y-hemostatic valve, but remove It 1-2 cm proximally to eliminate interference with other devices at the Y-valve entrance.

To exchange the angioplasty device (microcatheter), the Trapper has to be positioned more distally in the guide catheter than the microcatheter tip. The balloon is inflated between 12-20 atm, which fixates the guidewire in the guide catheter, then the microcatheter can be removed while the guidewire is held in position by the Trapper. Watch fixed distal wire position on fluoroscopy when removing the microcatheter. A new (OTW) angioplasty device can be again introduced by back-loading the fixated guide wire in the distal tip of the angioplasty device.

After Trapper is prepared for specific guiding catheter length, no fluoroscopy is needed to advance the traping balloon to the ideal location.

Microcatheters are easily trapped inside the 6 Fr guiding catheter.

7 Fr guide catheter is needed for Crossboss use, 8 Fr guide catheter for rotablation with 1.5 mm burr and above.

MISCELLANEOUS

1 mm marker band at the tip and a 2 mm marker band at the proximal balloon edge for easier placement and identification during the procedure.

An uncoated balloon enables a better grip on the trapped devices.

The Trapper Balloon Catheter is not intended for use outside of the guide catheter.

Comparison with TRAPIT (IMDS): trapping mechanism (telescopic) needs to be adjusted to guide catheter length. Restricted insertion and retraction of devices into guiding catheter - high profile of trapping mechanism (10 Fr) potentially interfere with devices in guiding catheter.

EN SNARE

MERIT MEDICAL

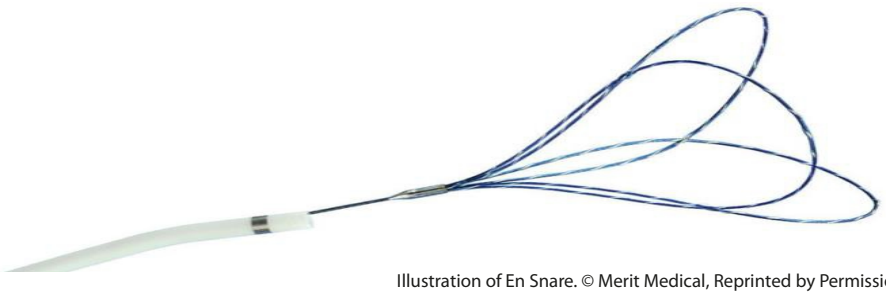


Illustration of En Snare. © Merit Medical, Reprinted by Permission.

CONSTRUCTION

CAPTURING/SNARING SYSTEM

3 interlaced Nitinol loops, platinum strands incorporated into the loops for visualization.

Snare, catheter, peel-away insertion tool, torquer

LOOP DIAMETER: STANDARD SNARE KIT 6-10, 9-15, 12-20, 18-30, 27-45 mm

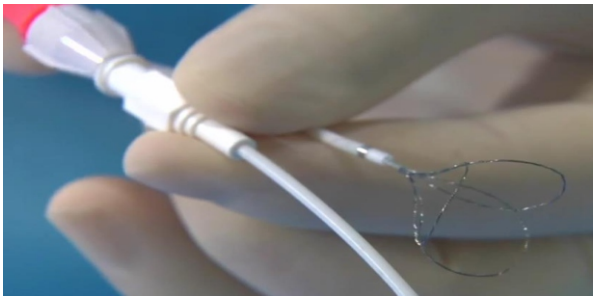
MINI SNARE KIT: 2-4, 4-8 mm

USABLE SNARE LENGTH: 120 cm for standard kit and 175 cm for the mini kit

CATHETER SIZE: 6 Fr (6-20 mm snare), 7 Fr (18-45 mm snare) 100 cm length for standard snare kit

3.2 Fr for mini snare kit, 150 cm length

RADIOPAQUE SEGMENT: platinum strands incorporated into the loops, embedded Radiopaque Marker Band on the catheter tip



+Similar loop snare system:

EXPRO ELITE SNARE (Teleflex). rapid deployment through any 0.035" compatible lumen. Nitinol Helical loop design. SNARE KIT: Loop diameter 5,10,15,25,35 mm catheter length 150 cm, shaft diameter 2.7 Fr. radiopaque marker gold-plated tungsten coil and tip

PURPOSE

The endovascular snaring system, SNARE with three interlaced Nitinol loops and CATHETER.

Retrieval and reposition intravascular foreign objects such as coils, balloons, lost stents, fragmented catheters, and guidewires within the cardiovascular system.

Retrograde CTO procedures, wire snaring in the aorta, at the truncus brachiocephalic area...

Possible retrieval of stents, wires, or other material in a coronary system with Mini snare kit (2-4 mm)

TIPS & TRICKS

1. Advance snare catheter or guiding catheter over the workhorse guidewire close to the target

2. Exchange guidewire to EN snare

3. Advance Snare to the target foreign body

4. Rotate snare with torque provided, advance and retrieve snare to catch a foreign body.

Need to rotate snare inside confined space; snare loops expand to the vessel size. Easy retrieval of side-wall objects

The best way for snaring objects is through a snare catheter for the best „grip" of the materials, especially small materials like coronary wire fragments.

Larger material can be snared through a guiding catheter without a snare catheter.

Large snares 27-45 or 18-30 mm are preferred to maximize the likelihood of capturing the retrograde guidewire. The floppy radiopaque part of the guidewire (RG3, R350) is the safest to snare, then carefully withdraw into the antegrade guide. Do not snare short, 180-190 cm wires.

Save snare collapsing tool, if needed to reintroduce snare again into the guiding catheter.

MISCELLANEOUS

Interlaced nitinol loops and wire providing flexibility, kink resistance, and superior 1:1 torque response – torquer included

Delivery catheter with reinforced strain-resistant hub and peel-away insertion tool.

Available in 7 configurations with lopp diameter sizes ranging from 2 mm to 45 mm

Embedded Radiopaque Marker Band - snare delivery catheter's precise location under imaging.

Improved Vessel Navigation with 15-degree curved tip on 6F and 7F snare delivery catheters.

High-Performance Snare Delivery Catheter - minimize the potential for kinking and buckling.

ONE SNARE

MERIT MEDICAL

Illustration of One Snare. © Merit Medical, Reprinted by Permission.

CONSTRUCTION

CAPTURING/SNARING SYSTEM

90-degree angle loop for a coaxial approach. Nitinol core, gold-plated tungsten loop is highly visible under fluoroscopy. Snare, catheter, peel-away insertion tool

LOOP DIAMETER: STANDARD SNARE KIT 5, 10, 15, 20, 25, 30, 35 mm

PETITE SNARE KIT: 10, 25 mm

MICROSNARE KIT: 2, 4, 7 mm (coronary system)

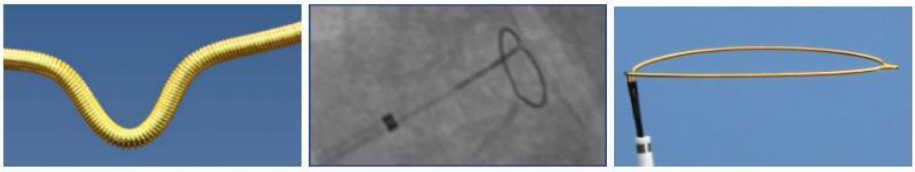
USABLE SNARE LENGTH: 120 cm for standard kit, 65 cm for the petite kit, 175 and 200 cm for microsnare kit

CATHETER SIZE: 4 Fr (5-10 mm snare), 6 Fr (15-35 mm snare), 100 cm length for standard snare kit

4 Fr for 10 mm and 6 Fr for 25 mm, 48 cm length for petite snare kit

2.3-3 Fr 150 and 175 cm length for microsnare kit

RADIOPAQUE SEGMENT: Gold-plated tungsten loop, Radiopaque Marker Band on the catheter tip



+Similar loop snare system:

SYMPRO ELITE SNARE (Teleflex). Nitinol single 90° loop design, SNARE KIT: Loop diameter 5,10,15,25,35 mm catheter length 150 cm, shaft diameter 2.7 Fr. (not for the coronary system)

AMPLATZ GOOSENECK (Medtronic): single-loop design. Nitinol shaft & gold plated tungsten loop, with a catheter. SNARE KIT loop diameter 5, 10, 15, 20, 25, 30, 35 mm MICROSNARE KIT loop diameter 2, 4, 7 mm

PURPOSE

The endovascular snaring system, single-loop SNARE

Retrieval and repositioning of intravascular foreign objects such as coils, balloons, lost stents, fragmented catheters, and guidewires within the cardiovascular system.

Retrograde CTO procedures, wire snaring in the aorta (truncus brachiocephalic area)

Possible retrieval of stents, wires, or other material in a coronary system with Micro snare kit (2-4 mm)

TIPS & TRICKS

1. Advance snare catheter or guiding catheter over the workhorse guidewire close to the target

2. Exchange guidewire to EN snare

3. Advance Snare to the target foreign body

4. Advance and retrieve snare to catch a foreign body, rotation of the snare

It can be used through coronary guiding catheters without snare catheters. Micro snares are 175 and 200 cm long for the coronary system, with 150 and 175 cm long catheters.

MISCELLANEOUS

Nitinol and gold-plated tungsten loop retain their circular shape, supporting foreign bodies' capture.

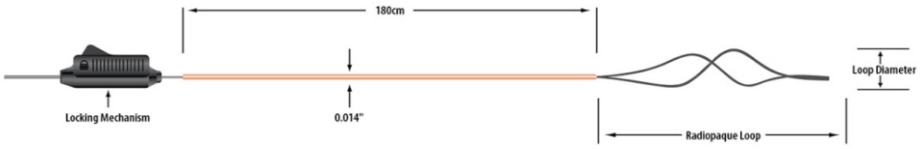
Snare delivery catheter – high-performance copolymer material, offers strength during foreign body retrieval, minimizes kinking and buckling.

Insertion tool with unique, peel-away design - quick and efficient snare loading. Easy-to-grip torque device for snare torqueability.

Available in 12 configurations, loop sizes

MICRO ELITE SNARE

TELEFLEX



CONSTRUCTION

CAPTURING/SNARING SYSTEM

Cobalt chromium Helical loop design, loops in 3 sizes. Unique locking mechanism for secure capture.

Preassembled, one-piece design - 0.014" outer sheath and a moveable central core with a pre-formed loop on the distal end, provides durability while allowing rapid deployment.

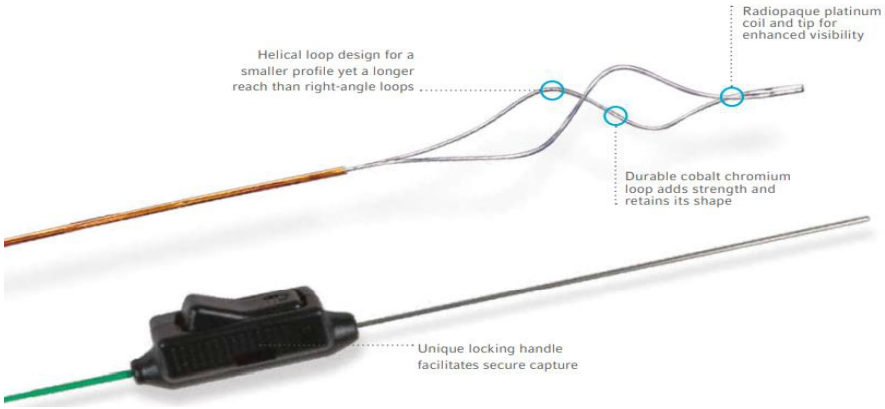
LOOP DIAMETER: 2, 4, 7 mm

USABLE WORKING LENGTH: 180 cm

SHAFT DIAMETER: 0.014" (0.36 mm) (1.09 Fr)

RADIOPAQUE SEGMENT: platinum coil and tip

MICRO SNARE KIT: Ultra-small 0.014" profile for delivery through microcatheters and balloon catheters.



+Similar loop snare system:

EN SNARE (Merit Medical). 3 interlaced nitinol lops. MINI SNARE KIT: Loop diameter 2-4 mm, 4-8 mm, catheter length 150 cm, snare length 175 cm, Catheter size 3.2 Fr (3 interlaced nitinol lops, radiopaque marker band on the delivery catheter, enhanced visualization of the loops by platinum strands)

PURPOSE

MICRO SNARE KIT with Ultra-small 0.014" profile for delivery through microcatheters and balloon catheters. Cobalt chromium helical loop design.

Intended for the retrieval and manipulation of atraumatic foreign bodies located in the coronary and peripheral cardiovascular system and the extra-cranial neurovascular anatomy.

Intracoronary retrieval of lost stents, wire fragments, microcatheter fragments, coils.

Rapid deployment of the system through any 0.014" or 0.035" compatible lumen.

TIPS & TRICKS

1. Advance standard coronary microcatheter or OTW balloon (0.014" internal lumen) over the workhorse guidewire close to the target (better with larger lumen tip like Finecross)

2. Exchange guidewire to Micro Elite snare system

3. Advance Snare system to the target foreign body

4. Rotate, advance, and retrieve snare to catch foreign body (lost stent, wire fragment, microcatheter fragment, coil...)

5. When an object is caught, the sheath and the central core can be locked with a unique locking handle to one unit for safer retrieval.

Need to rotate snare inside confined space; snare loops expand to the vessel size. Easy retrieval of side-wall objects

If the wire or balloon/stent shaft is in the patient, consider sliding the Micro Elite snare over the proximal part of the stucked wire or shaft so that the Micro Elite snare will enter the body of the patient already on the hardware to remove (wire or shaft), so basically, materials for snaring is already„loaded" on it. Then lock the snare close to the distal part of the hardware, and pull.

For a stucked rotaburr, consider cutting the proximal part of the burr and then slide the micro Elite snare on it.

MISCELLANEOUS

Preassembled, one-piece design. 0.014" outer sheath and a moveable central core with a pre-formed loop on the distal end.

The outer sheath acts as a lumen through which central core wire slides.

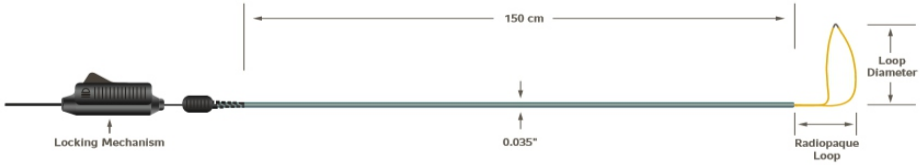
Unique locking handle to facilitate secure capture and retrieval with locking the sheath and the core wire to one unit.

Helical loop design for a smaller profile and more extended reach than right-angled loops. Durable cobalt-chromium loop - adds strength and retains its shape.

Radiopaque platinum coil and tip-enhanced visibility

SYMPRO ELITE SNARE

TELEFLEX



CONSTRUCTION

CAPTURING/SNARING SYSTEM

Nitinol single 90° loop design, loops in 5 sizes. Unique locking mechanism for secure capture.

Preassembled, one-piece design - 0.035" outer sheath and a moveable central core with a pre-formed loop on the distal end.

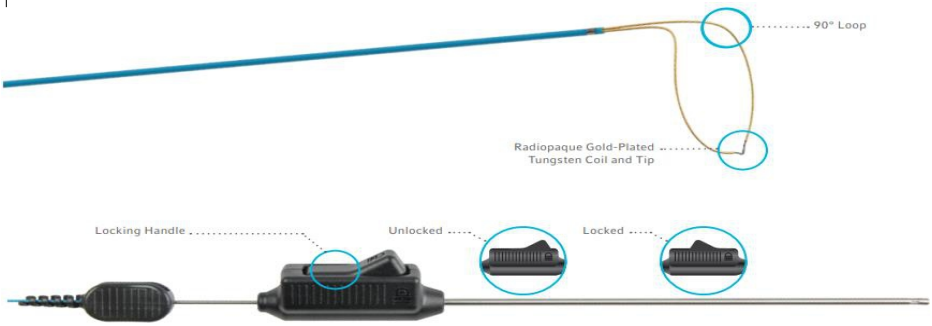
LOOP DIAMETER: 5, 10, 15, 25, 35 mm

USABLE WORKING LENGTH: 150 cm

SHAFT DIAMETER: 0.035" (0.89 mm) (2.7 Fr)

RADIOPAQUE SEGMENT: gold-plated tungsten coil and tip

SNARE KIT: 0.035" compatible snaring system.



Similar 90° single loop snare systems:

ONE SNARE (Merit Medical). Snare with a catheter, STANDARD SNARE KIT: loop diameter 5, 10, 15, 20, 25, 30, 35 mm, snare length 120 cm. PETITE SNARE KIT: loop diameter 10, 25 mm. MICROSNARE KIT: (coronary system) loop diameter 2, 4, 7 mm.

AMPLATZ GOOSENECK (Medtronic): single-loop design. Nitinol shaft & gold plated tungsten loop, with a catheter. SNARE KIT: loop diameter 5, 10, 15, 20, 25, 30, 35 mm, snare length 120 cm, 65 cm fo 10 and 25 mm loop diameter options, Catheter size 4 Fr and 6 Fr (15-35 mm). MICROSNARE KIT: (coronary system) loop diameter 2, 4, 7 mm, snare length 175 and 200 cm for every size, Catheter size 2.3-3 Fr.

PURPOSE

The endovascular snaring system, SNARE with Nitinol single 90° loop design.

Intended for use in the cardiovascular system and hollow viscus to retrieve and manipulate objects using minimally invasive surgical procedures.

Retrieval and reposition intravascular foreign objects such as coils, balloons, lost stents, fragmented catheters, and guidewires within the cardiovascular system.

Rapid deployment of the system through any 0.035" compatible lumen.

This device is not intended for use in the coronary arteries or neurovasculature.

TIPS & TRICKS

1. Advance guiding catheter over the workhorse guidewire close to the target.
2. Exchange guidewire to snare system.
3. Advance Snare system to the target foreign body.
4. Advance and retrieve snare to catch a foreign body, rotation of the snare.
5. When an object is caught, the sheath and the central core can be locked with a unique locking handle to one unit for safer retrieval.

MISCELLANEOUS

Preassembled, one-piece design. 0.035" outer sheath and a moveable central core with a pre-formed loop on the distal end.

The outer sheath acts as a lumen through which central core wire slides. The sheath has a grip tab on the proximal end for easier manipulation during snare deployment.

Unique locking handle to facilitate secure capture and retrieval with locking the sheath and the core wire to one unit.

Durable nitinol construction retains its shape and enhances pull strength.

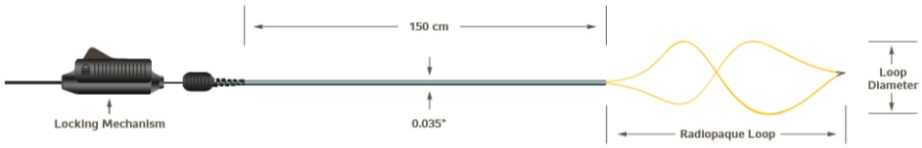
A simple 90° loop design remains coaxial to the vessel lumen.

1:1 torque response for precise positioning.

Excellent visibility due to gold-plated tungsten coil and tip.

EXPRO ELITE SNARE

TELEFLEX



CONSTRUCTION

CAPTURING/SNARING SYSTEM

Nitinol Helical loop design loops in 5 sizes. Unique locking mechanism for secure capture.

Preassembled, one-piece design - 0.035" outer sheath and a moveable central core with a pre-formed loop on the distal end.

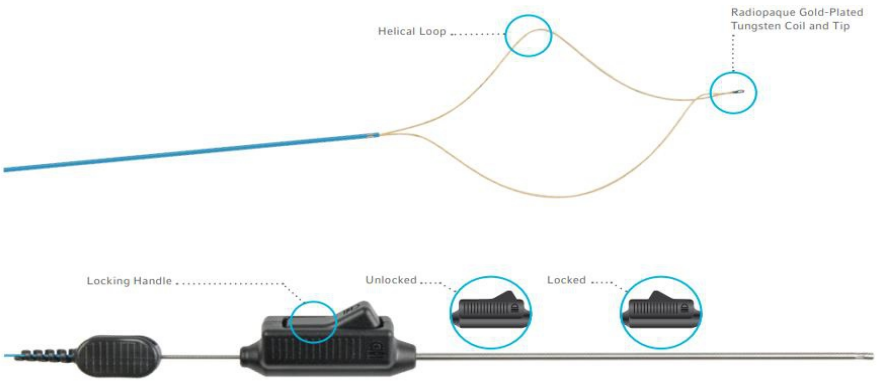
LOOP DIAMETER: 5, 10, 15, 25, 35 mm

USABLE WORKING LENGTH: 150 cm

SHAFT DIAMETER: 0.035" (0.89 mm) (2.7 Fr)

RADIOPAQUE SEGMENT: gold-plated tungsten coil and tip

SNARE KIT: 0.035" compatible snaring system.



+Similar loop snare system:

EN SNARE (Merit Medical). Three interlaced nitinol lops. STANDARD SNARE KIT: Loop diameter 6-10 mm, 9-15 mm, 12-20 mm, 18-30 mm, 27-45 mm, catheter length 100 cm, snare length 120 cm, Catheter size 6 Fr and 7 Fr (18-45 mm), radiopaque marker band on the delivery catheter, enhanced visualization of the loops by platinum strands)

PURPOSE

An endovascular snaring system, SNARE with Nitinol helical loop design.

Intended for use in the cardiovascular system and hollow viscus to retrieve and manipulate objects using minimally invasive surgical procedures.

Retrieval and reposition intravascular foreign objects such as coils, balloons, lost stents, fragmented catheters, and guidewires within the cardiovascular system.

Retrograde CTO procedures, wire snaring in the aorta (ascending aorta, truncus brachiocephalic area)

Rapid deployment of the system through any 0.035" compatible lumen.

This device is not intended for use in the coronary arteries or neurovasculature.

TIPS & TRICKS

1. Advance guiding catheter over the workhorse guidewire close to the target.

2. Exchange guidewire to snare system.

3. Advance Snare system to the target foreign body.

4. Advance and retrieve snare to catch a foreign body, rotation of the snare.

5. When an object is caught, the sheath and the central core can be locked with a unique locking handle to one unit for safer retrieval.

Need to rotate snare inside confined space; snare loops expand to the vessel size. Easy retrieval of side-wall objects.

MISCELLANEOUS

Preassembled, one-piece design. 0.035" outer sheath and a moveable central core with a pre-formed loop on the distal end.

The outer sheath acts as a lumen through which central core wire slides. The sheath has a grip tab on the proximal end for easier manipulation during snare deployment.

Unique locking handle to facilitate secure capture and retrieval with locking of the sheath and the core wire to one unit.

Helical loop design for capture in all directions and more extended reach. Durable nitinol retains its shape and enhances pull strength. Excellent visibility due to gold-plated tungsten coil and tip.

1:1 torque response.

CENTERCROSS

BTG

CONSTRUCTION

ANCHORING and CENTERING CATHETER. Coronary and peripheral
CenterCross, CenterCross ultra with Ultraliner (scaffold may be removed)

Mono-lumen system, Outer shaft catheter, inner shaft catheter – co-axial 3 Fr central lumen with re-sheatable Nitinol scaffold. Proximal portion: thumb lever/prime port with a release button, center lumen prime port, hemostasis valve.

OUTER CATHETER SHAFT MAX OD: 5.7 Fr, 0.073" (1.9 mm)

OUTER CATHETER SHAFT ID (ULTRALINER): 4.4 Fr, 0.058" (1.47 mm)

INNER CATHETER SHAFT ID: 3 Fr, 0.039", Compatible with most microcatheters on the market.

7 Fr guiding catheter compatible

SCAFFOLD DIAMETER: 4.5 mm at full expansion, 16 mm length (vessel size range 2.5 – 4.0 mm), hoop force <0.1 atm

RADIOPAQUE MARKERS: Inner shaft marker band. Outer shaft marker band.

COATING: hydrophilic coating on the distal portion of the catheter

USABLE LENGTH: 125 cm

ADVANCEMENT: pushing, OTW system

CenterCross Ultra features the UltraLiner (4.4 Fr inner diameter), a full-length guide extension for mother in child technique, better support... (after scaffold removal).

CenterCross Ultra LV (peripheral only). Scaffold 8.0 mm fully expanded, working length 100 cm.

PURPOSE

Special anchoring and centering catheter with stabilizing self-expanding scaffold that is deployed proximal to the target lesion

When extra support and stability are needed.

Anterograde procedures. AWE

A good option in blunt, hard, and calcified proximal CTO cap for precise central puncture with a maximum chance for true-to-true wiring.

TIPS & TRICKS

MicroCross requires an adequate proximal landing zone.

Advancement with pushing up to the proximal cap. A bulky device with overall good deliverability at less tortuous vessels.

Once positioned at the proximal cap, unsheath the device for passive nitinol scaffold self-expansion to gain active support inside the vessel's centered position. Then the microcatheter is placed through a single central lumen up to the proximal cap for safe and stable wiring.

Inner catheter shaft internal diameter is 3 Fr, and It is compatible with most microcatheters on the market.

The outer catheter shaft diameter is 5.7 Fr. Therefore, a 7 Fr guiding catheter is needed to use CenterCross.

Outer and inner shafts have radiopaque markers for easy navigation and control.

Needs at least 10 mm good proximal landing zone for scaffolding.

Cannot exchange with trapping balloon due to bigger crossing profile of the device. Long wire (300 cm) or extension guidewire are needed to remove CenterCross from the guide catheter.

MISCELLANEOUS

A self-expanding scaffold anchors catheter near the proximal cap - accurate centering and staying true lumen

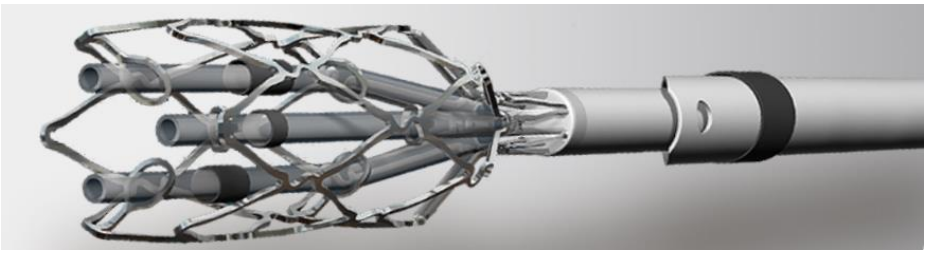
Gain Stability - positional accuracy to stay true lumen. Features a unique centering mechanism to penetrate the proximal cap. With stability, guidewire doesn't buckle when advanced.

The system amplifies guidewire tip penetration force to 5x, and when loaded with a microcatheter, boosts tip penetration force to 13x

Simila purpose catheters: NOVACROSS catheter (Nitiloop): 10 mm long flexible nitinol element which makes outward helical struts to scaffold to the vessel wall. PRODIGY catheter (Radius Medical) for strong wire support. 5 Fr catheter shaft with an atraumatic balloon at its distal tip can be expanded to 6 mm in diameter. When inflated, anchors the catheter in place.

MULTICROSS

BTG



CONSTRUCTION

ANCHORING CATHETER, multi-lumen. Coronary and peripheral

3-lumen system, Outer shaft, 3 inner catheter shafts, around resheatable Nitinol scaffold, Thumb lever/catheter prime port, three proximal guidewire luers (blue, red, white) with caps.

OUTER CATHETER SHAFT MAX OD: 5.7 Fr, 0.073" (1.9 mm)

INNER 3 CATHETER LUMEN DIAMETER ID: Compatible with 0.014" (0.36 mm) guidewire)

7 Fr guiding catheter compatible

SCAFFOLD DIAMETER: 4.5 mm at full expansion, 16 mm length (vessel size range 2.5 – 4.0 mm), 3 luer lumens - red, blue, white

RADIOPAQUE MARKERS: bands on the distal portion of each guidewire lumen, which correspond to three proximal ports, color-coded red, white and blue. Outer shaft marker band.

COATING: hydrophilic coating on the distal portion of the catheter

USABLE LENGTH: 135 cm

ADVANCEMENT: pushing, OTW system

PURPOSE

Special Multi-lumen anchoring catheter

Provides positional options - staying in the true lumen with more options. Up to three 0.014" guidewires can be used independently for lumen crossing. Tripple parallel wire technique

When extra support and stability are needed.

Anterograde procedures. AWE

A good option in blunt, hard, and calcified proximal CTO cap for precise central puncture with a maximum chance for true-to-true wiring.

TIPS & TRICKS

MicroCross requires an adequate proximal landing zone, at least 10 mm for scaffolding.

Advancement with pushing up to the proximal cap through the 7 Fr guiding catheter.

Once positioned at the proximal cap, unsheath the device for passive nitinol scaffold self-expansion to gain active support inside the vessel's centered position. Then advance up to three coronary guidewires for proximal CTO cap crossing.

The proximal shaft has three separate guidewire Luers colored blue, red, and white for easier wire differentiation.

The outer catheter shaft diameter is 5.7 Fr. Therefore, a 7 Fr guiding catheter is needed to use CenterCross.

Cannot exchange with a trapping balloon due to the bigger crossing profile of the device. Long wire (300 cm) or extension guidewire are needed to remove CenterCross from the guide catheter.

MISCELLANEOUS

A self-expanding scaffold anchors the catheter near the proximal cap

With stability, guidewires don't buckle when advanced.

Amplifies tip penetration force to 15x in comparison with guidewire alone.

MAESTRO

MERIT MEDICAL

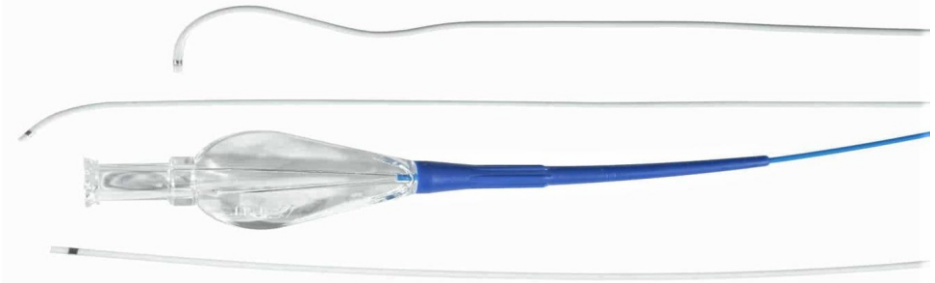


Illustration of Maestro © Merit Medical, Reprinted by Permission.

CONSTRUCTION

COILS and EMBOLICS deploying Multipurpose microcatheter

CONSTRUCTION: Nylon ribbon braiding, flexible distal 20 cm region.

3 tip shapes – STRAIGHT, 45°, SWAN. 4 sizes of microcatheter

OUTER DIAMETER: TAPERING SHAFT 2.8 – 2.1 Fr (max coil size 0.016", 0.41 mm)

TAPERING SHAFT 2.8 – 2.4 Fr (max coil size 0.018", 0.46 mm)

NON TAPERING SHAFT 2.8 Fr (max coil size 0.018", 0.46 mm)

NON TAPERING SHAFT 2.9 Fr (max microsphere size 900 um, others 700 um)

INNER DIAMETER: 0.018", 0.46 mm (2.8 – 2.1 Fr) 0.020", 0.52 mm (2.8 – 2.4 Fr), 0.24", 0.62 mm (2.8 Fr), 0.27", 0.68 mm (2.9 Fr)

COATING: Hydrophilic coating distal 80 cm

RADIOPAQUE MARKER: 1.3 mm from the tip

USABLE LENGTH: 110, 130, and 150 cm for every ship tape

ADVANCEMENT: pushing

OVERVIEW

Designed to deploy coils up to 0.018" and embolic up to and including 900 µm.

Maestro 2.8-2.4 Fr can be used for all typical coils used in the coronary system (Azur CX, Interlock-18, IDC-18 Soft, Axium...)

Nylon ribbon braiding - excellent pushability, trackability, and kink recovery. Flexible distal 20 cm region for atraumatic vessel entry.

0.20" and 0.24" for coils 0.018" and microspheres to 700 um. 0.27" for deploying microspheres to 900 m.

TERUMO

PROGREAT

CONSTRUCTION

COILS and EMBOLICS deploying microcatheter
CONSTRUCTION: Unique varied tungsten coil pitch
4 sizes of microcatheter
OUTER DIAMETER:

- 2.0 – 2.7 Fr (max coil size 0.018", 0.46 mm) max guidewire 0.016", only Azur CX coils
- 2.4 – 2.9 Fr (max coil size 0.018", 0.46 mm) max guidewire 0.018"
- 2.7 – 2.9 Fr (max coil size 0.018", 0.46 mm) max guidewire 0.021"
- 2.8 – 3.0 Fr (max microsphere size 900 um) max guidewire 0.021"

INNER DIAMETER: 0.019", 0.49 mm (2.0 – 2.7 Fr) 0.022", 0.57 mm (2.4 – 2.9 Fr), 0.25", 0.65 mm (2.4 – 2.9 Fr), 0.27", 0.70 mm (2.8 – 3.0 Fr)
COATING: hydrophilic TERUMO Glide TechnologyTM Hydrophilic coating distal 80 cm
RADIOPAQUE MARKER: 0.7 mm platinum/iridium marker
USABLE LENGTH: 110, 130, and 150 cm
ADVANCEMENT: pushing

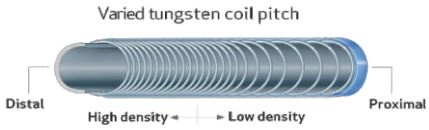
OVERVIEW

Designed to deploy coils up to 0.018"

Progreat 2.4 – 2.9 Fr can be used for all typical coils used in the coronary system (Azur CX, Interlock-18, IDC-18 Soft, Axium...). Progreat 2.0 – 2.7 Fr can be used also with the Azur CX and Axium coils.

Unique varied tungsten coil pitch construction - distal flexibility and proximal pushability for better vessel selectivity and catheter placement. Kink resistance.

PTFE inner layer for exceptional guidewire tracking and virtually frictionless delivery of coils and other embolic



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AZUR CX

TERUMO

CONSTRUCTION

EMBOLIZATION COILS, 0.018"

Vessel occlusion coils with cross-sectional coverage, Hydrogel. 2mm and 3mm sizes are available for small vessel embolization. Detachment system.

Coil O.D. 0.018", Loop diameter 2 – 20 mm, coil length 2 – 40 cm

CATHETER COMPATIBILITY ID: 0.019" to 0.027" (Compatible with Progreat 2.0 – 2.7 Fr)

(official compatibility is 0.019". Azur CX is compatible with Finecross microcatheter!)

Azur Detachment Controller system

In AZUR family also available: AZUR Hydrocoil - Detachable and pushable designs, 0.018", loop diameter 2-20 mm, coil length 2 – 30 cm. Hydrogel expands 4-5 times the original size in the presence of blood - creates a mechanical occlusion. Reduces rates of recanalization. Potential to use fewer coils and achieve cost savings per procedure with optimal filling volume. CATHETER COMPATIBILITY ID: 0.021" to 0.027" (Compatible with Progreat 2.4 – 2.9 Fr and above)

PURPOSE

Peripheral embolization coil system. 2mm and 3mm sizes are available for small vessel embolization. Optimal for the coronary system.

Distal vessel perforation (type 5 coronary perforation)

Septal collateral perforation, preventing septal hematoma

AV and AA shunts/fistulas coiling

TIPS & TRICKS

1. Before opening the packaging, check the correct coil size. Remove the clear cap from the delivery system

2. Prior to using the device, insert the proximal end delivery pusher into the funnel of the Azur Detachment controller (green handle device). Do NOT press the button. If the light doesn't light, replace Azur Controller. If a red light appears, replace Azur Controller. If the indicator light remains solid green, continue using Azur Controller.

3. Fill a 5cc syringe with saline. Secure syringe filled with saline into coil flush port and inject 5cc saline into flush port. Remove the syringe

4. Pull the Azur CX system out of the housing hoop until you see the black shrink lock. Slide the black shrink lock proximally to expose the tab on the introducer sheath. The shrink lock will not peel away. Continue to pull the Azur CX system out of the housing hoop

5. Insert the distal tip of the coil introducer sheath into the microcatheter hub. The coil introducer sheath will not go inside the catheter. Using rotating hemostatic Y-valve, do not over-tighten the Y-valve around the introducer because It can damage the coil.

6. Push the coil into the lumen of the microcatheter.

7. Deliver the coil to the appropriate location. Verify the coil position and connect the proximal end of the delivery pusher to the Azur Detachment Controller. If a red light appears, wipe the end of the coil with saline-soaked to gauze. If the indicator remains solid green, continue.

8. Press the button and wait for the detachment cycle, which consists of three audible tones accompanied by three amber lights.

9. Verify the detachment of the coil under fluoroscopy by pulling back slowly on the delivery pusher and confirming there is no coil movement. Remove the delivery pusher.

Finecross microcatheter is compatible with AZUR CX (Terumo) 0.018" embolization coils. No need for Progreat or other special microcatheters. Azur Cx coils easy deployable through Finecross MG due to 0.018" inner tip diameter (Finecross MG inner diameter: TIP 0.018", SHAFT 0.021"). Azur Cx cannot be deployed through tapered tip microcatheters like Corsair Pro or Turnpike LP.

Coils don't work immediately after delivery. Hydrogel has to expand. Sometimes is needed 5-10 min for maximum effect.

„Block-and-deliver" technique: simultaneous balloon inflation and coil delivery through a microcatheter can be achieved through a single 7 or 8 Fr guide catheter

MISCELLANEOUS

Creates a solid core with Hydrogel expansion for non-absorbable and stable mechanical occlusion. Fill the vessel with minimal landing zone requirements. Soft feel with up to 30 minutes repositioning time

Anchor coil for precise placement and control in high-flow areas

AXIUM

MEDTRONIC

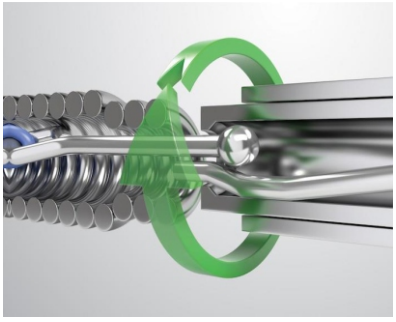
CONSTRUCTION

EMBOLIZATION COILS, 0.0108" – 0.0115"

Vessel occlusion coils. Detachable system

AXIUM PRIME Super Soft Helix and 3D, Coil O.D 0.0115", Loop diameter 4-6 mm, coil length 6-20 cm

AXIUM PRIME Extra Soft Helix and 3D: Coil O.D 0.0108" Loop diameter 1-3 mm, Coil length 1-10 cm



Axium detachment system: mechanical system with manual break back-up and detachment method.

In Axium Family also available: Axium Prime Frame: Coil O.D. 0.0115" (0.29 mm) – 0.0145" (0.37 mm). Aneurisms treatment contains proximal and distal anchor loops, open-loop configuration, uniform loop distribution. Axium MicroFX: Coil O.D. 0.0115"– 0.0145". Polymer fibers, PGLA, or nylon microfilaments. LAtticeFX technology provides an interlocked surface area or scaffold which orients cell adhesion and extracellular deposition.

PURPOSE

Peripheral embolization coil system. 1-3 mm size Axium Prime Extra Soft Helix is available for small vessel embolization. It is a good option for the coronary system due to its very soft and atraumatic architecture.

Distal vessel perforation (type 5 coronary perforation)

Septal collateral perforation, preventing septal hematoma

AV and AA shunts/fistulas coiling

Recommended to be available in interventions when epicardial collaterals crossing is used

TIPS & TRICKS

Axium coils are compatible with every standard coronary microcatheter with a 0.014" inner lumen. Therefore, delivery of Axium coils is quick and easy during the procedure, without the need for special microcatheter exchange.

HOW TO DELIVER AXIUM COILS.

1. Remove coil from the plastic hoop.

2. The coil is preloaded into the delivery catheter sleeve. Insert the delivery catheter tip into the hub of the coronary microcatheter.

3. Deliver the back end of the coil inside the microcatheter, usually by a second operator.

4. Remove plastic catheter sleeve, and continue to deliver coil inside the microcatheter. Advance coil towards the tip of the microcatheter.

5. Once satisfied with the location of the coil inside the coronary system, connect to the proximal end a special release device (EV3) and pull back the trigger button, which releases (detach) coil.

6. Verify the detachment of the coil under fluoroscopy by pulling back slowly on the delivery pusher and confirming there is no coli movement. Remove the delivery pusher

Coils don't work immediately after delivery. Sometimes is needed 5-10 min for maximum effect.

„Block-and-deliver" technique: simultaneous balloon inflation and coil delivery through a microcatheter can be achieved through a single 7 or 8 Fr guide catheter

MISCELLANEOUS

Axium Prime Extra Soft and Super Soft are some of the softest coils on the market. This softness is achieved with thinner filar and thinner stretch-resistant stranders.

RANDOM BREAK COIL technology in Axium Prime soft and Extra Soft: Due to its winding pattern, when the coil encounters resistance, it can more easily deflect and seek out open spaces

Compared to the Azur Cx detachment system, which is electronic, the Axium EV3 is mechanical.

INTERLOCK, IDC-18 SOFT

BOSTON SCIENTIFIC

CONSTRUCTION

EMBOLIZATION COILS, 0.018"

Vessel occlusion coils. Bare microcoil system. Interlocking detachable coil (IDC). Interlocking arms - simple detachment, no handle required.

ICD-18 SOFT Interlocking Detachable Coil (2D shape): Coil O.D 0.018"

Loop diameter 2-5 mm, coil length 2-12 cm

CATHETER COMPATIBILITY ID: 0.021" inner lumen (example Direxion™ Microcatheter)

Push coil outside of the catheter

Detachment of coil requires no additional devices

Interlock family also available: Interlock-18: Coil O.D. 0.018". Compatible with 0.021" lumen catheters, Fibered thrombogenic coils for complex and distal peripheral vasculature, loop diameter 2-14 mm, coil length 4-30 cm. Interlock-35: Coil O.D. 0.035", compatible with 5 Fr selective dg. catheters, heavily fibered system for large, proximal vessels, loop diameter 3-18 mm, coil length 4-40 cm (2D, cube and diamond shape)

PURPOSE

Peripheral embolization bare microcoil system. 2-5 mm size ICD-18 Soft is available for small vessel embolization. It is a good option for the coronary system due to its very soft and atraumatic 2D architecture.

Distal vessel perforation (type 5 coronary perforation)

Septal collateral perforation, preventing septal hematoma, AV and AA shunts/fistulas coiling

Recommended to be available in interventions when epicardial collaterals crossing is used.

TIPS & TRICKS

The interlocking connection is a simple coupling that remains attached while inside the lumen of the catheter. Compared to Axium and Azur coils, detachment of the Interlock coil requires no additional devices, simply a push outside the catheter. The best option is to deploy the coil with the Direxion microcatheter, which has visible radiopaque markers 30 mm distance apart.

HOW TO DELIVER INTERLOCK COILS.

1. Remove coil from the plastic hoop.

2. Insert the coil system into the hub of the delivery microcatheter (Direxion Torqueable Microcatheter, Renegade microcatheter, Progreat catheter, Maestro catheter....)

3. Continue to deliver the coil inside the microcatheter. Advance coil towards the tip of the microcatheter.

4. Coils have a visible radiopaque marker band under the fluoro on the delivery wire 30 mm proximal to the interlocking arms. Also, interlock arms are visible under fluoro. The coil can be pushed out of the microcatheter and retracted before final placement but not pushed further than the interlock arms position.

5. Once satisfied with the location of the coil inside the coronary system, push the coil further outside of the delivery catheter to interlock arms come out of the microcatheter. With that maneuver, the coil is detached and deployed into the vessel—simple detachment by an interlocking system that requires no additional devices.

6. Verify the detachment of the coil under fluoroscopy.

Coils don't work immediately after delivery. Sometimes is needed 5-10 min for maximum effect.

„Block-and-deliver" technique: simultaneous balloon inflation and coil delivery through a microcatheter can be achieved through a single 7 or 8 Fr guide catheter

MISCELLANEOUS

ICD-18 Soft – thinner platinum wire and softer primary coil designed for smooth and tight nesting during vessel embolization

The interlocking arms allow the coil to be advanced and retracted before final placement for security in embolization procedures. When interlock arms come out of the catheter, the coil is deployed.

Detachable soft coil technology with interlocking arms allows precise coil placement and reduces catheter kickback risk. Exact detachment mechanism and microcatheter compatibility as Interlock-18 fibered coils.

OKAY II

GOODMAN

CONSTRUCTION

Y-CONNECTOR WITH TWO VALVES DESIGN

Large lumen valve, Transparent plastic. Opener (yellow part), hemostatic valve, fixed valve, thumbwheel.

LUMEN PROFILE: I.D. 10 Fr (3.33 mm)

HEMOSTATIC VALVE: Opener (yellow part) push to open, release to close. Once opened, clockwise quarter (1/4) turn locks the valve in the open position.

FIXED VALVE: deeper position, counterclockwise rotation to lock the wire.

OVERVIEW

Minimizes blood loss with two valves.

Large lumen - 10 Fr, allows usage of various angioplasty devices for complex PCI

One-touch easy use hemostatic valve design / facilitates single-handed operation.

Easy operate with push and release maneuvers with the opener (hemostatic valve – yellow part). To open the valve for device inserting, push the opener. To close the valve, for blood loss prevention, release/pull the opener. If the valve has to stay open, make a quarter clockwise turn.

To fix the angioplasty device (wire shaft, microcatheter...) turn counterclockwise the fixed valve (transparent part).

A set: Y-connector, inserter, torque device

E set: Y-connector, Inserter, Torque device, Extension tube

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TELEFLEX

GUARDIAN II

CONSTRUCTION

Y CONNECTOR, HEMOSTATIC VALVE with star-shaped seal technology. Available in two versions: "Click" version & "No-Click" version. Device length 92 mm. Content: Y-connector, guidewire insertion tool, torque device

LUMEN PROFILE: I.D. 8 Fr (2.67 mm)

HEMOSTATIC VALVE: Click-open and Click-close Design

ROTOLOCK: deeper position, designed to provide an additional mechanism for securing device position

OVERVIEW

Minimizes blood loss.

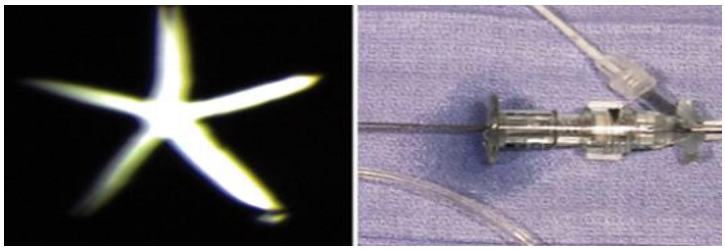
The unique proximal cap is easily depressed for both opening and closing the lumen

8 Fr. inner lumen and star-shaped seal technology - independently secure multiple devices for reduced blood loss/allow independent guidewire movement during interventions. Provides separation of guidewires and other devices during procedures. Rotolock provides an option to secure devices.

Ergonomic design promotes easy, single-handed operation.

Contraindication: The sidearm extension tubing is not designed for use with pressure injections > 150 psi (10 ATM or 1034 kPa).

Illustration of the Guardian II Hemostasis Valve Star-Shaped Seal



COVERED STENTS

	PK PAPYRUS (Biotronik)	GRAFTMASTER (Abbott Vascular)	BeGRAFT (Bentley Innomed)	DIRECT-STENT (InSitu Technologies)	ANEUGRAFT Dx (ITGI Medical)
Stent	CoCr with silicon carbide coating Single-layer	Stainless steel Sandwich design	CoCr Single-layer	Stainless steel Sandwich design	Stainless steel Single-layer
Graft	Non-woven Polyurethane fibers, 10 um	ePTFE	micro-porous ePTFE tubing	ePTFE	processed equine pericardium
Stent diameter	2.5 - 5.0 mm (max 5.63 mm)	2.8 - 4.8 mm	2.5 - 5.0 mm	2.25 - 6.0 mm	2.5 - 4.0 mm
Stent Length	15 - 26 mm	16 - 26 mm	8 - 24 mm	10 - 38 mm	13 - 27 mm
Nominal pressure	8 atm (2.5-3.5) 7 atm (4.0-5.0) RBP 14 atm	15 atm RBP 16 atm	11 atm (2.5-4.0) 10 atm (4.5-5.0) RBP 14-16 atm	8 atm	5 atm
Crimped profile	1.18 - 1.55 mm	1.63 - 1.73 mm	1.1 - 1.4 mm	1.2 - 1.8 mm	1.26 - 1.41 mm
Guiding compatibility	5 Fr (< 4.0 mm) 6 Fr (> 4.0 mm)	6 Fr (< 4.0 mm) 7 Fr (4.5, 4.8 mm)	5 Fr	6 Fr 7 fr	6 Fr (for tortuous vessels)

ADVANCEMENT: best option with guide extension catheters on supportive wires. Single guiding/double guiding techniques (ping-pong)„Block and deliver" technique.

PURPOSE

CORONARY PERFORATIONS/RUPTURE: type II and III perforations. When hemostasis cannot be achieved by prolonged balloon inflation and reversal of anticoagulation (protamine reversal of heparin...)

EXCLUSION OF CORONARY FISTULAS

EXCLUSION OF CORONARY ANEURYSMS

SAPHENOUS VEIN GRAFTS

IVUS / GUIDING COMPATIBILITY

	EAGLE EYE PLATINUM/ST (Philips Volcano)	OPTICROSS/HD (Boston Scientific)
Diameter at transducer	3.5 Fr	3.1 Fr
Distal shaft diameter	3.3 Fr	2.4 Fr
Proximal shaft diameter	2.9 Fr	3.0 Fr
Minimum guide catheter	5 Fr (ID > 0.056“)	5 Fr (ID > 0.058“)
Tip entry profile	0.019“	0.026“
Tip to transducer length	10 mm / ST 2.5 mm	20 mm
Working length	150 cm	135 cm
Radiopaque markers	Scanner + 3 marks 10 mm apart	5 mm distal marker 15 mm to a transducer
Coating	GlyDx hydrophilic	Bio-Slide™ hydrophilic
Transducer frequency	Digital 20 MHz	Rotational 40 MHz/ 60 MHz (HD)

AVERAGE GUIDING CATHETER INNER LUMEN DIAMETER

5 Fr - (1.4 mm, 4.24 Fr, 0.06") 6 Fr - (1.8 mm, 5.45 Fr, 0.07")

7 Fr - (2.0 mm, 6.06 Fr, 0.08") 8 Fr - (2.2 mm, 6.66 Fr, 0.09")

TIPS & TRICKS

IVUS in CTO PCI can be used with a 7 Fr guiding in combination with almost every microcatheter available (exceptions are Supercross angled, Tornus, M-Cath)

The inner diameter of the 7 Fr guiding catheter is 6 Fr, 2.0 mm, 0.08". The crossing profile of the proximal shaft of IVUS catheters is 2.9-3.0 Fr. Therefore, any device with a diameter up to 3 Fr can be used simultaneously (example: 7Fr guiding + Opticross HD + Corsair Pro, which has 2.8 Fr proximal shaft diameter) (do not mistake proximal shafts diameters with distal shaft/crossing profiles. Example: the proximal shaft of Corsair Pro is 2.8 Fr, and of Corsair Pro XS is 2.9 Fr)

The best microcatheters to use with IVUS due to lower proximal shaft crossing profile are Caravel - 2.6 Fr, Finecross - 2.6 Fr, Supercross straight - 2.5 Fr, Nhancer ProX - 2.6 Fr, Teleport - 2.6 Fr, Telemark - 2.6 Fr...)

When Philips Volcano Eagle Eye is used, the best option is to position IVUS distally. After that, insert the microcatheter because the distal shaft of the Eagle eye and transducer (3.5 Fr) are thicker than the proximal shaft. To remove the IVUS, first, the microcatheter has to be removed with the extension wire, and after IVUS is out, the microcatheter has to be advanced back again.

In 7 Fr guiding with IVUS catheters can be used: NHancer Rx (prox. shaft diameter 2.6 Fr, distal oval shaft diameter 2.3/3.3 Fr). If the Eagle Eye Platinum is used, it must be inserted intracoronary first due to the thicker transducer crossing profile. Also, SwiftNinja can be used with IVUS inside the 7 Fr guiding catheter.

For other dual lumen microcatheters with IVUS, an 8 Fr guiding is necessary.

CTO TOOLBOX

SECOND EDITION

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