



### Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 13485:2016

This is to certify that: BIOTRONIK AG

Ackerstrasse 6 8180 Bülach Switzerland

Facility ID Number: F000099

Holds Certificate No: MDSAP 688646

Statement of Conformity: The company listed on this certificate has been audited to and found to conform with the following criteria: ISO 13485:2016 and Australia - Therapeutic Goods (Medical Devices) Regulations, 2002, Schedule 3 Part 1 (excluding Part 1.6) - Full Quality Assurance Procedure; Brasil - RDC ANVISA n. 16/2013, RDC ANVISA n. 23/2012, RDC ANVISA n. 67/2009; Canada - Medical Devices Regulations - Part 1 - SOR 98/282; Japan - MHLW Ministerial Ordinance 169, Article 4 to Article 68, PMD Act; USA - 21 CFR 820, 21 CFR 803, 21 CFR 806, 21 CFR 807 - Subparts A to D

Design, development, manufacture, and distribution of the following sterile devices: PTCA balloon catheters, PTA balloon catheters, drugreleasing PTCA balloon catheters, drug-releasing PTA balloon catheters, coronary stents and stent systems, peripheral stents and stent systems, drugeluting coronary stents and stent systems, coronary guidewires, peripheral guidewires, drug-eluting resorbable coronary scaffolds and scaffold systems.

For and on behalf of BSI:

Gary E Slack, Senior Vice President - Medical Devices

jany C Stade

Original Registration Date: 2018-10-11 Effective Date: 2021-10-11 Expiry Date: 2024-10-10

Page: 1 of 1

BSI Group America Inc. is an MDSAP authorized auditing organization

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Directive 93/42/EEC on Medical Devices, Annex II excluding Section 4

No. CE 608280

Issued To: BIOTRONIK AG

Ackerstrasse 6 8180 Bülach Switzerland

In respect of:

Design and manufacture of PTCA balloon catheters, PTA balloon catheters, drug-releasing PTCA balloon catheters, drug-releasing PTA balloon catheters, coronary stent systems, peripheral vascular stent systems, drug-eluting coronary stent systems, drug-eluting resorbable coronary scaffold systems, coronary guidewires and peripheral guidewires

on the basis of our examination of the quality assurance system under the requirements of Council Directive 93/42/EEC, Annex II excluding section 4. The quality assurance system meets the requirements of the directive. For the placing on the market of class III products an Annex II section 4 certificate is required.

For and on behalf of BSI, a Notified Body for the above Directive (Notified Body Number 2797):

Gary E Slack, Senior Vice President Medical Devices

Gay C Stade

First Issued: **2014-04-01** Date: **2019-10-30** Expiry Date: **2024-05-26** 

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Validity of this certificate is conditional on the quality system being maintained to the requirements of the Directive as demonstrated through the required surveillance activities of the Notified Body. This approval excludes all products designed and/or manufactured by a third party on behalf of the company named on this certificate, unless specifically agreed with BSI.





#### **Supplementary Information to CE 608280**

Issued To: BIOTRONIK AG

Ackerstrasse 6 8180 Bülach Switzerland

| Number    | Device Name   | Intended purpose per IFU |
|-----------|---|--------------------------|
| Class III |   |                          |
|           | Magmaris Sirolimus-Eluting Resorbable<br>Coronary Magnesium Scaffold System | See CE 608221            |
|           | PRO-Kinetic Energy Coronary Stent System                                    | See CE 608282            |
|           | Pantera LEO Fast-Exchange PTCA catheter                                     | See CE 608283            |
|           | Orsiro Sirolimus-Eluting Coronary Stent System                              | See CE 608284            |
|           | Pantera Lux Paclitaxel releasing PTCA Balloon<br>Catheter                   | See CE 608285            |
|           | PK Papyrus Covered Coronary Stent System                                    | See CE 608286            |
|           | Synsiro Sirolimus-Eluting Coronary Stent System                             | See CE 608289            |
|           | Passeo-18 Lux Paclitaxel releasing PTA Balloon<br>Catheter                  | See CE 610590            |
|           | Cruiser and Cruiser Hydro coronary and peripheral artery guidewires         | See CE 619676            |
|           | Pantera Pro Coronary Dilatation Catheter                                    | See CE 620197            |
|           | Orsiro Mission Sirolimus Eluting Coronary Stent<br>System                   | See CE 704680            |
|           | Synsiro Pro Sirolimus Eluting Coronary Stent<br>System                      | See CE 708283            |

First Issued: **2014-04-01** Date: **2019-10-30** Expiry Date: **2024-05-26** 

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Validity of this certificate is conditional on the quality system being maintained to the requirements of the Directive as demonstrated through the required surveillance activities of the Notified Body. This approval excludes all products designed and/or manufactured by a third party on behalf of the company named on this certificate, unless specifically agreed with BSI.

This certificate was issued electronically and is bound by the conditions of the contract.





#### **Supplementary Information to CE 608280**

Issued To: BIOTRONIK AG

Ackerstrasse 6 8180 Bülach Switzerland

| Number    | Device Name                              | Intended purpose per IFU  |
|-----------|--|---|
| Class IIb |  |   |
| 47932     | Self-expanding NiTi<br>peripheral stents | For use in patients with atherosclerotic disease of the iliac arteries and for the treatment of insufficient results after percutaneous transluminal angioplasty (PTA), e.g. residual stenosis and dissection.  |
|           |  | For use in patients with atherosclerotic disease of the femoral and infrapopliteal arteries and for the treatment of insufficient results after percutaneous transluminal angioplasty (PTA), e.g residual stenosis and dissection.                                  |
|           |  | For use in patients with atherosclerotic disease of the superficial femoral, proximal popliteal and infrapopliteal arteries and for the treatment of insufficient results after percutaneous transluminal angioplasty (PTA), e.g. residual stenosis and dissection. |

First Issued: **2014-04-01** Date: **2019-10-30** Expiry Date: **2024-05-26** 

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Validity of this certificate is conditional on the quality system being maintained to the requirements of the Directive as demonstrated through the required surveillance activities of the Notified Body. This approval excludes all products designed and/or manufactured by a third party on behalf of the company named on this certificate, unless specifically agreed with BSI.

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#### **Supplementary Information to CE 608280**

Issued To: BIOTRONIK AG

Ackerstrasse 6 8180 Bülach Switzerland

| Number    | <b>Device Name</b>   | Intended purpose per IFU   |
|-----------|--|--|
| Class IIb |  |  |
| 47932     | Balloon-expandable<br>Cobalt Chromium<br>peripheral stents | To improve sub-optimal angiographic results ( $\geq 50\%$ residual stenosis) and/or flow-limiting dissections after PTA of atherosclerotic lesions in the infrapopliteal arteries. |
| 44279     | Iliac artery stents  | For the treatment of de novo or restenotic atherosclerotic lesions in iliac arteries.  |
| 45852     | Renal artery stents  | For improving arterial luminal diameter in patients with clinical symptoms attributable to atherosclerotic stenosis of the renal arteries.   |
| Class IIa |  |  |
| MD 0106   | PTA balloon<br>catheters                                   |  |

First Issued: **2014-04-01** Date: **2019-10-30** Expiry Date: **2024-05-26** 

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Validity of this certificate is conditional on the quality system being maintained to the requirements of the Directive as demonstrated through the required surveillance activities of the Notified Body. This approval excludes all products designed and/or manufactured by a third party on behalf of the company named on this certificate, unless specifically agreed with BSI.

This certificate was issued electronically and is bound by the conditions of the contract.

### **EC-Declaration of Conformity**



DOC No. 11-02-01 Issue: 18

Manufacturer: Biotronik AG

Ackerstrasse 6 8180 Bülach Switzerland Authorised Representative: BIOTRONIK SE & Co. KG

Woermannkehre 1 12359 Berlin Germany

Product Category: Drug-eluting stents for vascular intervention

Product Name: Orsiro Sirolimus Eluting Coronary Stent System

Class: III, according to Council Directive 93/42/EEC, Annex IX, rule

8 and 13

Conformity Assessment Route: Council Directive 93/42/EEC, Annex II, Section 3 and 4

Scope: 54 different variants. See list on next pages

We hereby declare that the above-mentioned products meet the provisions of Council Directive 93/42/EEC for medical devices. All supporting documentation is retained under the premises of the manufacturer.

For these products the following EC-Design Examination Certificate has been issued:

Certificate Number: CE 608284

Notified Body: BSI Group The Netherlands B.V.

EEC No: 2797

Expiry date: 26.May.2024

To these products our approved Full Quality Assurance System according to Annex II of the Directive 93/42/EEC is applied. For this Quality Assurance System, the following certificate has been issued:

Certificate Number: CE 608280

Notified Body: BSI Group The Netherlands B.V.

EEC No: 2797

Expiry date: 26.MAY.2024

Date of first CE-marking: 25.FEB.2011

Place, Date of issue: Bülach, 21.MAY.2021

Signature:

Marcel Schäfer, Ph.D.

Senior Director Regulatory Affairs and Post Market Surveillance



### **Scope of DoC No.** 11-02-01

| Pos. Designation |                | Catalogue number (REF) | Stent diameter [mm] | Stent length<br>[mm] | Nominal Total<br>Drug Load TDL<br>[µg] |  |  |
|------------------|----------------|------------------------|---------------------|----------------------|--|--|--|
| 1                | Orsiro 2.25/9  | 364469                 | 2.25                | 9                    | 55                                     |  |  |
| 2                | Orsiro 2.5/9   | 364470                 | 2.5                 | 9                    | 55                                     |  |  |
| 3                | Orsiro 2.75/9  | 364471                 | 2.75                | 9                    | 55                                     |  |  |
| 4                | Orsiro 3.0/9   | 364472                 | 3.0                 | 9                    | 55                                     |  |  |
| 5                | Orsiro 3.5/9   | 364473                 | 3.5                 | 9                    | 70                                     |  |  |
| 6                | Orsiro 4.0/9   | 364474                 | 4.0                 | 9                    | 70                                     |  |  |
| 7                | Orsiro 2.25/13 | 364475                 | 2.25                | 13                   | 80                                     |  |  |
| 8                | Orsiro 2.5/13  | 364476                 | 2.5                 | 13                   | 80                                     |  |  |
| 9                | Orsiro 2.75/13 | 364477                 | 2.75                | 13                   | 80                                     |  |  |
| 10               | Orsiro 3.0/13  | 364478                 | 3.0                 | 13                   | 80                                     |  |  |
| 11               | Orsiro 3.5/13  | 364479                 | 3.5                 | 13                   | 95                                     |  |  |
| 12               | Orsiro 4.0/13  | 364480                 | 4.0                 | 13                   | 95                                     |  |  |
| 13               | Orsiro 2.25/15 | 364481                 | 2.25                | 15                   | 93                                     |  |  |
| 14               | Orsiro 2.5/15  | 364482                 | 2.5                 | 15                   | 93                                     |  |  |
| 15               | Orsiro 2.75/15 | 364483                 | 2.75                | 15                   | 93                                     |  |  |
| 16               | Orsiro 3.0/15  | 364484                 | 3.0                 | 15                   | 93                                     |  |  |
| 17               | Orsiro 3.5/15  | 364485                 | 3.5                 | 15                   | 113                                    |  |  |
| 18               | Orsiro 4.0/15  | 364486                 | 4.0                 | 15                   | 113                                    |  |  |
| 19               | Orsiro 2.25/18 | 364487                 | 2.25                | 18                   | 109                                    |  |  |
| 20               | Orsiro 2.5/18  | 364488                 | 2.5                 | 18                   | 109                                    |  |  |
| 21               | Orsiro 2.75/18 | 364489                 | 2.75                | 18                   | 109                                    |  |  |
| 22               | Orsiro 3.0/18  | 364490                 | 3.0                 | 18                   | 109                                    |  |  |
| 23               | Orsiro 3.5/18  | 364491                 | 3.5                 | 18                   | 131                                    |  |  |
| 24               | Orsiro 4.0/18  | 364492                 | 4.0                 | 18                   | 131                                    |  |  |
| 25               | Orsiro 2.25/22 | 364499                 | 2.25                | 22                   | 134                                    |  |  |
| 26               | Orsiro 2.5/22  | 364500                 | 2.5                 | 22                   | 134                                    |  |  |
| 27               | Orsiro 2.75/22 | 364501                 | 2.75                | 22                   | 134                                    |  |  |
| 28               | Orsiro 3.0/22  | 364502                 | 3.0                 | 22                   | 134                                    |  |  |
| 29               | Orsiro 3.5/22  | 364503                 | 3.5                 | 22                   | 162                                    |  |  |
| 30               | Orsiro 4.0/22  | 364504                 | 4.0                 | 22                   | 162                                    |  |  |
| 31               | Orsiro 2.25/26 | 364505                 | 2.25                | 26                   | 159                                    |  |  |
| 32               | Orsiro 2.5/26  | 364506                 | 2.5                 | 26                   | 159                                    |  |  |
| 33               | Orsiro 2.75/26 | 364507                 | 2.75                | 26                   | 159                                    |  |  |
| 34               | Orsiro 3.0/26  | 364508                 | 3.0                 | 26                   | 159                                    |  |  |
| 35               | Orsiro 3.5/26  | 364509                 | 3.5                 | 26                   | 193                                    |  |  |
| 36               | Orsiro 4.0/26  | 364510                 | 4.0                 | 26                   | 193                                    |  |  |
| 37               | Orsiro 2.25/30 | 364511                 | 2.25                | 30                   | 184                                    |  |  |
| 38               | Orsiro 2.5/30  | 364512                 | 2.5                 | 30                   | 184                                    |  |  |
| 39               | Orsiro 2.75/30 | 364513                 | 2.75                | 30                   | 184                                    |  |  |
| 40               | Orsiro 3.0/30  | 364514                 | 3.0                 | 30                   | 184                                    |  |  |
| 41               | Orsiro 3.5/30  | 364515                 | 3.5                 | 30                   | 224                                    |  |  |
| 42               | Orsiro 4.0/30  | 364516                 | 4.0                 | 30                   | 224                                    |  |  |
| 43               | Orsiro 2.25/35 | 391234                 | 2.25                | 35                   | 213                                    |  |  |



| 44 | Orsiro 2.5/35  | 391235 | 2.5  | 35 | 213 |
|----|----------------|--------|------|----|-----|
| 45 | Orsiro 2.75/35 | 391236 | 2.75 | 35 | 213 |
| 46 | Orsiro 3.0/35  | 391237 | 3.0  | 35 | 213 |
| 47 | Orsiro 3.5/35  | 391018 | 3.5  | 35 | 261 |
| 48 | Orsiro 4.0/35  | 391019 | 4.0  | 35 | 261 |
| 49 | Orsiro 2.25/40 | 391238 | 2.25 | 40 | 247 |
| 50 | Orsiro 2.5/40  | 391239 | 2.5  | 40 | 247 |
| 51 | Orsiro 2.75/40 | 391240 | 2.75 | 40 | 247 |
| 52 | Orsiro 3.0/40  | 391241 | 3.0  | 40 | 247 |
| 53 | Orsiro 3.5/40  | 391020 | 3.5  | 40 | 298 |
| 54 | Orsiro 4.0/40  | 391021 | 4.0  | 40 | 298 |

### **Change History**

Check version index is up to date prior to use.

| Version of SAP<br>Document | Main changes from previous release to current release   |
|----------------------------|---|
| 01                         | Transfer from previous template to new template TMP 111387. New issue due to transfer of Notified Body to BSI Group The Netherlands B.V.  |
| 02                         | New issue due to sterilizer addition  |
| 03                         | Revised for the introduction of the electronic IFU in compliance with regulation 207/2012.  |
| 04                         | Declaration of Conformity updated with the new expiry date of the EC Full Quality Assurance System Certificate  |
| 05                         | Implementation of the recertification   |
| 06                         | New issue due to changes affecting Sirolimus at supplier Biocon Limited (heavy metals in specification; test methods for particle size and residual solvent; and re-test period). |
| 07                         | Designation of Authorised (EU) Representative. Addition of name and address.  |



### **EC-Declaration of Conformity**



DOC No. 13-06-02 Issue: 11

Manufacturer: Biotronik AG

Ackerstrasse 6

8180 Bülach

Switzerland

Authorised Representative: BIOTRONIK SE & Co. KG

Woermannkehre 1

12359 Berlin Germany

**Product Category:** 

Coronary stent system

Product Name:

PK Papyrus Covered Coronary Stent System

Class:

III, according to Council Directive 93/42/EEC, Annex IX, rule 8

Conformity Assessment Route:

Council Directive 93/42/EEC, Annex II, Section 3 and 4

Scope:

17 different variants. See list on next page

We hereby declare that the above-mentioned products meet the provisions of Council Directive 93/42/EEC for medical devices. All supporting documentation is retained under the premises of the manufacturer.

For these products the following EC-Design Examination Certificate has been issued:

Certificate Number:

CE 608286

Notified Body:

BSI Group The Netherlands B.V.

EEC No:

2797

Expiry date:

10.Jun.2023

To these products our approved Full Quality Assurance System according to Annex II of the Directive 93/42/EEC is applied. For this Quality Assurance System the following certificate has been issued:

Certificate Number:

CE 608280

Notified Body:

BSI Group The Netherlands B.V.

EEC No:

2797

Expiry date:

26.May.2024

Date of first CE-marking:

12.Jun.2013

Place, Date of issue:

Bülach, 21.MAY.201

Signature:

Marcel Schäfer, Ph.D.

Senior Director Regulatory Affairs and Post Market Surveillance

A11 REG 146249 EN 06



### **Scope of DoC No.** 13-06-02

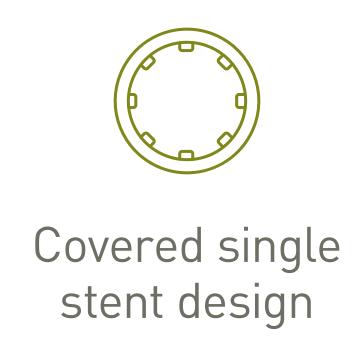
| Pos. | Designation       | Catalogue number (REF) | Stent diameter [mm] | Stent length [mm] |
|------|-------------------|------------------------|---------------------|-------------------|
| 1    | PK Papyrus 2.5/15 | 369380                 | 2.5                 | 15                |
| 2    | PK Papyrus 3.0/15 | 369381                 | 3.0                 | 15                |
| 3    | PK Papyrus 3.5/15 | 369382                 | 3.5                 | 15                |
| 4    | PK Papyrus 4.0/15 | 369383                 | 4.0                 | 15                |
| 5    | PK Papyrus 4.5/15 | 369384                 | 4.5                 | 15                |
| 6    | PK Papyrus 5.0/15 | 369385                 | 5.0                 | 15                |
| 7    | PK Papyrus 2.5/20 | 369386                 | 2.5                 | 20                |
| 8    | PK Papyrus 3.0/20 | 369387                 | 3.0                 | 20                |
| 9    | PK Papyrus 3.5/20 | 369388                 | 3.5                 | 20                |
| 10   | PK Papyrus 4.0/20 | 369389                 | 4.0                 | 20                |
| 11   | PK Papyrus 4.5/20 | 369390                 | 4.5                 | 20                |
| 12   | PK Papyrus 5.0/20 | 369391                 | 5.0                 | 20                |
| 13   | PK Papyrus 3.0/26 | 381789                 | 3.0                 | 26                |
| 14   | PK Papyrus 3.5/26 | 381790                 | 3.5                 | 26                |
| 15   | PK Papyrus 4.0/26 | 381791                 | 4.0                 | 26                |
| 16   | PK Papyrus 4.5/26 | 369392                 | 4.5                 | 26                |
| 17   | PK Papyrus 5.0/26 | 369393                 | 5.0                 | 26                |

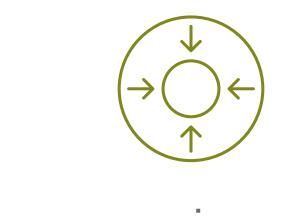


### **Change History**

Check version index is up to date prior to use.

| Version of SAP<br>Document | Main changes from previous release to current release   |
|----------------------------|---|
| 01                         | New Document using current template. Replaces "PK Papyrus 130602 Issue 5".                                      |
| 02                         | Declaration of Conformity updated with the new expiry date of the EC Design Examination Certificate.            |
| 03                         | New issue due to transfer of Notified Body to BSI Group The Netherlands B.V.                                    |
| 04                         | New issue due to sterilizer addition.   |
| 05                         | Declaration of Conformity updated with the new expiry date of the EC Full Quality Assurance System Certificate. |
| 06                         | Designation of Authorised (EU) Representative. Addition of name and address.                                    |





Low crossing profile



Exceptional deliverability



Vascular Intervention // Coronary Covered Coronary Stent System





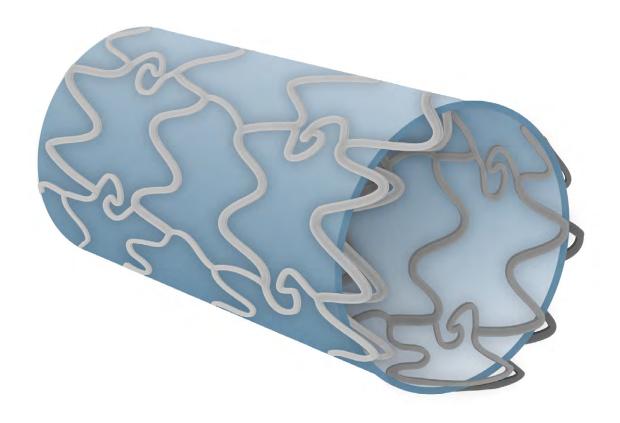


# PK Papyrus

Designed to save lives when seconds count.

# Covered single stent design

With its covered single stent design, PK Papyrus achieves greater bending flexibility and a smaller crossing profile compared to the traditional sandwich design stent, allowing you to seal perforations with confidence.



Traditional sandwich design stent

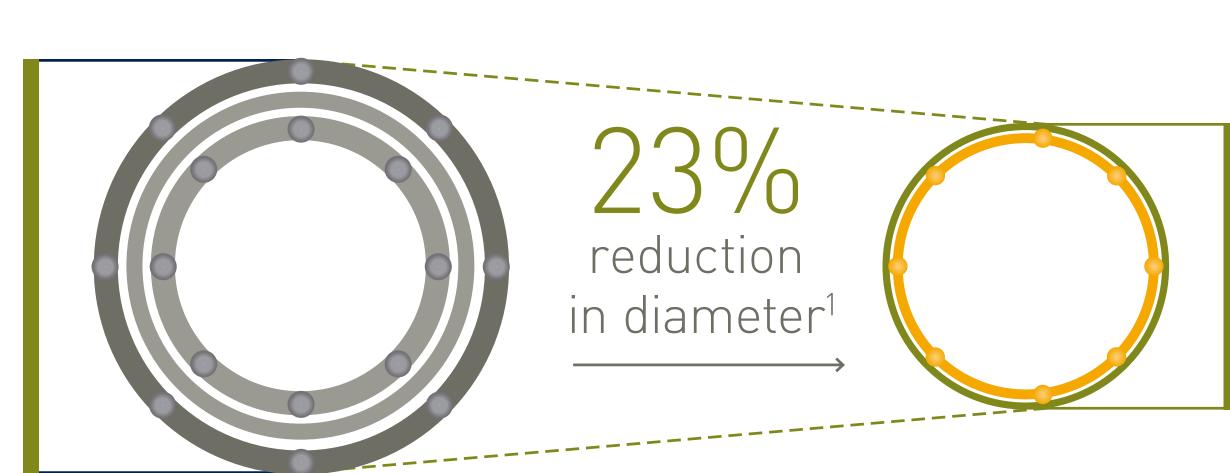


PK Papyrus
Covered single stent design

# Low crossing profile<sup>1</sup>

Crossing profile

1.63 mm



Traditional sandwich design stent

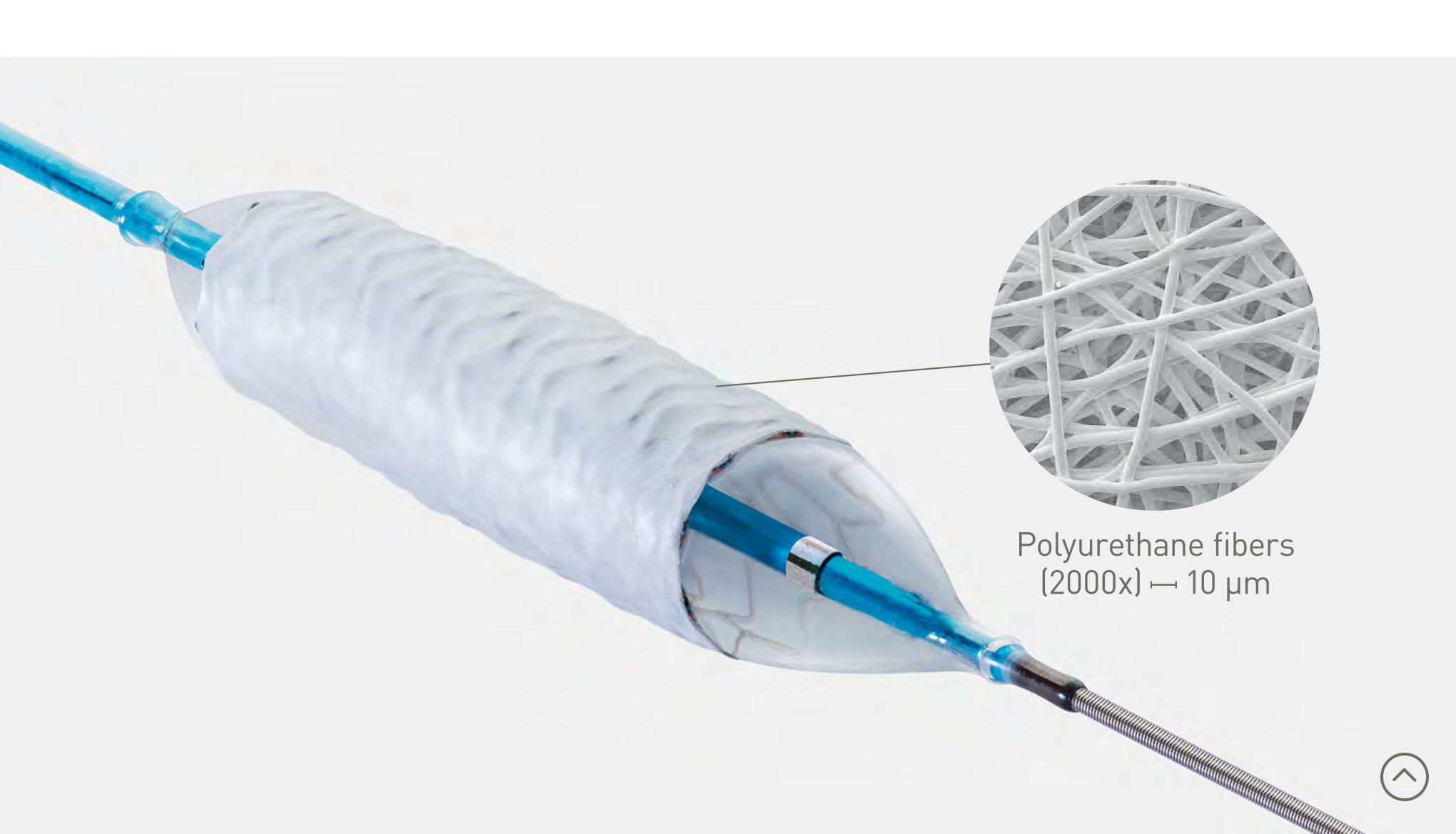
PK Papyrus 3.0/15

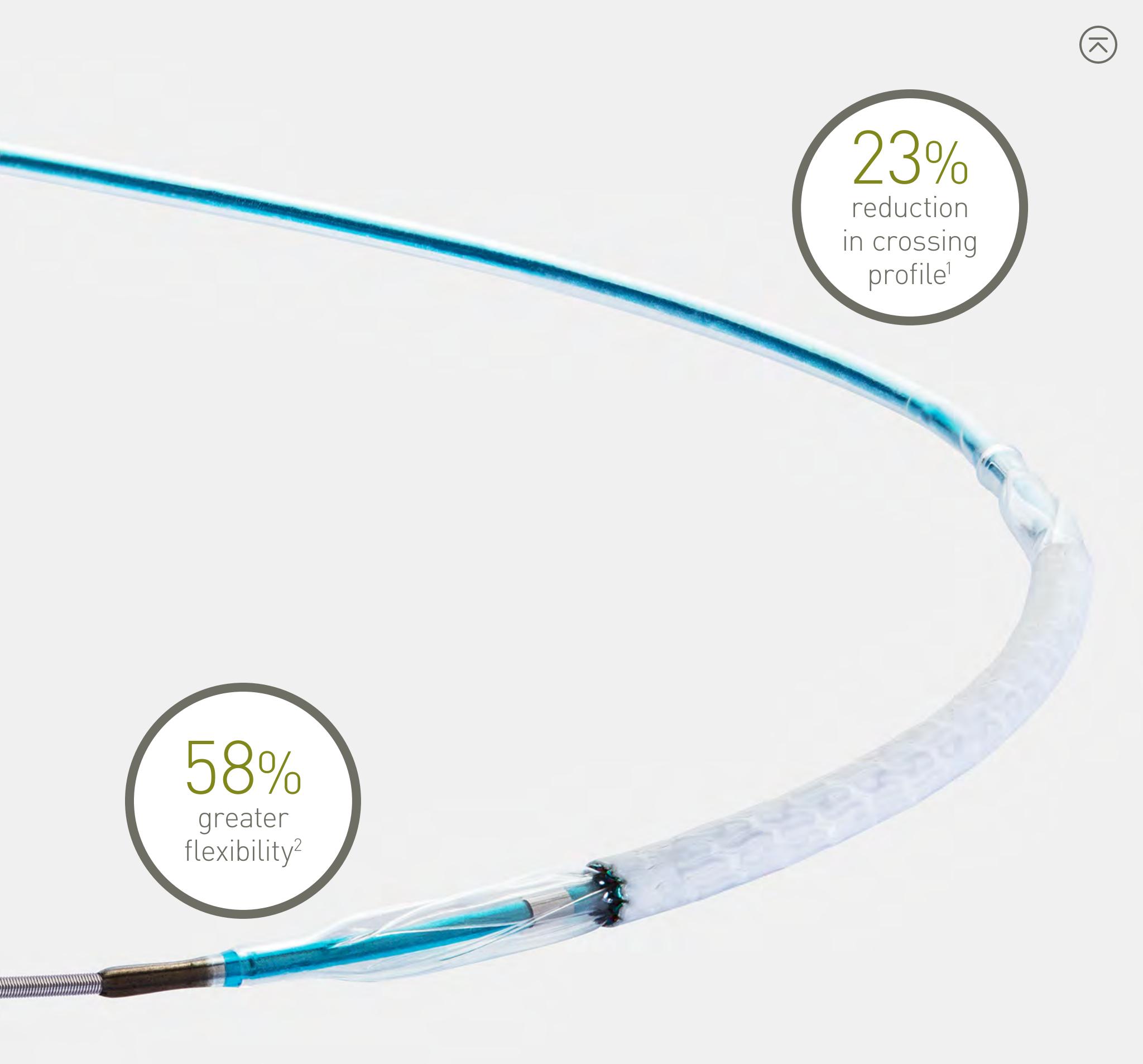
1.25 mm

Illustration depicts crimped devices prior to inflation

## Innovative polyurethane membrane

Electrostatic forces spin polyurethane fibers onto the stent surface, creating a thin and highly elastic membrane.

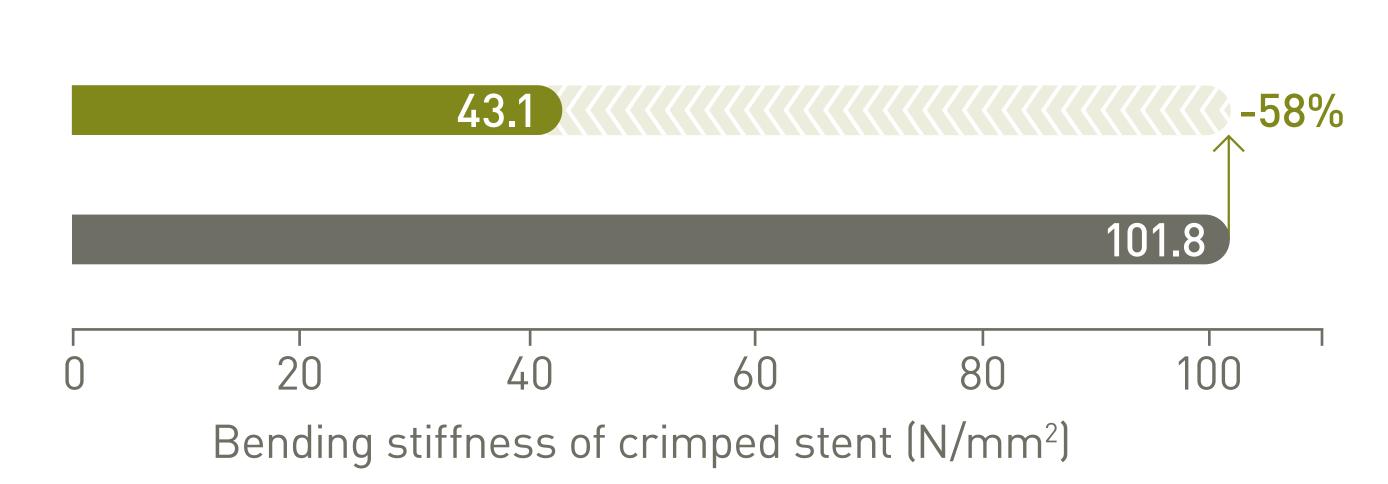




# Exceptional deliverability

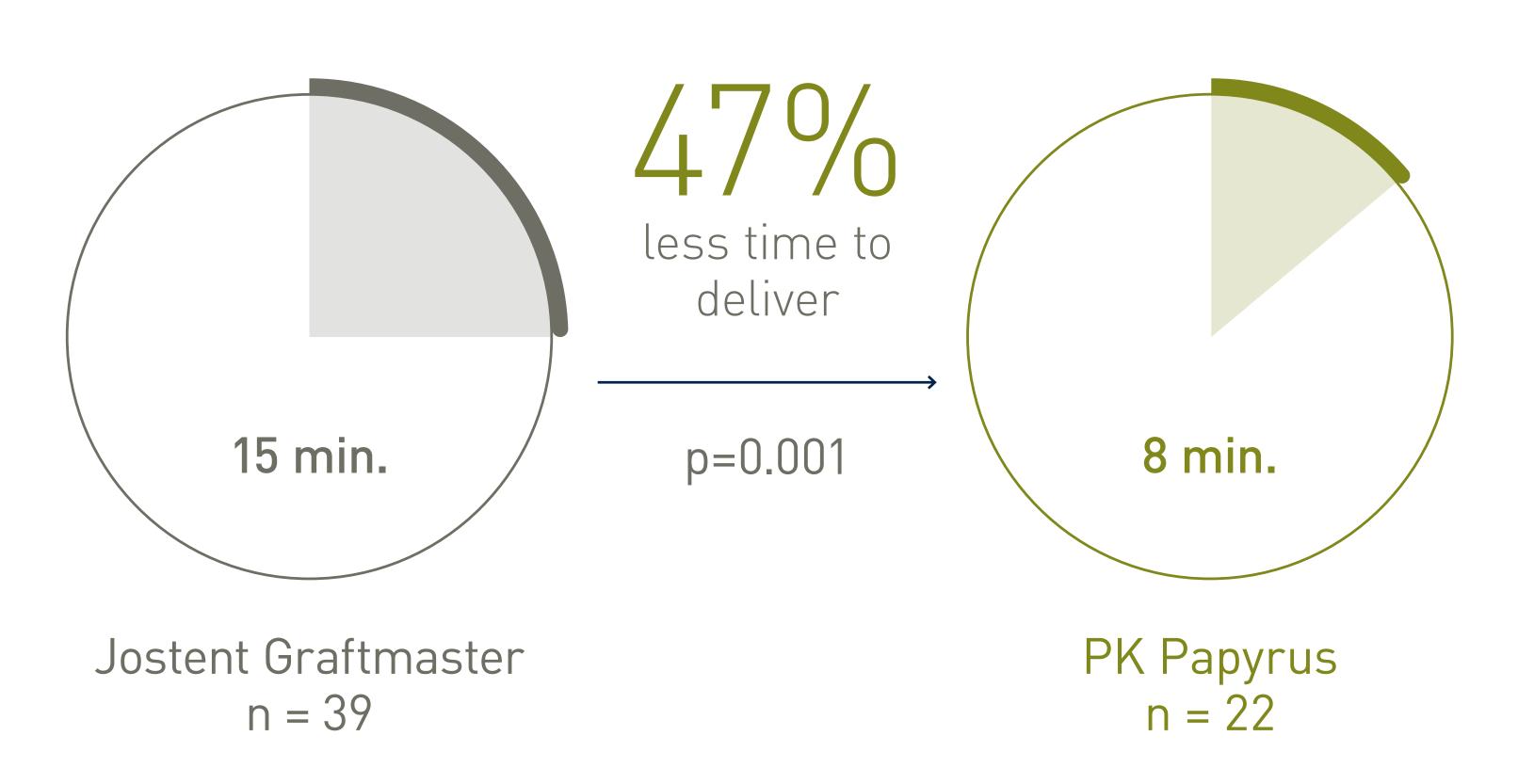
# 58% greater flexibility<sup>2</sup>





## Shorter median time to deliver

Single center, retrospective investigation of 61 patients treated with covered coronary stents.<sup>3, 4</sup>



"In rare cases of a coronary perforation, time is the enemy."

Dr. Dean Kereiakes, Interventional Cardiologist and Medical Director of The Christ Hospital and Vascular Center, Cincinnati, Ohio, USA.

# 5F Compatibility

5F

For main sizes - no need for guide catheter upgrade (ø 2.5-4.0 mm).



### $\bigcirc$

# PK Papyrus

# Indicated for acute coronary artery perforations.\*

5.0

Vascular Intervention Coronary



| Technical Data       |    | Stent               |                                     |           |  |  |  |  |  |
|----------------------|----|---------------------|-------------------------------------|-----------|--|--|--|--|--|
|                      |    | Stent cove          | r material                          |           | Non-woven, electrospun polyurethane  |  |  |  |  |
|                      |    | Stent cove          | r thickness                         |           | 90 μm  |  |  |  |  |
|                      |    | Stent strut         | thickness                           |           | ø 2.5 - 3.0 mm: 60 μm (0.0024");<br>ø 3.5 - 4.0 mm: 80 μm (0.0031");<br>ø 4.5 - 5.0 mm: 120 μm (0.0047") |  |  |  |  |
|                      |    | Stent mate          | erial                               |           | Cobalt chromium (L-605) with <b>proBIO</b> (Amorphous Silicon Carbide) coating                           |  |  |  |  |
|                      |    | Maximum<br>diameter | stent expansi                       | on        | ø 2.5 - 3.0 mm: 3.50 mm;<br>ø 3.5 - 4.0 mm: 4.65 mm;<br>ø 4.5 - 5.0 mm: 5.63 mm                          |  |  |  |  |
|                      |    | Delivery sy         | /stem                               |           |  |  |  |  |  |
|                      |    | Guide wire          | diameter                            |           | 0.014"   |  |  |  |  |
|                      |    | Usable cat          | heter length                        |           | 140 cm   |  |  |  |  |
|                      |    | Recomme             | nded guide ca                       | theter    | ø 2.5 - 4.0 mm: 5F (min. I.D.** 0.056");<br>ø 4.5 - 5.0 mm: 6F (min. I.D.** 0.070")                      |  |  |  |  |
|                      |    | Nominal p           | ressure (NP)                        |           | ø 2.5 - 3.5 mm: 8 atm; ø 4.0 - 5.0 mm: 7 atm   |  |  |  |  |
|                      |    | Rated burs          | st pressure (R                      | BP)       | ø 2.5 - 4.0 mm: 16 atm; ø 4.5 - 5.0 mm: 14 atm   |  |  |  |  |
|                      |    |                     |                                     |           | **I.D. = Inner Diamete   |  |  |  |  |
| Ordering Information |    | Stent<br>ø (mm)     | <b>Catheter l</b> e<br>Stent length |           |  |  |  |  |  |
|                      |    |                     | 15                                  | 20        | 26   |  |  |  |  |
|                      |    | 2.5                 | 369380                              | 36938     | 386 -  |  |  |  |  |
|                      |    | 3.0                 | 369381                              | 36938     | 387 381789   |  |  |  |  |
|                      | 5F | 3.5                 | 369382                              | 36938     | 381790   |  |  |  |  |
|                      |    | 4.0                 | 369383                              | 36938     | 389 381791   |  |  |  |  |
|                      |    | 4.5                 | 369384                              | 36939     | 369392   |  |  |  |  |
|                      | 6F |                     | 0/0005                              | 0 / 0 0 / | 204 070000   |  |  |  |  |

1. Compared to Graftmaster 2.8/16 (BIOTRONIK data on file); 2. Compared to Jostent Graftmaster 3.0/16 (BIOTRONIK data on file); 3. Hernández-Enríquez M, Lairez O, Campelo-Parada F, et al. Outcomes after use of covered stents to treat coronary artery perforations. Comparison of old and new-generation covered stents. J Interv Cardiol. 2018;1–7. doi: 10.1111/joic.12525; 4. Population is representative of real world interventional practice and was not a randomized prospective clinical trial.

369391

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369385

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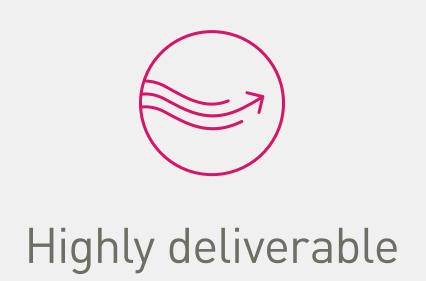
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<sup>\*</sup>Indication as per IFU.





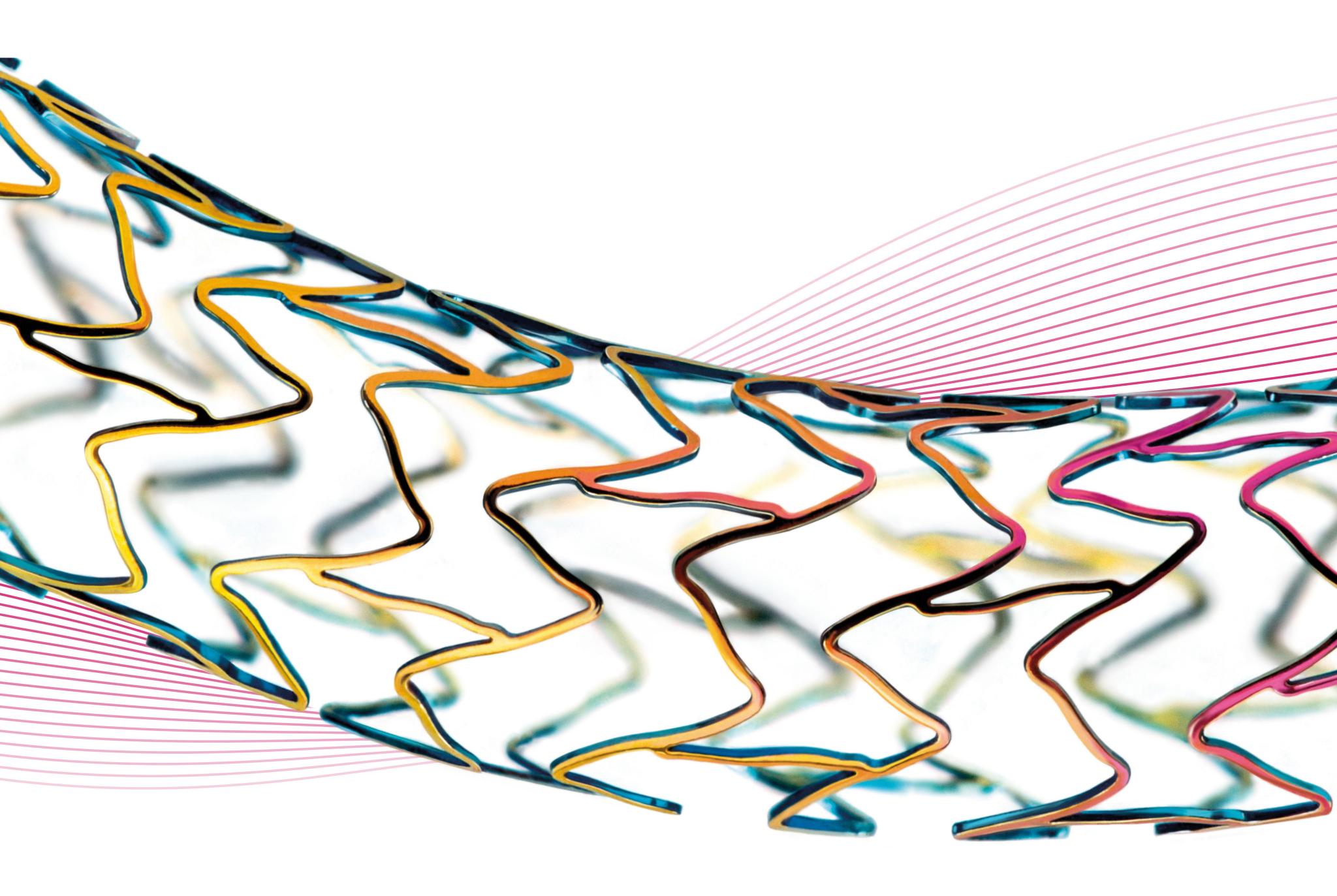




Vascular Intervention // Coronary
Drug-Eluting Stent System



# Orsiro®





## Orsiro

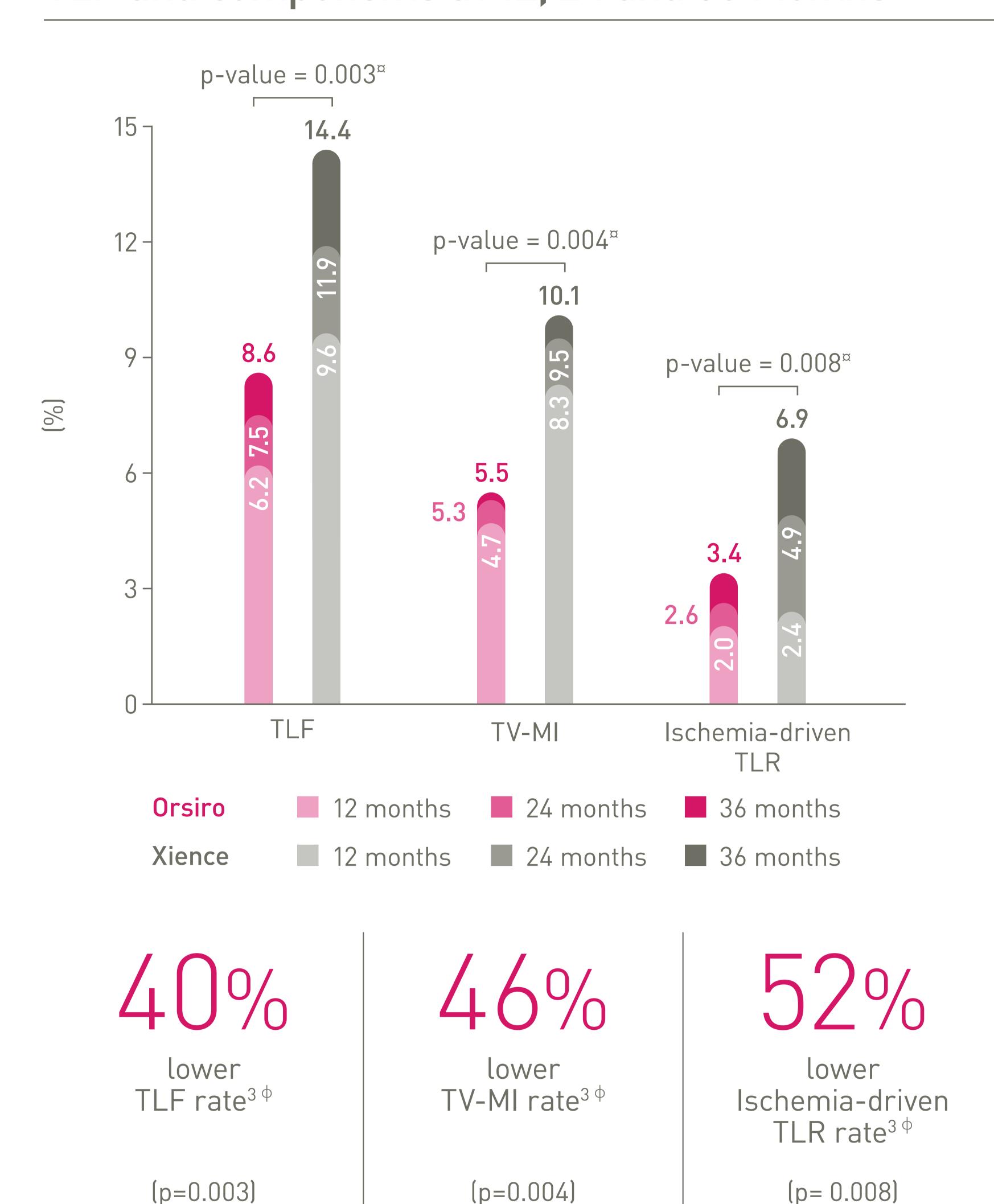
# Ultrathin struts§. Outstanding patient outcomes.

# Outstanding patient outcomes

## Improving patient outcomes, year after year\* BIOFLOW-V (n = 1,334) the FDA pivotal trial

Significant differences in TLF observed at year 1 and 2 were maintained and further increased at year 3 (8.6% vs. 14.4%, p = 0.003), driven by significant differences in TV-MI (5.5% vs. 10.1%, p = 0.004) and Ischemiadriven TLR (3.4% vs. 6.9%, p = 0.008) that favor Orsiro over Xience.  $^{1,2,3}$ 

## TLF and components at 12, 24 and 36 Months



TLF - Target Lesion Failure; TV-MI - Target Vessel Myocardial Infarction; TLR - Target Lesion Revascularization.

§As characterized with respect to strut thickness in Bangalore et al. Meta-analysis. Based on investigator's interpretation of BIOFLOW-V primary endpoint results.

\*Compared to Xience, based on three consecutive years. p-values for 36-m frequentist analysis.

# Superiority in STEMI<sup>4</sup>

### BIOSTEMI (n=1,300) is the first RCT demonstrating superiority between two contemporary DES Orsiro is superior to Xience in STEMI patients undergoing primary PCI with

respect to Target Lesion Failure (TLF) rate at 12 months.

Orsiro Rate Ratio (95% BCI\*\*): 0.59, (0.37-0.94),

Xience

Lower risk\* of TLF with Orsiro in STEMI

Bayesian ITT Population<sup>x</sup>

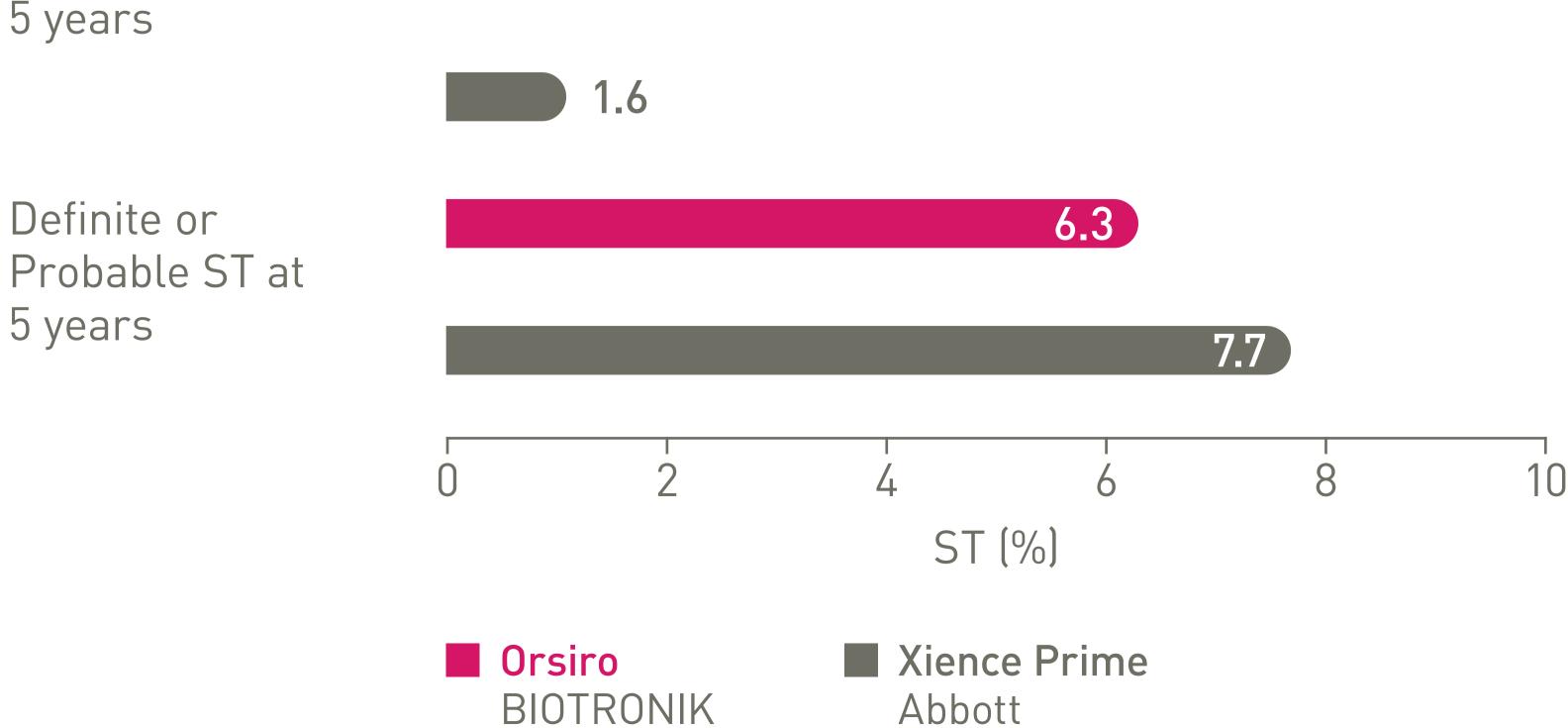
Posterior Probability of Superiority: 98.6%

# In the randomized, all-comers BIOSCIENCE trial (n= 2,119)<sup>5</sup>

Long-term safety

Orsiro shows numerically equal or lower Stent Thrombosis (ST) in

complex patients in comparison to Xience. Definite ST at 1.6



<sup>&</sup>lt;sup>\phi</sup>vs. Xience, based on 36-m frequentist analysis.

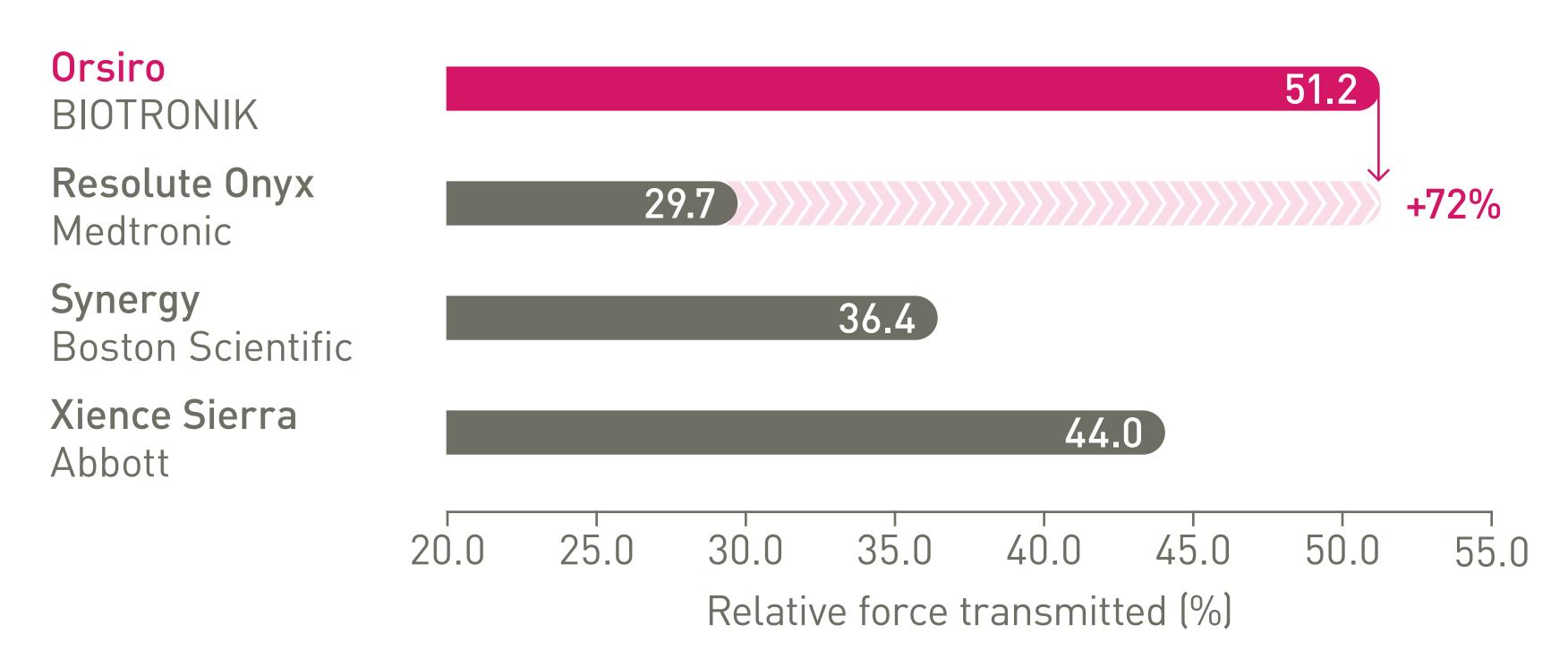
<sup>\*</sup>Compared to Xience, BIOTRONIK data on file based on the Rate Ratio of 0.59.

<sup>\*\*</sup>BCI: Bayesian Credibility Interval. "n= 1,300 newly enrolled STEMI patients including 407 patients from the BIOSCIENCE STEMI subgroup used as prior information.

## Highly deliverable

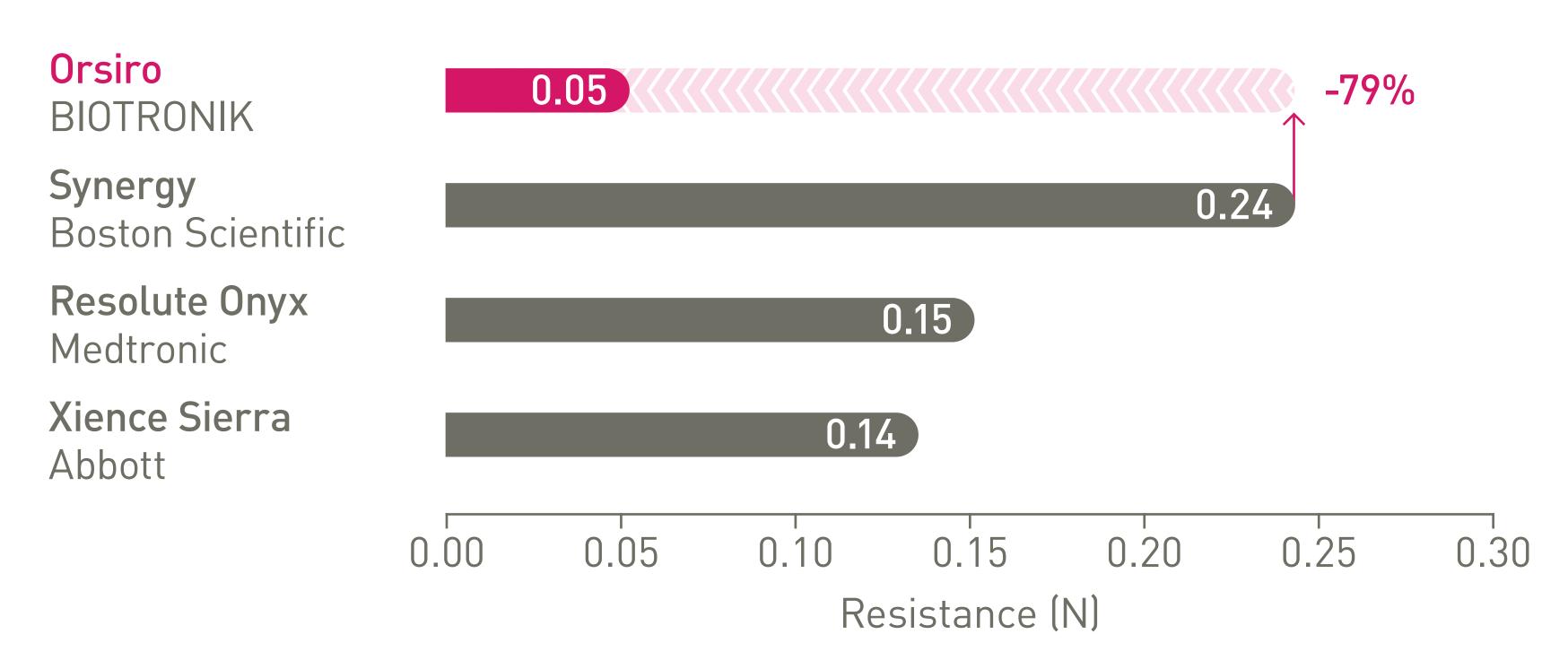
## Better push

Transmits up to 72% more force from hub to tip.13



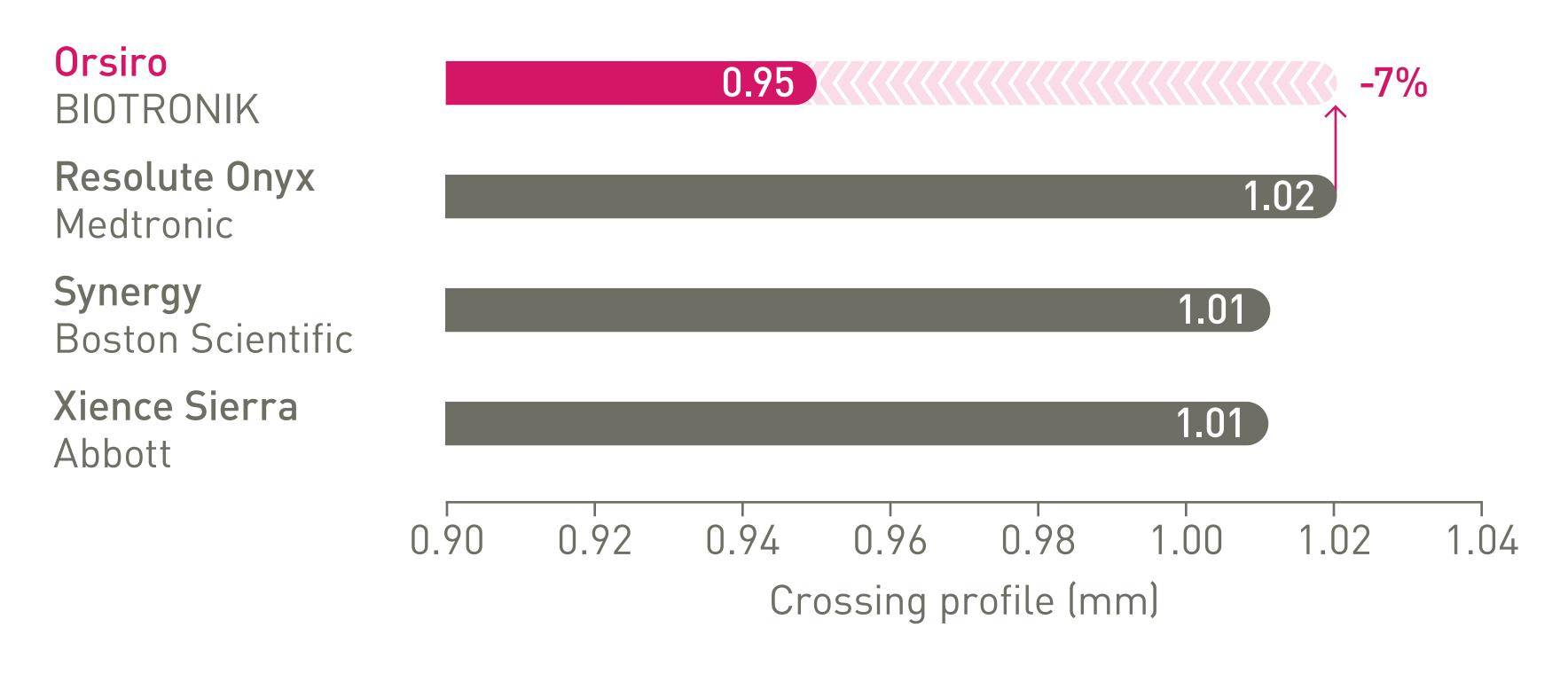
### Easier cross

Up to 79% less force needed to successfully cross demanding anatomies.<sup>13</sup>



## Lower crossing profile

Improved acute performance – up to 7% lower crossing profile.<sup>13</sup>





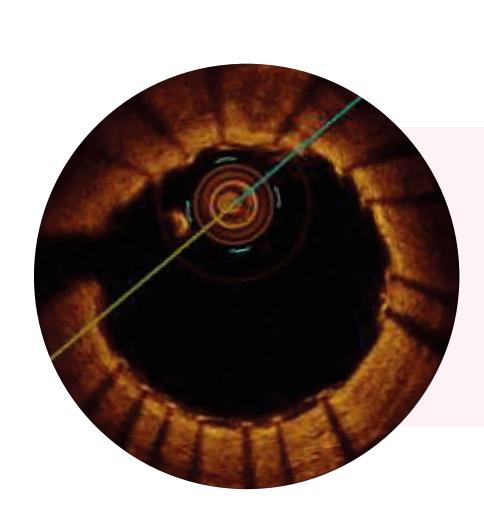


# Ultrathin 60 µm struts

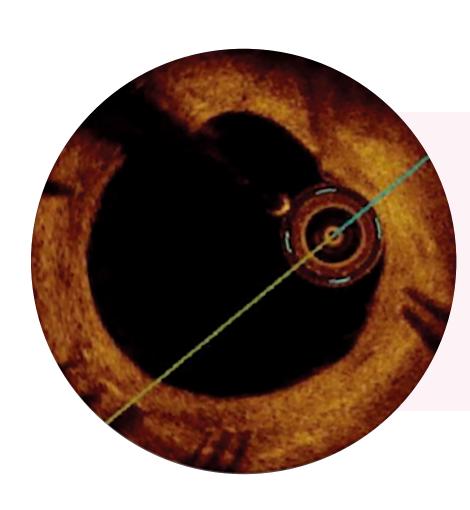
# Improved outcomes start in the early phase



48 hours
Thinner struts mean less vessel injury<sup>6</sup>



**30 days**<sup>∆</sup> 80.4% strut coverage<sup>7</sup>



90 days<sup>∆</sup> 98.7% strut coverage<sup>7</sup>

## Thinner struts make the difference

Ultrathin vs. second generation DES in a large scale meta-analysis including more than 11,000 patients<sup>8,9</sup>

160/0

Relative risk reduction in TLF at 12 months RR (95% CI) 0.84 (0.72, 0.99)

‡ Driven by peri-procedural MI events (<48 hours). In-hospital rate may include events > 48 hours.

Δ Images: Secco G et al. Time-related changes in neointimal tissue coverage following a new generation SES implantation: an OCT observational study. Presented at: euro PCR, May 20, 2014; Paris, France.

Strut thickness in perspective<sup>10</sup>

Orsiro
BIOTRONIK
CoCr-SES

60 μm\*

Synergy
Boston Scientific
PtCr-EES

74 µm

Ultimaster
Terumo
CoCr-SES

80 ur

80 µm

Resolute Onyx<sup>11,12</sup>
Medtronic
CoNi-ZES

81 µm

Xience Family
Abbott
CoCr-EES

81 un

81 µm

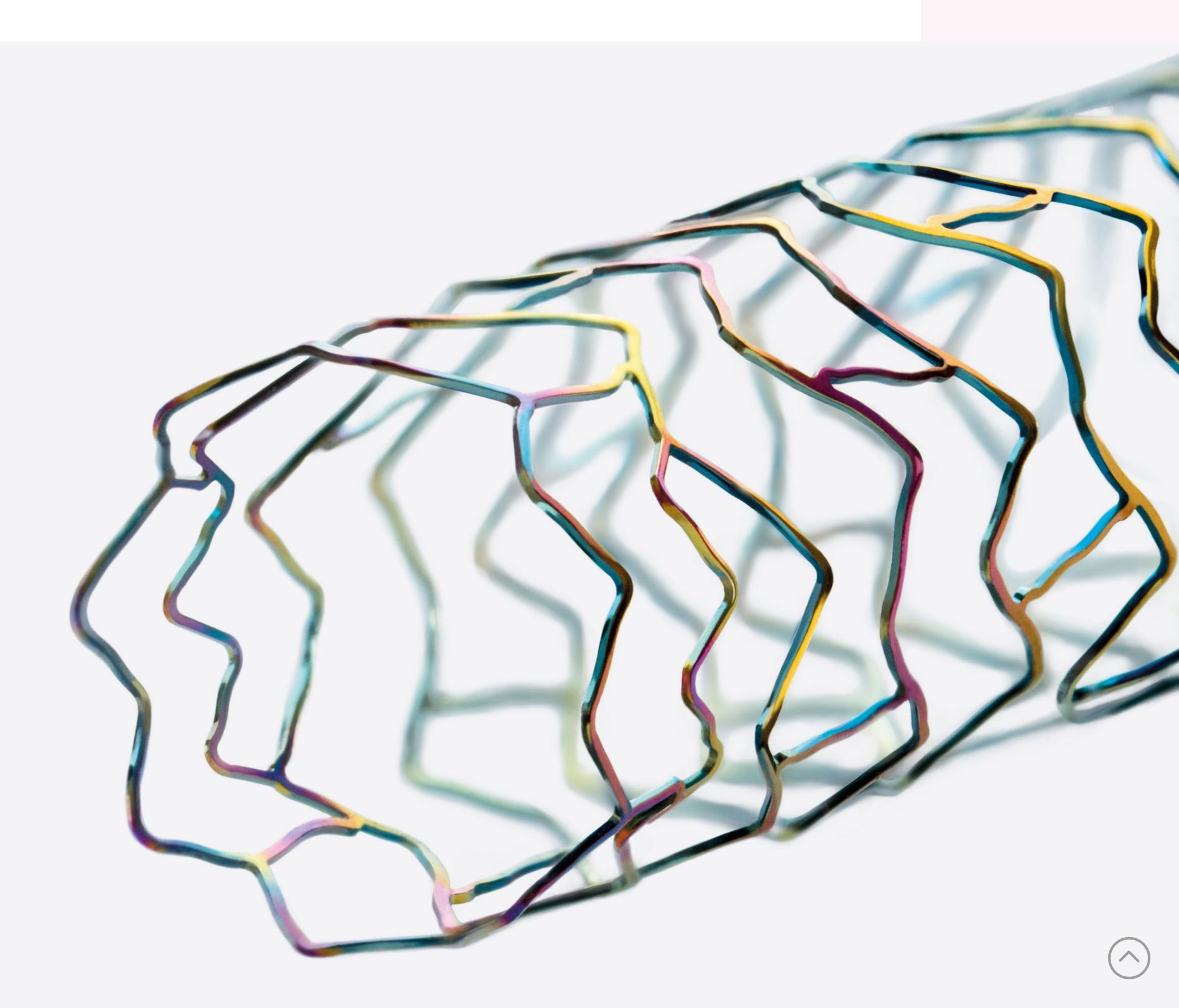
Promus
Boston Scientific
PtCr-EES

81 µm

BioMatrix Biosensors 316L-BES

120 µm

\* ø 2.25 – 3.0 mm





## Orsiro®

atm\*\*

ø (mm)

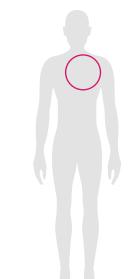
16

2.50

Rated Burst

Pressure (RBP)

### Vascular Intervention Coronary



### Indicated for discrete de novo stenotic lesions and in-stent restenotic lesions.\*

| Technical Data          |                            | Stent            |                 |                                    |   |               |               |  |  |  |
|-------------------------|----------------------------|------------------|-----------------|------------------------------------|---|---------------|---------------|--|--|--|
|                         |                            | Stent material   |                 | Cobalt chr                         | omium, L-605  |               |               |  |  |  |
|                         |                            | Passive coatin   | g               | proBIO (Amorphous Silicon Carbide) |   |               |               |  |  |  |
|                         |                            | Active coating   |                 |                                    | <b>BIOlute</b> bioabsorbable Poly-L-Lactide (PLLA) eluting a limus drug |               |               |  |  |  |
|                         |                            | Drug dose        |                 | 1.4 µg/mr                          | $n^2$   |               |               |  |  |  |
|                         |                            | Strut thickness  | S               |                                    | ø 2.25 - 3.0 mm: 60 μm (0.0024");<br>ø 3.50 - 4.0 mm: 80 μm (0.0031")   |               |               |  |  |  |
|                         |                            | Delivery syste   | em              |                                    |   |               |               |  |  |  |
|                         |                            | Catheter type    |                 | Rapid exch                         | nange   |               |               |  |  |  |
|                         | Recommended guide catheter |                  |                 |                                    | D. 0.056")  |               |               |  |  |  |
|                         |                            | Lesion entry p   | rofile          | 0.017"                             | 0.017"  |               |               |  |  |  |
|                         |                            | Guide wire dia   | meter           | 0.014"                             | 0.014"  |               |               |  |  |  |
|                         |                            | Usable cathete   | er length       | 140 cm                             | 140 cm  |               |               |  |  |  |
|                         |                            | Balloon mater    | ial             | Semi crys                          | Semi crystalline polymer material                                       |               |               |  |  |  |
|                         |                            | Coating (distal  | shaft)          | Hydrophili                         | Hydrophilic coating   |               |               |  |  |  |
|                         |                            | Marker bands     |                 | Two swage                          | Two swaged platinum-iridium markers                                     |               |               |  |  |  |
|                         |                            | Proximal shaft   | diameter        | 2.0F                               |   |               |               |  |  |  |
|                         |                            | Distal shaft dia | ameter          | 2.6F: ø 2.2                        | 2.6F: ø 2.25 - 3.5 mm; 2.8F: ø 4.0 mm                                   |               |               |  |  |  |
|                         |                            | Nominal press    | sure (NP)       | 8 atm                              | 8 atm   |               |               |  |  |  |
|                         |                            | Rated burst pr   | essure (RBP)    | 16 atm                             |   |               |               |  |  |  |
|                         |                            |                  |                 |                                    |   |               |               |  |  |  |
| <b>Compliance Chart</b> |                            | Balloon diame    | ter x length (m | m)                                 |   |               |               |  |  |  |
|                         |                            | ø 2.25 x 9-40    | ø 2.50 × 9-40   | ø 2.75 × 9-40                      | ø 3.00 × 9-40   | ø 3.50 × 9-40 | ø 4.00 × 9-40 |  |  |  |
| Nominal Pressure        | atm**                      | 8                | 8               | 8                                  | 8   | 8             | 8             |  |  |  |
| (NP)                    | ø (mm)                     | 2.25             | 2.50            | 2.75                               | 3.00  | 3.50          | 4.00          |  |  |  |

\*\*1 atm = 1.013 bar

16

4.44

16

3.88

| Ordering Information | Stent<br>ø (mm) | Catheter length 140 cm<br>Stent length (mm) |        |        |        |        |        |        |        |        |
|----------------------|-----------------|---|--------|--------|--------|--------|--------|--------|--------|--------|
|                      |                 | 9   | 13     | 15     | 18     | 22     | 26     | 30     | 35     | 40     |
|                      | 2.25            | 364469                                      | 364475 | 364481 | 364487 | 364499 | 364505 | 364511 | 391234 | 391238 |
|                      | 2.50            | 364470                                      | 364476 | 364482 | 364488 | 364500 | 364506 | 364512 | 391235 | 391239 |
|                      | 2.75            | 364471                                      | 364477 | 364483 | 364489 | 364501 | 364507 | 364513 | 391236 | 391240 |
|                      | 3.00            | 364472                                      | 364478 | 364484 | 364490 | 364502 | 364508 | 364514 | 391237 | 391241 |
|                      | 3.50            | 364473                                      | 364479 | 364485 | 364491 | 364503 | 364509 | 364515 | 391018 | 391020 |
|                      | 4.00            | 364474                                      | 364480 | 364486 | 364492 | 364504 | 364510 | 364516 | 391019 | 391021 |

16

3.05

16

3.33

16

2.77

1. Kandzari D et al. Ultrathin, bioresorbable polymer sirolimus-eluting stents versus thin, durable polymer everolimuseluting stents in patients undergoing coronary revascularisation (BIOFLOW V): a randomised trial. Lancet. 2017 Oct 21; 390(10105):1843-1852; 2. Kandzari D et al. Ultrathin bioresorbable polymer sirolimus-eluting stents versus thin durable polymer everolimus-eluting stents. Journal of the American College of Cardiology. 2018 Dec 17;72(25):3287-97; 3. Kandzari D et al. J Am Coll Cardiol. Cardiovasc Interven. 2020, doi: 10.1016/j.jcin.2020.02.019. 4. Iglesias JF et al. Biodegradable polymer sirolimus-eluting stents versus durable polymer everolimus-eluting stents in patients with ST-segment elevation myocardial infarction (BIOSTEMI): a single-blind, prospective, randomised superiority trial; Lancet, September, 2019; 5. Pilgrim T et al. 5-year outcomes of the BIOSCIENCE randomised trial. Supplementary appendix; Lancet 2018; published online Aug 28. http://dx.doi.org/10.1016/S0140-6736(18)31715-X; 6. Foin et al. Impact of stent strut design in metallic stents and biodegradable scaffolds. Int J Cardiol.2014 Dec 20;177(3):800-8; 7. Secco G et al. Time-related changes in neointimal tissue coverage of a novel Sirolimus eluting stent: Serial observations with optical coherence tomography. Cardiovascular Revascularization Medicine 17.1 (2016): 38-43; 8. Bangalore S et al. Newer-generation ultrathin strut drug-eluting stents versus older second-generation thicker strut drug-eluting stents for coronary artery disease: metaanalysis of randomized trials. Circulation. 2018 Nov 13;138(20):2216-26; 9. Bangalore S, et al. Newer-generation ultrathin strut drug-eluting stents versus older second-generation thicker strut drug-eluting stents for coronary artery disease: meta-analysis of randomized trials. Circulation. 2018 Jul. 24: 2216-2226; 10. Stefanini GG et al. Coronary stents: novel developments. Heart. 2014 Jul 1;100(13):1051-61; 11. Low AF. Stent platform for procedural success: Introducing the Continuous Sinusoidal & Core Wire Technologies. Presented at: AsiaPCR; 22-24 January, 2015; Singapore, Singapore; 12. Tolentino A. Evolving DES Strategy: Biodegradable Polymer vs. Bioabsorbable Scaffold. Presented at: Cardiovascular Nurse/TechnologistSymposium; June 17, 2016; New York, USA; 13. BIOTRONIK data on file.

Target Lesion Failure (TLF), Target Lesion Revascularization (TLR), Target Vessel Myocardial Infarction (TV-MI), Stent Thrombosis (ST).

\*Indication as per IFU.

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