INSTRUCTIONS FOR USE
3V SIRONIX
[Sirolimus Eluting (Nickel Free) Stent System]

STERILE. Sterilized with ethylene oxide gas. Non pyrogenic. For one procedure only. Do not re-sterilize. Do not use opened or damaged packages. Store between 15°C -25°C temperatures in a dry, dark, cool place. Protect from light. Refer to accompanying Instructions for Use.

DESCRIPTION

The 3V SIRONIX Sirolimus Eluting (Nickel Free) Stent System comprises of following components;

- A balloon expandable nickel free stainless steel stent;
- A stent coating that consists of a blend of anti-proliferative drug and polymers
  a. Anti-proliferative drug Sirolimus (also known as Rapamycin)
  b. Biocompatible, bio-degradable co-polymer coating which acts as drug reservoir and drug release platform
- A double lumen rapid exchange stent delivery PTCA balloon catheter
- The stent is pre-mounted on balloon catheter and placed between two platinum-iridium radio opaque markers bands, proximal and distal, to aid the balloon positioning under fluoroscopy

Device Components Description
Available stent lengths and diameters

Table 1

Available Sizes						
Lengths in mm	**Diameter in mm**					
8	**2.25**	**2.50**	**2.75**	**3.00**	**3.50**	**4.00**
12	○	○	○	○	○	○
13	○	○	○	○	○	○
15	○	○	○	○	○	○
16	○	○	○	○	○	○
20	○	○	○	○	○	○
23	○	○	○	○	○	○
24	○	○	○	○	○	○
28	○	○	○	○	○	○
32	○	○	○	○	○	○
33	○	○	○	○	○	○
36	○	○	○	○	○	○
38	○	○	○	○	○	○
40	○	○	○	○	○	○

Tabel-2

Stent Material	Electro polished stainless steel alloy (nickel free), laser-cut from seamless tubing in ahybrid design pattern
Stent delivery balloon catheter system	Semi-complaint polyamide balloon, nominally 0.5 mm longer than stent length. Mounted stent length & location is defined by two platinum-iridium swaged radiopaque markers under the balloon catheter. Two proximal delivery system shaft markers (90cm, 100 cm proximal to distal tip) indicate the relative position of the delivery system to the end of brachial or femoral guiding catheter
Delivery system usable length	140 cm
Guide wire lumen	Starts at the distal tip of the balloon catheterand ends approximately 25cm from distal tip of the balloon catheter
Guide-wire rapid exchange (Rx) port	Starts at distal tip of the balloon catheter emerges approximately 25cm from distal tip of the balloon catheter. A disposable stylet protects the distal catheter from an inadvertent kinking.
Shaft outerprofile	Proximal 1.98 F (0.66 mm/0.026”) Distal 2.4 F (0.77 mm.0.30”) (2.00 mm diameter) Distal 2.7 F(0.87 mm/0.035”) (2.25 to 4.00 mm diameter)
Stent dilatation/balloon inflation pressures	Nominal pressure: 8 atm Rated burst pressure: 16 atm except for balloon diameter 4.00 mm with length higher than 20 mm (14 bars)
Guide catheter compatibility	5Fr (Min I.D 0.056”/ 1.42 mm)
Guide wire compatibility	0.014’’ (0.36 mm)

Balloon Compliance Chart

Pressure (atm)	Balloon Diameter (mm)						
	2.25	**2.50**	**2.75**	**3.00**	**3.50**	**4.00**	**4.50**
2	1.98	2.20	2.42	2.64	3.08	3.52	3.96
3	2.03	2.25	2.48	2.70	3.15	3.60	4.05
4	2.07	2.30	2.53	2.76	3.22	3.68	4.14
5	2.12	2.35	2.59	2.82	3.29	3.76	4.23
6	2.16	2.40	2.64	2.88	3.36	3.84	4.32
7	2.21	2.45	2.70	2.94	3.43	3.92	4.41
8*	**2.25**	**2.50**	**2.75**	**3.00**	**3.50**	**4.00**	**4.50**
9	2.28	2.54	2.79	3.05	3.55	4.06	4.57
10	2.32	2.58	2.83	3.09	3.61	4.12	4.64
11	2.35	2.61	2.87	3.14	3.66	4.18	4.70
12	2.39	2.65	2.92	3.18	3.71	4.24	4.77
13	2.42	2.69	2.96	3.23	3.77	4.31	4.85
14	2.46	2.74	3.01	3.29	3.83	**4.38**	**4.93**
15	2.50	2.78	3.06	3.34	3.89	4.45	5.01
16**	**2.54**	**2.83**	**3.11**	**3.39**	**3.96**	4.52	5.09
17	2.58	2.86	3.15	3.44	4.01	4.58	5.15
18	2.61	2.90	3.19	3.48	4.06	4.64	5.22

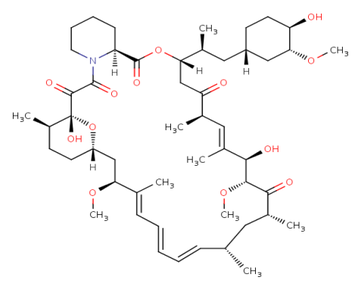
***Nominal Pressure:** 8 Bar

****Rated Burst Pressure:** 16 Bar/ Do not exceed

For 4.00mm, 4.50mm it is 14 Bar/ Do not exceed

Drug Component Description
The component is coated on the stent. This coating consists of a blend of sirolimus drug (the active ingredient) and biodegradable polymers (the inactive ingredient).
Sirolimus is also known as Rapamycin. Sirolimus is a Macrocyclic lactone produced by Streptomyces hygroscopicus.
The chemical name of Sirolimus (also known as rapamycin) is (3S, 6R, 7E, 9R, 10R, 12 R, 14S, 15E, 17E, 19 E, 21S, 23S, 26R, 27R, 34aS) -9, 10, 12, 13, 14, 21, 22, 23, 24, 25, 26, 27, 32, 33, 34 ahexadecahydro 9, 27 dihydroxy – 3 - [(1R) – 2 - [(1S, 3R, 4R) – 4 – hydroxyl – 3 ethoxycyclohexyl] - 10, 21- dimethoxy- 6, 8, 12, 14, 20, 26- hexamethyl - 23, 27 - epoxy - 3H - pyrido [2, 1 - c] [1, 4] oxaazacyclohentriacontine - 1, 5, 11, 28, 29 (4H, 6H, 31H) - pentone. Its molecular formula is C51H79NO13 and M.Wt. is 914.2.

Sirolimus drug chemical structure



Sirolimus is a white to off-white powder and is insoluble in water, but freely soluble in benzyl alcohol, chloroform, acetone, and acetonitrile & has a melting temperature of approximately 183-185° C. Sirolimus belongs to a class of therapeutic agents known as macro cyclic lactones or macrolides. It is a cytostatic drug and an immunosuppressant.

It inhibits cell motility by suppression of m-TOR mediated 56K1 and 4E-BP1 pathways.
It inhibits T-Lymphocyte activation and proliferation occurring in response to antigen and cytokine. It also inhibits antibody production. It demonstrates ant proliferative activities.
The drug content on 3V SIRONIX sirolimus eluting coronary stent ranges between 34 microgram to 412 microgram. The coating concentration is 1.4 microgram/ sq.mm

Polymer
The inactive ingredient of the coating consists of a blend of lactide and glycolide based biodegradable polymers. These polymers control the drug release kinetics and they degrade as the drug is released from the stent.

INDICATIONS

The 3V SIRONIX Sirolimus Eluting (Nickel Free) Stent System is indicated for improving coronary luminal diameter in patients with symptomatic ischemic heart disease due to de novo & in-stent re-stenotic lesions (lengths<44 mm) in native coronary arteries with a reference vessel diameter of 2.25mm to 4.00mm in patients eligible for percutaneous trans luminal coronary angioplasty and stenting procedures.

CONTRA-INDICATIONS

3V SIRONIX Sirolimus Eluting (Nickel Free) Coronary Stent System is contraindicated for patients with;

- Known sensitivity to Rapamycin.
- Known allergy to stainless steel.
- Known allergy to PLGA polymer
- Severe reaction to contrast agents.
- Patients in whom anti-platelet and/or anticoagulant therapy is contraindicated.
- In-stent Restenosis.
- Myocardial infarction < 72 hours.
- Stenting of Saphenous Vein Grafts.
- Unprotected left main coronary artery.
- Total occlusion of target vessel.
- Heavily calcified lesions.
- Lesions involving arterial segments with highly tortuous anatomy.
- Lesions involving a bifurcation
- Left ventricular ejection fraction < 30 %.
- Cardiogenic shock.
- Presence of definite or probable intraluminal thrombus.
- Any patients judged to have a lesion which may prevent proper stent deployment.

WARNING

- ***The aluminium bag is only for protection from light and humidity and is NOT sterile! Only the content of the inner Tyvek pouch placed inside the aluminium bag is sterile!***
- Judicious patient selection is necessary during use of this device since it carries the associated risks of sub-acute thrombosis, vascular complications and/ bleeding events.
- Long term permanent implantation effect of this device is unknown.
- Safety and effectiveness of direct stenting has not been studied.
- Safety and effectiveness of stenting of saphenous vein grafts has not been established.
- Never try to straighten a kinked hypotube.
- Straightening of a kinked metal may result in breakage of the shaft.

PRECAUTIONS FOR USE

General Precautions

- Only physicians who have received adequate training should perform implantation of the stent.
- Stent placement should only be performed at hospitals where emergency coronary artery bypass graft surgery (CABG) is readily available.
- Subsequent blockage may require repeat dilatation of the arterial segment containing the stent. The long term outcome following repeat dilatation of endothelialized stents is not well characterized.

Stent Handling Precautions

- Do not use if the package has been opened or damaged.
- Use the device before the “Use By” date as specified on the product label
- For Single Use only. Do not resterilize or reuse
- Remove the protective stylet from the guide wire lumen and discard
- Do not remove the stent from delivery system as removal may damage the stent and/lead to stent embolization. The 3V SIRONIX Sirolimus Eluting (Nickel Free) Coronary Stent System is intended to perform as a system.
- The stent should not be removed for use in conjunction with other dilatation catheter.
- Special care must be taken not to handle or in any way disrupt the stent position on the delivery device. This is especially important during catheter removal from packaging, placement of guidewire, advancement through the rotating haemostatic valve adaptor and guiding catheter hub.
- Do not manipulate, touch or handle the stent with fingers or contact with liquids prior to preparation and delivery as this may result in coating damage, contamination or dislodgement of stent from the delivery balloon catheter.
- Do not expose or wipe the device with organic solvents such as alcohols or detergents.
- Use only the appropriate balloon inflation media. Do not use any gaseous medium to inflate the balloon as this may cause uneven expansion and difficulty in deployment of the stent.
- When back loading catheter on the guidewire, provide adequate support to shaft segment’s.

Stent placement precautions

- Do not prepare or pre-inflate the balloon prior to stent deployment, other than as directed.
- Do not include vacuum on (negative pressure) on the delivery balloon catheter before reaching the target lesion.
- Implantation of a stent may lead to dissection of the vessel distal and/ or proximal to the stented portion and may cause acute closure of the vessel requiring additional intervention (eg: CABG, further dilatation or placement of additional stents.)
- Do not expand the stent if it is not properly positioned in the vessel.
- Long term outcome following repeat dilatation of endothelialized coronary stents is unknown at present.
- Placement of stents has the potential to compromise side branch patency.
- Do not exceed rated burst pressure as indicated on labeling .use of pressures higher than those specified on product label may result in a raptured balloon and potential intimal damage and dissection.
- Guiding catheter used must have lumen sizes that are suitable to accommodate the introduction of 3V SIRONIX stent. (Table 2)
- Stent retrieval methods (use of additional wires, snares or forceps)may result in additional trauma to the coronary vasculature and/or the vascular access site. Complications may include bleeding,hematoma or pseudo aneurysm.
- To avoid the possibility of dissimilar metal corrosion, do not implant stents of different materials in tandem overlap or contact if possible.
- When treating multiple lesions, the distal lesion should be initially stented, followed by stenting of the proximal lesion. Stenting in this order obviates the need to cross the proximal stent in placement of the distal stent and reduces the changes for dislodging the proximal stent.
- The safety and effectiveness of the 3V SIRONIX coronary stent in patients with prior brachytherapy of the target lesion have not been established.
- The safety and effectiveness of using mechanical artherectomy devices or laser angioplasty catheters in conjunction with 3V SIRONIX Sirolimus Eluting coronary stent implantation have not been established.
- The Tyvek pouch is the sterile barrier. Therefore only the contents of the sealed Tyvek pouch should be considered sterile. Do not remove the contents from Tyvek pouch until immediately prior to use.
- During withdrawal of the delivery system, hold saline- soaked gauze around the exposed catheter shaft and pull the catheter through the gauze to remove any excess contrast medium.

- If reinserting the catheter, flush the guidewire lumen using flushing needle before insertion.
- Additional expansion of a deployed stent may cause a flow limiting dissection.
- This may be treated by implantation of another stent. When multiple stents are implanted, the ends should overlap slightly.

Stent/ system removal precautions

- Should any unusual resistance be felt at any time during either lesion access or removal of stent delivery system, pre-stent implantation, the entire system must be removed as a single unit.
- When removing the delivery system as a single unit, do not retract the delivery system into the guiding catheter.
- Advance the guide wire into the coronary anatomy as far distally as safely possible. Tighten the rotating haemostatic valve to secure the stent delivery system as a single unit.
- Failure to follow these steps and /or applying excessive force to the stent delivery system can potentially result in loss or damage to the stent and /or stent delivery system components.

Post Implant Precautions

Great care must be excercised when crossing a newly deployed stent with other devices such as another stent delivery system, an intravascular ultrasound (IVUS) catheter, a coronary guidewire or balloon catheter to avoid disrupting the stent geometry and stent coating.

Magnetic Resonance Imaging (MRI) statement

Non-clinical testing of coronary stents of similar metal configurations as 3V SIRONIX stents available in the market are shown to be MRI safe at filed strengths of 3 tesla or less, spatial gradient field of 720 gauss/ cm or less and a maximum whole body averaged specific absorbtion rate (SAR) of 2.0 W/kg for 15 min of MRI.

The effect of heating in the MRI environment for stents with fractured struts is not known.

MRI image quality may be compromised if the area of interest is in theexact same area or relatively close to the position of the stent.

Drug Interaction

While no specific clinical data are available drugs like tacrolimus that act through the same binding protein (FKBP) may interfere with the efficacy of Sirolimus.

Drug interaction studies have not been performed. Sirolimus is metabolized by CYP3A4. Strong inhibitors of CYP3A4 (eg: Ketoconazole) might cause increased sirolimus exposure to levels associated with systemic effects, especially if multiple stents are deployed. Systemic exposure of sirolimus should also be taken into consideration if the patient is treated concomitantly with systemic immunosuppressive therapy.

INSTRUCTIONS FOR USE

Inspection Prior to use

- Carefully inspect the sterile package before opening.
- Do not use if the package has been damaged or opened.
- ***The aluminium bag is only for protection from light and humidity and is NOT sterile! Only the content of the inner Tyvek pouch placed inside the aluminium bag is sterile!***
- The product should not be used after the “USE By” date
- If the sterile package appears intact, carefully remove the system from the package and inspect for bends, kinks and other damage.
- Tear open the sterile pouch to carefully remove the product and pass on or drop the contents into the sterile field using aseptic technique.
- Verify that the stent is located between the radiopaque markers.
- Do not use if any defects are noted.

Materials Required

- Appropriate guiding catheter(s)
- 2-3 syringes (10-20 cc)
- 1000 micro/500 cc Normal heparinized saline (Hep NS)
- 0.014” (0.36 mm) diameter guidewire, 175 cm minimum length
- Rotating hemostatic valve with an appropriate internal diameter
- Contrast diluted 1:1 with normal saline
- Inflation device
- Three-way stopcock
- Torque device
- Guidewire introducer

Preparation

Guide wire Lumen flush

- Remove the protective stylet from the guide wire lumen and discard
- Flush the guide wire lumen with HepNS until the fluid exists, the guide wire exit port approximately 25 cms distal to catheter distal tip.

Caution: Avoid manipulation of stent during flushing of guide wire lumen, as this may disrupt the placement of the stent on the balloon.

Delivery System Preparation

- Prepare an inflation device with diluted contrast medium
- Attach inflation device to stopcock: attach to hub (balloon inflation port)

Caution: Do not apply negative or positive pressure to balloon at thistime

- Open stopcock to stent delivery system
- Leave inflation device on neutral
- Purge the inflation device of all air

Delivery Procedure

- Prepare vascular access site according to standard practice
- Prepare lesion site according to standard practice. Pre-dilate thelesion with a PTCA catheter.
- Maintain neutral pressure on inflation device. Open rotating hemostatic valve as widely as possible.
- Backload delivery system onto proximal portion of guide wire while maintaining guidewire position across target lesion
- Advance the stent delivery system over guide wire to target lesion.
- Use radiopaque balloon markers position stent across lesion
- Perform angiography to confirm stent position.

ANTI-PLATELET REGIMEN

The use of aspirin together with clopidogrel or ticlopidine is referred toas ‘dual antiplatelet therapy. The optimal duration of dual antiplatelet therapy, specifically clopidogrel is unknown and DES thrombosis may still occur despite continued therapy. Data from several studies suggest that a longer duration of clopidogrel than was recommended post procedurally in drug eluting stent pivotal trails may be beneficial. Based upon consensus opinion, practice guidelines recommended that patients receive aspirin indefinitely plus a minimum of 6 months of clopidogrel, with clopidogrel therapy extended to 12 months in patients that are not at high risk of bleeding (ref: American college of cardiology (ACC)/ American heart association (AHA)/ Society of cardiovascular angiography interventions (SCAI) and the European society of cardiology (ESC) PCI practice guidelines). For patients treated for AMI, a 12 month clopidogrel therapy is recommended.

It is very important that the patient is complaint with the post- procedural antiplatelet recommendations. Early discontinuation of prescribed antiplatelet medication could result in a higher risk of thrombosis, myocardial infraction or death. Prior to percutaneous coronary intervention (PCI), if a surgical or dental procedure is anticipated that requires early discontinuation of antiplatelet therapy, the interventional cardiologist and patient should carefully consider whether a drug – eluting stent and its associated recommended antiplatelet therapy is the appropriate PCI treatments choice. Following PCI, should a surgical or dental procedure be recommended that require suspension of antiplatelet therapy, the risk and benefits of the procedure should be weighed against the possible risk associated with early discontinuation of antiplatelet therapy.

STORAGE REQUIREMENTS

- Use before the expiry date clearly indicated on the label.
- Store between 15°C - 25°C temperatures in a dry, cool place.
- Protect from light

WARRANTY

S3V Vascular Technologies Pvt. Ltd. warrants that reasonable care has been used in the design and manufacture of this Device. This warranty is in lieu of and excludes all other warranties not expressly set forth herein, whether expressed or implied by operation of law or otherwise, including, but not limited to, any implied warranties of merchantability or fitness for a particular purpose. Handling, storage, cleaning and sterilization of this Device as well as other factors relating to thepatient, diagnosis, treatment, surgical procedures and other matters beyond S3V Vascular Technologies control directly affect the Device and the results obtained from its use. S3V Vascular Technologies obligation under this warranty is limited to the replacement of this Device and S3V Vascular Technologies shall not be liable for any incidental or consequential loss, damage, or expense directly or indirectly arising from the use of this Device. S3V Vascular Technologies neither assumes, nor authorizes any other person to assume for it, any other or additional liability or responsibility in connection with this Device. S3V Vascular Technologies assumes no liability with respect to Devices reused, reprocessed or re-sterilized and makes no warranties, expressed or implied, including but not limited to merchantability or fitness for a particular purpose, withrespect to such Device.

PACKAGING

Delivered in a peelable tyyek pouch, covered by an aluminium pouch
Placed in an outer cardboard carton box

Device is sterilized by Ethylene Oxide

Non- Pyrogenic

CONVERSION CHART

1 cc	1 mL		
1 French	0.0131”	0.33 mm	
1 bar	1.02 atm	14.5 PSI	10^8Pa

SYMBOLS MEANING

Qty	Quantity per box
Ø	Diameter
	Length
	Do Not Reuse
	Consult instructions for use or consult electronic Instruction for Use
	Caution
	Keep away from sunlight
	Keep dry
Ø	Min. guiding catheter internal diameter
Ø	Maximum guidewire diameter
	Temperature limitation
	Non-Pyrogenic

REF	Catalogue number
SN	Serial number
	Manufacturer
	Manufacturing Date
LOT	Lot Number
	Use by date
	Do not resterilize
	Do not use if package is damaged & consult Instruction for Uses

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