INSTRUCTIONS FOR USE

3V SIRIS

[Rapamycin Eluting Coronary Stent Implantation System]

STERILE: Sterilized with ethylene oxide. Do not use if the sterile package is open or damaged.

Read carefully all instructions prior to use. Observe all warnings and precautions noted in these instructions. Failure to do so may result in complications.

Use the product before expiration of the "Best-Before-Date" mentioned on the packing.

DESCRIPTION

The 3V SIRIS Rapamycin Eluting Coronary Stent Implantation System (3V SIRIS Stent for short) is a pre-mounted balloon expandable drug-eluting stent with the following attributes:

- A stainless steel stent with Carbon Ion implanted surface with a conformal coating of a biodegradable polymer carrier loaded with 2.0µg/mm² sirolimus in a specified release formulation with a maximum nominal content of 450µg on the largest stent (4.0 mm x 38 mm). The proportion of sirolimus in the coating amounts to 33% by weight.
- Rapid exchange balloon catheter;
- Two radiopaque markers which aid the accurate placement of the stent;
- A balloon enabling high pressure inflations that can be used for post stent dilatation;
- Stent diameters of 2.0 to 4.0 mm, and stent lengths of 10 to 38 mm.

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Recommended Storage

1. Keep in a cool, dark and dry place.
2. Use immediately after the sterile package is opened.
3. Refer to the symbol legend at the end of this document

Disposal Instructions

After use, dispose of product and packaging in accordance with hospital, administrative and/or local government policy.

INDICATIONS AND USAGE

The 3V SIRIS Sirolimus-Eluting Coronary Stent Implantation System is indicated for improving coronary luminal diameter in patients with symptomatic ischemic disease due to discrete de novo and in-stent re-stenoctic lesions (length ≤38mm) in native coronary arteries with vessel diameter of 2.0 mm to 4.0mm.

- The 3V SIRIS Sirolimus-Eluting Coronary Stent has been shown to significantly reduce binary restenosis, target lesion re-vascularization and angiographic late loss.
- The 3V SIRIS Stent is also indicated for treatment of abrupt or threatening closure in patients with failed interventional therapy. The treated lesion (>50%) length should be less than the nominal stent length (10 to 38 mm) with reference vessel diameters from 2.0 to 4.0 mm.

CONTRAINDICATIONS

The 3V SIRIS Rapamycin Eluting Coronary Stent Implantation System is contraindicated for patients with:

- Known sensitivity to Sirolimus.
- 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.

WARNINGS

- This device is intended to be used once only. DO NOT re-sterilize and/or reuse it.
- Reuse, reprocessing or re-sterilization can potentially result in compromised device performance and increase the risk of cross contamination, leading to injuries, illness or death of the patient.
- The device carries an associated risk of sub-acute thrombosis, vascular complications (Complications can include bleeding, hematoma or pseudoaneurysm), and/or bleeding events. Therefore, patients should be carefully selected, and antiplatelet therapy (i.e., clopidogrel or ticlopidine) must be prescribed for a period of 6 months post procedure.
- The device should not be used in patients with a known hypersensitivity to Sirolimus or stainless steel or poly (dl-lactid-co-glycolid).
- Implantation of the stent should be performed only by physicians who have received appropriate training.
- Stent placement should only be performed at hospitals where emergency coronary artery bypass graft surgery can be readily performed.
- The device should be manipulated while under high-quality fluoroscopic observation. Do not advance or retract the catheter unless the balloon is fully deflated under vacuum. If resistance is met during manipulation, determine the cause of resistance before proceeding.
- Never try to straighten a kinked hypotube. Straightening a kinked metal shaft may result in breakage of the shaft.
- Balloon pressure should not exceed the rated burst pressure. The rated burst pressure is based on the results of in vitro testing. Use of a pressure-monitoring device is recommended to prevent over pressurization.
- Use the device before the "Expiry" date specified on the package.

- Direct Stenting without prior dilation of the lesion has not been studied using this product (note Precaution regarding predilation prior to stent implantation).
- Subsequent restenosis may require repeated dilation of the arterial segment containing the stent. The long-term outcome following repeated dilation of coronary stents is unknown at present.
- When multiple stents are required, if placement results in stent to stent contact, stent materials should be of similar composition to avoid the possibility of dissimilar metal corrosion.
- The use of Sirolimus-Eluting stents could cause the risk of a possible inflammatory and/or prothrombotic reaction induced by the polymer coating of the stents. The responsible physician should in each case calculate the potential risk for the patient compared to the advantages of the use of a Sirolimus-Eluting stent
- The 3V SIRIS Stent is not recommended for use in lesions that require stent overlapping.
- Due to the known risks of the implantation of drug eluting stents in combination with the following prolonged dual oral anti-platelet therapy the user must reconsider the alternative of a bypass surgery with the accompanying known risks.

POTENTIAL ADVERSE EVENTS

Adverse events (alphabetical order) may be associated with the implantation of a coronary stent in coronary arteries, but are not limited to the following;

- Allergic reaction
- Aneurysm
- Arrhythmias
- Death
- Dissection
- Drug reactions to antiplatelet agents / anticoagulation agents / contrast medium
- Emboli, distal (tissue, air or thrombis emboli)
- Embolization, stent
- Failure to deliver the stent to intended site
- Hemorrhage
- Hypotension / Hypertension
- Infection and pain at the insertion site
- Myocardial ischemia and /or infarction
- Occlusion
- Restenosis of stented segment (greater than 50% obstruction)
- Stroke
- Thrombosis (acute, sub-acute or late)
- Ventricular fibrillation
- Vessel spasm
- Stent migration
- Stent Collapse
- Stent breakage or fracture may occur during implant
- During dual oral anti-platelet therapy no surgery in other fields is possible without a high risk of complications.

There may be other potential adverse events that are unforeseen at this time.

PRECAUTIONS

Also see Reuse Precaution Statement

Stent Handling Precautions

- Note product “Expire” date.
- Verify visually that the stent is located between the proximal and distal balloon markers.
- The 3V SIRIS Sirolimus-Eluting Coronary Stent Implantation System is designed for use as a uniform unit. The stent should not remove from its delivery balloon. The stent is not designed to be crimped onto another balloon. Removing the stent from its delivery balloon may damage the stent and/or lead to stent embolization.
- Special care must be taken not to handle or in any way disrupt the stent position on the delivery device. This is most important during catheter removal from packaging, placement over guidewire, and advancement through hemostasis valve adapter and guiding catheter hub.
- Excessive manipulation, e.g., rolling the mounted stent, may cause coating damage or dislodgement of the stent from the delivery balloon.
- In the event the 3V SIRIS Stent could not deploy, please return the product to S3V Vascular Technologies and avoid handling of the stent with bare hands.
- Use only the appropriate balloon inflation media. Do not use air or any gas medium to inflate the balloon.
- Stent contact with any fluid prior to placement is not recommended as there is a possibility of drug release. However, if it is absolutely necessary to flush the stent with sterile/isotonic saline, contact time should be limited (1 minute maximum).

Stent placement Precautions

- Do not prepare or pre-inflate balloon prior to stent deployment other than as directed. Use balloon purging technique described in “Instructions for use section”.
- Implanting 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 (e.g., CABG, further dilation, placement of additional stents, or other).
- The target lesion must be sufficiently pre-dilated prior to stent implantation.
- Do not expand the stent if it is not properly positioned in the vessel (see section “Stent System Removal Precautions”).
- Placement of the stent has the potential to compromise side branch patency.
- Balloon pressures should be monitored during inflation. Do not exceed rated burst pressure as indicated on product label. Use of pressures higher than specified on product label may result in a ruptured balloon and potential intimal damage and dissection. The vessel should be pre-dilated with appropriate diameter balloon having a 1:1 ratio with the vessel diameter.
- Stent retrieval methods (use of additional wires, snares and/or forceps) may result in additional trauma to the vascular site. Complications can include bleeding, hematoma or pseudoaneurysm.
- If unusual resistance is felt at any time during lesion access before stent implantation, the Stent System and the guiding catheter should be removed as a single unit (see “Stent System Removal – Precautions”).

- Do not attempt to pull an unexpanded stent back into the guiding catheter while engaged in the coronary arteries, as stent damage or stent dislodgement from the balloon may occur (see "Stent System Removal Precautions").
- An unexpanded stent should be introduced into the coronary arteries one time only. An unexpanded stent should not be subsequently moved in and out through the distal end of the guiding catheter as stent damage or stent dislodgement from the balloon may occur.

Stent System Removal Precautions

- If unusual resistance is felt at any time during lesion access before stent implantation, the stent system and guiding catheter should be removed as a single unit.
- Do not attempt to pull an unexpanded stent back into the guiding catheter while engaged in the coronary arteries, as stent damage or stent dislodgement from the balloon may occur.

When removing the entire stent system as a single unit:

NOTE: The following steps should be executed under direct visualization using fluoroscopy.

- Maintain guidewire placement across the lesion during the entire removal process. Carefully pull back the stent system until the proximal balloon marker of the stent system is aligned with the distal tip of the guiding catheter.
- The stent system and guiding catheter should be pulled back until the tip of the guiding catheter is just distal to the arterial sheath, allowing the guiding catheter to straighten. Carefully retract the stent system into the guiding catheter and remove the stent system and guiding catheter from the patient as a single unit while leaving the guidewire across the lesion.
- Failure to follow these steps and/or applying excessive force to the stent system can potentially result in stent damage, stent dislodgement from the balloon and/or damage to the delivery system.

Post Implant Precautions

- Care must be exercised when crossing a newly deployed stent with an intravascular ultrasound (IVUS) catheter, a coronary guidewire, or a balloon catheter to avoid disrupting the stent geometry or coating.
- Do not perform Magnetic Resonance Imaging (MRI) scan on patient's post-stent implantation until the stent has been completely endothelialized (90 days) to minimize the potential for migration. The stent may cause artefacts in MRI scans due to distortion of the magnetic field.
- Prescribe an antiplatelet therapy (i.e., clopidogrel or ticlopidine) for a period of 6 months to reduce the risk of stent thrombosis.

Drug Interactions

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 (e.g. ketoconazol) might cause increased sirolimus exposure to levels associated with systemic effects, especially if multiple stents are deployed. Systemic exposure of the drug should also be taken into consideration if the patient is treated concomitantly with systemic immunosuppressive therapy.

Pregnancy and Lactation

This product has not been tested in pregnant women, women who wants to be pregnant, nursing mothers or in men intending to father children, effects on the developing foetus have not been studied. While there is no contraindication, the risks and reproductive effects remain unknown.

Pregnancy

In animals, Sirolimus was embryo- and foetotoxic at clinically relevant exposures. Teratogenic effects have not been observed. The potential risk for humans is unknown. The 3V SIRIS Stent should not be used in pregnant women, unless the clinical condition of the mother requires treatment with the stent.

Lactation

It is not known whether Sirolimus is excreted in human breast milk. Sirolimus is excreted in milk of lactating rats. A risk to the suckling child cannot be excluded. A decision must be made whether to discontinue breast-feeding or to implant the stent taking into account the importance of the stent to the mother.

Antiplatelet Regimen

Patients receiving the 3V SIRIS Sirolimus-Eluting Coronary Stent should receive Clopidogrel or Ticlopidine for at least 6 months post procedure and aspirin indefinitely. Since the relative risk of stent thrombosis with the 3V SIRIS Stent is equivalent to that of a bare metal stent, the physician should use best clinical judgment in determining the need for a more extended duration of antiplatelet therapy in high risk groups, as they would when using a bare metal stent.

Materials required (not included in Stent System package)

- Select guiding catheter(s) (inner lumen min. 1.42mm) with the appropriate configuration for the coronary artery to be treated.
- 10 or 20 ml syringe
- Rotating hemostatic valve(s) with a minimum diameter of 0.096 inch/ 2.39mm
- Guide wire 0.014 inch/ 0.36mm
- 60% contrast medium diluted 1:1
- Sterile physiological saline solution
- Inflation device and a three-way stopcock for balloon inflation

INSTRUCTIONS FOR USE

Inspection Prior to Use

Carefully inspect the sterile package before opening. Do not use after the "Expiry" date. If the integrity of the sterile package has been compromised prior to the product "Expire" date (e.g., damage of the package), contact 3V SIRIS for return information. Do not use if any defects are noted.

NOTE: If at any time during use of the Pre-mounted Stent System the stainless steel proximal shaft has been bent or kinked, do not continue to use the catheter.

Preparation

Packaging Removal

1. Carefully remove the delivery system from its protective tubing for preparation of the delivery system. Do not bend or kink hypotube during removal.

2. Remove the product mandrel and stent protector by grasping the catheter just proximal to the stent (at the proximal balloon bond site), and with the other hand, grasp the stent protector on the distal end and remove gently.

NOTE: Care should be taken not to kink or bend the shaft upon application.

Balloon Preparation

1. Stent contact with any fluid is not recommended, as there is a possibility of drug release. However, if it is absolutely necessary to flush the stent with saline, contact time should be limited (1 minute maximum).
2. Prepare inflation device/syringe with diluted contrast medium.
3. Attach inflation device/syringe to stopcock; attach to inflation port. Do not bend the hypotube when connecting to inflation device/syringe.
4. With tip down, orient Stent System vertically.
5. Open stopcock to Stent System; pull negative for 15 seconds; release to neutral for contrast fill.
6. Close stopcock to Stent System; purge inflation device/syringe of all air.
7. Repeat steps 4 through 6 until all air is expelled. If bubbles persist, do not use device.
8. If a syringe was used, attach a prepared inflation device to stopcock.
9. Open stopcock to Stent System.
10. Leave on neutral.

Delivery Procedure

1. Prepare the vascular access site according to standard PTCA practice.
2. Pre-dilate the lesion/vessel with appropriate diameter balloon having a ratio of 1:1 with the diameter of the vessel.
3. Maintain neutral pressure on inflation device attached to Stent System.
4. Backload Stent System onto proximal portion of guidewire while maintaining guidewire position across target lesion.
5. Fully open rotating hemostatic valve to allow for easy passage of the stent and prevent damage to the stent.
6. Ensure guiding catheter stability before advancing the Stent System into the coronary artery. Carefully advance the Stent System into the hub of the guiding catheter, keeping the hypotube straight.

NOTE: If unusual resistance is felt before the stent exits the guiding catheter, do not force passage. Resistance may indicate a problem and use of excessive force may result in stent damage or stent dislodgement from the balloon. Maintain guidewire placement across the lesion and remove the Stent System and guiding catheter as a single unit.

7. Advance the Stent System over the guidewire to target lesion under direct fluoroscopic visualization. Utilize the proximal and distal radiopaque balloon markers as a reference point. If the position of the stent is not optimal, it should be carefully repositioned or removed (see Section "Stent System Removal Precautions"). The inside edges of the marker bands indicate both the stent edges and balloon shoulders inflated. Expansion of the stent should not be undertaken if the stent is not properly positioned in the target lesion segment of the vessel.

NOTE: If unusual resistance is felt at any time during lesion access before stent implantation, the Stent System and the guiding catheter should be removed as a single unit (see section "Stent System Removal Precautions").

8. Sufficiently tighten the rotating hemostatic valve. Stent is now ready to be deployed.

Deployment Procedure

1. Inflate the Stent System expanding the stent to a minimum pressure of the nominal pressure. Higher pressures may be necessary to expand the stent to optimize stent apposition against the arterial wall. Balloon pressure must not exceed rated burst pressure.
2. Maintain inflation pressure for 15-30 seconds for full expansion of the stent.
3. Deflate balloon by pulling negative on inflation device until balloon is fully deflated.
4. Confirm stent position and deployment using standard angiographic techniques. For optimal results, the entire stenosed arterial segment should be covered by the stent. Fluoroscopic visualization during stent expansion should be used in order to properly judge the optimum expanded stent diameter as compared to the proximal and distal coronary artery diameter(s). Optimal expansion requires that the stent be in full contact with the artery wall. All efforts should be taken to assure that the stent is not under dilated.
5. If stent sizing/apposition requires optimization, re-advance the Stent System balloon, or another balloon catheter of the appropriate size, to the stented area using standard angioplasty techniques.
6. Inflate the balloon to the desired pressure while observing under fluoroscopy. Deflate the balloon (see Balloon Compliance Chart supplied with device).
7. Reconfirm stent position and angiographic result. Repeat inflations until the desired result is achieved.

Removal Procedure

1. Ensure balloon is fully deflated.
2. Fully open rotating hemostatic valve.
3. While maintaining guidewire position and negative pressure on inflation device, withdraw Delivery System.

In Vitro Information

Refer to Balloon Compliance Chart supplied with device for stent inner diameter at nominal to rated burst pressure.

References: *The physician should consult recent literature on current medical procedures involving balloon dilatation, such as that published by international cardiologists' associations.*

REUSE PRECAUTION STATEMENT

Contents supplied STERILE using an ethylene oxide (EO) process. Do not use if sterile seal is damaged. If damage is found call S3V Vascular Technologies's representative.

For single patient use only. Do not reuse, reprocess or re-sterilize. Reuse, reprocessing or re-sterilization may compromise the structural integrity of the device and/or lead to device failure which, in turn, may result in patient injury, illness or death. Reuse, reprocessing or re-sterilization may also create a risk of contamination of the device and/or cause patient infection or cross-infection, including, but not limited to, the transmission of infectious disease from one patient to another. Contamination of the device may lead to injury, illness or death of the patient

We recommend a deployment pressure for the 3V SIRIS Coronary Stent Implantation System of minimum 9bar.

Compliance Chart for the 3V SIRIS Coronary Stent System

Pressure (atm)	Balloon Diameter (mm)							
	2.00	**2.25**	**2.50**	**2.75**	**3.00**	**3.25**	**3.50**	**4.00**
4	1.80	2.10	2.30	2.55	2.75	3.00	3.15	3.70
6	1.88	2.16	2.38	2.63	2.85	3.10	3.29	3.82
8	1.96	2.22	2.46	2.71	2.95	3.20	3.43	3.94
9*	**2.00**	**2.25**	**2.50**	**2.75**	**3.00**	**3.25**	**3.50**	**4.00**
10	2.04	2.28	2.54	2.79	3.05	3.30	3.57	4.06
12	2.12	2.34	2.62	2.87	3.15	3.40	3.71	4.18
14	2.20	2.40	2.70	2.95	3.25	3.50	3.85	4.30
16	2.28	2.46	2.78	3.03	3.35	3.60	3.99	**4.42**
18**	**2.36**	**2.52**	**2.86**	**3.11**	**3.45**	**3.70**	**4.13**	-

Nominal Pressure (NP)

****Rated Burst Pressure (RBP)***

NOTE: **RBP 16 bar from diameter 4.00mm**; Tolerance of Balloon diameter: ±10%

LIABILITY

It has endeavoured to ensure that the products comply with all relevant standards and regulations currently in force and to ensure that the quality of the products meets the requirements of the above mentioned standards and regulations for a period ending upon the indicated expiry date. The above statement does not apply when the products are used for a purpose other than its intended purpose. Where any loss or damage is caused (other than death or personal injury) due to a defective product shall not be liable for such loss or damage.

STORAGE REQUIREMENTS

Use before the expiry date clearly indicated on the label. Keep in a cool, dry and dark place.

PACKAGING AND PRODUCT RANGE

- Delivered in a peelable tyvek pouch, covered by an aluminium pouch placed in an outer cardboard carton box
- One unit per box
- Device is sterilized by Ethylene Oxide
- Non-Pyrogenic

Lengths and diameters available

Stent Length (mm)	Balloon Diameter (mm)							
	2.00	**2.25**	**2.50**	**2.75**	**3.00**	**3.25**	**3.50**	**4.00**
10	✓	✓	✓	✓	✓	✓	✓	✓
14	✓	✓	✓	✓	✓	✓	✓	✓
18	✓	✓	✓	✓	✓	✓	✓	✓
24	✓	✓	✓	✓	✓	✓	✓	✓
28	✓	✓	✓	✓	✓	✓	✓	✓
34	✓	✓	✓	✓	✓	✓	✓	✓
38	✓	✓	✓	✓	✓	✓	✓	✓

CONVERSION CHART

1cc	1 mL.		
1 French	0.0131"	0.33 mm	
1 bar	0.98 atm	14.5 PSI	10^5 Pa

SYMBOLS MEANING

Qty	Quantity per box
Ø	Diameter
⟷	Length
	Single Use
	Store Protected from Sun
	Store in a Dry Place
Ø	Min. Guiding Catheter Internal Diameter
Ø	Maximum Guide Wire Diameter
	Temperature Limitation
	Manufacturer
	Manufacturing Date
LOT	Lot Number
	Expiry Date
CE	CE Mark
EC REP	European Representative

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