

MERIL CARDIAC SURGERY SOLUTIONS

Meeting the challenging needs of today's
Cardiovascular Surgery, Building trust and consistency



Introduction to Meril

Meril is a global medical device company dedicated to the design and development of novel, clinically relevant, state-of-the-art and best-in-class devices to alleviate human suffering and improve the quality of life. We span a broad operational canvas ranging from Vascular Interventional Devices to Orthopedics, In-Vitro Diagnostics and Endo Surgery.

With more than 350,000 sq. ft. of ultra-modern R&D and manufacturing facilities at Vapi, Meril has vertical integration of all activities to ensure superior product quality, competitive market price and dedicated customer services at all times.

Meril strongly adheres to International quality & manufacturing standards. Our manufacturing facilities are certified & approved as per ISO 13485 and Canadian CMD CAS. Products are not only approved by Indian regulatory body – DCG(I) but also CE marked and in several instances approved by USFDA, Japan - PMDA China - CFDA, Australia - TGA, Korea - KFDA, ANVISA, ANMAT, Russia MoH, Singapore HSA and other regulatory bodies.



Commitment to R&D

At Meril, Research is directed towards individual patient's care, hence a large, eclectic team of professionals are engaged in research and development of novel medical devices and technologies ever since its inception.

Meril has under development, an eclectic cardiovascular portfolio ranging from Tapered Coronary DES, Bioresorbable Scaffold, Drug Coated Balloon & TAVR to tissue covered stent systems.

Commitment to Training and Education

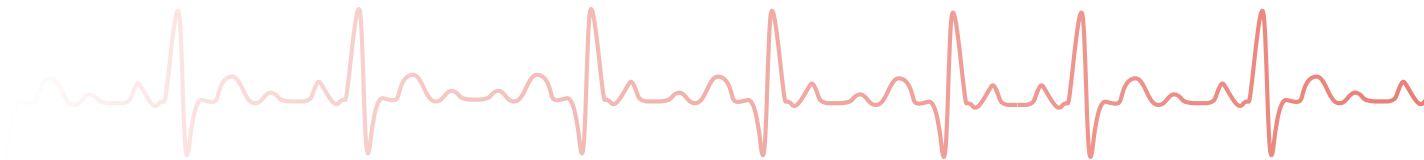
Meril has a strong commitment towards spreading awareness, imparting education and training of all our stake holders which range from patients to their care providers.

Meril Training Academy has a large campus spread over 100,000 sq. ft. at Vapi which allows sufficient room for doctors and para-medical personnel to be trained by global KOL faculty while using innovative and modern training modalities.

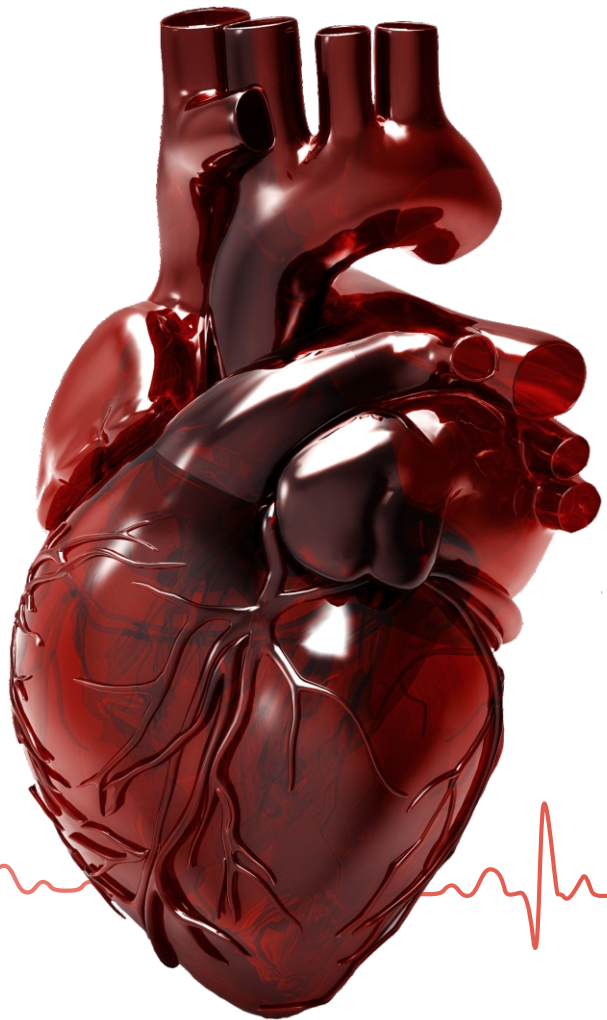


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MERIL CARDIOVASCULAR SUTURES



With an endeavour to expand its innovative solutions, Meril introduces a revolutionary Cardiovascular Suture Range. Designed together with cardiothoracic surgeons and made with the best-in-quality material at our World class facility, Meril Cardiovascular Sutures ensure eventless surgical outcomes in cardiac surgeries.

The Meril Cardiovascular Suture Range comprises some of the most preferred suture codes of Cardiovascular Surgeons. The broad gamut has more than 90 codes including those of **FILAPROP™** (Polypropylene), **FILAPROP™P** (Polypropylene with pledgets), **MERICRON XL™** (Polyester), **MERICRON XL™P** (Polyester with Pledgets) and **MERISTEEL™** (Steel) to meet all the cardiovascular surgical needs.

Advantages of Meril Sutures & it's packaging

LID

Adhesive-free and clipped in place, reduces contamination, tugging and tangling of the suture.

Larger LMT Design

Fewer turns allow, even less memory than other marketed sutures.

Longer length

45 to 90 cm ranges in lengths provides longer suture strand in comparison to other sutures in the market.

Needle Park

For added needle security.

LID Design

Fewer particulates than paper cards, reducing the chance of surgical site contamination due to particulate matter.

Trusted Brand

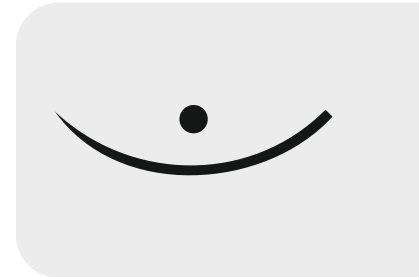
Offering great quality products, manufactured in world class facilities and backed with CE and USFDA certifications.



NEEDLE DESCRIPTION & SPECIFICATIONS

Round Body Needle:

These are needles with round bodies, and can either have sharp or blunt points. These round-bodied needles pierce and spread the tissues with minimal cutting. They are used in easily penetrated tissues like the peritoneum and abdominal viscera. This type of needle is also used in internal anastomosis to prevent leakage. Round bodied needles are manufactured with different wire diameters and in different size according to tissue to be sutured. For soft tissue small fine size and fine diameter needles are used, while for tissues like muscle or fascia, heavy wire diameter needles are used.



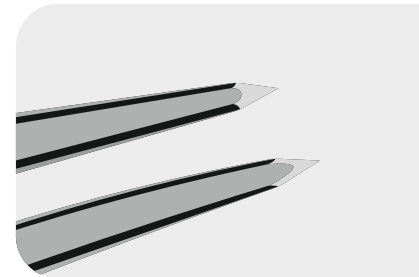
Taper Point Needle:

Taper needles are used for tissue that is easy to penetrate, such as bowel or blood vessels. This needle profile is specially designed to provide easy penetration of intended tissues. Taper point needles are found in different wire diameters range and fine size diameter needles are also available. Fine diameter needle can be used for soft tissue in vascular procedures, while heavy diameter needles are used for tough tissue such as muscles.



Taperpoint Plus Needle:

Taper point plus is modified point profile needle, small round bodied with sizes between 20-30mm. The tapered cross section immediately behind the tip has been flattened to an oval shape rather than a conventional round shape. This continues for several millimetres before merging into the conventional round bodied cross section. This design was developed to help facilitate improved separation of tissue layers.



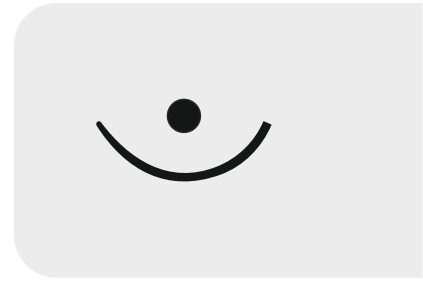
V-black Needle:

These needles are specially designed to provide outstanding visibility against tissue and where blood is present in operating field. V-black needle is specially designed in slim taper point which provides improved penetration properties and minimises tissue trauma.



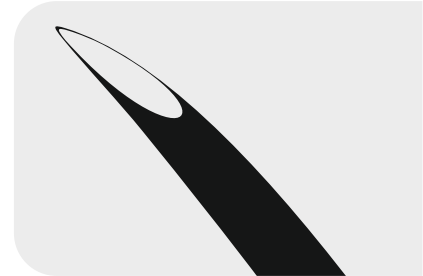
Blunt Point Needle:

Blunt point needles are not sharp like hypodermic needles. These needles are similar to a small tube for insertion into a duct or IV to transfer medications. Sometimes specially designed Blunt point needles are used for insertion into a body cavity or blood vessel. This needle specially designed to minimise the risk of needle stick injury. This needle is sharp enough to penetrate fascia and muscle but not skin. This needle is also used for suturing friable tissue such as liver.



C2 Needle:

The cutting needle has a triangular point and it has a cutting edge. The unique point design of CC needle provides significantly improved penetration properties for cardiac/vascular surgery, when suturing tough, calcified vessels. This is achieved with no increase in tissue trauma compared to the conventional round bodied needle. Square body geometry, in addition to this makes it a stronger fine vascular needle, also this needle is particularly secure in the needle holder.



Taper Cut Needle:

Taper needles are used for tissue that is easy to penetrate, such as bowel or blood vessels. This needle combines the initial penetration of a cutting needle with the minimized trauma of a round bodied needle. The cutting tip is limited to the point of the needle, which then tapers out to merge smoothly into a round cross section.



Cutting Needles

Cutting needles are required wherever fibrous or dense tissue needs to be sutured.

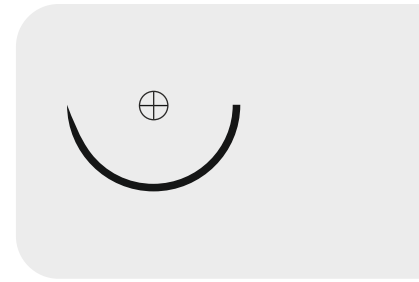
Reverse Cutting Needle:

The reverse cutting needles is similar to conventional cutting needle, except that the cutting edge faces down instead of up. This may decrease the likelihood of suture pulling through tissue. Reverse cutting needles have more strength than cutting needles, and reduces the risk of cutting through tissue. The body of this needle is triangular in cross section, having apex cutting edge on the outside of the needle curvature. This improves the strength of the needle and particularly increases its resistance to bending.



Trocar Point Needle:

Based on the traditional Trocar point needle, this needle has strong cutting head which then merges into a robust round body. This type of needle usually has heavy diameter and it is used on tough muscles. This is similar to the taper cut but with a cutting edge. The design of the cutting head ensures powerful penetration, even in deep and dense tissue.



Flash Point Needle:

These types of needles are specially designed with an exclusive needle tip design. The cross sectional geometry of the needle tip reduces the angles of the cutting edges which gives improved penetration and control. A square body of the needle greatly increases the strength and offers improved stability of the needle holder. It is ribbed for better gripping capacity during suturing. This flash point needles are available either with reverse cutting or conventional cutting profile.



Round body needle, recommended for blood vessels



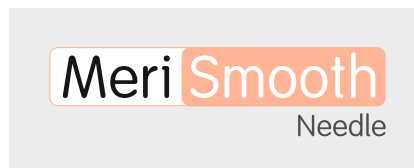
Round body/ Trpercut needle with black finish for enhanced visibility under glaring OT lights



Trpercut needle, for tough, difficult-to-penetrate tissues



Round body / Spatulated needle for finer surgeries



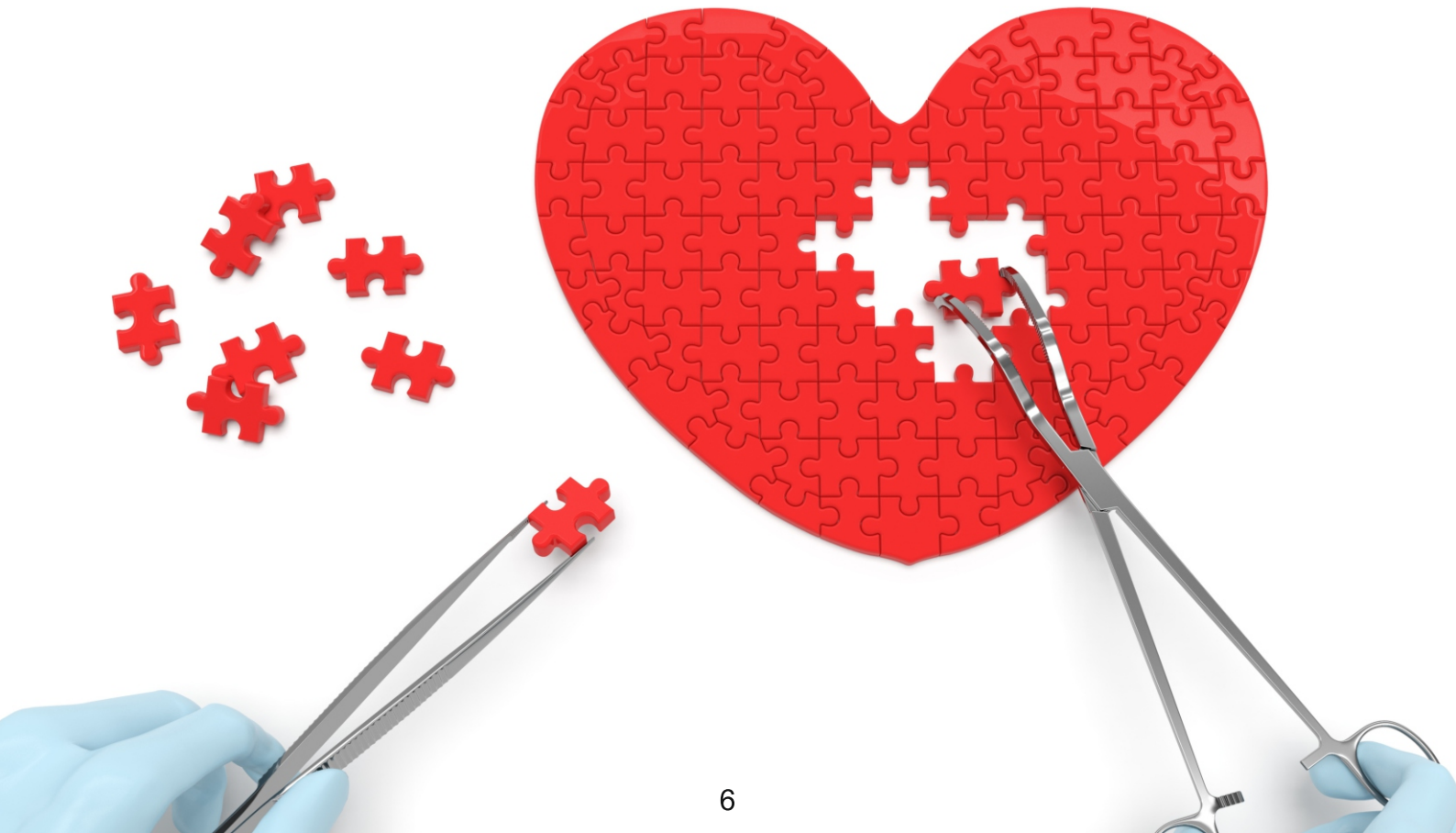
For easy penetrations pass after pass



Needle tip with cross sectional geometry giving improved penetration and surgical outcome

VALVE
REPLACEMENT

Strength And Consistency,
Delivered



MERICRON XL™ polyester suture is a non absorbable synthetic braided suture made of poly (ethyleneterephthalate). Its high quality material combined with precise braiding mechanism nearly eliminates the occurrence of post - operative suture fragments in the tissue.

MERICRON XL™ Polyester



MERICRON XL™ P Polyester with Pledgets (Coated with Beeswax / Silicon)



Mericron XL P sutures come with specialized Oval Shaped pledgets to minimize the tissue trauma.

Advantages

- Better strength
- Pliable structure
- Less resistance to knot sliding
- Smoother suture surface

Indications

Cardiac Valve Repair and Replacement
Cannulation
Sternum Closure

PRODUCT SPECIFICATIONS

Composition : Polyester

Structure : Braided

Colour : Green / White

Sizes : USP 6-0, 5-0, 4-0, 3-0, 2-0, 0, 1, 2 and 5

Suture Lengths (cm) : 45, 75, 76, 90 and 100

Needle Dimensions & Profiles : A variety ranging from 8 mm to 55 mm with round body, reverse cutting, tapercut and spatulated profiles and tapercut profiles

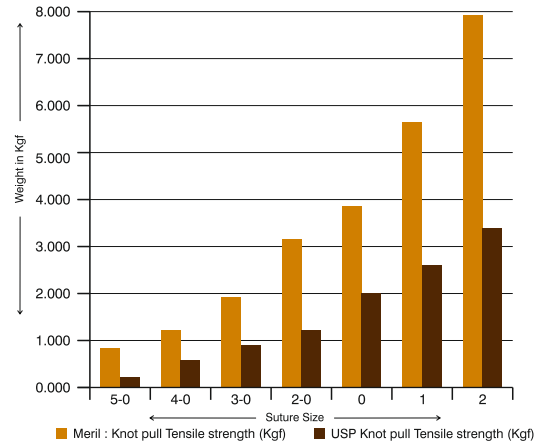
Pledget Shape & size (for pledgeted codes) : Oval; 6mm x 3mm x 1.5 mm and 3 mm x 3mm x 1.5

Mericon XL has a rough surface which is ideal for knot holding, making it an excellent ligature. Its material is inert and is classed as a permanent suture. It does not hydrolyze or fragment.

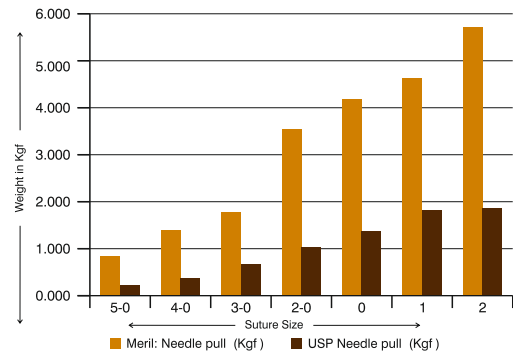
Following studies were performed at the Meril Plant, where the Mericon XL properties were compared with USP standards for the suture properties, required for USFDA approvals.

Studies prove that Mericon XL has excellent knot pull tensile strength as compared to USP standards, as well as exceptional Needle pull value as compared to USP requirements.

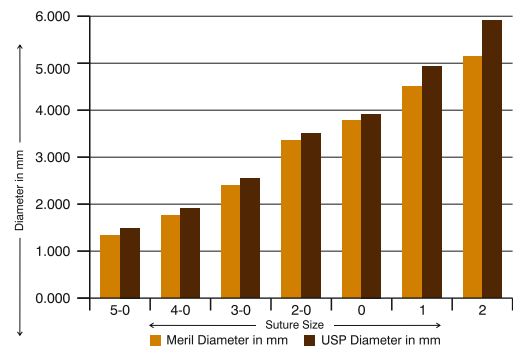
Suture Size	Meril : Knot pull Tensile strength (Kgf)	USP Knot pull Tensile strength (Kgf)
5-0	0.747	0.400
4-0	1.278	0.600
3-0	1.810	0.960
2-0	3.465	1.440
0	3.915	2.160
1	5.717	2.780
2	8.067	3.520



Suture Size	Meril: Needle pull (Kgf)	USP Needle pull (Kgf)
5-0	0.897	0.230
4-0	1.586	0.450
3-0	1.866	0.680
2-0	3.557	1.100
0	4.201	1.500
1	4.815	1.800
2	5.522	1.800



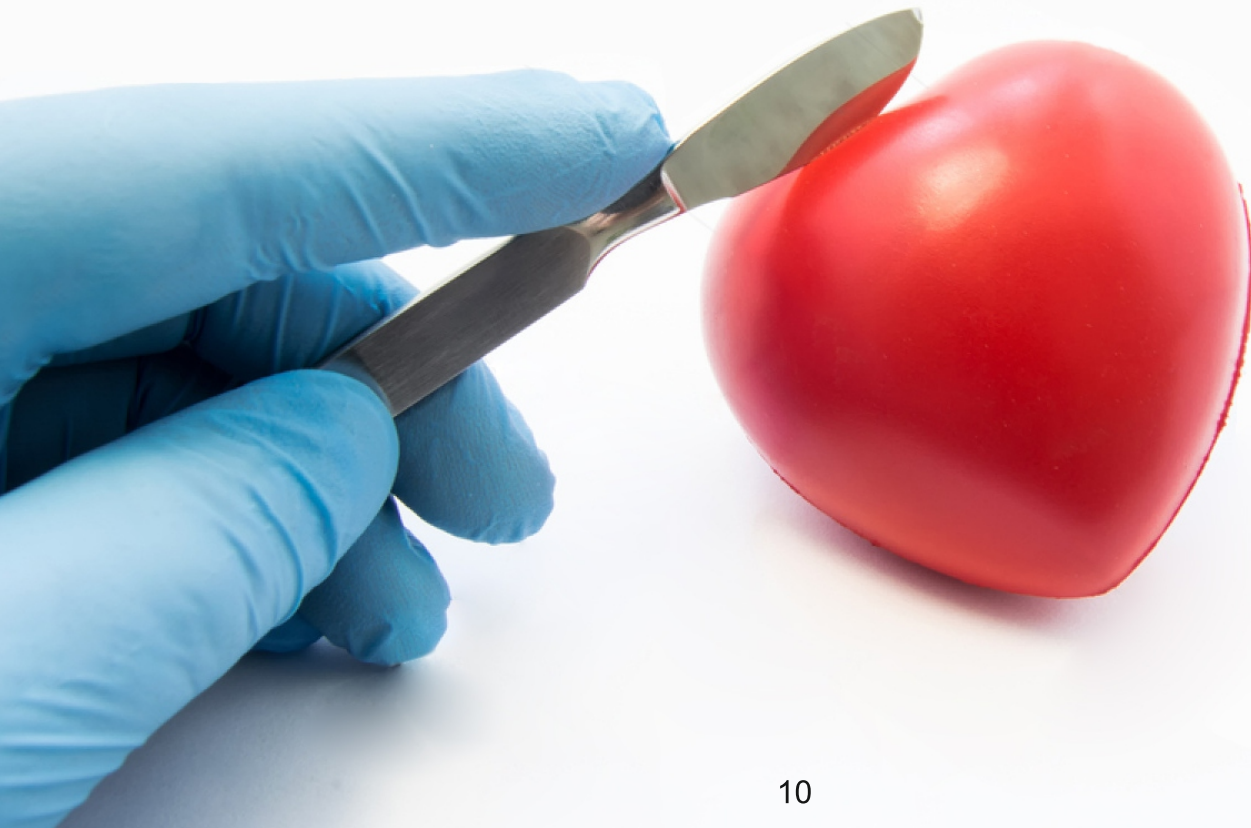
Suture Size	Meril Diameter (in mm)	USP Diameter (in mm)
5-0	0.139	0.149
4-0	0.184	0.199
3-0	0.234	0.249
2-0	0.327	0.349
0	0.382	0.399
1	0.457	0.499
2	0.525	0.599



PROCEDURE	SITE OF CLOSURE	PRODUCT	COMMONLY USED CODES
Mitral Valve	Aortic Cannulation	FILAPROP 3-0	PPL30 8522
	Venous Cannulation	FILAPROP 4-0	PPL40 8935
	Cardioplegia Cannulation	FILAPROP 3-0	PPL30 8522
	Pericardial Hitching	FILASILK 1-0	SLK10 824R
	Valve Sutures	MERICRON XL P 2-0	MME6577MP
	LA Closure	FILAPROP 3-0	PPL30 8522
	Pericardium Closure	FILAPROP 2-0	PPL20 844
	Sternal Closure	MERISTEEL 6	STC654
	Skin Closure (Chest)	FILAPRON 3-0/MIRUS Skin Stapler	PCL30 1326U / MSSP35
	Hand/Leg Wound Closure (Hand/leg)	MITSU /MIRUS Skin Stapler	PGN012421 / MSSP35
Clips	MIRUS MLT 100	MLT 100	
PROCEDURE	SITE OF CLOSURE	PRODUCT	COMMONLY USED CODES
Aortic Valve	Aortic Cannulation	FILAPROP 3-0	PPL30 8522
	Venous Cannulation	FILAPROP 4-0	PPL40 8935
	Cardioplegia Cannulation	FILAPROP 3-0	PPL30 8522
	Pericardial Hitching	FILASILK 1-0	SLK10 824R
	AS/VS Closure	FILAPROP 5-0	PPL50 8803
	RA/LA Closure	FILAPROP 4-0	PPL40 8557
	Pericardium Closure	FILAPROP 2-0	PPL20 844
	Skin Closure	FILAPRON 3-0/MIRUS Skin Stapler	PCL30 1326U / MSSP35
	Umbilical Cotton Tape	UCT76	UCT76
	Bonewax	Bw810	Bw810

CABG

When minimal tissue
damage and elasticity
is a priority



FILAPROP™ Polypropylene suture is a non-absorbable synthetic monofilament suture made of an isotactic crystalline stereoisomer of polypropylene, a synthetic linear polyolefin. The suture is pigmented blue for enhanced visibility. **FILAPROP™** is offered in less memory tray (LMT) as well as in long folders to minimize the memory effect.

FILAPROP™
Polypropylene Suture

FILAPROP™ P
Polypropylene with Pledgets



Advantages

- Unsurpassed strength
- Optimal elasticity and elongation properties
- Smooth passage through tissue
- Minimal acute inflammatory reaction in tissues
- Available in Less Memory Tray (LMT)

Indications

Cardiovascular Procedures

- Distal and Proximal Anastomoses
- Atrial Septal Defect(ASD)
- Ventricular Septal Defect(VSD)
- Cannulation

Peripheral vascular Procedures

- A/V Fistula
- Carotid Endarterectomy

PRODUCT SPECIFICATIONS

Composition : Polypropylene

Structure : Monofilament

Colour : Blue

Sizes : USP 8-0,7-0, 6-0, 5-0, 4-0, 3-0 and 2-0

Suture Lengths (cm) : 45,60,70,75,and 90

Needle Dimensions & Profiles : A variety ranging from 6 mm to 26 mm with round body and tapercut profiles

Pledget Shape & size (for pledgeted codes) : Oval; 3mm x 3mm x 1.5 mm

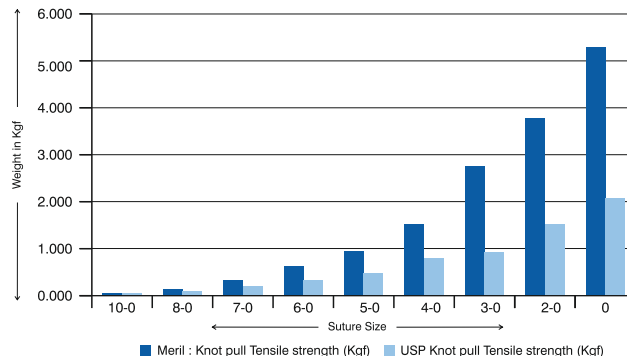
Filaprop Suture is exceptionally smooth, passes through tissue with little resistance.

In case of vascular surgeries , minimal tissue drag is crucial. In case of significant tissue drag, there are chances of Adventetia to be pulled in the vascular lumen , leading to thrombosis.

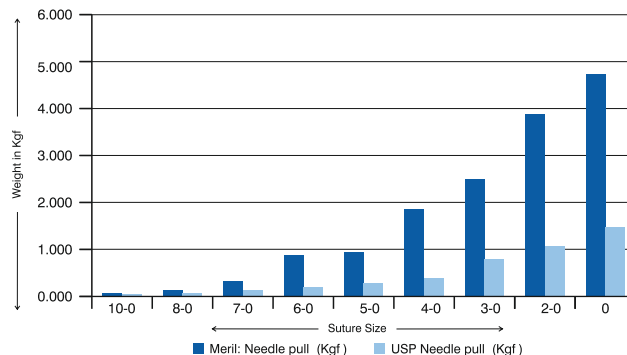
Thus Filaprop is the material of choice, which has minimal or no tissue drag due to its smooth surface.

Following studies were performed at the Meril Plant, where the Meril Filaprop properties were compared with USP standards for the suture properties, required for USFDA approvals.

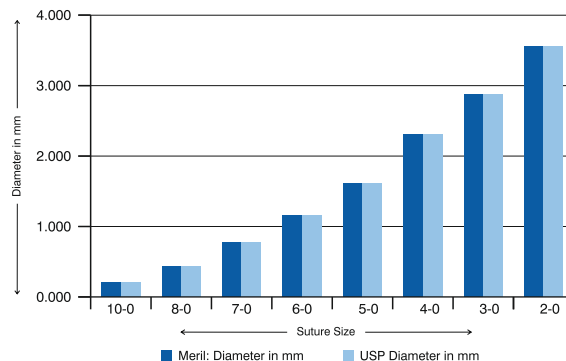
Suture Size	Meril : Knot pull Tensile strength (Kgf)	USP Knot pull Tensile strength (Kgf)
10-0	0.035	0.019
8-0	0.103	0.060
7-0	0.210	0.110
6-0	0.653	0.200
5-0	0.972	0.400
4-0	1.618	0.600
3-0	2.620	0.960
2-0	3.876	1.440
0	5.306	2.160



Suture Size	Meril: Needle pull (Kgf)	USP Needle pull (Kgf)
10-0	0.026	0.014
8-0	0.119	0.050
7-0	0.226	0.080
6-0	0.881	0.170
5-0	0.967	0.230
4-0	1.837	0.450
3-0	2.501	0.680
2-0	3.945	1.100
0	4.609	1.500



Suture Size	Meril: Diameter (in mm)	USP Diameter (in mm)
10-0	0.023	0.023
8-0	0.043	0.043
7-0	0.072	0.072
6-0	0.139	0.139
5-0	0.165	0.165
4-0	0.224	0.224
3-0	0.294	0.294
2-0	0.368	0.368



PROCEDURE	SITE OF CLOSURE	PRODUCT	COMMONLY USED CODES
On Pump	Aortic Cannulation	FILAPROP 3-0	PPL30 8522
	Venous Cannulation	FILAPROP 4-0	PPL40 8935
	Cardioplegia Cannulation	FILAPROP 3-0	PPL30 8522
	Pericardial Hitching	FILASILK 1-0	SLK10 824R
	Proximal Anastomosis	FILAPROP 6-0	PPL60 8726
	Distal Anastomosis	FILAPROP 7-0	PPL70 8704
	Pericardium Closure	FILAPROP 3-0	PPL30 825
	Sternal Closure	MERISTEEL 6	STC654
	Skin Closure (Chest)	FILAPRON 3-0/MIRUS Skin Stapler	PCL30 1326U / MSSP35
	Hand/Leg Wound Closure	MITSU /MIRUS Skin Stapler	PGN012421/MSSP35
	Clips	MIRUS Liga Clips	MLT 100
	Umbilical Cotton Tape	UCT76	UCT76
	Bonewax	Bw810	BW810
PROCEDURE	SITE OF CLOSURE	PRODUCT	COMMONLY USED CODES
Beating Heart	Pericardial Hitching	FILASILK 1-0	SLK10 5332
	Proximal Anastomosis	FILAPROP 6-0	PPL60 8726
	Distal Anastomosis	FILAPROP 7-0	PPL70 8704
	Pericardium Closure	FILAPROP 3-0	PPL30 825
	Sternal Closure	MERISTEEL 6	STC654
	Skin Closure (Chest)	FILAPRON 3-0/MIRUS Skin Stapler	PCL30 1326U / MSSP35
	Hand/Leg Wound Closure	MITSU /MIRUS Skin Stapler	PGN012421/MSSP35
	Clips	MIRUS MLT 100	MLT 100
	Umbilical Cotton Tape	UCT76	UCT76
	Bonewax	BW810	BW810

WOUND CLOSURE
CARE

When Seamless wound
approximation is the Goal.



MERISTEEL™ suture is a non absorbable monofilament suture composed of 316LVM stainless steel. It is indicated for use in sternum closures.

MERISTEEL™

Steel Suture



Advantages

- Exceptional tensile strength
- Excellent tissue compatibility

Indications

- Sternum closure

PRODUCT SPECIFICATIONS

Composition : Stainless Steel

Structure : Monofilament

Colour : Silver / Steel

Sizes : USP 1, 2, 4, 5, 6 and 7

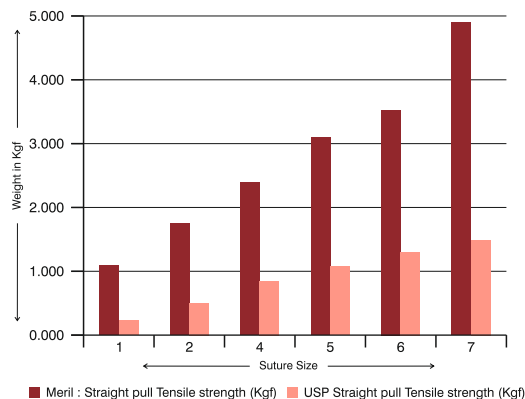
Suture Lengths (cm) : 45 and 75

Needle Dimensions & Profiles : A variety of 44mm and 48 mm with blunt point and cutting profiles

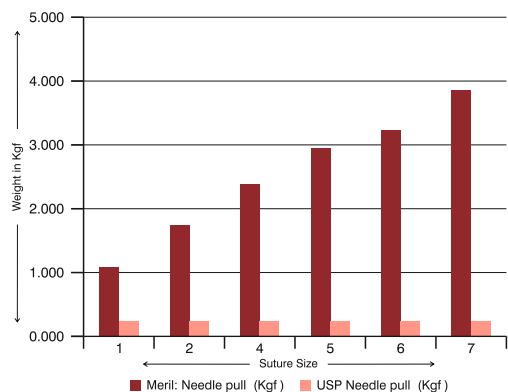
Meristeel surgical Sutures are highly flexible, with high tensile strength, minimal tissue reactivity and it holds knots well. Meristeel wire suture is used in places where strength is critical, thus is the suture of choice in Sternal closures.

Following studies were performed at the Meril Plant, where the properties were compared with USP standards for the suture properties, required for USFDA approvals.

Suture Size	Meril : Straight pull Tensile strength (Kgf)	USP Straight pull Tensile strength (Kgf)
1	12.04	4.76
2	17.852	5.90
4	24.03	9.11
5	31.57	11.40
6	36.76	13.60
7	49.62	15.90



Suture Size	Meril: Needle pull (Kgf)	USP Needle pull (Kgf)
1	11.87	1.800
2	18.08	1.800
4	24.51	1.800
5	30.265	1.800
6	32.64	1.800
7	39.3	1.800



Meril has introduced the LASER welding Technology for attaching the Meristeel needle to the Suture.

- The Laser welding has much better needle pull strength as compared to the Leading Competitor where Channel Swaging is used.
- LASER welding helps to create a uniform swage surface at the attached point, thus also prevents tissue damage while suturing.
- LASER welding is performed for Needles of sizes 2 and above(2, 3, 4, 5, 6 and 7)

BRAND	CODE	SIZE	NEEDLE PULL (KGF)			SWAGING TYPE
			MIN	MAX	AVG	
ETHICON	M649	6	38.742	39.799	38.038	CHANNEL
MERIL	STC654	6	43.307	45.328	42.281	LASER WELDING

MITSU™

Polyglactin 910 Suture

Features

- Skin closure (intracutaneous, subcutaneous)
- Gastrointestinal procedures
- Gynaecology / Obstetric procedures
- Ophthalmic procedures
- Orthopedic procedures
- Urology procedures
- Ligatures



FILAXYN™

Polydioxanone Suture

Features

- Pediatric sternum closure
- When prolonged wound support is desirable
- Abdominal wall closure
- Orthopedic procedures
- Oncological procedures



FILAPRON™

Poliglecaprone 25 Suture

Features

- When short wound support is desirable
- Skinclosure (intracutaneous, subcutaneous)
- Ligatures



BONEWAX™

FEATURES

- Ivory white
- Intended to aid mechanically in the control of bleeding of bone injuries, whether attributable to trauma or surgical intervention.
- It is composed of refined beeswax with a softening agent added and is supplied sterile in thin sheets.
- It is opaque and has a waxy odor.



MERIZELLE™

Oxidized Regenerated Cellulose

Features	Benefits
Rapid in Action	Achieves Hemostasis in 2-5 minutes
Anti-Adhesive	Does not interfere with instrument handling and tissue healing
Adaptable	Applicable for various tissue thicknesses and surgery sites
Absorbable	Within 1-2 weeks if left in place; may be removed prior to closure (at a surgeon's discretion)



MIRUS™ Skin Stapler

FEATURES

- Easy skin penetration
- Minimal cross-hatching marks
- Outstanding performance across wider wounds

