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TRENT
Revision Stem System

Meril
Healthcare



**World's First
Modular Revision
Stem System**

More to Life

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.

We share an enduring perseverance to advance healthcare solutions, for more patients to live longer and healthier lives. We have a strong commitment towards R&D and adhere to the best quality standards in manufacturing, scientific communication and distribution known today.

Established in 2006, Meril's launch was in line with the healthcare diversification plan of Bilakhia Group. Located in Vapi, 150km north of Mumbai, and ensconced within the serene hill-sides of Chala town, Meril sits proud in its ultra modern manufacturing facilities.

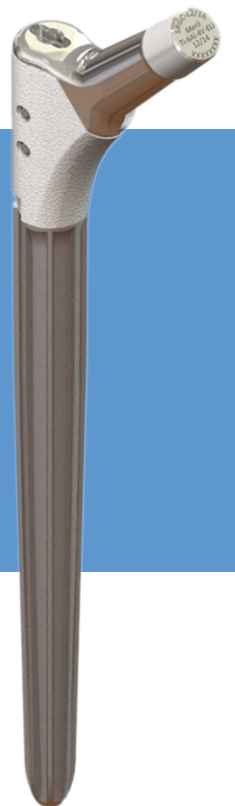
Where research becomes the basis for discovering new ways of alleviating human suffering and empowering an individual with good health



Philosophy And Design Rationale

Tapered Fluted Titanium (TFT) stems undoubtedly represent the future of femoral revision stems as they have been conclusively shown to have superior results in comparison to other designs. However, surgeons continue to have a dilemma in choosing between the monobloc option and the modular version TFT for a given clinical situation. Both types of TFT stems bring with them a unique set of advantages as well as disadvantages. TFT stems are easy to insert and have no risk of breakage but have a higher incidence of subsidence added with an inability to restore soft tissue tension in some cases. In contrast, modular ones are more resistant to subsidence and has a better scope to achieve soft tissue balance. However, they are more cumbersome to insert and have an intrinsic risk of breakage at the junction, especially if the proximal portion is left devoid of bone support. **The Meril TRENT stem is the 1st stem in the world to combine the advantages of the monobloc and modular TFT stems while potentially eliminating their disadvantages.**

The key design philosophy of **TRENT revision stem** is combining the advantages of **monobloc** and **modular** types of tapered titanium revision stems. The broad longitudinal ribs along the stem, supporting adhesion to the trochanter and is designed to be beneficial for both bony apposition and rotational stability.



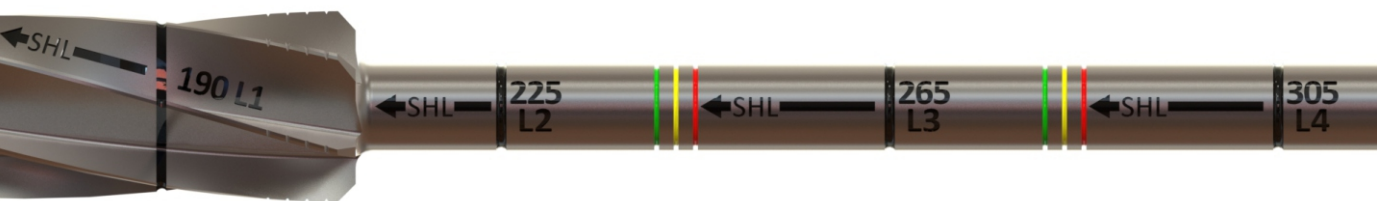
Salient Features

- Combines the advantages of monobloc and modular types of tapered titanium revision stems, while eliminating their respective disadvantages
- Lateralised design with 2.5° taper geometry giving an enhanced zone of scratch xation for a given segment of prepared bone
- 8-10 longitudinal ribs depending on size for additional rotational resistance and to increase the total host bone contact surface area
- HA coated neck to promote osteointegration with rounded shoulders to decrease soft tissue irritation.
- Availability of highly porous proximal femoral augments for the 1 time
- Two holes for wire attachment to trochanteric fragment
- Smaller sizes Ø12 & Ø13 to suit Narrow canal / Asian anatomy
- Expanded size matrix for all bone varieties and sizes
- Bevelled tip to accommodate bowed femoral bone

The TRENT stem is monobloc without any junctions has 3 unique features which enable it to harvest the advantages of both types of TFT stems

1. Shoulder Height level (SHL) and Bone Reference Mark (BRM):

The usage of these two technical concepts minimizes or completely eliminates the variation between the seating level of the trial stem during trialing and definitive prosthesis after nal impaction, thereby reducing the need for modularity. The SHL is marked on the reamers for different lengths of stems and is indicative of where the shoulders of the trial and definitive prosthesis will seat. As the shoulder of the prosthesis is in close proximity to the bone, precise matching of the reamer SHL and the shoulders of the trial definitive stems to the desired Bone Reference Mark (BRM) is possible. All current revision stem designs use the head centre as the reference level for the reamer, trial, and nal prosthesis. As the femoral head is spatially away from the bone, head height level in relation to bone cannot be estimated accurately giving rise to the need for modularity for precise soft tissue balancing.



2. Using offset specic trials and a two step reaming/ trialing process with a constant force stem applicator.

A two step preparation process has been described namely the PP reaming trialing and SS reaming /trialing. TRENT trials are designed to provide exact offset as that of the definitive implant over the entire size range. As a rst step, primary provisional (PP) reaming & trialing is done followed by secondary scratch t (SS) reaming trialing.(Table 1). This two step process is essential to eliminate the need for modularity in the last minute. The precision is further aided by the use of specially designed constant force stem applicators. Two stem applicators are provided, with the larger one designed for dense sclerotic bone and smaller one for weak osteoporotic bone. The constant force stem applicators deliver a constant, identical force at every application which is independent of surgeon related factors and is used for both the SS trial and definitive stems.

Table 1

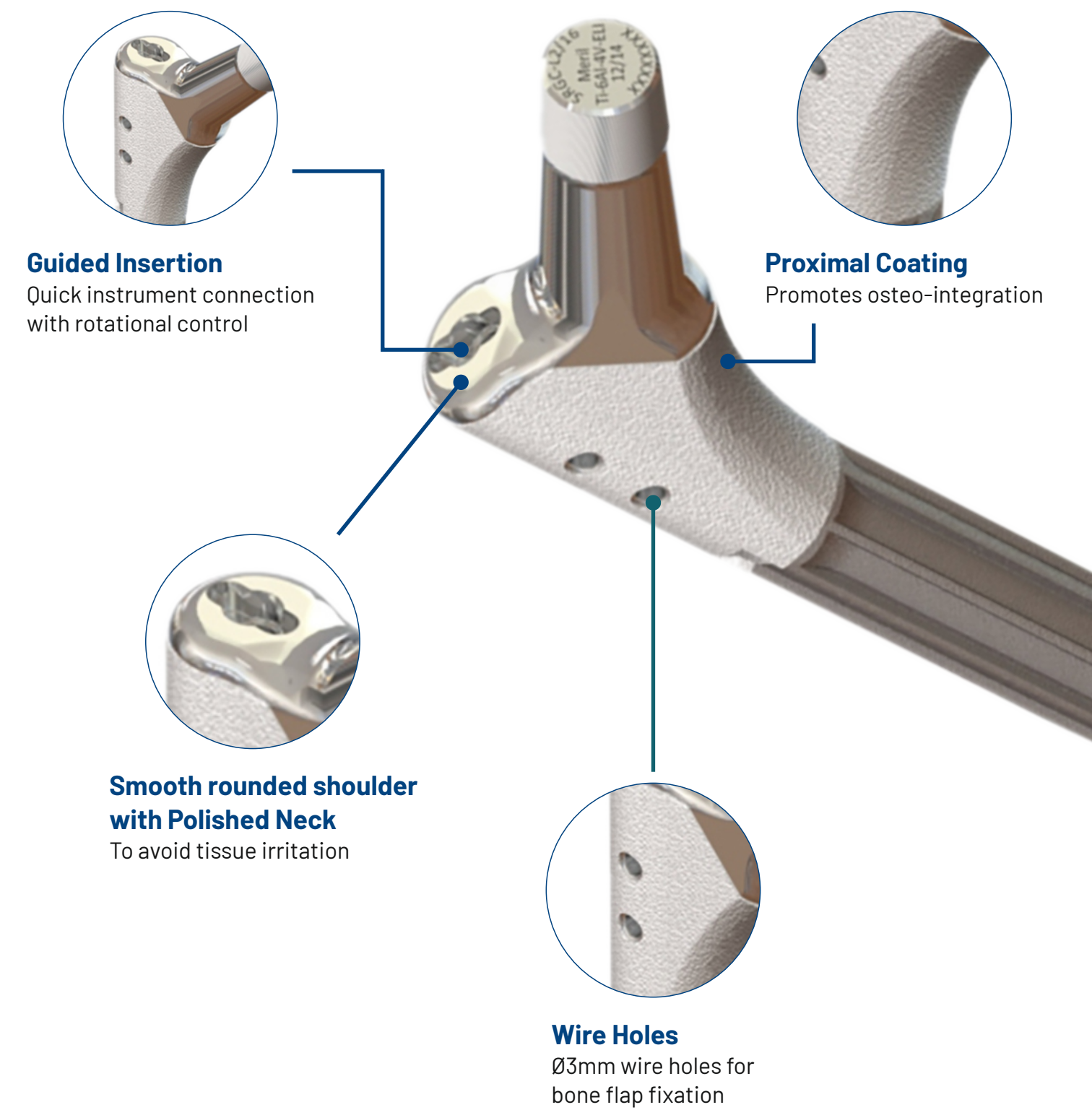
Primary Provisional (PP) reaming & trialing	Secondary Scratch fit (SS) eaming & trialing
- Reaming by hand - Reamer reference is the centre of head - Trial with offset different from the final prosthesis (1- 2 sizes lower) - Trial impaction with light mallet - Provisional stability obtained Aim is to establish soft tissue balance and Bone Reference Mark (BRM)	- Reaming by hand and power - Reamer reference is shoulder of prosthesis (SHL) - Trial with same stem size /offset of the final prosthesis used - Trial impaction with constant force applicator - Rigid scratch fit stability obtained Aim is to establish adequate scratch fit and fine tune balance making modularity redundant

3. Use of proximal femoral highly porous 3D printed augments:

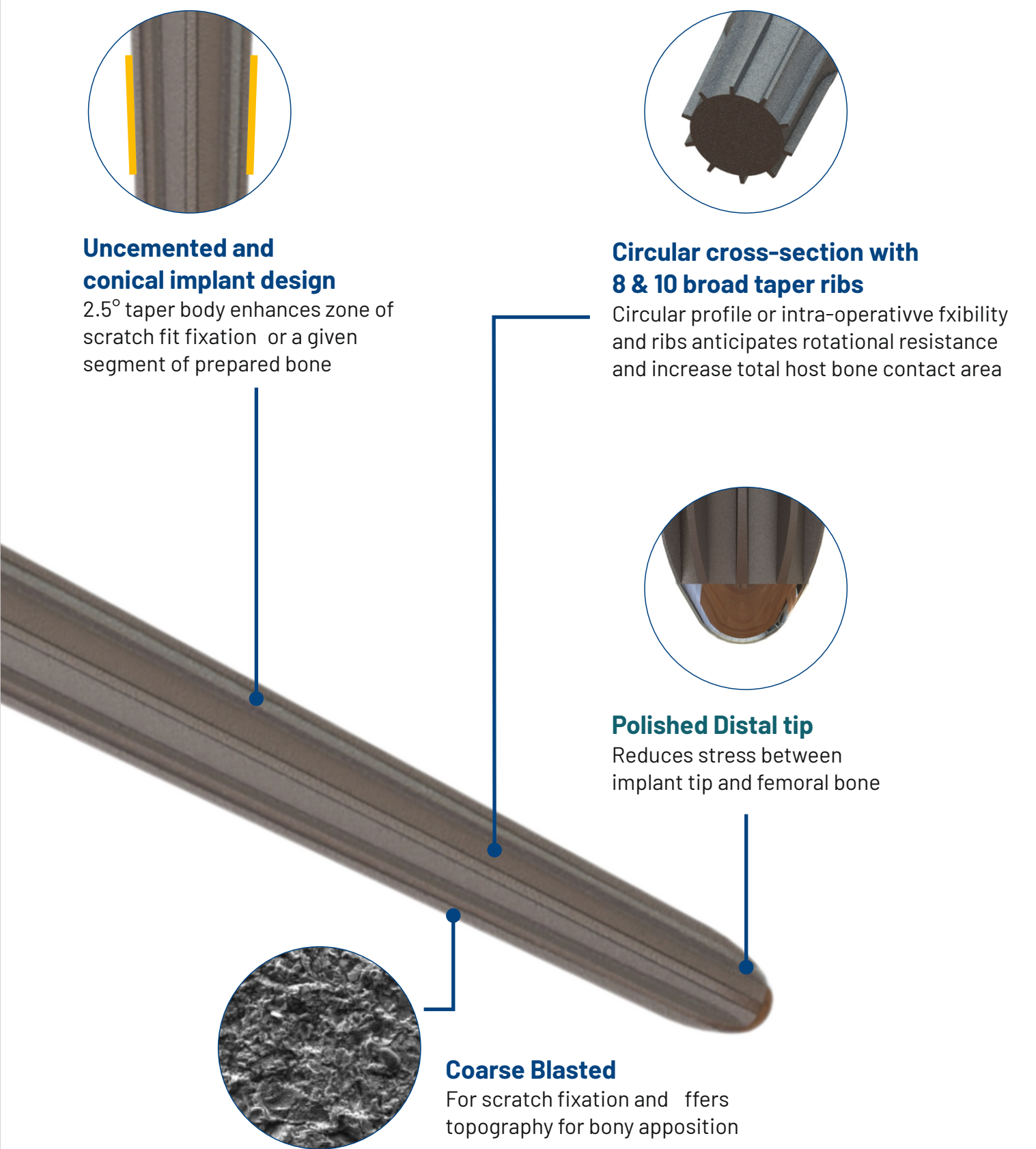
The proximal femoral augment is inserted after bone preparation done with the dedicated instruments provided. It is crucial that the augment is xed to the implant only after rigid impaction of the definitive prosthesis. The highly porous augment acts as a safety belt in cases for which the surgeon perceives a potential risk of subsidence which is anticipated to be required in about 30 of cases. The highly porous material of the augment has the same macrostructure as bone and this will achieve quick osteointegration, providing secondary resistance against subsidence. The highly porous augment will also offer additional help to unitize the trochanteric fragment with the stem if the trochanteric bone is of poor quality or fractured.



TRENT Specication & Features



TRENT Revision Stem constructed from Forged Titanium Alloy [Ti-6Al-4V-ELI] is lateralized design for optimum bio-mechanical construction.



TRENT Revision Stem has 2 Trays Revision System, which reduces the instruments compared to other competitive systems.

Meril TRENT size matrix

Meril's TRENT revision stems are available in 4 different length variants



Diametrical Sizes	Horizontal Offset with +0mm Head	Length			
		L1 190 mm	L2 225 mm	L3 265 mm	L4 305 mm
Ø12	40 mm	✓	*	N / A	
Ø13		✓	*		
Ø14	42 mm	✓	✓	✓	✓
Ø15		✓	✓	✓	✓
Ø16		✓	✓	✓	✓
Ø17		✓	✓	✓	✓
Ø18	44 mm	✓	✓	✓	✓
Ø19		✓	✓	✓	✓
Ø20		✓	✓	✓	✓
Ø21			✓	✓	✓
Ø22	46 mm		*	*	*
Ø23		N / A		*	*
Ø24				*	*
Ø25				*	*

Available variants for Meril's Revision Stem are marked with "✓"

" * " Marked sizes are available on special request

Notes :