Embedding considerations

Quick reference for Core range products

Co-process integration of bigHeads: generic process types

We refer to embedding as co-process integration; the embedded bigHead and the component materials are processed together within the principal manufacturing or forming process. This ensures the bigHeads are mechanically interlocked into the component material and eliminates the secondary operations associated with post-process fastener installation.

Open and bag lamination processes

Fibre reinforcement materials may need preparation to accommodate the embedded bigHead - this can often be included in cutting/ kitting operations

To avoid secondary operations or re-work, take care to fully seal the threaded sections against resin/ polymer ingress

Closed mould lamination processes

In closed-mould proceeses, part ejection direction and tooling design may prevent integration of bigHeads in certain orientations

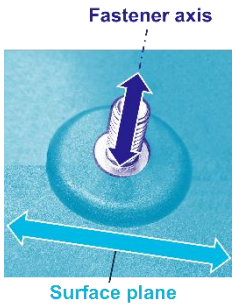
Over-patching of bigHeads is a convenient way to achieve embedment and mechanical interlock without disturbing fibre reinforcements of laminate materials

Closed moulding processes

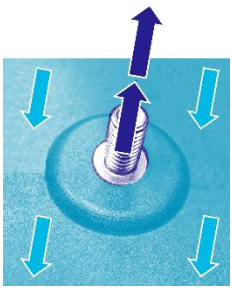
Core range products can be co-processed but may not represent the optimum overall solution, especially for closed-mould processes…

…so we invite you to contact us and ask about our Lean Moulding ® solutions if you are considering to embed/ co-process a bigHead

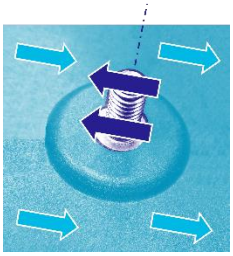
Generic loading considerations for embedded bigHeads



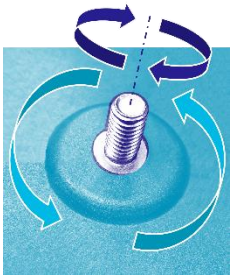
The terminology used to describe mechanical loading of embedded bigHeads may vary from other fasteners or fastening technologies



Tensile loading
Opposing forces acting perpendicular to the surface plane and along the fastener axis - expect 5 kN to 20 kN *depending on the bigHead & embedment material used*



Shear loading
Opposing forces acting parallel to the surface plane and perpendicular to the fastener axis - expect 3 kN to 20 kN *depending on the bigHead & embedment material used*



Torsion loading
Forces acting in opposing directions, rotating about the fastener axis - expect 5 Nm to 75 Nm *depending on the bigHead & embedment material used*
BE AWARE: this does not imply tightening torque capabilities

Embedding considerations

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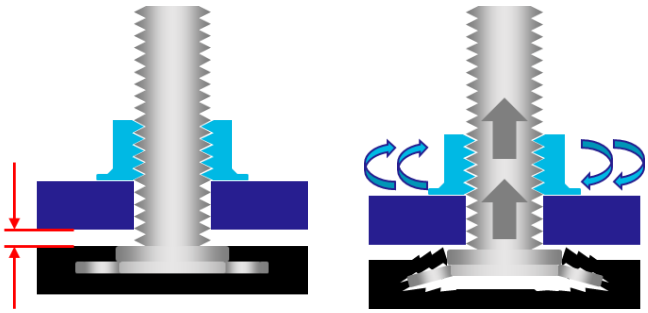
Critical issues and specific guidance topics for co-processing of bigHeads

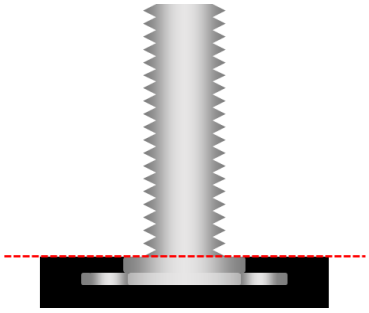
Beware of assembly gaps

The tightening forces generated during assembly can be enough to detach a bigHead from the component surface. To avoid this, especially in cases where there are gaps between the fastened components, ensure that tightening torques do not create resultant forces above loading capability of the embedment material or the bigHead.



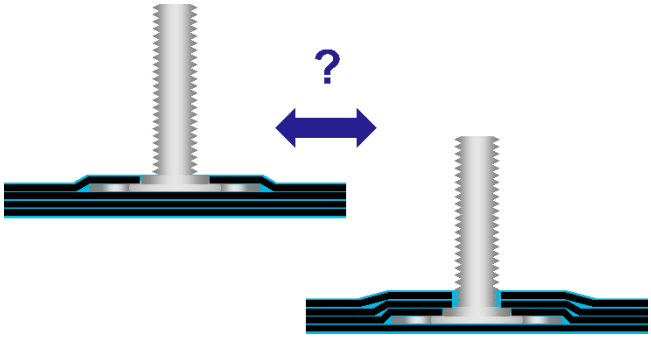
Material shut-off line

A material shut-off against the shoulder face on the bigHead can help ensure adjoining parts clamp against the metallic shoulder material of the bigHead - not the surrounding material. This reduces the chance of overloading the welded bigHead fixing/ Head joint during assembly tightening and can help prevent issues with creep relaxation of tightened assemblies.



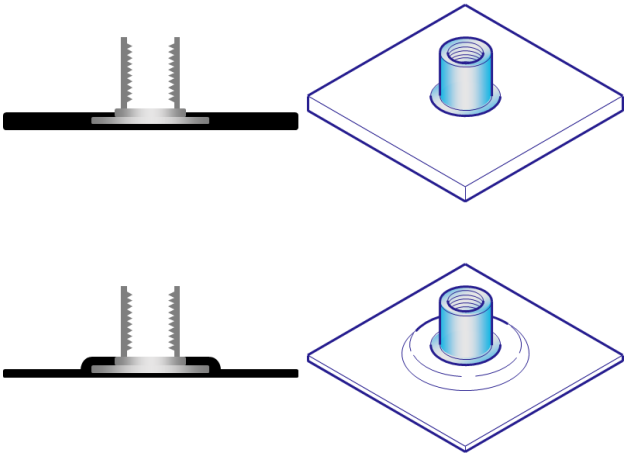
Embedment height effects

You will probably see the biggest benefit to deeper embedment of the bigHead in a tensile loading, or pull-out condition - in shear and torsion loading conditions, deeper embedment may not increase loading capability.



Embedding bigHeads into thick (>3 mm) or thin (<3 mm) section materials

With closed-mould processes, encapsulation of the head in a pocket of material is usually required for material thicknesses of 3 mm or less.



Be aware of electrical and galvanic corrosion implications

This is especially important when embedding bigHeads into materials with carbon reinforcement materials or pigments. If you need a non-metallic coating option, please contact us to discuss options.