BOSSARD
Proven Productivity

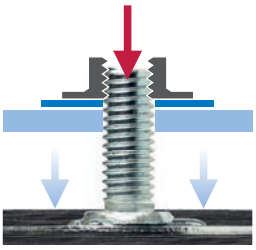
bigHead®

Critical assembly considerations

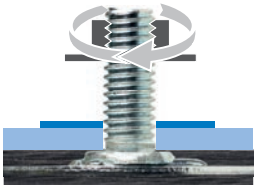
«every bigHead® is perfectly engineered.»

How do I create assemblies with bigHeads?

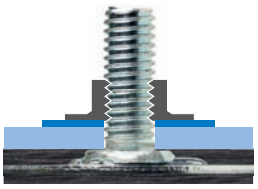
Embedded stud fixing bigHead on component



Adjoining component fitted over bigHead stud, retained by nut and washer

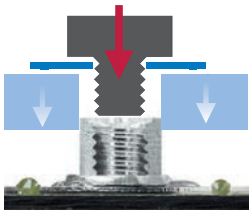


Nut tightened into bigHead stud to secure assembly



Completed assembly

Adhesively bonded collar fixing bigHead on component

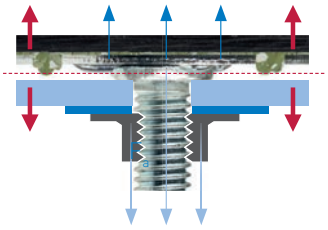


Adjoining component fitted over bigHead collar, retained by screw and washer

Screw tightened into bigHead collar to secure assembly

Completed assembly

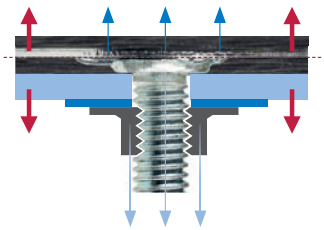
Why do I need to consider the assembly design and conditions?



Application loads: Adhesively bonded

- Opposing out-of-plane forces on component and adjoining part
- Tensile loading on bigHead welded joint

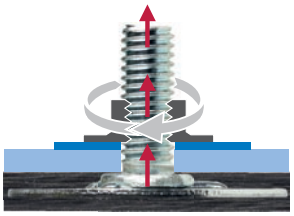
Loading and performance limitations are typically determined by the strength of the adhesive joint between the bigHead and the component, or the welded joint strength of the bigHead.



Application loads: Embedded bigHead

- Opposing out-of-plane forces on component and adjoining part
- Tensile loading on bigHead welded joint

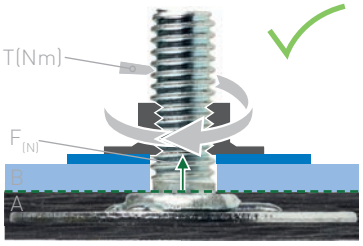
Loading and performance limitations are typically determined by the component material strength or the welded joint strength of the bigHead.



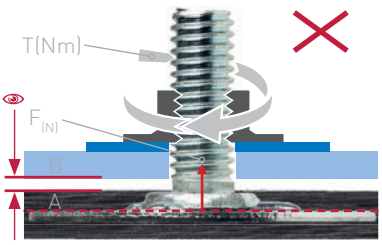
Assembly conditions and resultant loading
In the example assemblies above, tightening the parts together during assembly causes a resultant force within the bigHead - we call this "assembly load". Overleaf, we offer basic guidance on how assembly designs and conditions can affect loading within the bigHead. Please visit the Bossard website or contact us directly – we are happy to support!

Considering and managing the assembly conditions and resultant load paths is essential for avoiding failure of the bigHead or fastened components during assembly operations.

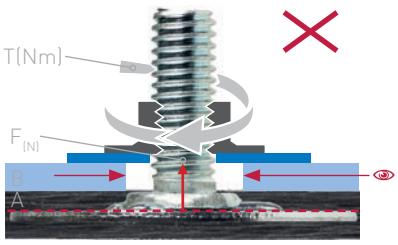
Assembly design awareness



Correct condition:
Adjoining component (B) meets shoulder and clearance hole is smaller than bigHead shoulderdiameter.



Incorrect conditions:
Gap between component with bigHead (A) and adjoining component (B).

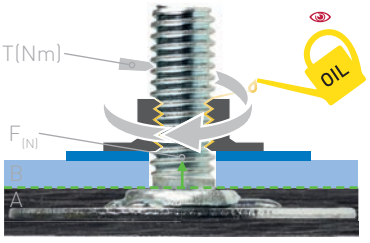


Clearance hole for stud fixing in adjoining component (B) is greater than **80~90% of bigHead shoulder** diameter.

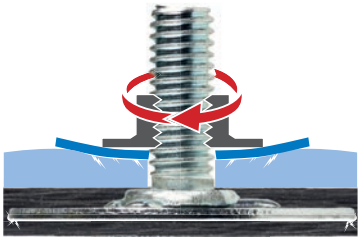
In the correct condition, tightening the nut with torque T (Nm) creates resultant force F (N), which clamps the adjoining part (B) against the fixing shoulder. **Optimum or maximum tightening torque T (Nm) for a given assembly design** is always dependent on the exact combination of bigHead product, additional fasteners (e.g. nut, bolt, washer), **component material and adjoining material, and should always be determined and validated by appropriate testing.**

Please always contact us for further information or advice about tightening torques and assembly testing. We are always happy to support you!

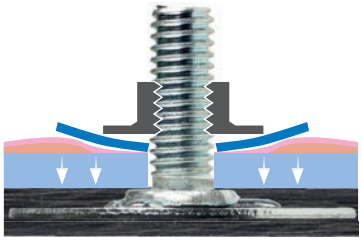
Factors that affect assembly design and assembly operations



Thread friction coefficient and presence of lubricants
Thread friction coefficients and presence of lubricants within the assembly will affect the transfer of radial forces (e.g. applied torque) into axial forces (e.g. resultant forces). Variations in the amount of force transfer may affect the applicability/ suitability of assembly parameters, e.g. tightening torque value, so it is important to always clarify thread friction coefficient values and determine whether lubricants are present within the assembly.



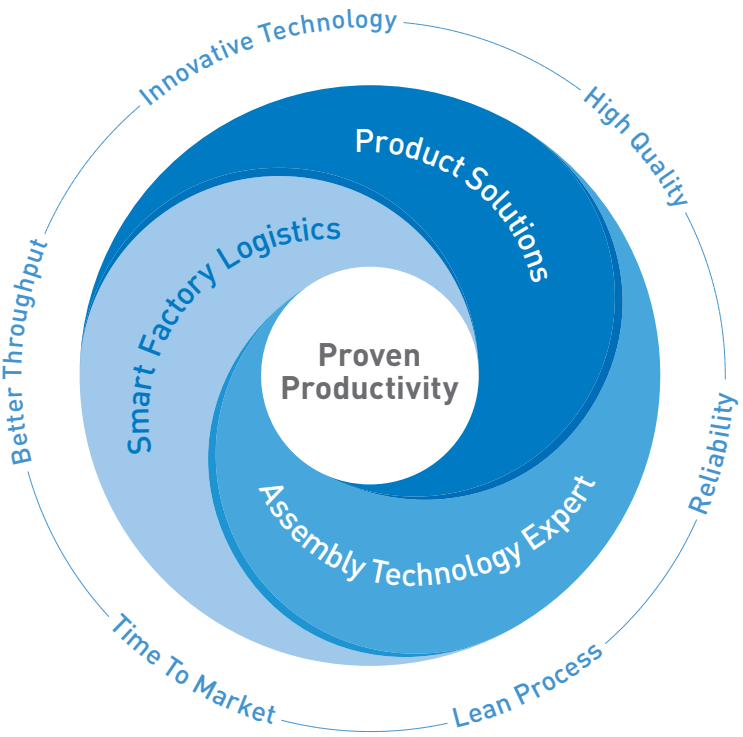
Compression of the assembly materials
Tightening operations on bigHead assemblies may create high levels of compressive clamp force on the assembly materials, with subsequent damage to or failure of the materials. Applications testing is typically required to determine clamp-load behaviour, and appropriate tightening parameters/ profiles for a given material and assembly configuration.



Creep relaxation within the assembly
Creep relaxation is a critical consideration if the materials within the assembly are susceptible to creep under compressive loading (e.g. thermoplastic polymers or polymer matrix composites). Especially if the adjoining component material is known to be susceptible to creep-relaxation, it is imperative to undertake appropriate testing to determine or qualify long-term assembly integrity expectations.

PROVEN PRODUCTIVITY – A PROMISE TO OUR CUSTOMERS

The strategy for success



From years of cooperation with our customers we know what achieves proven and sustainable impact. We have identified what it takes to strengthen the competitiveness of our customers. Therefore we support our customers in three strategic core areas.

Firstly, when finding optimal **Product Solutions**, that is in the evaluation and use of the best fastening part for the particular function intended in our customers' products.

Second, our **Assembly Technology Expert** services deliver the smartest solutions for all possible fastening challenges. Our services cover from the moment our customers developing a new product, to assembly process optimization as well as fastening technology education for our customers' employees.

And thirdly, optimising our clients' productions in a smart and lean way with **Smart Factory Logistics**, our methodology, with intelligent logistics systems and tailor-made solutions.

Understood as a promise to our customers, "Proven Productivity" contains two elements: Firstly, that it demonstrably works. And secondly, that it sustainably and measurably improves the productivity and competitiveness of our customers.

And this for us is a philosophy which motivates us every day to always be one step ahead.

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