BOSSARD
Proven Productivity

Torque and preload with friction scatter

Calculate tightening torque and preload for hex head and socket head screws.
The calculation considers friction scatter, tool accuracy and scatter on preload.

Based on VDI 2230:2014

Screw type

 Hex head
 Socket head

ISO 4014/ISO 4017

Clearance hole - ISO 273

Fine Medium Coarse

Mechanical properties of material, thread size and friction

Property class of screw	80	
Thread size	M 5	
Utilization of yield strength %	80	
Friction range		
Thread friction value	0.20	Lower
	0.35	Upper
Nut/bolt head friction value	0.20	Lower
	0.35	Upper

Tool precision

 Include tool precision ±2%

Data used in calculation

Yield strength Rp02	600	N/mm²
Thread pitch P	0.8	mm
Pitch diameter d2	4.48	mm

Root diameter d3	4.019	mm
Clearance hole dh	5.5	mm
Head bearing diameter dw	8.03	mm
Stress area As	14.2	mm^2

Results

Maximum tightening torque MA	6.9	Nm
Maximum preload FM	5.3	kN
Minimum preload FM	3.1	kN
Difference	43	%

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