

ONESIDE 10.9 / A490M M16 & M20 Critical Dimensions

Bolt Size and thread pitch	Required Hole dia (Z)	Min Pitch Length (X)	Distance to Flat Corner (Y)	Min Thickness of Material (W)	Across the flat dimensions of Nut	Bolt lengths available				
						45mm (1.77")	65mm (2.36")	75mm (2.95")	90mm (3.54")	250mm (9.84")
M16 x 2.0	24.0/24.5"	40.0	18.0	5.0	26.0/27.0	45mm (1.77")	65mm (2.36")	75mm (2.95")	90mm (3.54")	
M20 x 2.5	30.0/31.0	50.0	24.0	5.0	33.0/34.0	65mm (2.56")	95mm (3.74")	135mm (5.32")	165mm (6.50")	250mm (9.84")

Mechanical Properties

Bolt Size and thread pitch	Ultimate Stress (Mpa)	Yield Stress (Mpa)	Proof Stress (Mpa)	Hardness Range HRC	Shank Area in (mm ²)	Stress Area in (mm ²)	Core Shear Area in (mm ²)	Sleeve Shear Area in (mm ²)
M16 x 2.0	1040	940	830	32 - 38*	201	157	144	163
M20 x 2.5	1040	940	830	32 - 38*	314	245	225	280

*Hardness HRC specialized to ensure acceptance to ISO-898-1 (10.9) and ASTM 490

Bolt Size and thread pitch	Tensile Load *		Shear Across Shank*		Shear Across Threads*		Tightening Torque (Nm)
	Ultimate (kN)	Proof (kN)	Ultimate (kN)	Proof (kN)	Ultimate (kN)	Proof (kN)	
M16 x 2.0	163	130	131	90	94	65	270
M20 x 2.5	255	203	204	140	146	100	528

The following table summarises the maximum load carrying capacities (causing failure of the bolt) for the product. Shear data is given per shear plane based on ASTM A490M and international Structural standards

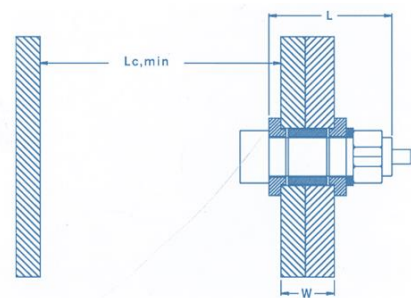
Bolt Size and thread pitch	Shear Across Standard Sleeve		Shear Across "Hi Shear" Sleeve	
	Ultimate (kN)	Proof (kN)	Ultimate (kN)	Proof (kN)
M16 x 2.0	84	61		
M20 x 2.5	144	104		

* Note that these values assume the breakage of the bolt achieved when the tube wall thickness is large. Otherwise the failure will be due to tearing of the tube wall which is dependent on the strength and thickness of the tube wall among other parameters.

** Tightening torques are based on 65% proof load and a nut factor of 0.2. These are suggestions only. Engineer must specify the desired tightening specifications as per the design.

Design Scope Hollow Section (cavity) installation

Bolt Size and thread pitch	Bolt Length in MM	Range of Joint Thickness (W)	ONESIDE STANDARD Cavity Length Required (Lc, Min)	ONESIDE TC Cavity Length Required (Lc, Min)
M16 x 2.0	45	5-10	135	146
	65	5-25	150	161
	75	20-40	165	176
	90	35-55	180	191
M20 x 2.5	65	5-20	190	202
	95	5-50	220	232
	135	20-90	260	272
	165	55-120	290	302
	250	120-211	400	412
M24 x 3.0	95	10-50	225	240
	135	35-90	265	280
	165	45-120	295	310
	195	75-150	325	340



The ONESIDE™ structural blind fastening system requires a minimum length of cavity space (Lc,min) available behind the joint. This is governed by the joint thickness / grip length (W) and the Bolt Length (L). Bolt length is measured from under head to the end of the thread as shown in the figure (spigot not included). The following table provides the available range of joint thickness / grip length (W) and the minimum cavity length required for each bolt size.