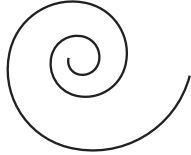


### WORKING DEFINITIONS

**TORQUE** : The energy taken to twist the nut up the thread of the bolt (Measured in Nm).

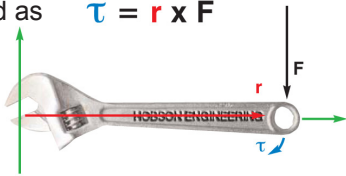


Torque is not used as a measure for the tensioning of structural bolting. Bolt torque values are not shown in AS4100.

Mathematically,

torque can be defined as

$$\tau = r \times F$$



**TENSION** : The force generated in the bolt to clamp the steel plies together (Measured in kN).



**Structural Bolts Installation**

#### AS1252 STRUCTURAL ASSEMBLIES Class 8.8 - Minimum Bolt Tension

Nominal Size	Pitch	Minimum Bolt Tension Kn
M12	1.75	51
M16	2.0	95
M20	2.5	145
M22	2.5	180
M24	3.0	210
M27	3.0	270
M30	3.5	335
M36	4.0	490

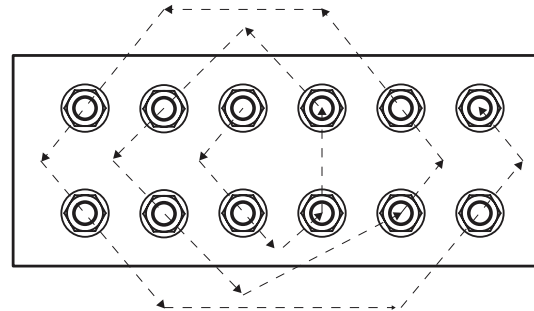
Note: the minimum bolt tension shown (AS4100-1998) is approximately equivalent to the minimum proof loads shown in AS1252-1996.

### SNUG TIGHT

Prior to final tensioning of structural bolts the steel plies must be brought into effective contact. This is referred to as Snug-tight. i.e. no gap between the steel plates. Snug-tight can be achieved by a few impacts of an impact wrench or by the full effort of a person using a standard podger spanner. Correct bolt tension is required to ensure effective load transmission on the joint. Effective load transmission will not be achieved if a gap between the steel plates remains, which can occur if there is deformation from welding.

### TIGHTENING PATTERN

Snug-tightening and final tensioning of the bolts in a connection shall proceed from the stiffest part of the connection towards the free edges. An example interpretation of a systematic pattern for tightening is provided:



### DELIVERY STORAGE & HANDLING

Structural bolt assemblies supplied to AS1252-1996 must be stored in the manufacturers carton protected from wet weather. White rusting on the galvanised surface, dust and removal of the water soluble lubricant on the nut can severely effect installation and correct tensioning.

### RE-USE OF STRUCTURAL ASSEMBLIES

Under no circumstances can a structural bolt which has been fully tensioned (i.e. the minimum values shown above) be re-used. If a bolt has been tensioned and then has to be removed it must be marked accordingly and destroyed.