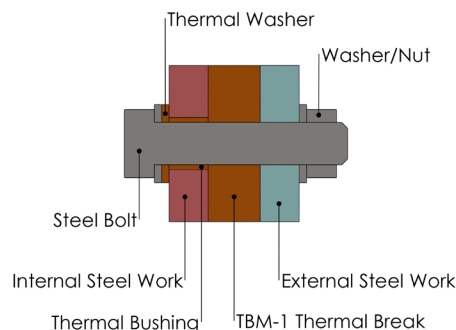
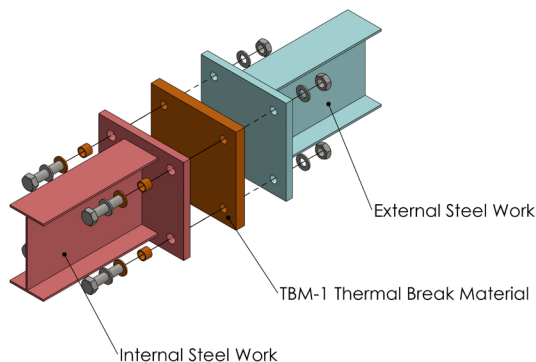


Thermal Break Material™ (TBM-1) Washers & Bushings

Reduces thermal bridging in structural connections

Reduces conductive and convective heat losses at the bolts in structural steel connections.



Heat flows from warmer to cooler material surfaces. A bolt in a structural thermal break connection, passes through the thermal break from the warm side of the connection to the cooler side of the connection, conducting heat and creating a thermal bridge.

For large connections with many bolts or many connections with a few bolts, the heat loss due to the bolts themselves is a thermal “short circuit” through the thermal break material. A thermal break washer under the steel washer prevents conductive heat flow from the structural steel to the bolt. Similarly, a thermal break insulating sleeve or bushing around the bolt, prevents convective heat flow as the bolt passes through the steel. If specified, thermal washers and bushings should be installed on the warmer side of the connection only.

The bolt itself will still conduct heat through the thermal break connection, however, the amount of heat (heat flow) is reduced by the thermal break washer and sleeve/bushing at each bolt.

Thermal break washers are available in standard ASTM washer sizes. Thermal break bushings have an ID with a 0.06" bolt clearance and a 0.09" wall thickness. Bushing OD for standard ASTM bolts are given below. Note: holes in steel must be drilled or punched to accept bushing OD as a snug fit.

ASTM A325 Bolt Diameter	Washer OD	Washer/Bushing ID	Bushing OD	Bushing Length*
1/2	1.06	0.56	0.75	
5/8	1.30	0.68	0.875	
3/4	1.50	0.81	1.00	
7/8	1.75	0.93	1.125	
1	2.00	1.06	1.25	

* Bushing length varies depending on steel plate thickness



The Design Standard...