

TECH SHEET

PEM® REF/ TORQUE BASICS



SUBJECT: Torque Basics

Tightening Torque - The application of pre-load to a fastener by the turning of mating hardware.

Torque-Out - The amount of torque necessary to spin the fastener out of the sheet. The torsional holding power of a self-clinching fastener in a sheet. Torque-Out testing is conducted by applying pure torsion (no axial load) to the self-clinching fastener.

Torque-Thru - An indirect measure of the tensile strength of a self-clinching fastener. The term torque-thru is most commonly applied to studs. Torque-thru tests on studs are conducted by placing a bushing over the stud, applying a nut and tightening until failure results from the induced tensile load exceeding the tensile strength of the stud.

Prevailing Torque - The force required to turn a screw to overcome the thread locking feature.

Pushout - The resistance of a self-clinching feature to axial loading. Push-out is conducted in the direction opposite the direction of installation of a self-clinching fastener.

Formula to calculate pushout: Bending Moment = Force x Distance
Bending Moment = $2 \times \text{Mounting Hole Dia.} \times \text{Pushout} / 3\pi$

Tensile Strength - The axial strength of a stud or nut.

Side Load - The load applied to the fastener parallel to the clinched panel at a given distance from the panel that will cause the clinch feature to fail or yield the panel or fastener. Thinner panel may yield, thicker panel will cause the clinch feature to fail either by push-out on the bending compression side or pull-thru on the bending tension side. Typically, failure occurs when the bending moment resulting from the side load and distance exceeds the bending strength of the installed fastener. Side loads at other distances can be estimated by computing the bending moment from the published load and distance and then dividing by the distance of interest.

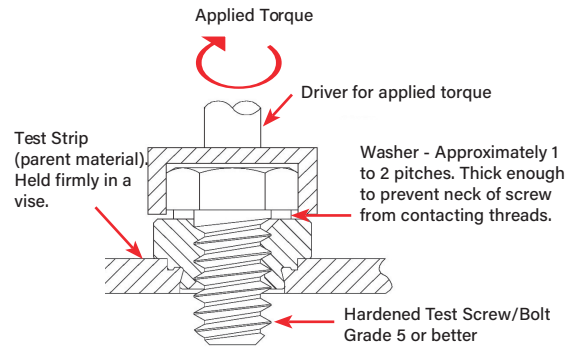
Pull-Through - The resistance of a fastener to a force applied in the same direction to which it was installed.

TECH SHEET

PEM® REF/ TORQUE BASICS



TORQUE-OUT



PUSH-OUT

