

## **WORLDWIDE FASTENER STANDARD**

Date: 2001-06-26

### **WE 961 MATERIAL, PHYSICAL PROPERTIES AND PERFORMANCE OF PIERCE NUTS**

#### **1. SCOPE.**

This standard covers the material, physical properties and performance requirements of self piercing nuts in the range M6 to M12 inclusive.

##### **1.1 REFERENCES.**

- ISO 3573 - Hot-rolled carbon steel sheet of commercial and drawing qualities.
- ISO 3574 - Cold-reduced carbon steel sheet of commercial and drawing qualities.
- W-DX10 - WDX Worldwide Die Design and Construction Specifications Manual
- WE 950 - Prevailing Torque-Type Steel Hexagon Nuts and Hexagon Flange Nuts - Mechanical and Performance Properties

#### **2. MATERIAL AND PHYSICAL PROPERTIES.**

The material and physical properties for pierce nuts shall be in accordance with WE952. After installation of a thread rolling screw, these nuts shall withstand the proof load equivalent to property class 8.

#### **3. GENERAL.**

Nuts shall be capable of piercing their own hole in a test plate as described in Clause 5.

#### **4. PERFORMANCE.**

NOTE: In all tests, damage pertains to nut loosening, panel distortion is allowable.

##### **4.1 PUSH-OUT.**

After assembly in a steel sheet panel of the thickness specified in Table 1 the assembly must be placed on a test rig as shown in Figure 1 and a load applied in the direction shown. The assembly must withstand the push-out load specified in Table 1 without loosening in the panel, or showing evidence of damage when examined at 10x magnification.

##### **4.2 TORQUE-OUT.**

After assembly in a steel sheet panel of the thickness specified in Table 1 the assembly must be placed in a test rig as shown in Figure 2 and a torque applied in the direction shown. The assembly must withstand the torque-out load specified in Table 1 without turning or loosening in the panel.

##### **4.3 SEALED APPLICATIONS.**

Accomplished through use of special die button (see W-DX10) during nut installation. After installation assembly must contain standing water for one hour after electrocoat and spray primer surfacer.

##### **4.4 PREVAILING TORQUE**

Accomplished through use of special installation tool (see W-DX10). The pierce nuts shall meet the requirements of WE 950 - Property Class 8.

#### **5. TEST PLATE.**

The test plate shall be 0.2% maximum carbon steel to ISO 3573 or ISO 3574 and thickness as specified in Table 1.

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**Table 1.**

| Nominal Size | Test Plate Thickness $t$ , mm | Minimum Push-Out kN | Minimum Torque-Out Nm |
|--------------|-------------------------------|---------------------|-----------------------|
| M5           | 1 +/- 0.08                    | 0.9                 | 7.4                   |
| M6           | 1 +/- 0.08                    | 0.9                 | 12.4                  |
| M8           | 1 +/- 0.08                    | 0.9                 | 30.0                  |
| M10          | 1 +/- 0.08                    | 1.3                 | 60.0                  |
| M12          | 1.5 +/- 0.08                  | 1.5                 | 105.0                 |

NOTE: Lower values will apply if the test plate is under 1.0mm.

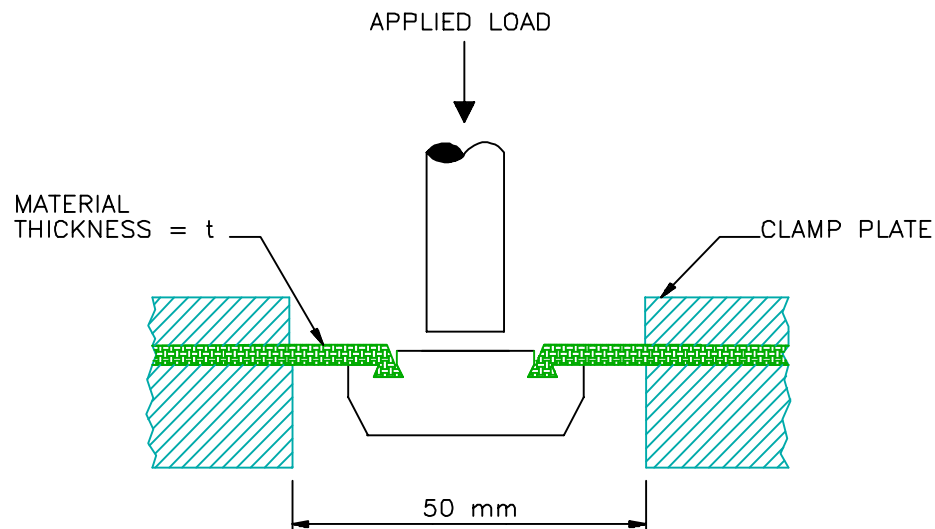


**Figure 1.**

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