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Westfield Fasteners Product Specification:

Thread Forming Screws for Plastics - Torx Pan Flange Head with 30° Thread Angle

This product guide contains the specification for thread forming screws for plastics, a series of standard parts available from Westfield Fasteners. The information presented here is specific to products with a torx pan flange head and a 30° thread angle.

Product Description

Torx Pan Flange head thread forming screws for thermo plastics, made from through hardened steel, with a silver zinc plated Cr3 finish.

These thread forming screws have a 30 degree thread angle and an 8 degree thread pitch to optimise performance in all types of thermoplastics. Correctly used these screws will minimise the stress to the plastic and give optimal thread engagement and clamping loads. Figure 1 and table 1 show the product dimensions and tolerances.

Thread forming screws deform the plastic around the thread as they are inserted. This gives an optimum fastening force, which is superior to standard self-tappers. The narrow thread profile increases the pull out resistance and gives lower radial stress. The lower radial stress also prevents boss damage.

The 6 lobed torx drive is also known as multidrive T or T-drive.

Please see figure 2 and table 2 for the recommended pilot pre-drilled or moulded holes required for different plastics.

Useful principles to follow when specifying fasteners for plastics:

- Pilot holes should ideally be chamfered (or have a counterbore) to the thread major diameter to prevent cracking.
- Boss heights should be constructed so that there is no gap between the top of the boss and the component being clamped.
- Boss diameters should be approximately 2.5 to 3 times the diameter of the pilot hole.
- The stripping torque to tapping torque ratio should be at least 3-1 or around 5-1 for automated high volume manufacturing.
- Pilot holes should have a threaded engagement of at least twice the screw diameter.
- Specific application testing is advisable where there is uncertainty of type and size.

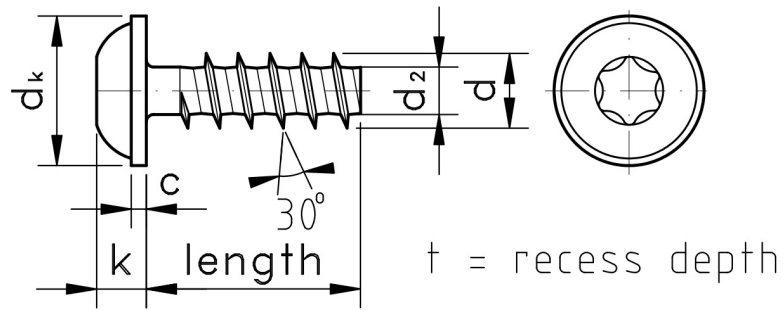
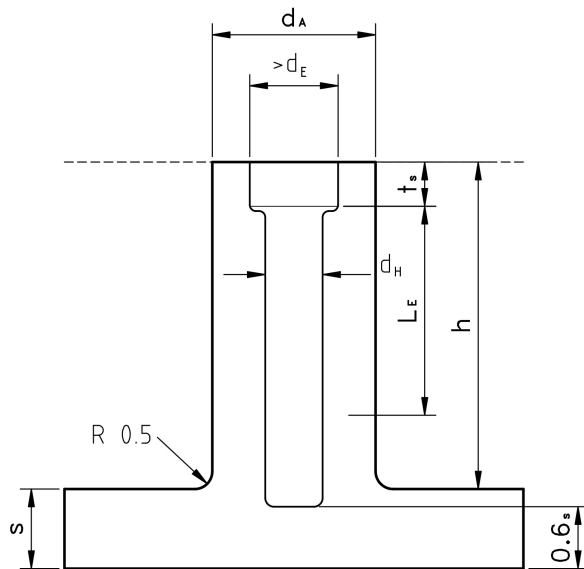


Figure 1: Torx Pan Flange Thread Forming Screw for Plastics

Table 1: Dimensions & Tolerances (mm)

| d | dk | k | c | d ₂ | t | | T |
|-----|-----|-----|-----|----------------|------|-----|----|
| | | | | | Min | Max | |
| 2.2 | 4.5 | 1.4 | 0.5 | 1.25 | 0.65 | 0.8 | 6 |
| 2.5 | 5 | 1.5 | 0.6 | 1.4 | 0.75 | 0.9 | 6 |
| 3 | 6 | 2.1 | 0.6 | 1.66 | 1 | 1.6 | 10 |
| 3.5 | 7 | 2.4 | 0.7 | 1.91 | 1.1 | 1.4 | 10 |
| 4 | 8 | 2.6 | 0.8 | 2.17 | 1.25 | 1.7 | 20 |
| 5 | 10 | 3.3 | 1 | 2.68 | 1.4 | 1.8 | 20 |
| 6 | 12 | 3.6 | 1.2 | 3.19 | 1.6 | 2 | 25 |



d = Nominal screw diameter
 $d_A \geq (2 \times d)$
 $d_H = (0.70 \text{ to } 0.85 \times d)$
 $t_s = 0.4 \times d$
 $h \geq L_E + 1 \times d$
 $L_E \geq (2 \times d)$
 s = without set parameter
 $d_E = 1.05 \times d$

Figure 2: Pilot Hole Diameter For Threadforming Screws for Plastics with 30° Thread

Table 2: Recommended Pilot Hole Diameter For Threadforming Screws for Plastics with 30° Thread (mm)

| Material | Hole Diameter | Outer Diameter | Screw-in-depth |
|--------------|---------------|----------------|----------------|
| | d_H | d_A | L_E |
| ABS | 0.80 x d | 2.00 x d | 2.00 x d |
| ABS/PC Blend | 0.80 x d | 2.00 x d | 2.00 x d |
| ASA | 0.78 x d | 2.00 x d | 2.00 x d |
| PA 4.6 | 0.73 x d | 1.85 x d | 1.80 x d |
| PA 4.6 GF 30 | 0.78 x d | 1.85 x d | 1.80 x d |
| PA 6 | 0.75 x d | 1.85 x d | 1.70 x d |
| PA 6 GF 30 | 0.80 x d | 2.00 x d | 1.90 x d |
| PA 6.6 | 0.75 x d | 1.85 x d | 1.70 x d |
| PA 6.6 GF 30 | 0.82 x d | 2.00 x d | 1.80 x d |
| PBT | 0.75 x d | 1.85 x d | 1.70 x d |
| PBT GF 30 | 0.80 x d | 1.80 x d | 1.70 x d |
| PC | 0.85 x d | 2.50 x d | 2.20 x d |
| PC GF 30 | 0.85 x d | 2.20 x d | 2.00 x d |
| PE LD | 0.70 x d | 2.00 x d | 2.00 x d |
| PE HD | 0.75 x d | 1.80 x d | 1.80 x d |
| PET | 0.75 x d | 1.85 x d | 1.70 x d |
| PET GF 30 | 0.80 x d | 1.80 x d | 1.70 x d |
| PMMA | 0.85 x d | 2.00 x d | 2.00 x d |
| POM | 0.75 x d | 1.95 x d | 2.00 x d |
| POM GF 30 | 0.80 x d | 1.95 x d | 2.00 x d |
| PP | 0.70 x d | 2.00 x d | 2.00 x d |
| PP GF 30 | 0.72 x d | 2.00 x d | 2.00 x d |
| PP TV 20 | 0.72 x d | 2.00 x d | 2.00 x d |
| PPO | 0.85 x d | 2.50 x d | 2.50 x d |
| PS | 0.80 x d | 2.00 x d | 2.00 x d |
| PVC (hart) | 0.80 x d | 2.00 x d | 2.00 x d |
| PEEK | 0.85 x d | 2.00 x d | 2.00 x d |
| SAN | 0.77 x d | 2.00 x d | 2.00 x d |