

Translation of the German edition from October 2007

The fundamentals have been stipulated in the DVS 2241-1 technical code, "Direct screwing of mouldings made of plastics". Furthermore, statements have been made not only about the procedural description, the assembly, the screw-in operation, the multiple assembly, the failure type and the assembly devices but also about the design-related instructions and the crucial influencing variables. The direct screwing of thin-walled components with additional elements is defined in Section 4. The test procedures for the determination of the characteristics have been documented too.

It was necessary to highlight not only examples of direct screwing but also additional elements for direct screwing on thin-walled components in a supplement.

Selected examples were chosen for the supplement and are intended to give users instructions which should help to provide solutions not only for new structures but also for problems in ongoing applications.

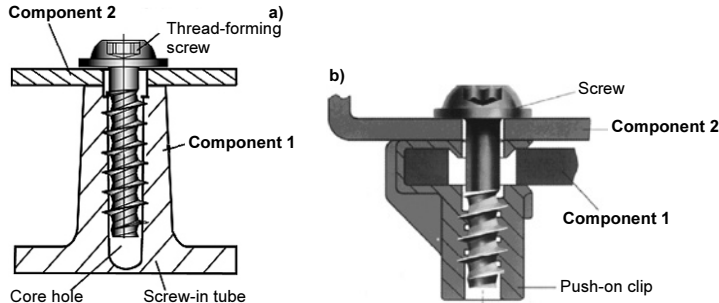
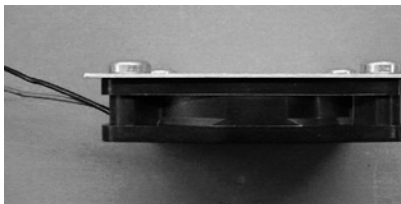


Figure 1.

- a) Directly screwed joint on mouldings. Examples including the material information, the screw sizes and the torques in Sections 1 to 3.
- b) Additional elements for thin-walled components. Various additional elements with the screw size, the material and the

1 Screwed joint on a ventilator housing

1.1 Variant with a blind hole



For the fastening of a cover sheet to a ventilator housing, the screw is screwed into a tube at the maximum screw-in depth.

Component 1: Ventilator

Material: PBTP
Screw hole diameter: $d_b = 4 \text{ mm}$
Screw-in depth: $t_e = 10 \text{ mm}$

Blind hole

Component 2: Cover sheet

Material: Steel sheet
Through-hole: $d_h = 6.1 \text{ mm}$
Clamping thickness: $t_c = 3.0 \text{ mm}$
Surface: Galvanised

Screw:

Designation: DELTA PT 50 x 12 (10)
Material: Steel, quenched and tempered
Surface: Galvanised, blue-passivated
Twisting-in moment: $M_E = 1.0 \text{ Nm}$
Over-tightening moment: $M_O = 3.2 \text{ Nm}$
Recommendation:
Tightening torque: $M_A = 2.0 \text{ Nm}$

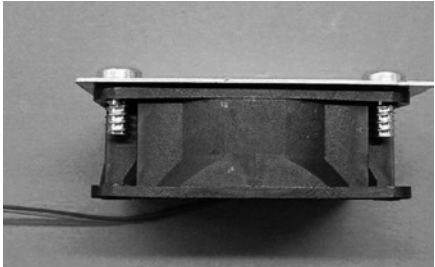
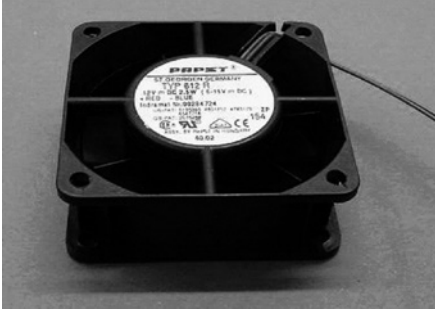
Screw driver:

Type: Hand-held compressed-air screwdriver
No-load rotation speed: $n_0 = 480 \text{ rpm}$

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DVS, Technical Committee, Working Group "Joining of Plastics"

1.2 Variant with a through-borehole



For the fastening of a cover sheet to a ventilator housing, the screw is screwed into a plate material at the minimum screw-in depth.

Component 1: Ventilator

Material: PBTP - GF30
 Screw hole diameter: $d_b = 4.5 \text{ mm}$
 Screw-in depth: $t_e = 3.5 \text{ mm}$

Through-borehole

Component 2: Cover sheet

Material: Steel sheet
 Through-hole: $d_h = 6.1 \text{ mm}$
 Clamping thickness: $l_k = 3.0 \text{ mm}$
 Surface: Galvanised

Screw:

Designation: DELTA PT 50 x 12 (10)
 Material: Steel, quenched and tempered
 Surface: Galvanised, blue-passivated
 Twisting-in moment: $M_E = 0.5 \text{ Nm}$
 Overtwisting moment: $M_U = 1.5 \text{ Nm}$
 Recommendation
 Tightening torque: $M_A = 1.0 \text{ Nm}$

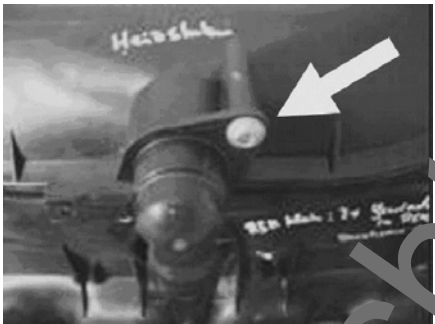
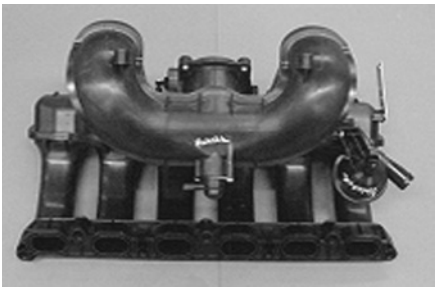
Screwdriver:

Type: Hand-held compressed-air screwdriver
 No-load rotational speed: $n_0 = 480 \text{ rpm}$

Comments:

In spite of extremely different screw-in depths with the two variants, it is always possible to use the same screw dimensions. However, different tightening torques must be designed because the screw-in depths are not the same. If the possible screw-in depths of both components can already be designed identically in the design phase, not only the same screw but also a uniform tightening torque can be used.

2 Screwed joint on a six-cylinder intake tube



General view: Fastening of an oil separator as a heating connection piece to a six-cylinder intake tube

Component 1: Intake tube

Material: PBTP - GF30
 Screw hole diameter: $d_b = 5.0 \text{ mm}$
 Screw-in depth: $t_e = 12.3 \text{ mm}$

Blind hole

Component 2: Oil separator / heating connection piece

Material: PBTP - GF30
 Through-hole: $d_h = 6.7 - 5.9 \text{ mm}$
 Clamping thickness: $l_k = 5.0 \text{ mm}$

Screw:

Designation: DELTA PT 50 x 66/20
 Material: Steel, quenched and tempered
 Surface: DELTA PROTEKT
 Twisting-in moment: $M_E = 1.8 \text{ Nm}$
 Overtwisting moment: $M_U = 7.8 \text{ Nm}$
 Recommendation
 Tightening torque: $M_A = 4.2 \text{ Nm}$

Screwdriver:

Type: Hand-held compressed-air screwdriver
 No-load rotational speed: $n_0 = 480 \text{ rpm}$