

Report

about the use of
Torque Impact Screw Driver to screw-in
»fischer POWER-FULL screws«
(Date: 24 August 2020)

Based on:

Accredited Test Report: Influence on the load-carrying capacities of fischer POWER-FULL screws according to ETA-12/0073 due to the use of different screw-in devices - TVFA-Innsbruck, 2020 (Report No. 201811-0081-4:2020)

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1 State of technology

Screws can only ensure a sustainable and reliable connection, if they get screwed-in until the screw head contact is reached without damaging the timber parts or the screw itself. Thus the screw-in process is of essential significance for an effective connection.

In an European Technical Assessment (ETA) there is usually no information about the usage of torque impact screw drivers, because screw manufacturers determine the characteristic parameters of screws with standard screw drillers in the course of initial type tests. The screw-in process is thereby only regulated indirectly through the torsional strength or rather the required ratio value of the mean value of the insertion moment to the characteristic value of the torsional strength.

However the effects on the mechanical properties of the screws remain unconsidered if screw-in devices with different operating principles such as *Screw Drillers* or *Torque Impact Screw Drivers* are being used.

To give answers to these questions, experimental investigations were carried out together by the *fischer group of companies* and the accredited *Technical Test and Research Center* of the University of Innsbruck. The results are summarised in the Test Report TR 201811-0081-4.

2 Recommendations for the screw-in process of screws with special consideration of the usage of impact screwdrivers

To examine the opportunities of using impact screwdrivers *fischer Power-Full* screws were alternately screwed-in into hardwood as well as into softwood with both a standard *screw-driver* and a *tangential impact screwdriver*, with subsequent testing according to EAD 130118-00-0603, EAD 130118-01-0603 and EN 14592. **In this process no statistically significant differences on the tensile strength and the withdrawal parameters of the screws could be determined.**

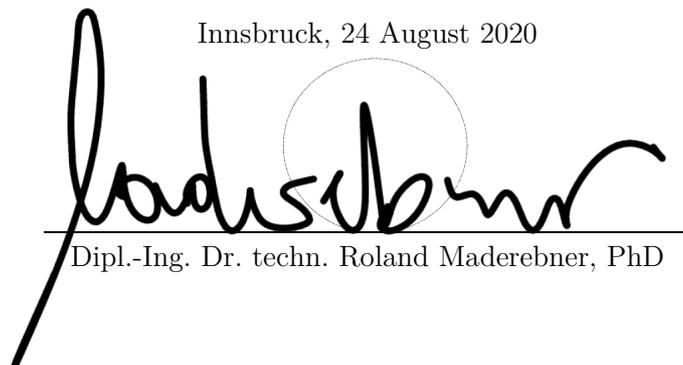
Based on the findings of this experimental examinations the following application matrix was developed to ensure a secure screw-in process in practical usage.

It is generally recommended to use torque controlled screw-in devices to tighten screws in steel-timber-connections. Though it should be noted, that stopping and restarting the screw-in process, especially in hardwood, can cause considerable difficulties and damages, especially in the area of the screw drive. Regardless of this investigations, the installation conditions of ETA-12/0073 have to be observed.

Table 1: Application of fischer Power-Full screws

Screw type	fischer Power-Full					
	Torque Impact Screw Driver (e.g. fischer FSS 18V 400 BL or fischer FSS 18V 600)			Standard Screw Driller		
Device	6,5	8	10	6,5	8	10
Nominal diameter [mm]	6,5	8	10	6,5	8	10
Softwood with- and without predrilled holes	✓			✓		
Hardwood with predrilled holes	✓	≤ 400 mm	≤ 300 mm	✓		
Timber-Timber Connection (soft screw-joint)	✓			✓		
Steel-Timber Connection (hard screw-joint)	Tighten the screw with e.g. torque wrench required			Tighten the screw with e.g. torque wrench required		
Wrist Strain	-- → +			+ → +++		
Speed	← - ---			← + --		
Caption:						

Innsbruck, 24 August 2020



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