Institute for Construction and Material Science

Timber Engineering Unit

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Report

about the use of
Torque Impact Screw Driver to screw-in
»fischer POWER-FAST II screws«
according to ETA-19/0175

(Date: 10 May 2021)

Based on:

Accredited Test Report: Load-carrying capacities of screws type fischer Power-Fast II by the use of different screw-in devices fischer POWER-FAST II - TVFA-Innsbruck, 2021 (Test Report No. 201811-0081:2021)

Project: 201811-0081			
Client:	fischerwerke GmbH & Co. KG Klaus-Fischer Straße 1, D-72178 Waldachtal		
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Annex:		**Revision:**	
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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.

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-Fast II* screws were alternately screwed-in according to ETA-19/0175 in hardwood as well as in softwood with both a standard *Screw Driller* and a *Torque Impact Screw Driver*, 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 of the screws could be determined.**
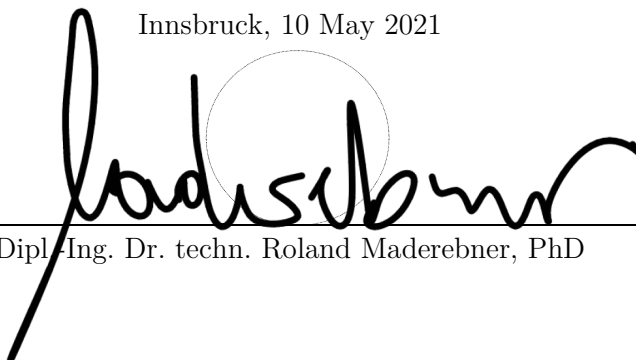
Based on the findings of this experimental examinations the following application matrix was developed to ensure a secure screw-in process in practical usage.

It is generally recommended to use torque controlled screw-in devices to tighten screws in steel-timber-connections.

Table 1: Application of fischer Power-Fast II screws

Screw type	fischer Power-Fast II acc. to ETA-19/0175					
Device	**Torque Impact Screw Driver** (e.g. fischer FSS 18V 400 BL or fischer FSS 18V 600)			**Standard Screw Driller**		
Nominal diameter [mm]	**4,5**	**5**	**6**	**4,5**	**5**	**6**
Softwood with- and without predrilled holes	✅			✅		
Hardwood with and without predrilled holes	✅			✅		
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:	extremely low - - - very low - - low - high + very high ++ extremely high +++ ➔					

Innsbruck, 10 May 2021

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