

Technical information sheet

Tensile strength of flow-drill threads

Introduction

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Jakob Rope Systems also supplies its Webnet products pre-installed in made to measure tubular frames. These thin-walled frames can be suited with threaded holes for fixing the frame to the pre-installed structures. These holes should be drilled using the method of "flow drilling". Flow drilling is a combination of drilling and frictional heat, drawing the frames' thin material into a longer thread, see picture.

Example of a flow-drill thread
[source: thermdrill.de / ONTOOL GmbH, Groß-Umstadt]

Results of pulling out tests

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To determine the tensile capacities of these threads, Jakob Rope Systems carried out a series of tests using classic Webnet frames with round (Ø) and rectangular (□) profiles. Based on the test results, the tensile capacity of the threads was determined using a static safety level of 95% (for the calculations, the Student or T-distribution according to EN 1990 was used). Additionally, a common safety factor of the building sector still needs to be considered to the figures shown below. Depending on the technical standard, these values should again be divided by the factor of 2.

Metric thread M4 in □ 30 × 2 mm	
test 1	6,74 kN
test 2	5,84 kN
test 3	5,98 kN
average value	6,19 kN
standard deviation	0,40 kN
Minimum tensile capacity M4 in □, 95% safety level	5,67 kN
e.g. incl. safety factor 2	2,84 kN

Metric thread M5 in □ 30 × 2 mm	
Versuch 1	8,20 kN
Versuch 2	8,04 kN
Versuch 3	9,84 kN
Versuch 4	8,22 kN
Mittelwert	8,58 kN
Standardabweichung	0,73 kN
Minimum tensile capacity M5 in □, 95% safety level	7,80 kN
e.g. incl. safety factor 2	3,9 kN

Metric thread M6 in □ 30 × 2 mm	
Versuch 1	9,97 kN
Versuch 2	10,45 kN
Versuch 3	11,90 kN
Versuch 4	11,45 kN
Versuch 5	10,59 kN
Mittelwert	10,87 kN
Standardabweichung	0,70 kN
Minimum tensile capacity M6 in □, 95% safety level	10,20 kN
e.g. incl. safety factor 2	5,10 kN

Metric thread M8 in □ 30 × 2 mm	
Versuch 1	12,87 kN
Versuch 2	13,44 kN
Versuch 3	13,98 kN
Versuch 4	13,06 kN
Mittelwert	13,34 kN
Standardabweichung	0,42 kN
Minimum tensile capacity M8 in □, 95% safety level	12,89 kN
e.g. incl. safety factor 2	6,45 kN

Metric thread M4 in Ø 26,9 × 2 mm	
Versuch 1	13,53 kN
Versuch 2	12,73 kN
Versuch 3	14,15 kN
Versuch 4	12,44 kN
Versuch 5	12,98 kN
Mittelwert	13,17 kN
Standardabweichung	0,61 kN
Minimum tensile capacity M8 in Ø, 95% safety level	12,59 kN
e.g. incl. safety factor 2	6,30 kN