

● Mechanical properties

The tables below show some indicative standard values for Tubtara's with round or hexagonal shank and flat head in first grip:

Mechanical reference values

product	material	pull-out	max. torque	torque-to-turn	shear test
		kN	Nm	Nm	kN
Round shank					
	Steel C8C	> 5,8	> 2,0	1,8	1,9
M3 UPO 20	Alu 5052	> 3,1	1,9	0,8	0,6
	SS 304Cu	-	-	-	-
M4 UPO 30	Steel C8C	> 10,8	> 7,5	2,7	2,6
M4 UPO 30	Alu 5052	> 4,5	4,9	1,4	1,1
M4 UPO 20	SS 304Cu	> 11,0	7,1	2,6	3,5
	Steel C8C	> 12,0	> 10,0	4,7	3,5
M5 UPO 30	Alu 5052	> 5,2	4,9	1,5	1,6
	SS 304Cu	> 14,5	> 16,0	3,0	4,8
	Steel C8C	> 21,0	> 19,0	7,0	5,0
M6 UPO 30	Alu 5052	> 10,5	16,0	3,2	2,4
	SS 304Cu	> 27,0	> 22,0	6,8	7,3
	Steel C8C	> 33,0	> 50,0	13,0	6,0
M8 UPO 30	Alu 5052	> 15,0	33,0	5,3	2,9
	SS 304Cu	> 40,0	> 70,0	9,0	9,0
	Steel C8C	> 40,0	> 70,0	15,0	8,0
M10 UPO 35	Alu 5052	> 20,0	39,5	7,0	3,7
	SS 304Cu	> 43,0	> 70,0	8,0	8,5
	Steel C8C	> 40,0	> 70,0	15,0	8,0
M10 SPO 35	Alu 5052	-	-	-	-
	SS 304Cu	> 43,0	> 70,0	13,0	8,4
	Steel C8C	> 63,0	> 150,0	32,0	11,5
M12 UPO 40	Alu 5052	-	-	-	-
	SS 304Cu	-	-	-	-
Hexagonal shank					
M4 HUPO 20	Steel C8C	> 8,8	> 7,5	> 5,5	2,6
	SS 304Cu	> 10,8	> 7,1	6,0	3,7
M5 HUPO 30	Steel C8C	> 12,0	12,0	> 6,5	3,6
	SS 304Cu	> 15,5	15,0	> 9,0	4,8
M6 HUPO 30	Steel C8C	23,0	> 24,5	> 21,0	5,1
	SS 304Cu	24,5	> 23,0	> 22,0	7,2

product	material	pull-out	max. torque	torque-to-turn	shear test
		kN	Nm	Nm	kN
M8 HUPO 30	Steel C8C	32,8	> 50,0	> 30,0	6,6
	SS 304Cu	39,0	> 64,0	32,0	9,4
M10 HSPO 35	Steel C8C	> 40,0	> 70,0	50,0	7,9
	SS 304Cu	> 43,0	> 70,0	> 50,0	10,2
M12 HUPO 40	Steel C8C	> 63,0	> 150,0	68,0	12,5
	SS 304Cu	-	-	-	-

- Bolts class 8.8 were used
- > : value will be higher, but test could not be completed due to breakage of bolt or min. value is used as reference
- Steel plate (HRB 55) was used to set the **TUBTARA®** (approximately middle of grip range)