

Testing Results

Product: Handrail fitting

1. Bending torque testing

Type	Size	Test requirement	Permissible Bending Torque (kNm)	Test result	Verdict
101	T,A27,B34,C42,D48,E60	A bending torque is forced in the fittings disadvantage direction .The torque can not disappear until a permanent distortion emerges, which is more than 10 degree, outside the tube axis direction or cracks appeared on fitting.	0.3 / 0.7 / 1.1 / 0.9 / 1.1 / 2.3	Cracks appeared on the fittings	P
104	C42		0.8		P
116	C42		0.8		P
119	C42		0.9		P
124	B34		0.8		P
125	B34		0.7		P
126	D48		1.4		P
127	D48		1.1		P
128	D48		1.0		P
129	D48		0.9		P
130	D48		1.3		P
131	D48		1.4		P
132	D48		2.3		P
134	D48		N/A		N/A
135	D48		0.7		P
137	D48		0.9		P
138	D48		N/A		N/A
140	D48		N/A		N/A
143	B34		N/A		N/A
144	D48		2.4		P
145	D48		2.6		P
146	D48		2.2		P
147	C42		1.3		P
148	D48		0.7		P
149	B34		1.0		P
150	D48		N/A		N/A
153	C42		0.9		P
154	C42		0.8		P
155	D48		1.7		P
156	D48		1.4		P
158	D48		1.0		P
160	D48		N/A		N/A
161	D48		1.4		P
165	C42		0.8		P
166	D48		0.9		P
167M	C42		0.7		P
168M	C42		0.6		P
169M	C42		N/A		N/A

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173F	B34, C42	A bending torque is forced in the fittings disadvantage direction. The torque can not disappear until a permanent distortion emerges, which is more than 10 degree, outside the tube axis direction or cracks appeared on fitting.	0.7 / 0.9	Cracks appeared on the fittings	P
173M	B34		0.4		P
176	D48		1.0		P
179	B34		N/A		N/A
198	D48		1.1		P
199	D48		0.9		P
232	D48		1.8		P
240	A27		0.9		P
245	D48		2.6		P
246	D48		1.9		P
250	C42		N/A		N/A
251	D48		1.9		P
252	D48		1.5		P
253	D48		1.3		P
255	D48		1.3		P
256	D48		0.6		P
545	C42		N/A		N/A
725	C42		N/A		N/A
746	C42		N/A		N/A
747	C42		N/A		N/A
748	C42		N/A		N/A
750	C42		N/A		N/A
751	C42		N/A		N/A

Note:

The safety coefficient equals to 2.0 for permissible bending torque.

2. Disassemble force testing**Tube fitting with foot-flange or wall-flange**

Type	Size	Test requirement	Permissible Disassemble Force (kN)		Verdict
			1 cs-g-p	2 cs-g-p	
131	D48	The foot-flanges are fixed onto the ground. A bending torque is forced on them in disadvantage directions. Then the force changed to the opposite direction. The force is changed 100 cycles (times). Its value is 0.5kNm. A pull or press force is put on the tube. Measure it when the tube begins slipping in the fittings.	7	N/A	P
132	D48		N/A	12.3	P
134	D48		2.3	N/A	P
144	D48		N/A	10.8	P
145	D48		N/A	10.8	P
146	D48		N/A	9.7	P
198	D48		7.8	N/A	P
232	D48		N/A	14	P
240	A27		6.4	N/A	P
245	D48		N/A	12.9	P
246	D48		N/A	11.8	P

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251	D48		N/A	9.2	P
252	D48		N/A	10.6	P

Tube fitting without flange

Type	Size	Test requirement	Permissible Disassemble Force (kN)		Verdict
			1 cs-g-p	2 cs-g-p	
101	T	A bending torque of 0.25kNm is forced on the tube fittings. The force is in most disadvantage direction. 100 tests cycle is developed. A pull or press force is put on the tube. Measure it when the tube begins slipping in the fittings.	4.9	N/A	P
101	A27		7.8	N/A	P
101	B34		8.3	N/A	P
101	C42		8.3	N/A	P
101	D48		8.7	N/A	P
101	E60		6.9	N/A	P
104	C42		7.3	7.6	P
116	C42		8.5	N/A	P
119	C42		7.4	N/A	P
124	B34		8	N/A	P
125	B34		10	N/A	P
126	D48		7	N/A	P
127	D48		9	N/A	P
128	D48		7.6	N/A	P
129	D48		5.5	N/A	P
130	D48		8.8	N/A	P
135	D48		2.9	N/A	P
137	D48		8.7	N/A	P
147	C42		8.6	N/A	P
148	D48		7	N/A	P
149	B34		N/A	7.5	P
153	C42		7.6	N/A	P
154	C42		6.6	N/A	P
155	D48		9.4	9.6	P
156	D48		8.6	N/A	P
158	D48		6.4	7.0	P
161	D48		5.4	N/A	P
165	C42		6.6	N/A	P
166	D48		9.4	N/A	P
167M	C42		8.3	N/A	P
168M	C42		5.2	N/A	P
173F	B34		8.4	N/A	P
173F	C42		7.0	N/A	P
173M	B34		7.8	N/A	P
176	D48		6.6	N/A	P
199	D48		8.1	N/A	P
253	D48		9.8	N/A	P

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255	D48		8.8	N/A	P
256	D48		8.3	N/A	P

Note:

- A. The safety coefficient equals to 2.0 for permissible disassemble force.
- B. Explanation of the abbreviations in the above table:
 - a. 1 clamp screw, gripping of the pipe: 1 cs-g-p
 - b. 2 clamp screws, gripping of the pipe: 2 cs-g-p