

// MATERIAL PROPERTIES

MECHANICAL PROPERTIES	<i>Polypropylene (PP)</i>	<i>Polyamide (PA 6)</i>	<i>Aluminium (Al)</i>	<i>Thermoplastic elastomer</i>
Density	0.90 g/cm ³	1.10 g/cm ³	2.65 g/cm ³	0.97 g/cm ³
Impact value at 23 °C / +73.4 °F	7 kJ/m ² (ISO 179/1eA)	8 kJ/mm ² (ISO 179/1eA)		
Impact value at -20 °C / -4 °F	3 kJ/m ² (ISO 179/1eA)			
Modulus of elasticity	1,400 N/mm ² (ISO 527)	2,000 N/mm ² (ISO 527)	72,000 N/mm ²	
Yield stress resp. tensile strength (Rm)	28 N/mm ² (ISO 527)	50 N/mm ² (ISO 527)	>240 N/mm ²	5.2 ... 8.8 N/mm ² (ASTM D412)

THERMAL PROPERTIES	<i>Polypropylene (PP)</i>	<i>Polyamide (PA 6)</i>	<i>Aluminium (Al)</i>	<i>Thermoplastic elastomer</i>
Temperature resistance	-30 ... +90 °C -22 ... +194 °F	-40 ... +120 °C -40 ... +248 °F	-40 ... +300 °C -40 ... +572 °F	-50 ... +120 °C -58 ... +248 °F

CHEMICAL PROPERTIES	<i>Polypropylene (PP)</i>	<i>Polyamide (PA 6)</i>	<i>Aluminium (Al)</i>	<i>Thermoplastic elastomer</i>
Weak acids	limited resistant	limited resistant	limited resistant	resistant
Weak alkalis	limited resistant	limited resistant	limited resistant	resistant
Alcohol	resistant	resistant	resistant	resistant
Petrol	limited resistant	resistant	resistant	limited resistant
Mineral oils	limited resistant	resistant	resistant	resistant
Other oils	resistant	resistant	resistant	resistant

The outlined particulars are approximate values and are only valid as references, which are not binding, also with regard to possible protection of third parties, and they do not exempt you from your own examination of suitability of the products delivered by us.

Therefore, these values can only be used in a limited sense for construction purposes.

The application of the products is carried out outside our control, and therefore, is exclusively subject to your own area of responsibility. If, however, liability should be possible, it would be limited for all damages to the value of the goods supplied by us and in use by you.

It goes without saying, that we guarantee the perfect quality of our products according to our general sales and delivery conditions.

// PREVENTIVE FIRE PROTECTION

Material:	PA66-F	
EN 45545-2		
T01 EN ISO 4589-2:	Oxygen Index	OI = 35.5 %
T10.03 EN ISO 5659-2:	25 kW/m ²	D ₅ max. = 124
T12 NF X 70 100-1 & -2:	600 °C / 1112 °F	CIT _{NLP} = 0.51
Compliance of the requirement set R22 for the hazard level:		HL1 - HL2 - HL3
Compliance of the requirement set R23 for the hazard level:		HL1 - HL2 - HL3
Compliance of the requirement set R24 for the hazard level:		HL1 - HL2 - HL3
Compliance of the requirement set R26 for the hazard level:		HL1 - HL2 - HL3

Material:	PP-F	
EN 45545-2		
T01 EN ISO 4589-2:	Oxygen Index	OI = 38.7 %
T10.03 EN ISO 5659-2:	25 kW/m ²	D ₅ max. = 48
T12.NF X 70 100-1 & -2:	600 °C / 1112 °F	CIT _{NLP} = 0.15
Compliance of the requirement set R22 for the hazard level:		HL1 - HL2 - HL3
Compliance of the requirement set R23 for the hazard level:		HL1 - HL2 - HL3
Compliance of the requirement set R24 for the hazard level:		HL1 - HL2 - HL3
Compliance of the requirement set R26 for the hazard level:		HL1 - HL2 - HL3

Further fire safety tests on request.

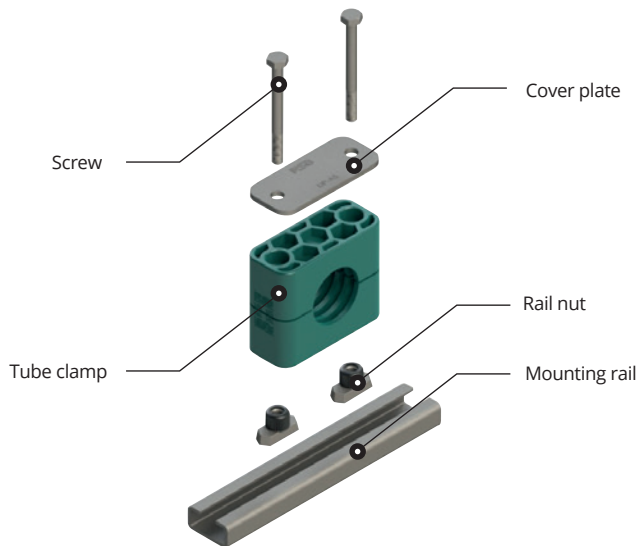
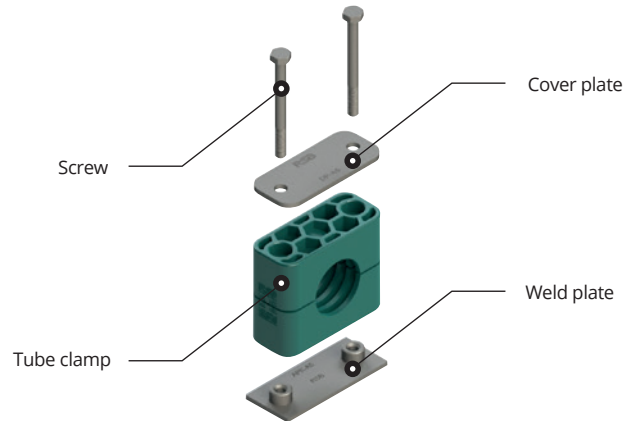
SPECIAL MATERIALS FOR TUBE AND HOSE CLAMPS

Material:	TPE-F	
EN 45545-2		
T01 EN ISO 4589-2	Oxygen Index	OI = 33.4 %
T10.03 EN ISO 5659-2:	25 kW/m ²	D _s max. = 79
T12 NF X 70 100-1 & -2:	600 °C / 1112 °F	CIT _{NLP} = 0.15
Compliance of the requirement set R22 for the hazard level:		HL1 - HL2 - HL3
Compliance of the requirement set R23 for the hazard level:		HL1 - HL2 - HL3
Compliance of the requirement set R24 for the hazard level:		HL1 - HL2 - HL3
Compliance of the requirement set R26 for the hazard level:		HL1 - HL2 - HL3

// ASSEMBLY INSTRUCTION

Assembly on metal welding plates

Place welding plates on a base appropriate for the load. Make sure that the clamps are properly aligned. Clamp lower clamp half onto welding plate, insert tube, place upper clamp half onto lower half and fasten with the screws. Attention must be paid to the prestress (after completed assembly, clamp halves must not be in contact!) Do not weld with fitted plastic clamp! Extended welding plates may be screwfastened to the base.

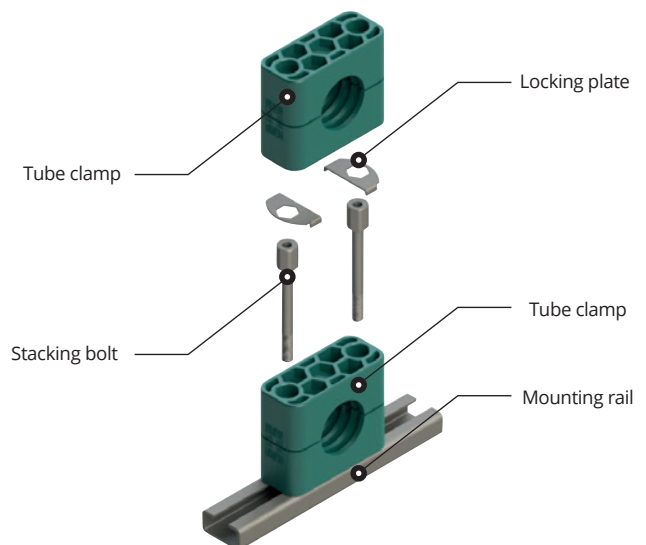


Assembly on mounting rails

Mounting rails are available in four different heights and come in pieces of 1 m or 2 m length, as required. Weld on mounting rail or screw-fasten with fastening angle bracket. Insert mounting rail nuts in rail and turn until stop. For heavy duty construction series, nuts are simply pushed in. Clamp lower clamp half on mounting rail nuts, insert tube, place upper clamp half onto lower half and fasten with the screws. Before fastening the screws, the clamp may still be positioned. Attention must be paid to the prestress (after completed assembly, the clamp halves must not be in contact!)

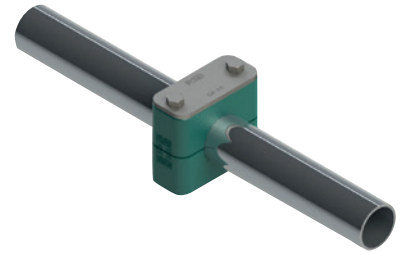
Stacking assembly

RSB-Clamps allow the assembly of multiple clamps of the same construction size and of different tube diameters one above the other. The construction assembly is carried out with special fixing screws that are secured against twisting by applying a locking plate. Clamp lower clamp half on welding plate or mounting rail respectively, insert tube, place upper clamp half on lower half and fasten with fixing screws. The fixing screw juts out from the upper clamp half. The application of a locking plate securely fastens the fixing screw and prevents twisting. Clamp on second clamp half on to the fixing screws etc.



// SCREW TIGHTENING TORQUE AND AXIAL PIPE SHEARING FORCES

The indicated screw tightening torque and axial pipe shearing forces refer to the assembly with weld plates, cover plates and hexagon head bolts according to ISO 4014/4017 (DIN 931/933). The axial pipe shearing force (according to DIN 3015, part 10) is an average value, determined by three tests made with a steel pipe according to DIN 2448 of St 37, for which static friction is presupposed (temperature during tests: 23 °C / 73.4 °F). When loading the RSB clamp with the indicated test force (F) in axial pipe direction, the pipe does not slide in the clamp.

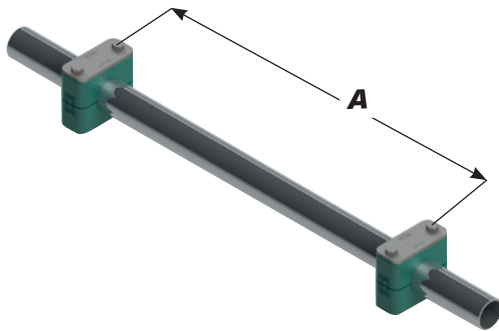


Light series (DIN 3015, part 1)														
SIZE	Fixing screw ISO 4014/4017 (DIN 931/933)		Polypropylene				Polyamide				Aluminium			
	Metric Thread	UNC Thread	Screw tightening torque		Pipe shearing force F		Screw tightening torque		Pipe shearing force F		Screw tightening torque		Pipe shearing force F	
			(Nm)	(ft-lb)	(kN)	(lbf)	(Nm)	(ft-lb)	(kN)	(lbf)	(Nm)	(ft-lb)	(kN)	(lbf)
0	M 6	¼-20 UNC	8	6	0.6	135	10	7	0.6	135				
1			8	6	1.1	247	10	7	0.7	157	12	9	4.2	944
2			8	6	1.2	270	10	7	0.8	180	12	9	4.3	967
3			8	6	1.4	315	10	7	1.6	360	12	9	4.8	1079
4			8	6	1.5	337	10	7	1.7	382	12	9	5.0	1124
5			8	6	1.9	427	10	7	2.0	450	12	9	7.3	1641
6			8	6	2.0	450	10	7	2.5	562	12	9	8.9	2000
7			8	6	2.3	517	10	7	3.2	719				
8			8	6	2.6	585	10	7	3.5	787				

Heavy series (DIN 3015, part 2)														
SIZE	Fixing screw ISO 4014/4017 (DIN 931/933)		Polypropylene				Polyamide				Aluminium			
	Metric Thread	UNC Thread	Screw tightening torque		Pipe shearing force F		Screw tightening torque		Pipe shearing force F		Screw tightening torque		Pipe shearing force F	
			(Nm)	(ft-lb)	(kN)	(lbf)	(Nm)	(ft-lb)	(kN)	(lbf)	(Nm)	(ft-lb)	(kN)	(lbf)
1	M 10	¾-16 UNC	12	9	1.6	360	20	15	4.2	944	30	22	12.1	2,720
2			12	9	2.9	652	20	15	4.5	1,044	30	22	15.1	3,395
3			15	11	3.3	742	25	18	5.1	1,146	35	26	15.5	3,485
4	M 12	7/16-14 UNC	30	22	8.2	1,843	40	30	9.3	2,090	55	41	29.4	6,609
5	M 16	5/8-11 UNC	45	33	11.0	2,472	55	41	15.8	3,551	120	89	34.8	7,823
6	M 20	¾-10 UNC	80	59	14.0	3,147	150	111	21.0	4,720	220	162	50.0	11,240
7	M 24	7/8-9 UNC	110	81	28.0	6,300	200	148	32.0	7,293	250	184	70.6	15,871
8	M 30	1 1/8-7 UNC	180	133	40.0	8,992	350	258	48.0	10,790	500	369	84.5	18,996
9			200	148	119.0	26,752	370	273	125.0	27,650	500	369	181.5	40,802
10			270	199	168.0	37,767	450	332	180.0	40,465	600	443	244.5	54,965

Double series (DIN 3015, part 3)														
SIZE	Fixing screw ISO 4014/4017 (DIN 931/933)		Polypropylene				Polyamide							
	Metric Thread	UNC Thread	Screw tightening torque		Pipe shearing force F		Screw tightening torque		Pipe shearing force F					
			(Nm)	(ft-lb)	(kN)	(lbf)	(Nm)	(ft-lb)	(kN)	(lbf)				
1	M 6	¼-20 UNC	5	4	0.9	202	6	4	0.9	202				
2	M 8	5/16-18 UNC	12	8	2.1	472	12	9	2.2	495				
3			12	8	1.9	427	12	9	2.0	450				
4			12	9	2.7	607	12	9	2.9	652				
5			8	6	1.7	382	8	6	2.5	562				

// RECOMMENDED CLAMP PITCH



The clamp pitches assigned to the respective outside pipe diameters are standard values for static load.

Outside pipe diameter (mm inch)		Clamp pitch A (m ft)	
6,0 - 12,7	0.24 - 0.50	1,0	3.28
12,7 - 22,0	0.50 - 0.87	1,2	3.94
22,0 - 32,0	0.87 - 1.26	1,5	4.92
32,0 - 38,0	1.26 - 1.50	2,0	6.56
38,0 - 57,0	1.50 - 2.24	2,7	8.86
57,0 - 75,0	2.24 - 2.95	3,0	9.84
75,0 - 76,1	2.95 - 3.00	3,5	11.48
76,1 - 88,9	3.00 - 3.50	3,7	12.14
88,9 - 102,0	3.50 - 4.02	4,0	13.12
102,0 - 114,0	4.02 - 4.49	4,5	14.76
114,0 - 168,0	4.49 - 6.61	5,0	16.40
168,0 - 219,0	6.61 - 8.62	6,0	19.69
219,0 - 324,0	8.62 - 12.76	6,7	21.98
324,0 - 356,0	12.76 - 14.02	7,0	22.97
356,0 - 406,0	14.02 - 15.98	7,5	24.61

// PIPE BEND ASSEMBLY



Pipe bends must be fixed with RSB-pipe clamps immediately in front of and behind the bend.