

Bondstrand® 2000M/7000M for marine

1 to 6 inch (Quick-lock® joint), 8 to 40 inch (Taper/Taper joint) with external pressure requirements

Uses and applications

- Ballast
- Chlorination
- Draining
- Cargo line
- Sanitary service & sewage
- Portable discharge line
- Stripping lines
- Tank cleaning (salt water)
- Fire protection mains
- Various other applications

A complete library of Bondstrand pipe and fittings in PDS and PDMS-format is available on CD-ROM. Please contact NOV Fiber Glass Systems for details.

For specific fire protection requirements, an outer layer of passive fire protection is available.

For pipe systems without external pressure requirements, please contact your Bondstrand representative.

Approvals

In 1993, IMO (International Maritime Organisation) issued a resolution (A.18/Res. 753) covering acceptance criteria for assuring ship safety. Major certifying bodies have adopted and implemented these Guidelines in their respective Rules and Regulations for the Classification of Ships.

All Bondstrand pipe series used in the marine industry are designed and type-approved by the below major certifying bodies. (A complete list is available, on request)

- American Bureau of Shipping (ABS), U.S.A.;
- Bureau Veritas, France;
- Det Norske Veritas, Norway;
- Germanischer Lloyd, Germany;
- Lloyd's Register, United Kingdom;
- Nippon Kaiji Kyokai, Japan;
- Registro Italiano Navale (RINA), Italy;
- United States Coast Guard (USCG), U.S.A.

Characteristics

Maximum operating temperature: up to 93°C. Higher temperature application is available, please consult NOV Fiber Glass Systems. Pipe diameter: 1 - 40 inch (25-1000 mm).

Pipe system design for pressure ratings up to: 25 bar (362 psi) for 1 - 4 inch and 17.2 bar (250 psi) for 5 - 40 inch, depending type of fittings, see contents for each fitting designated pressure rating.

ASTM D-2992 Hydrostatic Design Basis (Procedure B - service factor 0.5);

ASTM D-1599 Safety factor of 4:1. Design criteria for external pressure requirements are in accordance with IMO regulations.

Bondstrand 2000M

ASTM D-2310 Classification: RTRP-11FW or RTRP-11FX for static hydrostatic design basis. Complies with ASTM F-1173 Classification and ASTM D-2996 designation.

Bondstrand 7000M

ASTM D-2310 Classification: RTRP-11AW or RTRP-11AX for static hydrostatic design basis. Complies with ASTM F-1173 Classification and ASTM D-2996 designation.

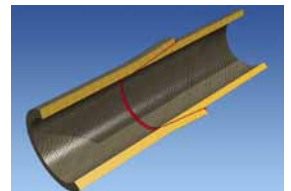
Joining Systems

Quick-Lock® joint
1-4 inch

Taper/Taper joint
6-40 inch



Quick-Lock® adhesive-bonded joint



Taper/Taper adhesive-bonded joint

Table of contents

Pipe series	3
Joining system and configuration	4
Typical Pipe length	4
Typical Pipe dimensions and weights	5
Ultimate Collapse Pressures	6
Joint dimensions Quick-Lock®	6
Joint dimensions Taper/Taper.....	7
Span length	8
Elbows	9-10
Tees (Equal, Reducing).....	11-17
Bushing Saddles	18
Laterals	18
Reducers (Concentric, Eccentric).....	19-20
Couplings	21
Nipples	21
Support Saddles	22
Grounding Saddles	23
Bell Mouths.....	23
Assembly of double O-ring expansion joint	24
Expansion coupling	24
Adapters	25
Adhesive	26
Engineering design & installation data	28
Specials	28
Field testing	28
Conversions	28
Important notice.....	28

Pipe series

Pipe

Filament-wound Glassfiber Reinforced Epoxy (GRE) pipe for Bondstrand adhesive-bonding systems.

Fittings

A wide range of lined filament-wound Glassfiber Reinforced Epoxy (GRE) fittings for Bondstrand adhesive-bonding systems. For special fittings, not listed in this product guide, please contact your NOV FGS representative.

Flanges

Filament-wound Glassfiber Reinforced Epoxy (GRE) heavy-duty flanges and stub-end ring flanges for Quick-Lock adhesive bonding systems. Standard flange drilling patterns as per ANSI B16.5 (150 Lb). Other flange drilling patterns, such as ANSI B16.5 (> 150 Lb), DIN, ISO and JIS are also available. Please refer to Bondstrand series 2000M/ 7000M Flanges brochure.

Bondstrand® 2000M

Glassfiber Reinforced Epoxy (GRE) pipe system. Standard 0.5 mm internal resin-rich reinforced liner. Maximum operating temperature: 93°C (for higher temperature rating, consult NOV Fiber Glass Systems).

Maximum pressure rating: 25 bar (362 psi) for 1 - 4 inch, 17.2 bar (250 psi) for 6 - 40 inch. Minimum pressure: full vacuum. External Pressure Requirements: In accordance with IMO Regulations.

Bondstrand® 7000M (* conductive)

Glassfiber Reinforced Epoxy (GRE) pipe system. Maximum operating temperature: 93°C (for higher temperature rating, consult NOV Fiber Glass Systems).

Maximum pressure rating: 25 bar (362 psi) for 1 - 4 inch, 17.2 bar (250 psi) for 6 - 40 inch. Minimum pressure: full vacuum.

External Pressure Requirements: In accordance with IMO Regulations.

*** Conductive**

Our conductive pipe systems have been developed to prevent accumulation of potentially dangerous levels of static electrical charges. Pipe, fittings and flanges contain high strength conductive filaments. Together with a conductive adhesive this provides an electrically continuous system.

Description	Bondstrand® 2000M	Bondstrand® 7000M
Pipe diameter	1-40 inch	1-40 inch
Joining system	Quick-Lock 1-6 inch Taper/Taper 8-40 inch	Quick-Lock 1-6 inch Taper/Taper 8-40 inch
Liner	*0.5 mm	-
**Temperature	93°C	93°C
Pressure Rating ^	17.2 bar (5-40 inch) 25 bar (1-4 inch)	17.2 bar (5-40 inch) 25 bar (1-4 inch)

* Also available without liner;

** For temperature above 93°C, please consult NOV Fiber Glass Systems;

^ See fitting table for specific pressure rating for individual fitting.

Joining system & configuration**Pipe**25-150 mm (1-6 inch):Quick-Lock (straight/taper) adhesive joint with integral pipe stop in bell end.
End configuration: Integral Quick-Lock bell end x shaved straight spigot.200-1000 mm (8-40 inch):

Taper/Taper adhesive joint.

End configuration: Integral Taper bell x shaved taper spigot

Fitting and Flanges25-150 mm (1-6 inch):Quick-Lock (straight/ taper) adhesive joint with integral pipe stop in bell end.
End configuration: Integral Quick-Lock bell ends.200-1000 mm (8-40 inch):

Taper/Taper adhesive joint.

End configuration: Integral Taper bell ends.

Note: * Pipe nipples, saddles and flanged fittings have different end configurations.

Typical pipe length

Nominal Pipe Size (mm)	(inch)	Joining System	Approximate overall Length	
			Europe Plant (m)	Asia Plant (m)
25-40	1-1.5	Quick-Lock	5.5	3.0
50-125	2-5	Quick-Lock	6.15	5.85/9.0
150	6	Quick-Lock	6.1	5.85/9.0
200-250	8-10	Taper/Taper	6.1/11.8	5.85/11.89
300-400	12-16	Taper/Taper	6.05/11.8	5.85/11.89
450-1000	18-40	Taper/Taper	11.8	11.89

* Tolerance +/- 50 mm

Typical pipe dimensions and weight

Bondstrand 2000M

Nominal Pipe Size		Pipe Inside Diameter	Minimum Struct. Wall Thickness [t]	Average Pipe Weight
[mm]	[inch]	[mm]	[mm]	[kg/m]
25	1	27.1	3.0	0.7
40	1.5	42.1	3.0	1.3
50	2	53.0	3.1	1.3
80	3	81.8	3.1	1.8
100	4	105.2	4.1	3.1
125	5	131.9	4.1	3.5
150	6	159.0	4.1	4.6
200	8	208.8	5.5	7.4
250	10	262.9	7.0	12
300	12	313.7	8.3	17
350	14	337.6	9.0	19
400	16	385.8	10.3	25
450	18	433.8	11.5	32
500	20	482.1	12.8	39
550	22	530.3	14.1	49
600	24	578.6	15.4	56
650	26	650.0	17.3	66
700	28	700.0	18.7	75
750	30	750.0	20.0	93
800	32	800.0	21.4	102
900	36	900.0	24.0	132
1000	40	1000.0	26.9	165

Bondstrand 7000M

Nominal Pipe Size		Pipe Inside Diameter	Minimum Struct. Wall Thickness [t]	Average Pipe Weight
[mm]	[inch]	[mm]	[mm]	[kg/m]
25	1	27.1	3.5	0.7
40	1.5	42.1	3.5	1.3
50	2	53.0	3.6	1.3
80	3	81.8	3.6	1.8
100	4	105.2	4.6	3.1
125	5	131.9	4.6	3.5
150	6	159.0	4.6	4.6
200	8	208.8	5.5	7.4
250	10	262.9	7.0	12
300	12	313.7	8.3	17
350	14	337.6	9.0	19
400	16	385.8	10.3	25
450	18	433.8	11.5	32
500	20	482.1	12.8	39
550	22	530.3	14.1	49
600	24	578.6	15.4	56
650	26	650.0	17.3	66
700	28	700.0	18.7	75
750	30	750.0	20.0	93
800	32	800.0	21.4	102
900	36	900.0	24.0	132
1000	40	1000.0	26.9	165

Outside diameters pipe in 250 and 300 mm sizes exceed iron pipe dimensions of ISO 559-1977 (273 and 324 mm, respectively) and cast iron pipe dimensions of ISO 13-1 978 (274 and 326 mm, respectively).

Ultimate collapse pressure

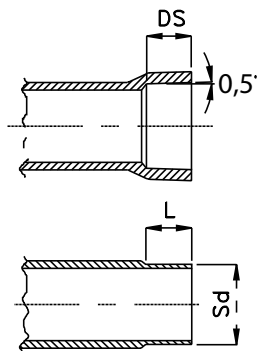
Ultimate collapse pressure (ultimate short term external failure pressure) at 65° C.

Nominal Pipe Size		Internal Pressure static*		2000M	7000M
[mm]	[inch]	[bar]	[bar]	[bar]	[bar]
25	1	25	702	742	
40	1.5	25	191	198	
50	2	25	105	108	
80	3	25	29.2	29.7	
100	4	25	31.9	32.4	
125	5	17.2	16.2	16.4	
150	6	17.2	9.3	9.4	
200	8	17.2	9.9	10.0	
250	10	17.2	10.2	10.3	
300	12	17.2	10.1	10.1	
350	14	17.2	10.3	10.3	
400	16	17.2	10.3	10.4	
450	18	17.2	10.1	10.2	
500	20	17.2	10.2	10.2	
550	22	17.2	10.2	10.3	
600	24	17.2	10.3	10.3	
650	26	17.2	10.3	10.3	
700	28	17.2	10.4	10.4	
750	30	17.2	10.3	10.3	
800	32	17.2	10.4	10.4	
900	36	17.2	10.4	10.5	
1000	40	17.2	10.6	10.6	

* Up to 93°C.

Quick-Lock® dimensions

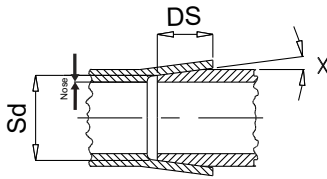
Dimensions for Quick-Lock bell & spigot adhesive bonded joints.



Nominal Pipe Size		Insertion Depth (Ds)	Spigot Diameter		Spigot Length	
[mm]	[inch]		Min Sd	Max Sd	Max L	Min L
25	1	27	32.6	32.9	28.5	31.0
40	1.5	32	47.5	47.8	33.5	36.0
50	2	46	59.2	59.6	49.0	52.0
80	3	46	87.6	88.0	49.0	52.0
100	4	46	112.5	112.9	49.0	52.0
125	5	57	139.5	139.9	58.5	61.5
150	6	57	166.2	166.6	59.0	62.0

Taper/Taper dimensions

Dimensions for adhesive Taper spigots for adhesive bonded Taper/Taper joints.



Nominal Pipe Size		Taper Angle	Insertion Depth	Nominal Spigot Nose thickn.	Dia of Spigot at Nose
[mm]	[inch]	X [degrees]	Ds [mm]	Nose [mm]	Sd [mm]
200	8	2.5	65	3.1	215.0
250	10	2.5	80	4.1	271.0
300	12	2.5	95	4.7	323.0
350	14	2.5	100	5.2	348.0
400	16	2.5	110	6.1	398.0
450	18	2.5	114	4.6	443.0
500	20	2.5	127	5.0	492.2
600	24	2.5	178	3.8	586.3
700	28	1.75	178	6.4	712.9
750	30	1.75	178	4.2	758.4
800	32	1.75	178	8.9	817.8
900	36	1.75	203	5.6	911.3
1000	40	1.75	320	8.1	1016.3

Span length**Bondstrand 2000M**

Nominal Pipe Size		Single Span*	Continuous Span*
[mm]	[inch]	[m]	[m]
25	1	2.6	3.3
40	1.5	2.9	3.7
50	2	3.1	4.0
80	3	3.5	4.5
100	4	4.0	5.1
125	5	4.3	5.4
150	6	4.5	5.7
200	8	5.1	6.5
250	10	5.8	7.3
300	12	6.3	8.0
350	14	6.5	8.3
400	16	7.0	8.8
450	18	7.4	9.3
500	20	7.7	9.8
600	24	8.5	10.8
700	28	9.3	11.8
750	30	9.6	12.2
800	32	10.0	12.7
900	36	10.5	13.4
1000	40	11.1	14.1

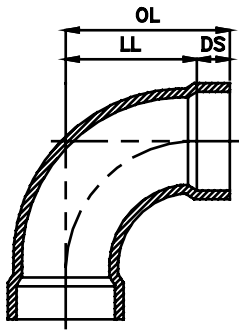
Bondstrand 7000M

Nominal Pipe Size		Single Span*	Continuous Span*
[mm]	[inch]	[m]	[m]
25	1	2.5	3.3
40	1.5	2.9	3.8
50	2	3.1	4.1
80	3	3.5	4.5
100	4	4.0	5.2
125	5	4.3	5.6
150	6	4.5	5.9
200	8	5.0	6.5
250	10	5.7	7.3
300	12	6.2	8.0
350	14	6.4	8.3
400	16	6.9	8.8
450	18	7.3	9.3
500	20	7.7	9.8
600	24	8.4	10.8
700	28	9.3	11.8
750	30	9.6	12.2
800	32	9.9	12.7
900	36	10.5	13.4
1000	40	11.1	14.1

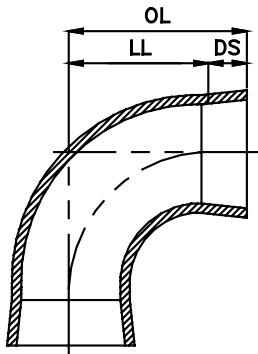
- Span recommendations are based on pipes filled with water having a density of 1000kg/m³ and include no provisions for weights caused by valves, flanges or other heavy objects.
- As per ISO 14692 recommendation, the maximum support span used is 6.0 m.

Elbows 90°

Filament-wound 90° elbows with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends for adhesive bonding.



Quick-Lock

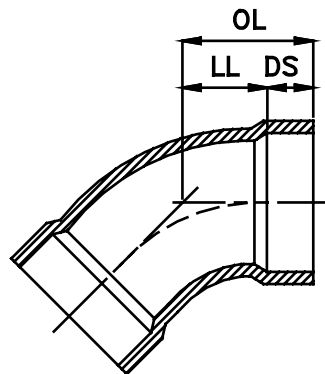


Taper/Taper

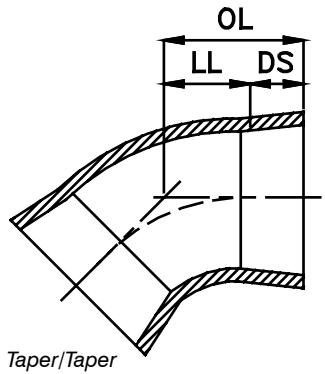
Nominal Pipe Size		Laying Length (LL)	Overall Length (OL)	Max. Working Pressure	Average Weight
[mm]	[inch]	[mm]	[mm]	[bar]	[kg]
25	1	65	92	25	0.3
40	1.5	81	113	25	0.4
50	2	76	122	25	0.5
80	3	114	160	25	1.1
100	4	152	198	25	1.6
125	5	195	252	17.2	2.7
150	6	229	286	17.2	3.6
200	8	315	380	17.2	6.8
250	10	391	471	17.2	11
300	12	472	567	17.2	18
350	14	364	464	17.2	26
400	16	402	512	17.2	31
450	18	458	572	17.2	53
500	20	508	635	17.2	65
550	22	559	711	17.2	94
600	24	584	762	17.2	122
650	26	660	838	17.2	180
700	28	711	889	17.2	205
750	30	762	940	17.2	243
800	32	813	991	17.2	330
900	36	915	1118	17.2	417
1000	40	1065	1385	17.2	489

Elbows 45°

Filament-wound 45° Quick-Lock (1-6 inch) and Taper/Taper (8-40 inch) socket ends for adhesive bonding.



Quick-Lock

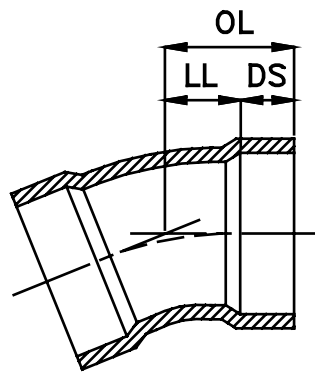


Taper/Taper

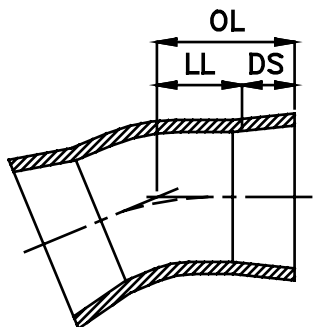
Nominal Pipe Size	[mm]	[inch]	Laying Length (LL)	[mm]	Overall Length (OL)	[mm]	Maximum Working Pressure	[bar]	Average Weight	[kg]
25		1	22		49		25		0.2	
40		1.5	29		61		25		0.3	
50		2	35		81		25		0.4	
80		3	51		97		25		0.8	
100		4	64		110		25		1.1	
125		5	84		141		17.2		1.8	
150		6	95		152		17.2		2.4	
200		8	137		202		17.2		4.3	
250		10	169		249		17.2		7.3	
300		12	205		300		17.2		11.0	
350		14	225		225		17.2		17.0	
400		16	142		252		17.2		20.0	
450		18	191		305		17.2		33	
500		20	210		337		17.2		40	
600		24	252		430		17.2		82	
700		28	295		473		17.2		140	
750		30	322		500		17.2		164	
800		32	337		515		17.2		283	
900		36	400		603		17.2		283	
1000		40	475		798		17.2		334	

Elbows 22½°

Filament-wound 22½° elbows with integral Quick-Lock (1-6 inch) and Taper/Taper (8-40 inch) socket ends for adhesive bonding.



Quick-Lock

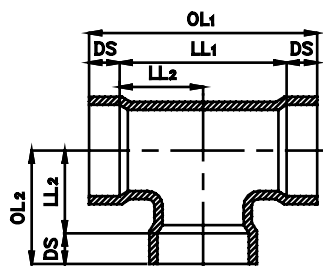


Taper/Taper

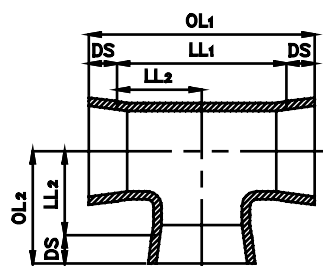
Nominal Pipe Size	[mm]	[inch]	Laying Length (LL)	[mm]	Overall Length (OL)	[mm]	Maximum Working Pressure	[bar]	Average Weight	[kg]
25		1	9		36		25		0.1	
40		1.5	9		41		25		0.2	
50		2	13		59		25		0.5	
80		3	21		67		25		0.7	
100		4	29		75		25		1	
125		5	43		100		17.2		1.4	
150		6	43		100		17.2		1.9	
200		8	76		141		17.2		3.9	
250		10	68		148		17.2		5.9	
300		12	86		181		17.2		10.4	
350		14	71		171		17.2		12	
400		16	85		195		17.2		14	
450		18	110		224		17.2		23	
500		20	101		228		17.2		28	
600		24	122		300		17.2		57	
700		28	142		320		17.2		98	
750		30	152		330		17.2		115	
900		36	182		385		17.2		198	
1000		40	258		578		17.2		234	

Equal Tees

Filament-wound equal Tee with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends for adhesive bonding.



Quick-Lock

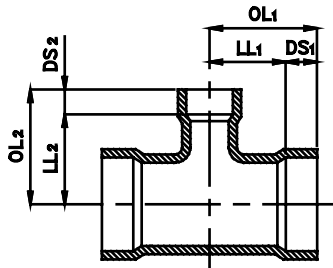


Taper/Taper

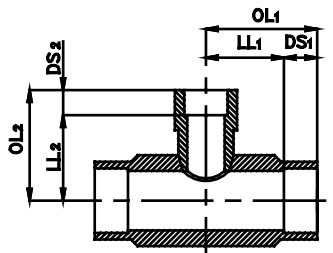
Nominal Pipe Size	Laying Length total run (LL1)		Overall Length total run (OL1)	Laying Length branch (LL2)		Overall Length branch (OL2)	Maximum Working Pressure	Average Weight
	[mm]	[inch]		[mm]	[mm]			
25	1	54	108	27	54	25	0.2	
40	1.5	60	124	30	62	25	0.4	
50	2	128	220	64	110	25	1	
80	3	172	264	86	132	25	1.8	
100	4	210	302	105	151	25	2.5	
125	5	254	368	127	184	17.2	5	
150	6	286	400	143	200	17.2	6.7	
200	8	376	506	188	253	17.2	10	
250	10	452	612	226	306	17.2	18	
300	12	546	736	273	368	17.2	29	
350	14	544	744	272	372	17.2	37	
400	16	590	810	295	405	17.2	56	
450	18	648	876	324	438	17.2	69	
500	20	712	966	356	483	17.2	92	
600	24	838	1194	419	597	17.2	168	
700	28	964	1320	482	660	17.2	285	
750	30	1016	1372	508	686	17.2	337	
800	32	1090	1446	545	723	17.2	459	
900	36	1220	1626	610	813	17.2	581	
1000	40	1466	2106	733	1053	17.2	686	

Reducing Tees

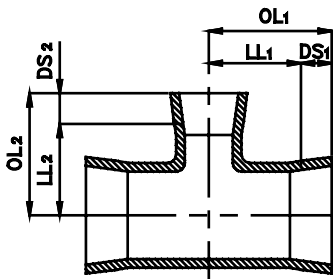
Filament-wound standard and fabricated reducing tees with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends for adhesive bonding.



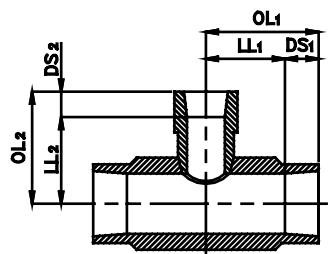
Quick-Lock Filament wound



Quick-Lock Fabricated



Taper/Taper Filament wound

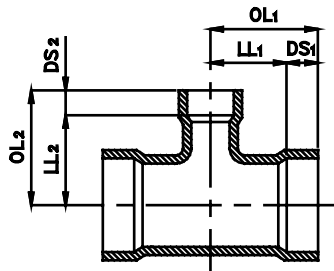


Taper/Taper Fabricated

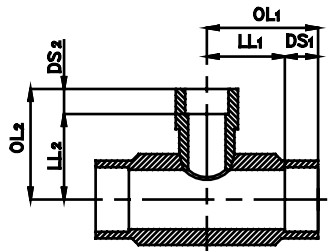
Nominal Pipe Size (runxbranch)	Laying Length (LL1) half run	Overall Length (OL1) half run	Laying Length (LL2) branch	Overall Length (OL2) branch	Maximum Working Pressure	Average Weight
[mm]	[mm]	[mm]	[mm]	[mm]	[bar]	[kg]
40x25	1.5x1	30	30	57	25	0.6
50x25	2x1	64	57	84	25	0.9
50x40	2x1.5	64	57	89	25	1
80x25	3x1	86	76	103	25	1.6
80x40	3x1.5	86	76	108	25	1.6
80x50	3x2	86	76	122	25	1.7
100x25	4x1	72	118	221	25	7.5
100x40	4x1.5	89	136	226	25	9.0
100x50	4x2	105	151	135	25	2.1
100x80	4x3	105	151	144	25	2.3
125x50	5x2	127	184	148	17.2	3.4
125x80	5x3	127	184	157	17.2	4
125x100	5x4	127	184	164	17.2	4.6
150x25	6x1	83	140	248	17.2	11.7
150x40	6x1.5	101	158	253	17.2	13.8
150x50	6x2	143	200	160	17.2	6.2
150x80	6x3	143	200	170	17.2	5.7
150x100	6x4	143	200	176	17.2	5.9
150x125	6x5	143	200	193	17.2	6.2
200x25	8x1	88	153	272	17.2	15.0
200x40	8x1.5	88	153	278	17.2	17.5
200x50	8x2	88	153	291	17.2	19.9
200x80	8x3	188	253	195	17.2	9.1
200x100	8x4	188	253	208	17.2	9.7
200x150	8x6	188	253	225	17.2	11.4
250x25	10x1	88	168	300	17.2	18.1
250x40	10x1.5	88	168	305	17.2	21
250x50	10x2	88	168	318	17.2	24
250x80	10x3	100	180	318	17.2	24
250x100	10"x4	226	306	230	17.2	14.8
250x150	10x6	226	306	251	17.2	15.5
250x200	10x8	226	306	268	17.2	16.5
300x25	12x1	88	183	325	17.2	21
300x40	12x1.5	88	183	330	17.2	25
300x50	12x2	88	183	344	17.2	29
300x80	12x3	100	195	344	17.2	29
300x100	12x4	273	368	252	17.2	21
300x150	12x6	273	368	276	17.2	22
300x200	12x8	273	368	294	17.2	23
300x250	12x10	273	368	321	17.2	24

Note: Regular numbers are filament wound tees; *Italic* numbers are fabricated tees.

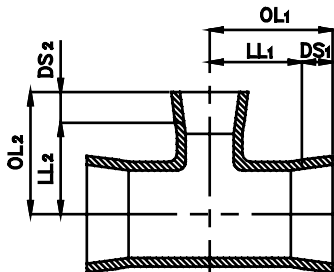
Reducing Tees (con't)



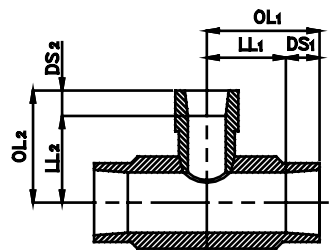
Quick-Lock Filament wound



Quick-Lock Fabricated



Taper/Taper Filament wound

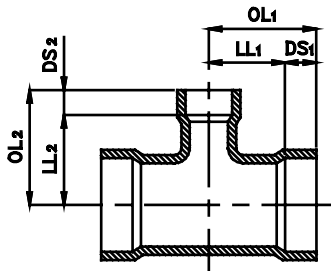


Taper/Taper Fabricated

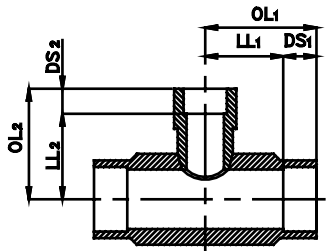
Nominal Pipe Size (run/branch)	Laying Length (LL1)	Overall Length (OL1)	Laying Length (LL2)	Overall Length (OL2)	Maximum Working Pressure	Average Weight
[mm]	[inch]	[mm]	[mm]	[mm]	[bar]	[kg]
350x25	14x1	88	188	314	17.2	24
350x40	14x1.5	88	188	314	17.2	28
350x50	14x2	88	188	314	17.2	31
350x80	14x3	100	200	314	17.2	31
350x100	14x4	113	213	314	17.2	31
350x150	14x6	272	372	244	17.2	29
350x200	14x8	272	372	254	17.2	30
350x250	14x10	272	372	267	17.2	32
350x300	14x12	272	372	288	17.2	34
400x25	16x1	88	198	338	17.2	29
400x40	16x1.5	88	198	338	17.2	33
400x50	16x2	88	198	338	17.2	37
400x80	16x3	100	210	338	17.2	37
400x100	16x4	113	223	338	17.2	37
400x150	16x6	295	405	264	17.2	37
400x200	16x8	295	405	273	17.2	38
400x250	16x10	295	405	283	17.2	41
400x300	16x12	295	405	304	17.2	45
400x350	16x14	295	405	292	17.2	49
450x25	18x1	88	202	358	17.2	31
450x40	18x1.5	88	202	358	17.2	31
450x50	18x2	88	202	358	17.2	22
450x80	18x3	100	214	358	17.2	35
450x100	18x4	113	227	358	17.2	38
450x150	18x6	138	252	367	17.2	45
450x200	18x8	324	438	306	17.2	53
450x250	18x10	324	438	319	17.2	60
450x300	18x12	324	438	328	17.2	67
450x350	18x14	324	438	317	17.2	66
450x400	18x16	324	438	319	17.2	69
500x25	20x1	88	215	382	17.2	35
500x40	20x1.5	88	215	382	17.2	35
500x50	20x2	88	215	382	17.2	36
500x80	20x3	100	227	382	17.2	39
500x100	20x4	113	240	382	17.2	43
500x150	20x6	138	265	391	17.2	50
500x250	20x10	356	483	344	17.2	77
500x300	20x12	356	483	354	17.2	82
500x350	20x14	356	483	343	17.2	85
500x400	20x16	356	483	344	17.2	85
500x450	20x18	356	483	350	17.2	89

Note: Tees main-run (18-40 inch) with Quick-Lock socket branch (1-6 inch) are fabricated Tees. Regular numbers are filament wound tees; *Italic* numbers are fabricated tees.

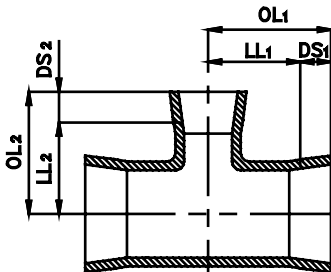
Reducing Tees (con't)



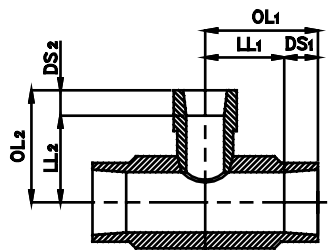
Quick-Lock Filament wound



Quick-Lock Fabricated



Taper/Taper Filament wound

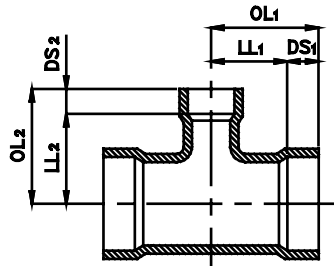


Taper/Taper Fabricated

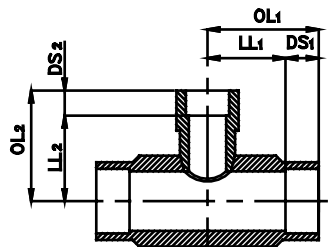
Nominal Pipe Size (runxbranch)	Laying Length (LL1) half run	Overall Length (OL1) half run	Laying Length (LL2) branch	Overall Length (OL2) branch	Maximum Working Pressure	Average Weight
[mm]	[mm]	[mm]	[mm]	[mm]	[bar]	[kg]
550x200	388	540	357	422	17.2	80
550x250	388	540	370	450	17.2	85
550x300	388	540	379	474	17.2	90
550x350	388	540	368	468	17.2	94
550x400	388	540	370	480	17.2	94
550x450	388	540	375	489	17.2	98
550x500	388	540	381	508	17.2	102
600x25	88	266	430	457	17.2	51
600x40	88	266	430	462	17.2	51
600x50	88	266	430	476	17.2	52
600x80	100	278	430	476	17.2	56
600x100	113	291	430	476	17.2	61
600x150	138	316	439	496	17.2	69
600x200	419	597	412	477	17.2	78
600x250	419	597	386	466	17.2	85
600x300	419	597	417	512	17.2	85
600x350	419	597	394	494	17.2	101
600x400	419	597	395	505	17.2	99
600x450	419	597	413	527	17.2	137
600x500	419	597	406	533	17.2	156
700x25	88	266	491	518	17.2	59
700x40	88	266	491	523	17.2	59
700x50	88	266	491	537	17.2	59
700x80	100	278	491	537	17.2	64
700x100	113	291	491	537	17.2	70
700x150	138	316	500	557	17.2	80
700x350	482	660	490	590	17.2	147
700x400	482	660	500	610	17.2	166
700x450	482	660	500	614	17.2	189
700x500	482	660	506	633	17.2	210
700x600	482	660	506	684	17.2	252
750x25	88	266	516	543	17.2	63
750x40	88	266	516	548	17.2	63
750x50	88	266	516	562	17.2	63
750x80	100	278	516	562	17.2	69
750x100	113	291	516	562	17.2	74
750x150	138	316	525	582	17.2	85
750x300	508	686	765	860	17.2	118
750x350	508	686	722	822	17.2	157
750x400	508	686	698	808	17.2	178
750x450	508	686	488	602	17.2	202
750x500	508	686	495	622	17.2	225
750x600	508	686	481	659	17.2	270

Note: Tees main-run (18-40 inch) with Quick-Lock socket branch (1-6 inch) are fabricated Tees. Regular numbers are filament wound tees; *Italic* numbers are fabricated tees.

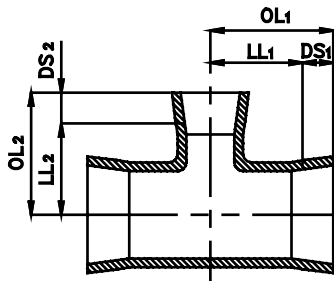
Reducing Tees (con't)



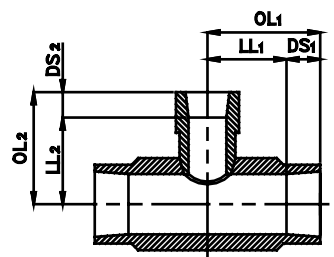
Quick-Lock Filament wound



Quick-Lock Fabricated



Taper/Taper Filament wound



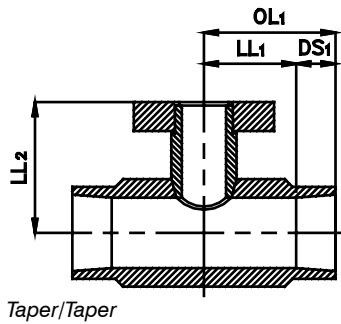
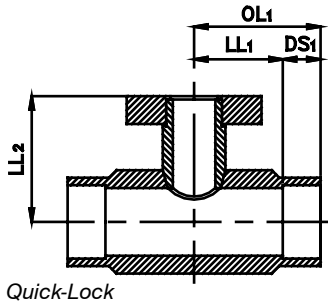
Taper/Taper Fabricated

Nominal Pipe Size (runxbranch)		Laying Length (LL1) half run	Overall Length (OL1) half run	Laying Length (LL2) branch	Overall Length (OL2) branch	Maximum Working Pressure	Average Weight
[mm]	[inch]	[mm]	[mm]	[mm]	[mm]	[bar]	[kg]
800x25	32x1	88	266	541	568	17.2	66
800x40	32x1.5	88	266	541	573	17.2	67
800x50	32x2	88	266	541	587	17.2	67
800x80	32x3	100	278	541	587	17.2	73
800x100	32x4	113	291	541	587	17.2	79
800x150	32x6	138	316	550	607	17.2	90
800x500	32x20	545	723	523	650	17.2	258
800x600	32x24	545	723	523	701	17.2	310
800x700	32x28	545	723	532	710	17.2	348
800x750	32x30	545	723	534	712	17.2	387
900x25	36x1	88	291	591	618	17.2	78
900x40	36x1.5	88	291	591	623	17.2	78
900x50	36x2	88	291	591	637	17.2	78
900x80	36x3	100	303	591	637	17.2	85
900x100	36x4	113	316	591	637	17.2	92
900x150	36x6	138	341	600	657	17.2	105
900x400	36x16	610	813	563	673	17.2	270
900x450	36x18	610	813	563	677	17.2	290
900x500	36x20	610	813	563	690	17.2	323
900x600	36x24	610	813	541	719	17.2	387
900x700	36x28	610	813	570	748	17.2	459
900x750	36x30	610	813	584	762	17.2	484
1000x25	40x1	120	440	641	668	17.2	92
1000x40	40x1.5	120	440	641	673	17.2	92
1000x50	40x2	120	440	641	687	17.2	92
1000x80	40x3	132	452	641	687	17.2	100
1000x100	40x4	145	465	641	687	17.2	100
1000x600	40x24	733	1053	593	771	17.2	456
1000x700	40x28	733	1053	632	810	17.2	541
1000x750	40x30	733	1053	633	811	17.2	571
1000x800	40x32	733	1053	652	830	17.2	605
1000x700	40x36	733	1053	652	855	17.2	634

Note: Tees main-run (18-40 inch) with Quick-Lock socket branch (1-6 inch) are fabricated Tees. Regular numbers are filament wound tees; *Italic* numbers are fabricated tees.

Fabricated Reducing Tees with Flanged Branch

Fabricated Reducing tees with integral Quick-Lock (4-6 inch) or Taper (8-16 inch) socket ends and flanged branch.

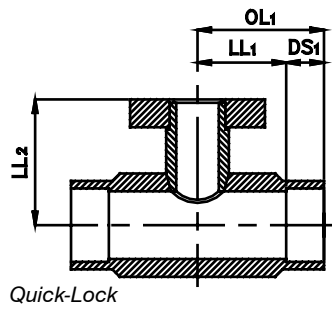


Nominal Pipe Size (runxbranch)	Laying Length (LL1) half run	Overall Length (OL1) half run	Laying Length (LL2) branch	Maximum Working Pressure	Average Weight
[mm]	[inch]	[mm]	[mm]	[bar]	[kg]
100x25	4x1	72	118	25	8.0
100x40	4x1.5	89	135	25	9.7
150x25	6x1	83	140	17.2	12.2
150x40	6x1.5	101	158	17.2	14.5
200x25	8x1	88	153	17.2	15.5
200x40	8x1.5	88	153	17.2	18.2
200x50	8x2	88	153	17.2	21
250x25	10x1	88	168	17.2	18.6
250x40	10x1.5	88	168	17.2	22
250x50	10x2	88	168	17.2	26
250x80	10x3	100	180	17.2	26
300x25	12x1	88	183	17.2	22
300x40	12x1.5	88	183	17.2	26
300x50	12x2	88	183	17.2	30
300x80	12x3	100	195	17.2	31
350x25	14x1	88	188	17.2	24
350x40	14x1.5	88	188	17.2	28
350x50	14x2	88	188	17.2	33
350x80	14x3	100	200	17.2	33
350x100	14x4	113	213	17.2	34
400x25	16x1	85	187	17.2	29
400x40	16x1.5	103	205	17.2	34
400x50	16x2	118	220	17.2	39
400x80	16x3	118	220	17.2	39
400x100	16x4	118	220	17.2	40

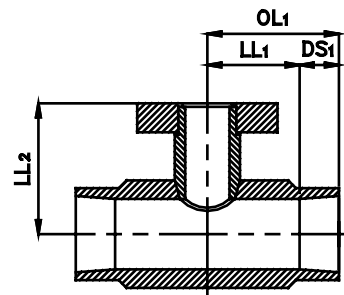
Note: Other sizes, or multiple size branched tees available on request. Please contact NOV Fiber Glass Systems.

Fabricated Reducing Tees with Flanged Branch (con't)

Fabricated Reducing tees with integral Taper (18-40 inch) socket ends and flanged branch.



Quick-Lock



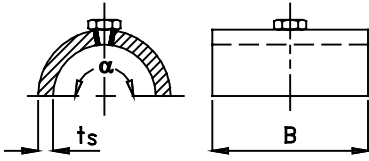
Taper/Taper

Nominal Pipe Size (runxbranch)	Laying Length (LL1) half run	Overall Length (OL1) half run	Laying Length (LL2) branch	Maximum Working Pressure	Average Weight
[mm]	[mm]	[mm]	[mm]	[bar]	[kg]
450x25	88	202	388	17.2	32
450x40	88	202	394	17.2	32
450x50	88	202	408	17.2	33
450x80	100	214	409	17.2	37
450x100	113	227	409	17.2	41
450x150	138	252	430	17.2	49
500x25	88	215	412	17.2	36
500x40	88	215	418	17.2	36
500x50	88	215	432	17.2	37
500x80	100	227	433	17.2	41
500x100	113	240	433	17.2	46
600x25	88	266	460	17.2	52
600x40	88	266	467	17.2	52
600x50	88	266	480	17.2	53
600x80	100	278	481	17.2	58
600x100	113	291	481	17.2	63
650x25	88	266	497	17.2	78
650x40	88	266	502	17.2	78
650x50	88	266	516	17.2	78
650x80	100	278	517	17.2	83
650x100	113	291	517	17.2	88
700x25	88	266	521	17.2	59
700x40	88	266	527	17.2	59
700x50	88	266	541	17.2	61
700x80	100	278	542	17.2	67
700x100	113	291	542	17.2	73
750x25	88	266	546	17.2	63
750x40	88	266	552	17.2	63
750x50	88	266	566	17.2	64
750x80	100	278	567	17.2	71
750x100	113	291	567	17.2	77
800x25	88	266	571	17.2	67
800x40	88	266	576	17.2	67
800x50	88	266	590	17.2	68
800x80	100	278	590	17.2	75
800x100	113	291	590	17.2	82
900x25	88	291	621	17.2	78
900x40	88	291	627	17.2	79
900x50	88	291	641	17.2	80
900x80	100	303	642	17.2	87
900x100	113	316	642	17.2	94
1000x25	120	440	672	17.2	92
1000x40	120	440	677	17.2	93
1000x50	120	440	691	17.2	94
1000x80	132	452	692	17.2	103
1000x100	145	465	692	17.2	113

Note: Other sizes, or multiple size branched tees available on request. Please contact NOV Fiber Glass Systems.

Bushing Saddles

Filament-wound pipe saddles with stainless steel, 1/2 inch and 3/4 inch threaded bushings.*

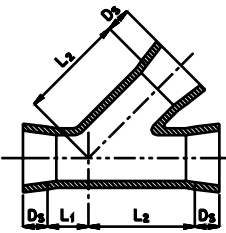


Nominal Pipe Size	Angle α	Saddle Length (B)	Saddle Thickn. (ts)	Maximum Working Pressure	Average Weight	Required Adhesive Kits
[mm] [inch]	[degree]	[mm]	[mm]	[bar]	[kg]	[3 Oz] [6 Oz]
50	2	180	100	17.2	0.5	1 -
80	3	180	100	17.2	0.6	1 -
100	4	180	100	17.2	0.8	1 -
125	5	180	100	17.2	0.9	- 1
150	6	180	100	17.2	1.0	- 1
200	8	180	100	17.2	1.2	- 1
250	10	180	100	17.2	1.6	1 1
300	12	180	100	12	1.9	1 1
350	14	180	100	12	2.1	1 1
400	16	180	100	12	2.5	- 2
450	18	90	100	12	3.3	- 1
500	20	90	100	12	3.7	1 1
600	24	90	100	12	4.4	- 2

* Consult NOV Fiber Glass Systems for other type material, or other sized bushings. For higher pressures, above 17.2/12 bar, please contact NOV Fiber Glass Systems.

45° Laterals

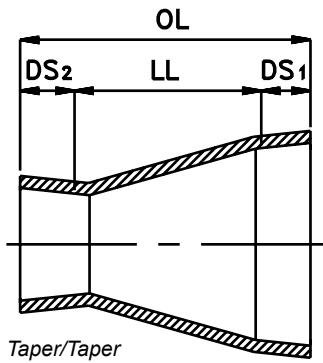
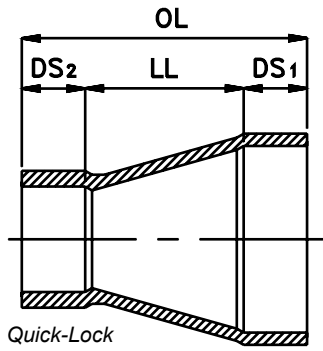
Filament-wound 45° laterals with integral Quick-Lock (2-6 inch) or Taper/Taper (8-16 inch) socket ends, for adhesive bonding.



Nominal Pipe Size	Laying Length (LL1)	Overall Length (OL1)	Laying Length (LL2)	Overall Length (OL2)	Maximum Working Pressure	Average Weight
[mm] [inch]	[mm]	[mm]	[mm]	[mm]	[bar]	[kg]
50	2	64	110	203	249	17.2 1.6
80	3	76	122	254	300	17.2 3.0
100	4	76	122	305	351	17.2 3.9
125	5	89	146	337	394	17.2 5.8
150	6	89	146	368	425	17.2 6.8
200	8	124	189	455	520	17.2 12.0
250	10	137	217	531	611	12 21
300	12	159	254	641	736	12 30
350	14	150	250	632	732	12 39
400	16	150	260	632	742	12 54

Concentric Reducers

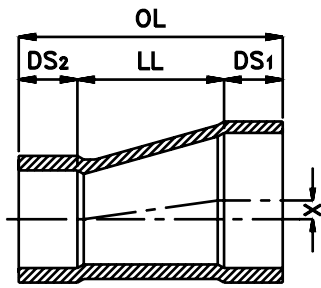
Filament-wound concentric reducers with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends, for adhesive bonding.



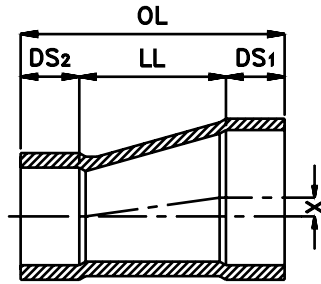
Nominal Pipe Size (run/run)		Laying Length (LL)	Overall Length (OL)	Maximum Working Pressure	Average Weight
[mm]	[inch]	[mm]	[mm]	[bar]	[kg]
40x25	1.5x1	32	91	25	0.2
50x25	2x1	64	137	25	0.3
50x40	2x1.5	32	110	25	0.5
80x40	3x1.5	76	154	25	0.5
80x50	3x2	54	146	25	0.5
100x50	4x2	76	168	25	1.1
100x80	4x3	73	165	25	0.9
125x80	5x3	74	177	17.2	1.4
125x100	5x4	74	177	17.2	1.5
150x80	6x3	97	200	17.2	1.8
150x100	6x4	94	197	17.2	1.8
150x125	6x5	110	224	17.2	1.8
200x100	8x4	153	264	17.2	2.9
200x150	8x6	119	241	17.2	2.7
250x150	10x6	138	275	17.2	3.7
250x200	10x8	135	280	17.2	3.6
300x200	12x8	189	349	17.2	5.0
300x250	12x10	176	351	17.2	4.6
350x250	14x10	214	394	17.2	7.2
350x300	14x12	217	412	17.2	7.3
400x300	16x12	204	409	17.2	8.9
400x350	1"x14	183	393	17.2	9.0
450x400	18x16	113	337	17.2	12.7
500x400	20x16	235	472	17.2	23
500x450	20x18	123	364	17.2	18.9
550x400	22x16	340	602	17.2	36
550x450	22x18	228	494	17.2	32
550x500	22x20	106	385	17.2	29
600x400	24x16	463	751	17.2	48
600x450	24x18	353	645	17.2	44
600x500	24x20	230	535	17.2	39
600x550	24x22	126	456	17.2	36
700x400	28x16	775	1063	17.2	79
700x450	28x1	661	953	17.2	74
700x500	28x20	542	847	17.2	69
700x600	28x24	311	667	17.2	67
750x400	30x16	886	1174	17.2	112
750x450	30x18	775	1067	17.2	107
750x500	30x20	653	958	17.2	100
750x600	30x24	422	778	17.2	87
750x650	30x26	240	596	17.2	72
750x700	30x28	111	467	17.2	57
800x450	32x18	920	1212	17.2	125
800x500	32x20	798	1103	17.2	109
800x600	32x24	570	926	17.2	94
800x700	32x28	259	615	17.2	82
800x750	32x30	148	504	17.2	71
900x500	36x20	1029	1359	17.2	210
900x600	36x24	799	1180	17.2	176
900x700	36x28	487	868	17.2	140
900x750	36x30	375	756	17.2	126
1000x900	40x36	310	833	17.2	182

Eccentric Reducers

Filament-wound Eccentric Reducers with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends, for adhesive bonding.



Quick-Lock

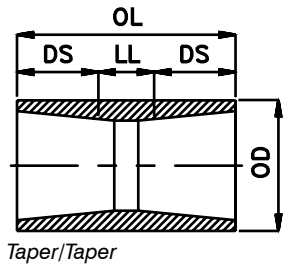
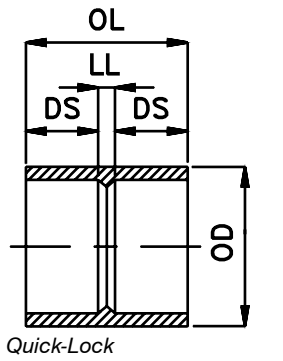


Taper/Taper

Nominal Pipe Size (run/run)	Laying Length (LL)		Overall Length (OL)	Eccentricity (X)	Maximum Working Pressure	Average Weight
	[mm]	[inch]				
40x25	56	1.5x1	115	7	25	0.2
50x25	100	2x1	173	13	25	0.3
50x40	44	2x1.5	122	6	25	0.5
80x40	150	3x1.5	228	20	25	0.5
80x50	108	3x2	200	14	25	0.5
100x50	200	4x2	292	27	25	1.1
100x80	93	4x3	185	12	25	0.9
125x100	101	5x4	204	14	17.2	1.5
150x80	293	6x3	396	39	17.2	1.8
150x100	200	6x4	303	27	17.2	1.8
150x125	100	6x5	214	13	17.2	1.8
200x100	405	8x4	516	52	17.2	2.9
200x150	205	8x6	327	25	17.2	2.7
250x150	410	10x6	547	53	17.2	3.7
250x200	235	10x8	380	27	17.2	3.6
300x200	429	12x8	589	53	17.2	5.0
300x250	229	12x10	404	26	17.2	4.6
350x250	340	14x10	520	42	17.2	7.2
350x300	159	14x12	354	16	17.2	7.3
400x300	344	16x12	549	41	17.2	8.9
400x350	215	16x14	425	25	17.2	9.0
450x300	450	18x12	640	63	17.2	15.6
450x350	322	18x14	525	43	17.2	14.2
450x400	197	18x16	413	18	17.2	12.7
500x400	324	20x16	553	39	17.2	23
500x450	197	20x18	438	22	17.2	18.9
600x400	580	24x16	860	93	17.2	48
600x450	450	24x18	742	73	17.2	44
600x500	325	24x20	630	48	17.2	39
750x400	451	30x24	807	86	17.2	87
900x400	832	36x24	1213	161	17.2	176
1000x800	739	40x32	1237	100	17.2	182
1000x900	419	40x36	942	52	17.2	192

Couplings

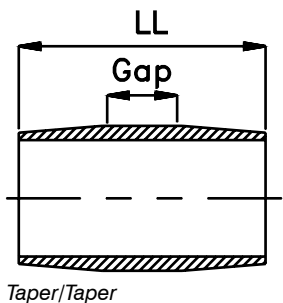
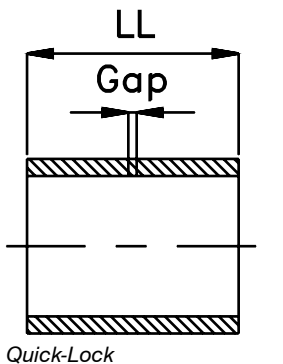
Filament-wound couplings with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) socket ends, for adhesive bonding.



Nominal Pipe Size	[mm]	[inch]	Laying Length (LL)	[mm]	Overall Length (OL)	[mm]	Outside Diameter (OD)	[mm]	Maximum Working Pressure	[bar]	Average Weight	[kg]
25		1	10		64		42		25		0.1	
40		1.5	10		74		58		25		0.1	
50		2	10		102		72		25		0.3	
80		3	10		102		100		25		0.4	
100		4	10		102		129		25		0.6	
125		5	10		124		153		17.2		0.9	
150		6	10		124		183		17.2		1.1	
200		8	70		200		235		17.2		1.7	
250		10	70		230		289		17.2		2.3	
300		12	70		260		340		17.2		2.8	
350		14	70		270		372		17.2		4.6	
400		16	70		290		422		17.2		7.2	
450		18	70		298		460		17.2		10.7	
500		20	70		324		514		17.2		13.0	
600		24	70		426		619		17.2		18.8	
700		28	70		426		742		17.2		24	
750		30	70		426		795		17.2		25	
800		32	70		426		848		17.2		27	
900		36	70		476		950		17.2		35	
1000		40	70		710		1057		17.2		41	

Nipples

Filament-wound nipples with integral Quick-Lock (1-6 inch) or Taper/Taper (8-40 inch) male ends, for adhesive bonding.

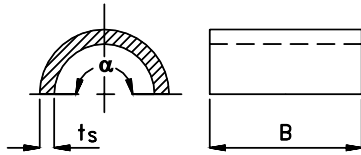


Nominal Pipe Size	[mm]	[inch]	Laying Length (LL)	[mm]	Gap*	[mm]	Maximum Working Pressure	[bar]	Average Weight	[kg]
25		1	57		3		25		0.1	
40		1.5	67		3		25		0.1	
50		2	95		3		25		0.1	
80		3	95		3		25		0.1	
100		4	95		3		25		0.2	
125		5	117		3		17.2		0.3	
150		6	117		3		17.2		0.4	
200		8	160		30		17.2		0.6	
250		10	190		30		17.2		0.9	
300		12	230		40		17.2		1.1	
350		14	240		40		17.2		3.1	
400		16	260		40		17.2		4.4	
450		18	278		50		17.2		5.9	
500		20	304		50		17.2		7.8	
600		24	406		50		17.2		12	
700		28	406		50		17.2		21	
750		30	406		50		17.2		22	
800		32	406		50		17.2		24	
900		36	456		50		17.2		36	
1000		40	690		50		17.2		51	

* Remaining gap after bonding.

Support Saddles

Filament-wound pipe saddles for wear, support and anchor.



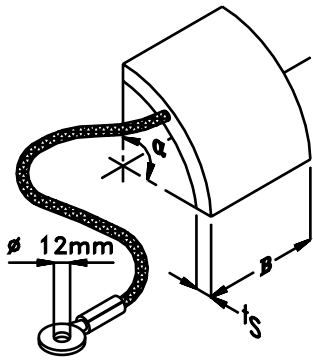
Nominal Pipe Size	Saddle Angle α		Saddle Thckn. t_s [mm]	Saddle Weight B=100mm [kg]	Required Adhesive Kits		Saddle Weight B=150mm [kg]	Required Adhesive Kits	
	[mm]	[inch]			[3 and 6Oz]	[3 and 6 Oz]			
25	1	180	14	0.2	1	-	0.3	1	-
40	1.5	180	14	0.3	1	-	0.5	1	-
50	2	180	14	0.4	1	-	0.6	1	-
80	3	180	14	0.5	1	-	0.8	-	1
100	4	180	14	0.7	1	-	1.1	-	1
125	5	180	14	0.8	-	1	1.2	-	1
150	6	180	14	0.9	-	1	1.4	-	1.5
200	8	180	14	1.1	-	1	1.7	-	1.5
250	10	180	14	1.5	-	1.5	2.3	-	2
300	12	180	14	1.8	-	1.5	2.7	-	2.5
350	14	180	14	2.0	-	1.5	3.0	-	2.5
400	16	180	14	2.4	-	2	3.6	-	3
450	18	180	16	-	-	-	3.2	-	2
500	20	180	16	-	-	-	3.6	-	2
600	24	180	16	-	-	-	4.3	-	2
700	28	180	16	-	-	-	5.1	-	3
750	30	180	16	-	-	-	5.5	-	3
800	32	180	16	-	-	-	5.8	-	3
900	36	180	16	-	-	-	6.5	-	4
1000	40	180	16	-	-	-	8.2	-	4

Notes:

- 1) Filament-wound support saddles are intended for protection of pipe at supports and clamps, as well as for anchoring purposes. Support and anchor saddles are standard 180°. Saddles are supplied in standard lengths of 100 mm and 150 mm.
- 2) For special saddle -lengths, -thickness and/or angles consult NOV Fiber Glass Systems.
- 3) Wear saddles are standard 90°. Weights of 90° degree saddles are 50% of value shown.

Grounding Saddles

Filament-wound pipe saddles for grounding in conductive piping systems.



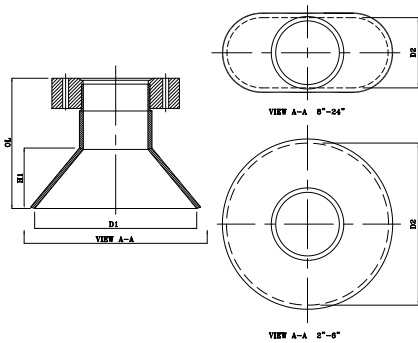
Nominal Pipe Size Required		Saddle Angle α	Saddle Length B	Saddle Thickness t_s	Average Saddle Weight	Adhesive Kits
[mm]	[inch]	[degree]	[mm]	[mm]	[kg]	[3Oz]
25	1	90	76	14	0.1	1
40	1.5	90	76	14	0.1	1
50	2	90	76	14	0.1	1
80	3	90	76	14	0.1	1
100	4	90	76	14	0.2	1
125	5	90	76	14	0.3	1
150	6	90	76	14	0.3	1
200	8	45	76	14	0.2	1
250	10	45	76	14	0.2	1
300	12	45	76	14	0.2	1
350	14	45	76	14	0.3	1
400	16	45	76	14	0.3	1
450	18	22.5	76	16	0.2	1
500	20	22.5	76	16	0.2	1
600	24	22.5	76	16	0.3	1
700	28	22.5	76	16	0.3	2
750	30	22.5	76	16	0.4	2
800	32	22.5	76	16	0.4	3
900	36	22.5	76	16	0.4	3
1000	40	22.5	76	16	0.5	3

Notes:

- 1) Bondstrand conductive adhesive should be used for mounting.
- 2) Saddles are supplied with integrated stainless steel cable with a length of 600 mm.

Bell Mouths

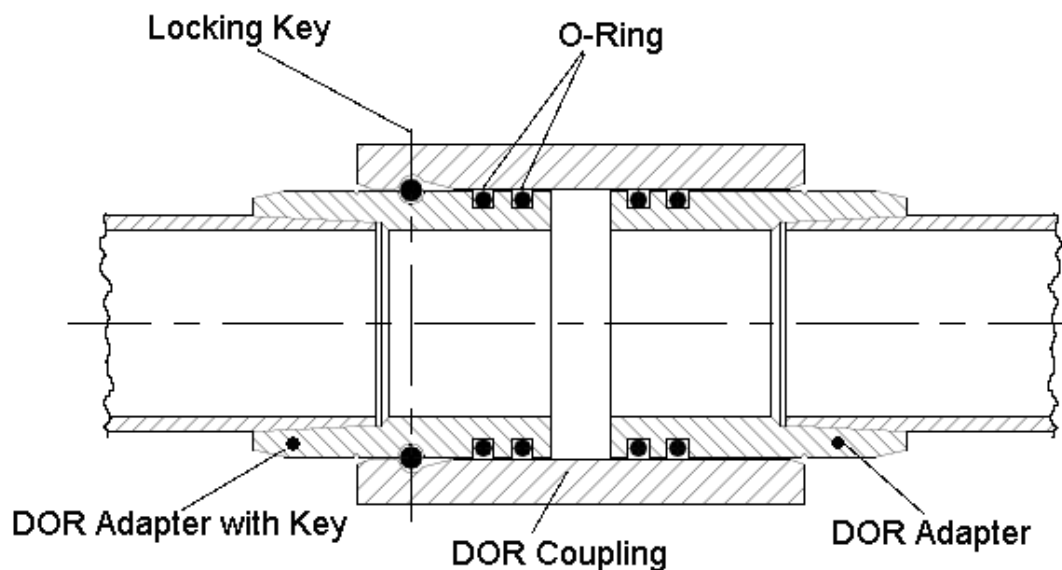
Filament-wound bell mouths with adhesive-bonded HD-flange.



Nominal Pipe Size		Overall Length (OL)	Length of Bell Mouth (H1)	Internal Diameter (D1)	Internal Diameter (D2)	Average Weight*
[mm]	[inch]	[mm]	[mm]	[mm]	[mm]	[kg]
50	2	269	115	110	110	3.1
80	3	274	120	220	220	5.0
100	4	289	135	275	275	8.4
125	5	323	158	400	400	12.7
150	6	324	158	450	450	14.7
200	8	534	340	750	418	26
250	10	604	395	850	518	39
300	12	588	365	850	510	51
350	14	616	375	850	510	60
400	16	596	345	850	510	67
450	18	627	360	900	548	90
500	20	724	450	1100	548	119
600	24	831	540	1300	648	171

* Weights provided are for bell mouth with CL150 flange.

Assembly of double O-ring expansion joint



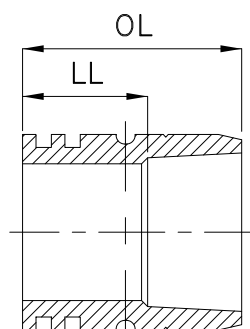
Expansion Coupling

Filament-wound Key-Lock expansion coupling with integral double O-ring Key-Lock female end one side and double O-ring female end on other side.

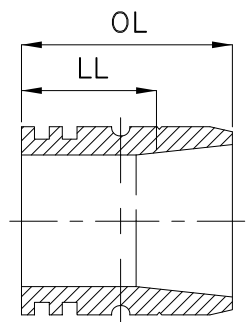
Nominal Pipe Size		Laying Length (LL)	Overall Length (OL)	O-ring Size	Key Size	Average Weight
[mm]	[inch]	[mm]	[mm]	[mm]	[mm]	[kg]
50	2	50	222	7 x 59.7	6 x 305	1.3
80	3	50	222	7 x 88.3	6 x 400	1.7
100	4	50	222	7 x 113.7	6 x 483	3.5
125	5	50	264	9 x 135	8 x 580	4.6
150	6	50	270	10 x 161.3	8 x 660	6.6
200	8	50	339	10 x 225.5	10 x 840	15.4
250	10	50	376	12.5 x 302	12 x 1270	19.9
300	12	50	478	12.5 x 342.3	15 x 1270	21
350	14	50	452	12.5 x 342.3	15 x 1360	25
400	16	50	496	12.5 x 393.1	18 x 1585	32
450	18	50	416	15.0 x 445.0	15 x 1750	27
500	20	50	433	15.0 x 490.0	15 x 1930	32
600	24	50	479	18.0 x 580.0	18 x 2240	52
700	28	50	560	20.0 x 685.0	20 x 2700	77
750	30	50	574	20.0 x 740.0	20 x 2700	90
800	32	50	644	20.0 x 790.0	20 x 3065	115
900	36	50	754	25.0 x 890.0	25 x 3175	170
1000	40	50	740	26.0 x 987.0	20 x 3500	208

Key-Lock Adapter for Expansion Coupling

Filament-wound double O-ring male Key-Lock adapter with integral Quick-Lock (2-6 inch) or Taper/Taper (8-40 inch) socket end, for adhesive bonding.



Quick-Lock

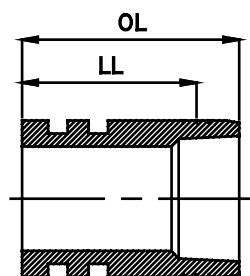


Taper/Taper

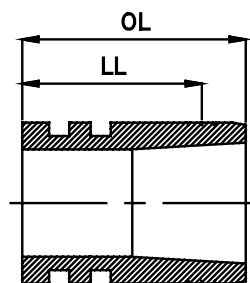
Nominal Pipe Size	[mm]	[inch]	Laying Length (LL)	[mm]	Overall Length (OL)	[mm]	Average Weight	[kg]
50		2	85		131		0.4	
80		3	85		131		0.6	
100		4	85		131		0.9	
125		5	102		159		1.6	
150		6	105		162		1.8	
200		8	149		202		5.1	
250		10	158		228		11.8	
300		12	185		285		14.6	
350		14	195		285		10.7	
400		16	205		320		15.9	
450		18	193		307		19.5	
500		20	201		328		24	
600		24	224		402		25	
700		28	265		443		29	
750		30	272		450		34	
800		32	307		485		42	
900		36	362		565		50	
1000		40	355		765		64	

Double O-ring Adapter for Expansion Coupling

Filament-wound double O-ring male adapter with integral Quick-Lock (1-6 inch) and Taper (8-40 inch) socket end, for adhesive bonding.



Quick-Lock



Taper/Taper

Nominal Pipe Size	[mm]	[inch]	Laying Length (LL)	[mm]	Overall Length (OL)	[mm]	Average Weight	[kg]
50		2	85		131		0.4	
80		3	85		131		0.7	
100		4	85		131		0.9	
125		5	102		159		1.6	
150		6	105		162		1.8	
200		8	138		203		5.1	
250		10	148		228		11.8	
300		12	175		285		14.6	
350		14	185		285		10.7	
400		16	195		320		15.9	
450		18	193		307		19.5	
500		20	201		328		24	
600		24	224		402		25	
700		28	265		443		29	
750		30	272		450		34	
800		32	307		485		42	
900		36	362		565		50	
1000		40	355		765		64	

Adhesive

Number of Adhesive Kits per joint.

Nominal Pipe Size			Required Adhesive Kit Size	Minimum number of Adhesive Kits required per joint
[mm]	[inch]	[cm ³]	[Oz]	nr.
25	1	88.7	3	1/5
40	1½	88.7	3	1/5
50	2	88.7	3	1/4
80	3	88.7	3	1/3
100	4	88.7	3	1/2
125	5	88.7	3	1
150	6	88.7	3	1
200	8	88.7	3	1
250	10	177.4	6	1
300	12	177.4	6	1
350	14	177.4	6	2
400	16	177.4	6	2
450	18	177.4	6	2
500	20	177.4	6	3
550	22	177.4	6	4
600	24	177.4	6	4
650	26	177.4	6	4
700	28	177.4	6	4
750	30	177.4	6	5
800	32	177.4	6	5
850	34	177.4	6	6
900	36	177.4	6	6
1000	40	177.4	6	7

Notes:

- 1) Adhesive Kits should never be split. If remainder is not used for other joints made at the same time, the surplus must be discarded.
- 2) Required adhesive for saddles is shown in the dimension table of the respective saddles.
- 3) For type of adhesive to be used, please refer to the Bondstrand Corrosion Guide.

Engineering design & installation

Consult the following literature for recommendations pertaining design, installation and installation use of Bondstrand pipe, fittings and flanges:

Assembly Instructions for Quick-Lock adhesive-bonded joints
Assembly Instructions for Taper/Taper adhesive-bonded joints
Assembly Instructions for Bondstrand fiberglass flanges
Bondstrand Corrosion Guide for fiberglass pipe and tubing
Bondstrand Pipe Shaver Overview
Bondstrand Marine Design Manual
Bondstrand Heating Blanket

Please consult NOV Fiber Glass Systems for the latest version of the above-mentioned literature.

Specials

Note: Elbows with non-standard angles, non-standard drilled flanges, multi-branch tees and special spools are available on request, please consult NOV Fiber Glass Systems.

Field testing

Pipe system is designed for hydrostatic testing with water at 150% of rated pressure.

Conversions

1 psi = 6895 Pa = 0.07031 kg/cm²
1 bar = 105 Pa = 14.5 psi = 1.02 kg/cm²
1 MPa = 1 N/mm² = 145 psi = 10.2 kg/cm²
1 inch = 25.4 mm
1 Btu.in/ft² h°F = 0.1442 W/mK
°C = 5/9 (°F-32)

National Oilwell Varco has produced this brochure for general information only, and it is not intended for design purposes. Although every effort has been made to maintain the accuracy and reliability of its contents, National Oilwell Varco in no way assumes responsibility for liability for any loss, damage or injury resulting from the use of information and data herein. All applications for the material described are at the user's risk and are the user's responsibility. All brands listed are trademarks of National Oilwell Varco.

North America

17115 San Pedro Avenue
Suite 200
San Antonio, TX 78232 USA
Phone: +1 210 477 7500

South America

Estrada de Acesso à Zona
Industrial Portuária de Suape, s/no.
Recife, PE, Brazil 55.590-000
Phone: +55 81 3501 0023

Europe

P.O. Box 6, 4190 CA
Geldermalsen, The Netherlands
Phone: +31 345 587 587

Asia Pacific

No. 7A, Tuas Avenue 3
Jurong, Singapore 639407
Phone: +65 6861 6118

Middle East

P.O. Box 17324
Dubai, UAE
Phone: +971 4881 3566

www.fgspipe.com • fgspipe@nov.com

The logo for NOV Fiber Glass Systems, featuring the letters 'NOV' in a stylized font with a red and blue circular graphic element, followed by the text 'Fiber Glass Systems' in a bold, blue, sans-serif font.

© 2013 National Oilwell Varco. All rights reserved.
MOS2000 supersedes FP 918 C - April 2013