



شركة أميانتيت قطر للأنابيب و ملحقاتها  
AMIANTIT QATAR PIPES CO. LTD

# DUAL LAMINATE PIPING

AMIANTIT PIPE SYSTEM  
**PRODUCT GUIDE**

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## 1 Introduction

In today's demanding industrial environments, selecting the right piping solutions is crucial for ensuring efficiency, durability, and safety. This catalog presents an extensive range of high-performance composite and dual laminate piping systems engineered to meet the most challenging operational conditions. Designed with cutting-edge technology and superior materials, our product offerings provide optimal resistance to corrosion, high pressures, and extreme temperatures, making them the ideal choice for industries such as chemical processing, power generation, water treatment, and marine applications.

## 2 Product Details

### Materials & Construction

Our composite piping solutions DualTie Technology, combine the mechanical strength of fiber-reinforced plastics (FRP) with the superior chemical resistance of thermoplastic liners such as UPVC, CPVC, PP, PE, PVDF and ECTFE. This unique combination results in piping systems that offer enhanced longevity, reduced maintenance, and cost-effectiveness compared to traditional metal alternatives.

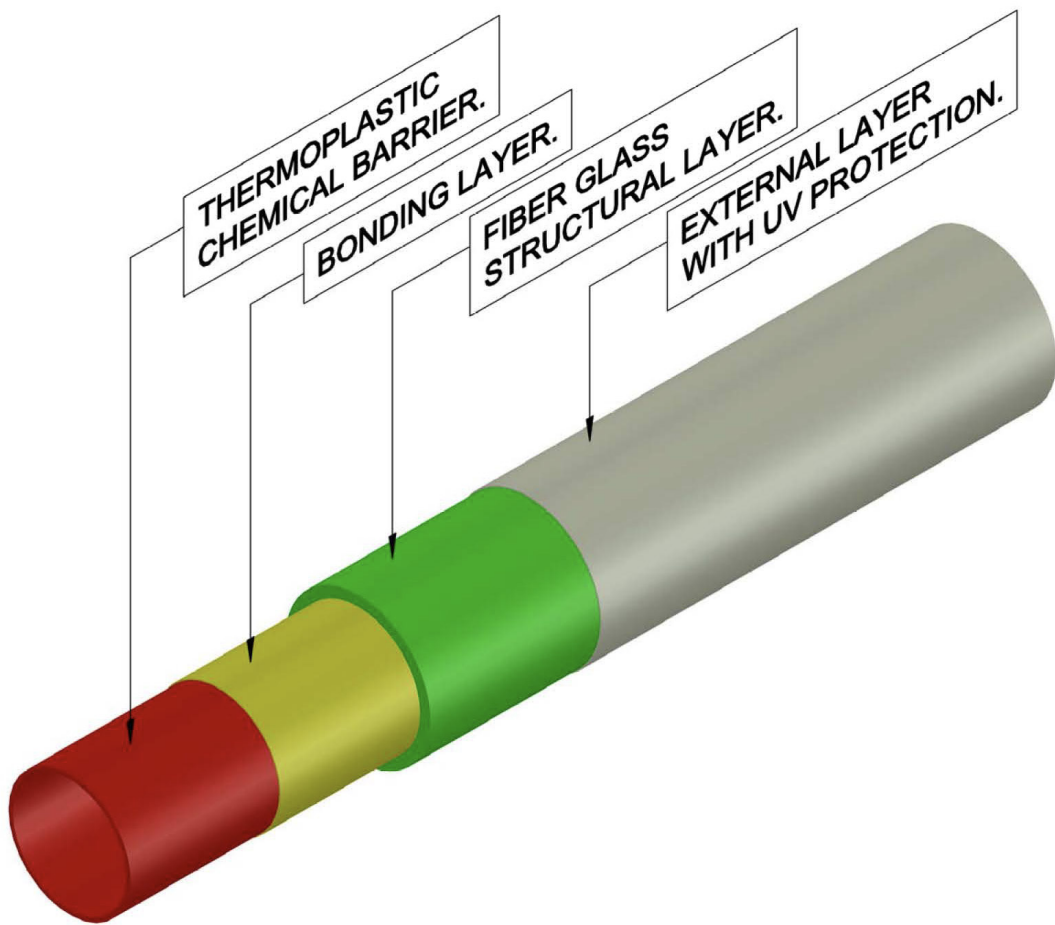
This catalog features a comprehensive selection of composite and dual laminate piping components, including:

**Connection Systems:** Including welded/laminate joints and flange connections for secure and leak-free installations.

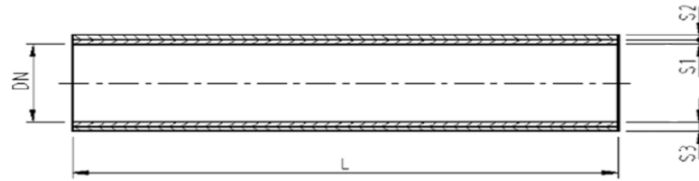
**Support Systems:** Engineered solutions to ensure proper pipe alignment and structural integrity.

**Specialized Components:** Such as curved elbows, miter bends, reducers, and tees to accommodate complex piping layouts.

### Dual Laminate Pipe Layers



PVC-U / FRP

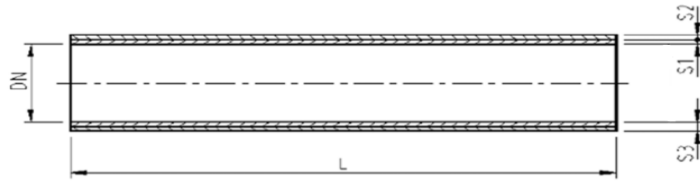


PVC-U / FRP				PN10			PN16			
DN	DL	S1	L	S2	S3	Wp	S2	S3	Wp	DN
(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg/m)	(mm)	(mm)	(kg/m)	(inch)
25	32	3.6	5,000	SEE PN 16			2.9	6.5	1.2	1"
32	40	4.5	5,000				2.9	7.4	1.7	1½"
40	50	3.7	5,000				2.9	6.6	1.9	1½"
50	63	4.7	6,000				2.9	7.6	2.7	2"
65	75	3.6	6,000				2.9	6.5	3.0	2½"
80	90	4.3	6,000				2.9	7.2	3.9	3"
100	110	5.3	6,000				2.9	8.2	5.2	4"
125	125	3.7	6,000				2.9	6.6	5.4	5"
150	160	4.7	6,000				3.2	7.9	7.3	6"
200	200	4	6,000				3.7	7.7	8.9	8"
250	250	4.9	6,000				4.4	9.3	13.3	10"
300	315	4.5	6,000				3.7	8.2	14.2	5.3
350	355	4.5	6,000	4.0	8.5	16.3	5.8	10.3	19.5	14"
400	400	5.0	6,000	4.4	9.4	21.3	6.4	11.4	25.0	16"
450	450	5.0	6,000	4.8	9.8	23.9	7.2	12.2	30.2	18"
500	500	5.0	6,000	5.2	10.2	28.9	7.8	12.8	35.9	20"
600	600	5.0	6,000	6.1	11.1	37.4	9.1	14.1	48.6	24"
700	708	5.0	6,000	7.0	12.0	43.7	10.6	15.6	56.8	28"
800	808	5.0	6,000	7.7	12.7	53.6	11.8	16.8	72.2	32"
900	908	5.0	6,000	8.6	13.6	64.4	13.2	18.2	89.5	36"
1000	1008	5.0	6,000	9.4	14.4	76.1	14.5	19.5	108.6	40"

REMARKS:

- DN = nominal diameter
- DL = liner outside diameter
- L = pipe length
- S1 = wallthickness thermoplastic liner (can vary; manufacture standard)
- S2 = thickness of fiberglass reinforcement
- S3 =total wall thickness with thermoplastic liner and 0,2 mm topcoat
- \* = min. thickness, liner made out of sheet
- Wp = pipe mass

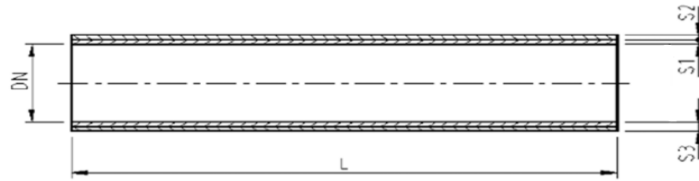
PVC-C / FRP



PVC-C / FRP				PN10			PN16			
DN	DL	S1	L	S2	S3	Wp	S2	S3	Wp	DN
(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg/m)	(mm)	(mm)	(kg/m)	(inch)
25	32	3.6	4,800	SEE PN 16			2.9	6.5	1.3	1"
32	40	4.5	4,800				2.9	7.4	1.8	1½"
40	50	3.7	4,800				2.9	6.6	2.0	1½"
50	63	4.7	4,800				2.9	7.6	2.8	2"
65	75	3.6	4,800				2.9	6.5	3.1	2½"
80	90	4.3	4,800				2.9	7.2	4.0	3"
100	110	5.3	4,800				2.9	8.2	5.5	4"
125	125	3.7	4,800				2.9	6.6	5.5	5"
150	160	4.7	4,800				3.2	7.9	7.7	6"
200	200	4	4,800				3.7	7.7	9.3	8"
250	250	4.9	4,800				4.4	9.3	13.8	10"
300	315	4.5	4,800				3.7	8.2	14.2	5.3
350	355	4.5	4,800	4.0	8.5	16.3	5.8	10.3	20.3	14"
400	400	5	4,800	4.4	9.4	21.3	6.4	11.4	26.0	16"
450	450	5	4,800	4.8	9.8	23.9	7.2	12.2	31.3	18"
500	500	5	4,800	5.2	10.2	28.9	7.8	12.8	37.1	20"
600	600	5	4,800	6.1	11.1	37.4	9.1	14.1	50.0	24"
700	708	5	6,000	7.0	12.0	43.7	10.6	15.6	58.2	28"
800	808	5	6,000	7.7	12.7	53.6	11.8	16.8	73.8	32"
900	908	5	6,000	8.6	13.6	64.4	13.2	18.2	91.3	36"
1000	1008	5	6,000	9.4	14.4	76.1	14.5	19.5	110.6	40"

**REMARKS:**  
 DN = nominal diameter  
 DL = liner outside diameter  
 L = pipe length  
 S1 = wallthickness thermoplastic liner (can vary; manufacture standard)  
 S3 =total wall thickness with thermoplastic liner and 0,2 mm topcoat  
 \* = min. thickness, liner made out of sheet  
 Wp = pipe mass

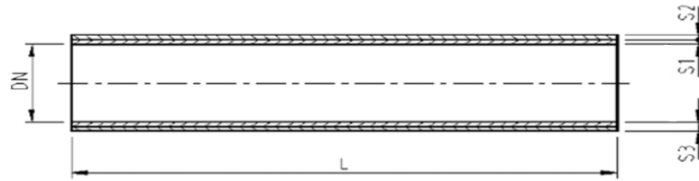
PP / FRP



PP / FRP				PN10			PN16			
DN	DL x S1	S1	L	S2	S3	Wp	S2	S3	Wp	DN
( mm )	( mm )	( mm )	( mm )	( mm )	( mm )	( kg/m )	( mm )	( mm )	( kg/m )	( inch )
25	32	3.5	4,700	SEE PN 16			2.9	6.4	1.0	1"
32	40	3.7	4,700				2.9	6.6	1.3	1½"
40	50	4.6	4,700				2.9	7.5	1.8	1½"
50	63	5.8	4,700				2.9	8.7	2.1	2"
65	75	4.3	4,700				2.9	7.2	2.8	2½"
80	90	5.1	4,700				2.9	8.0	3.2	3"
100	110	6.3	4,700				2.9	9.2	4.7	4"
125	125	4.8	4,700				2.9	7.7	5.2	5"
150	160	6.2	4,700				3.2	9.4	6.3	6"
200	200	4.9	4,700				3.7	8.6	9.0	8"
250	250	6.2	4,700				4.4	10.6	12.2	10"
300	315	7.7	4,700				3.7	11.4	14.2	5.3
350	355	8.7	4,700	4.0	12.7	16.3	5.8	14.5	21.6	14"
400	400	9.8	4,700	4.4	14.2	21.3	6.4	16.2	23.1	16"
450	450	8	4,700	4.8	12.8	23.9	7.2	15.2	29.5	18"
500	500	8	4,700	5.2	13.2	28.9	7.8	15.8	36.5	20"
600	608	8	6,000	6.1	14.1	37.4	9.1	17.1	42.2	24"
700	708	8	6,000	7.0	15.0	43.7	10.6	18.6	52.4	28"
800	808	8	6,000	7.7	15.7	53.6	11.8	19.8	67.2	32"
900	908	8	6,000	8.6	16.6	64.4	13.2	21.2	83.8	36"
1000	1008	8	6,000	9.4	17.4	76.1	14.5	22.5	102.3	40"

**REMARKS:**  
 DN = nominal diameter  
 DL = liner outside diameter  
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 S3 =total wall thickness with thermoplastic liner and 0,2 mm topcoat  
 \* = min. thickness, liner made out of sheet  
 Wp = pipe mass

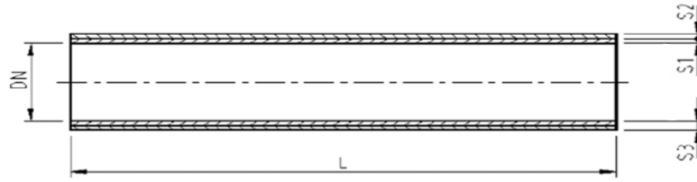
PE / FRP



PE / FRP				PN10			PN16			
DN	DL x S1	S1	L	S2	S3	Wp	S2	S3	Wp	DN
( mm )	( mm )	( mm )	( mm )	( mm )	( mm )	( kg/m )	( mm )	( mm )	( kg/m )	( inch )
25	32	2.9	5,700	SEE PN 16			2.9	5.8	1.0	1"
32	40	3.7	5,700				2.9	6.6	1.3	1½"
40	50	4.6	5,700				2.9	7.5	1.8	1½"
50	63	5.8	5,700				2.9	8.7	2.1	2"
65	75	4.5	5,700				2.9	7.4	2.8	2½"
80	90	5.4	5,700				2.9	8.3	3.2	3"
100	110	6.6	5,700				2.9	9.5	4.7	4"
125	125	4.8	5,700				2.9	7.7	5.2	5"
150	160	6.2	5,700				3.2	9.4	6.9	6"
200	200	4.9	5,700				3.7	8.6	9.0	8"
250	250	6.2	5,700				4.4	10.6	12.2	10"
300	315	7.7	5,700				3.7	11.4	14.2	5.3
350	355	8.7	5,700	4.0	12.7	16.3	5.8	14.5	21.6	14"
400	400	8	5,700	4.4	12.4	21.3	6.4	14.4	23.1	16"
450	450	8	5,700	4.8	12.8	23.9	7.2	15.2	28.4	18"
500	500	8	5,700	5.2	13.2	28.9	7.8	15.8	35.0	20"
600	608	8	6,000	6.1	14.1	37.4	9.1	17.1	42.2	24"
700	708	8	6,000	7.0	15.0	43.7	10.6	18.6	52.4	28"
800	808	8	6,000	7.7	15.7	53.6	11.8	19.8	67.2	32"
900	908	8	6,000	8.6	16.6	64.4	13.2	21.2	83.8	36"
1000	1008	8	6,000	9.4	17.4	76.1	14.5	22.5	102.3	40"

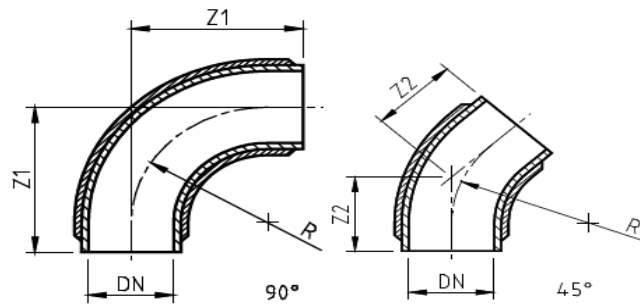
**REMARKS:**  
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 S3 =total wall thickness with thermoplastic liner and 0,2 mm topcoat  
 \* = min. thickness, liner made out of sheet  
 Wp = pipe mass

PVDF / FRP



PVDF / FRP				PN10			PN16			
DN	DL x S1	S1	L	S2	S3	Wp	S2	S3	Wp	DN
( mm )	( mm )	( mm )	( mm )	( mm )	( mm )	( kg/m )	( mm )	( mm )	( kg/m )	( inch )
25	32	2.4	4,800	SEE PN 16			2.9	5.3	1.1	1"
32	40	2.4	4,800				2.9	5.3	1.5	1½"
40	50	3	4,800				2.9	5.9	2.0	1½"
50	63	3	4,800				2.9	5.9	2.5	2"
65	75	3	4,800				2.9	5.9	3.1	2½"
80	90	3	4,800				2.9	5.9	3.7	3"
100	110	3	4,800				2.9	5.9	4.5	4"
125	125	3	4,800				2.9	5.9	5.5	5"
150	160	3	4,800				3.2	6.2	6.7	6"
200	200	3	4,800				3.7	6.7	8.7	8"
250	250	3	4,800				4.4	7.4	12.0	10"
300	315	4	4,800				3.7	7.7	14.2	5.3
350	355	4	4,800	4.0	8.0	16.3	5.8	9.8	22.6	14"
400	400	5	4,800	4.4	9.4	21.3	6.4	11.4	27.5	16"
450	456	5	6,000	4.8	9.8	23.9	7.2	12.2	27.8	18"
500	506	5	6,000	5.2	10.2	28.9	7.8	12.8	33.3	20"
600	606	5	6,000	6.1	11.1	37.4	9.1	14.1	45.5	24"
700	706	5	6,000	7.0	12.0	43.7	10.6	15.6	56.2	28"
800	806	5	6,000	7.7	12.7	53.6	11.8	16.8	71.6	32"
900	906	5	6,000	8.6	13.6	64.4	13.2	18.2	88.8	36"
1000	1006	5	6,000	9.4	14.4	76.1	14.5	19.5	107.8	40"

**REMARKS:**  
 DN = nominal diameter  
 DL = liner outside diameter  
 L = pipe length  
 S1 = wallthickness thermoplastic liner (can vary; manufacture standard)  
 S2 = thickness of fiberglass reinforcement  
 S3 =total wall thickness with thermoplastic liner and 0,2 mm topcoat  
 \* = min. thickness, liner made out of sheet  
 Wp = pipe mass



DN ( mm )	PN 10 / PN 16 PP / PE		PN 10 / PN 16 PVC-U / PVC-C		DN ( inch )
	Z1	Z2	Z1	Z2	
	( mm )	( mm )	( mm )	( mm )	
25	110	70	110	70	1"
32	130	80	130	80	1¼"
40	150	90	150	90	1½"
50	180	105	180	105	2"
65	140	85	140	85	2½"
80	165	100	165	100	3"
100	205	115	205	115	4"
125	245	135	245	135	5"
150	285	150	285	150	6"
200	365	190	365	190	8"
250	450	225	450	225	10"
300	525	260	525	260	12"
350	600	290	600	290	14"
400	680	325	680	325	16"
500	830	390	830	390	20"

**REMARKS:**

DN = nominal diameter

$R \approx 1,0 \times DN$  (PP and PE)

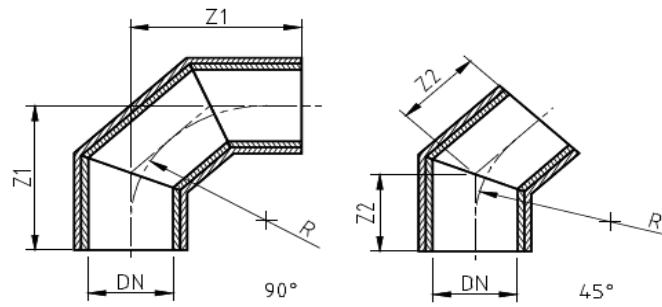
$R \approx 1,5 \times DN$  (PVC-U / PVC-C)

L = pipe length

Z1 = element Length for 90° elbow

Z2 = element Length for 45° elbow

Curved elbows only available in PVC, PP and PE100.



DN ( mm )	PN 10 / PN 16		DN ( inch )
	Z1 ( mm )	Z2 ( mm )	
25	110	70	1"
32	130	80	1¼"
40	150	90	1½"
50	180	105	2"
65	140	85	2½"
80	165	100	3"
100	205	115	4"
125	245	135	5"
150	285	150	6"
200	365	190	8"
250	450	225	10"
300	525	260	12"
350	600	290	14"
400	680	325	16"
450	770	365	18"
500	830	390	20"
600	950	430	24"
700	1,100	490	28"
800	1,250	545	32"
900	1,400	605	36"
1000	1,500	660	40"

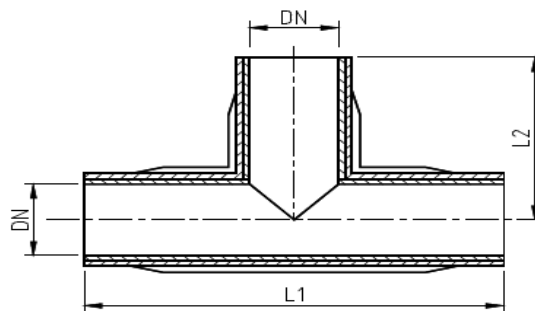
**REMARKS:**

DN = nominal diameter

R = 1,5 x DN

Z1 = element Length for 90° elbow

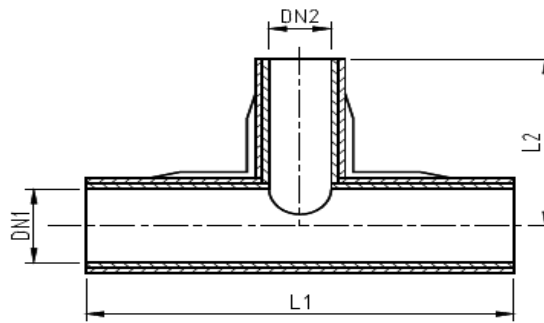
Z2 = element Length for 45° elbow



DN (mm)	PN 10 / PN 16		DN (inch)
	L1 (mm)	L2 (mm)	
25	440	215	1"
32	440	220	1¼"
40	450	225	1½"
50	480	235	2"
65	510	250	2½"
80	530	255	2½"
100	580	270	4"
125	620	285	5"
150	680	310	6"
200	700	370	8"
250	820	440	10"
300	990	520	12"
350	1,110	590	14"
400	1,240	655	16"
450	1,400	735	18"
500	1,520	810	20"
600	1,790	945	24"
700	2,080	1,085	28"
800	2,320	1,225	32"
900	2,610	1,385	36"
1000	2,890	1,525	40"

**REMARKS:**

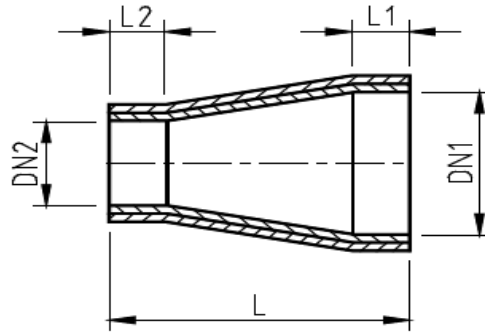
DN = nominal diameter  
L1 = run pipe length  
L2 = branch pipe length



DN1	DN2	PN 10 / PN 16		DN2	DN1	DN1	DN2	PN 10 / PN 16		DN2	DN1	
		L1	L2					L1	L2			
( mm )	( mm )	( mm )	( mm )	( inch )	( inch )	( mm )	( mm )	( mm )	( mm )	( inch )	( inch )	
32	25	440	220	1"	1½"	350	200	890	445	8"	14"	
40	25	440	225	1"	1½"		250	940	490	10"		
	32	440	225	1½"		300	1,020	545	12"			
50	25	450	230	1"	2"	400	250	1,000	515	10"	16"	
	32	450	230	1½"			300	1,600	570	12"		
	40	460	230	1½"			350	1,150	615	14"		
65	32	460	235	1½"	2½"	450	300	1,150	595	12"	18"	
	40	470	235	1½"			350	1,200	640	14"		
	50	490	240	2"			400	1,290	680	16"		
80	40	470	245	1½"	3"	500	350	1,270	670	14"	20"	
	50	490	250	2"			400	1,320	710	16"		
	65	500	255	2½"			450	1,430	765	18"		
100	50	500	260	2"	4"	600	400	1,470	760	16"	24"	
	65	510	265	2½"			450	1,520	815	18"		
	80	520	265	3"			500	1,590	860	20"		
125	65	520	275	2½"	5"	700	450	1,660	865	18"	28"	
	80	530	275	3"			500	1,710	910	20"		
	100	550	280	4"			600	1,870	995	24"		
150	80	550	290	3"	6"	800	500	1,850	960	20"	32"	
	100	570	295	4"			600	1,950	1,045	24"		
	125	590	300	5"			700	2,140	1,135	28"		
200	100	620	325	4"	8"	900	600	2,120	1,100	24"	36"	
	125	630	330	5"			700	2,230	1,190	28"		
	150	670	340	6"			800	2,410	1,280	32"		
250	125	670	360	5"	10"	1000	700	2,370	1,240	28"	40"	
	150	710	370	6"			800	2,490	1,330	32"		
	200	730	385	8"			900	2,690	1,435	36"		
300	150	770	405	6"	12"							
	200	820	420	8"								
	250	870	435	10"								

**REMARKS:**

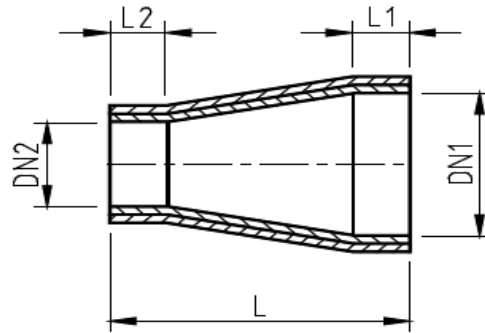
- DN = nominal diameter
- DN2 = nominal diameter branch pipe
- L1 = run pipe length
- L2 = branch pipe length



DN1	DN2	PN 10 / PN 16			DN2	DN1
		L	L1	L2		
(mm)	(mm)	(mm)	(mm)	(mm)	(inch)	(inch)
32	25	180	77	84	1"	1¼"
40	25	205	83	83	1"	1½"
	32	200	86	93	1¼"	
50	25	235	90	80	1"	2"
	32	230	93	90	1¼"	
	40	205	89	90	1½"	
65	32	260	97	78	1¼"	2½"
	40	235	94	76	1½"	
	50	210	88	83	2"	
80	40	275	97	75	1½"	3"
	50	245	88	79	2"	
	65	210	86	85	2½"	
100	50	325	109	87	2"	4"
	65	285	104	90	2½"	
	80	250	102	96	3"	
125	65	350	108	87	2½"	5"
	80	310	104	90	3"	
	100	285	111	109	4"	
150	80	375	112	82	3"	6"
	100	350	119	102	4"	
	125	310	128	117	5"	
200	100	495	139	98	4"	8"
	125	430	134	103	5"	
	150	370	128	113	6"	
250	125	575	153	100	5"	10"
	150	510	144	108	6"	
	200	400	143	128	8"	
300	150	655	164	105	6"	12"
	200	540	161	121	8"	
	250	435	163	143	10"	

**REMARKS:**

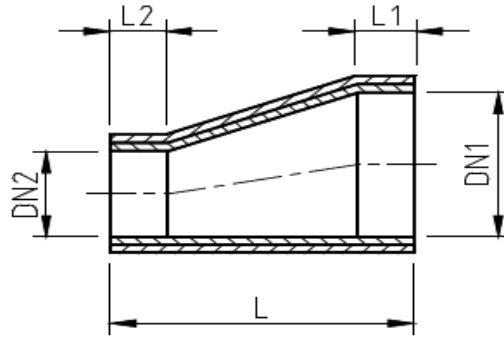
- DN1 = nominal diameter larger pipe
- DN2 = nominal diameter smaller pipe
- L = overall length
- L1 = straight length larger pipe
- L2 = straight length smaller pipe



DN1	DN2	PN 10 / PN 16			DN2	DN1
		L	L1	L2		
(mm)	(mm)	(mm)	(mm)	(mm)	(inch)	(inch)
350	200	665	166	113	8"	14"
	250	550	163	129	10"	
	300	440	161	150	12"	
400	250	695	179	130	10"	16"
	300	580	174	148	12"	
	350	450	168	153	14"	
450	300	680	170	124	12"	18"
	350	565	170	137	14"	
	400	450	169	152	16"	
500	350	710	184	140	14"	20"
	400	730	255	217	16"	
	450	485	184	172	18"	
600	450	785	219	180	18"	24"
	500	665	217	190	20"	
700	500	965	253	197	20"	28"
	600	735	253	224	24"	
800	600	1,030	284	231	24"	32"
	700	805	286	261	28"	
	750	685	284	272	30"	
900	700	1,110	326	269	28"	36"
	750	990	324	280	30"	
	800	875	325	292	32"	
1000	750	1,290	360	286	30"	40"
	800	1,175	361	299	32"	
	900	950	361	331	36"	

**REMARKS:**

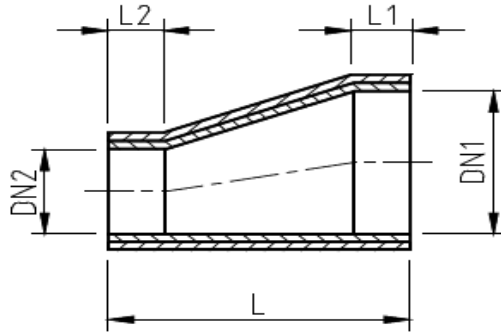
- DN1 = nominal diameter larger pipe
- DN2 = nominal diameter smaller pipe
- L = overall length
- L1 = straight length larger pipe
- L2 = straight length smaller pipe



DN1	DN2	PN 10 / PN 16			DN2	DN1
		L	L1	L2		
( mm )	( mm )	( mm )	( mm )	( mm )	( inch )	( inch )
32	25	180	77	85	1"	1½"
40	25	205	83	84	1"	1½"
	32	200	92	88	1½"	
50	25	235	95	78	1"	2"
	32	230	99	86	1½"	
	40	205	90	90	1½"	
65	32	260	96	82	1½"	2½"
	40	235	93	80	1½"	
	50	210	88	84	2"	
80	40	275	96	79	1½"	3"
	50	245	88	82	2"	
	65	210	87	85	2½"	
100	50	325	113	88	2"	4"
	65	285	103	95	2½"	
	80	250	102	88	3"	
125	65	350	112	89	2½"	5"
	80	310	108	90	3"	
	100	285	116	107	4"	
150	80	375	115	86	3"	6"
	100	350	124	102	4"	
	125	310	128	120	5"	
200	100	495	147	100	4"	8"
	125	430	138	106	5"	
	150	370	133	113	6"	
250	125	575	160	105	5"	10"
	150	510	147	115	6"	
	200	400	148	128	8"	
300	150	655	171	112	6"	12"
	200	540	165	127	8"	
	250	435	165	146	10"	

**REMARKS:**

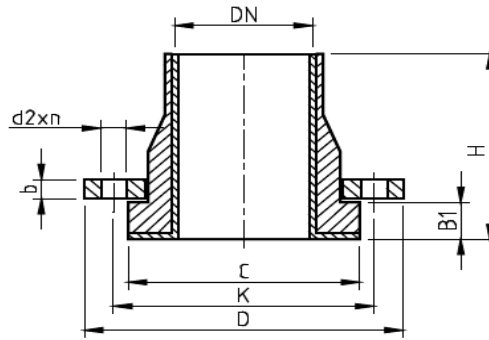
- DN1 = nominal diameter larger pipe
- DN2 = nominal diameter smaller pipe
- L = overall length
- L1 = straight length larger pipe
- L2 = straight length smaller pipe



DN1	DN2	PN 10 / PN 16			DN2	DN1
		L	L1	L2		
(mm)	(mm)	(mm)	(mm)	(mm)	(inch)	(inch)
350	200	665	173	120	8"	14"
	250	550	168	134	10"	
	300	440	164	152	12"	
400	250	695	187	136	10"	16"
	300	580	180	152	12"	
	350	450	171	155	14"	
450	300	685	180	133	12"	18"
	350	575	180	147	14"	
	400	465	180	161	16"	
500	350	715	195	148	14"	20"
	400	730	261	221	16"	
	450	500	195	181	18"	
600	450	795	232	191	18"	24"
	500	685	233	204	20"	
700	500	980	272	212	20"	28"
	600	760	271	241	24"	
800	600	1,055	308	251	24"	32"
	700	835	306	281	28"	
	750	725	307	294	30"	
900	700	1,130	346	288	28"	36"
	750	1,020	347	301	30"	
	800	910	348	314	32"	
1000	750	1,315	386	310	30"	40"
	800	1,205	386	323	32"	
	900	990	386	356	36"	

**REMARKS:**

- DN1 = nominal diameter larger pipe
- DN2 = nominal diameter smaller pipe
- L = overall length
- L1 = straight length larger pipe
- L2 = straight length smaller pipe



DN	STUB END with L.J. FLANGE   PN 10 - DIN PN 10 DRILLING						FRP		STEEL GALVANIZED		DN
	C	B1	H	D	K	d2 x n	b	PN	b	PN	
( mm )	( mm )	( mm )	( mm )	( mm )	( mm )	( mm x pc )	( mm )	( barg )	( mm )	( barg )	( inch )
25	SEE PN 16										1
32											1 1/4"
40											1 1/2"
50											2"
65	122	24	180	185	145	18 x 4 <sup>1)</sup>	20	10	18	16	2 1/2"
80	138	24	180	200	160	18 x 8	22	10	20	16	3"
100	158	26	200	220	180	18 x 8	24	10	20	16	4"
125	188	29	220	250	210	18 x 8	27	10	22	16	5"
150	212	30	240	285	240	22 x 8	30	10	22	16	6"
200	268	34	260	340	295	22 x 8	32	(6)	25	16	8"
250	320	37	280	395	350	22 x 12	34	(6)	26	10	10"
300	370	40	320	445	400	22 x 12	36	(6)	27	10	12"
350	430	42	360	505	460	22 x 16	38	(4)	25	10	14"
400	482	44	400	565	515	25 x 16	42	(4)	27	10	16"
450	531	46	460	615	565	25 x 20	45	(4)	27	10	18"
500	585	48	480	670	620	25 x 20	47	(4)	28	10	20"
600	685	50	560	780	725	30 x 20	50	(4)	28	10	24"
700	800	52	640	895	840	30 x 24	-	-	30	10	28"
800	905	54	700	1,015	950	33 x 24	-	-	33	10	32"
900	1,005	56	780	1,115	1,050	33 x 28	-	-	35	10	36"
1000	1,110	58	860	1,230	1,160	36 x 28	-	-	35	10	40"

**REMARKS:**

DN = nominal diameter

B1 = collar thickness incl. liner

C = outside diameter collar

D = outside diameter flange

K = diameter bolt circle

b = thickness of flange

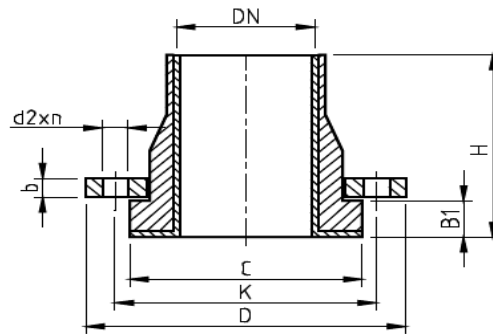
d2 = diameter bolt holes

n = number of bolt holes

1) also available with 8 holes Ø18

Drilling = according to EN 1029-2 / DIN 2501 - PN 10

For spool building, flanges are directly moulded to pipe or fitting



DN	STUB END with L.J. FLANGE   PN 16 - DIN PN 16 DRILLING						FRP		STEEL GALVANISED		DN
	C	B1	H	D	K	d2 x n	b	PN	b	PN	
(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm x pc)	(mm)	(barg)	(mm)	(barg)	(inch)
25	68	20	160	115	85	14 x 4	14	16	16	16	1
32	78	20	160	140	100	18 x 4	15	16	16	16	1½"
40	88	21	160	150	110	18 x 4	16	16	16	16	1½"
50	102	22	180	165	125	18 x 4	18	16	18	16	2"
65	122	24	180	185	145	18 x 4 <sup>1)</sup>	-	-	18	16	2½"
80	138	24	180	200	160	18 x 8	-	-	20	16	3"
100	158	26	200	220	180	18 x 8	-	-	20	16	4"
125	188	29	220	250	210	18 x 8	-	-	22	16	5"
150	212	30	240	285	240	22 x 8	-	-	22	16	6"
200	268	37	260	340	295	22 x 12	-	-	26	16	8"
250	325	41	280	405	355	25 x 12	-	-	27	16	10"
300	378	44	320	460	410	25 x 12	-	-	32	16	12"
350	437	46	360	520	470	25 x 16	-	-	35	16	14"
400	488	48	400	580	525	30 x 16	-	-	33	16	16"
450	552	51	460	640	585	30 x 20	-	-	32	16	18"
500	613	57	480	715	650	33 x 20	-	-	35	16	20"
600	730	60	560	840	770	36 x 20	-	-	37	16	24"
700	800	67	640	910	840	36 x 24	-	-	40	16	28"
800	907	69	700	1,025	950	39 x 24	-	-	52	16	32"
900	1,007	77	780	1,125	1,050	39 x 28	-	-	58	16	36"
1000	1,124	80	860	1,255	1,170	42 x 28	-	-	64	16	40"

**REMARKS:**

DN = nominal diameter

B1 = collar thickness incl. liner

C = outside diameter collar

D = outside diameter flange

K = diameter bolt circle

b = thickness of flange

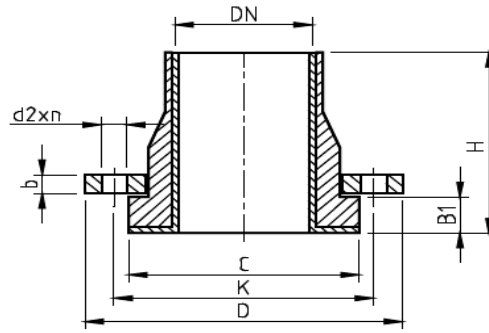
d2 = diameter bolt holes

n = number of bolt holes

1) also available with 8 holes Ø18

Drilling = according to EN 1029-2 / DIN 2501 - PN 16

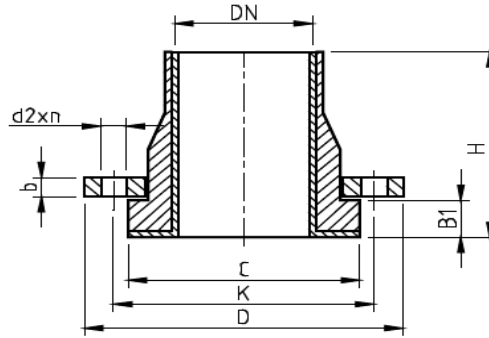
For spool building, flanges are directly moulded to pipe or fitting



DN (inch)	STUB END with L.J. FLANGE   PN 10 - ANSI 150 <sup>o</sup> DRILLING						FRP		STEEL GALVANISED		DN (inch)
	C (mm)	B1 (mm)	H (mm)	D (mm)	K (mm)	d2 x n (mm x pc)	b (mm)	PN (barg)	b (mm)	PN (barg)	
25	SEE PN 16   150 <sup>o</sup>										1
32											1 1/2"
40											1 3/4"
50											2"
65	117	24	180	177.8	139.7	19 x 4	21	10	19	16	2 1/2"
80	130	24	180	190.5	152.4	19 x 4	24	10	19	16	3"
100	169	26	200	228.6	190.5	19 x 8	25	10	19	16	4"
125	189	29	220	254.0	215.9	22 x 8	29	10	19	16	5"
150	212	30	240	279.4	241.3	22 x 8	31	10	19	16	6"
200	270	37	260	342.9	298.4	22 x 8	33	(6)	20	16	8"
250	328	41	280	406.4	361.9	25 x 12	36	(6)	23	16	10"
300	398	44	320	482.6	431.8	25 x 12	38	(6)	25	16	12"
350	438	42	360	533.4	476.2	28 x 12	40	(4)	28	16	14"
400	503	44	400	596.9	539.7	28 x 16	44	(4)	33	16	16"
450	538	46	460	635.0	577.8	32 x 16	49	(4)	33	16	18"
500	593	48	480	698.5	635.0	32 x 20	49	(4)	37	10	20"
600	708	50	560	812.6	749.3	35 x 20	58	(4)	37	10	24"
700	820	52	640	927.1	863.6	35 x 28	-	-	37	10	28"
800	928	54	700	1,060.5	977.9	41 x 28	-	-	38	10	32"
900	1,035	56	780	1,168.4	1,085.8	41 x 32	-	-	35	10	36"
1000	1,148	58	860	1,289.1	1,200.2	41 x 36	-	-	35	10	40"

**REMARKS:**

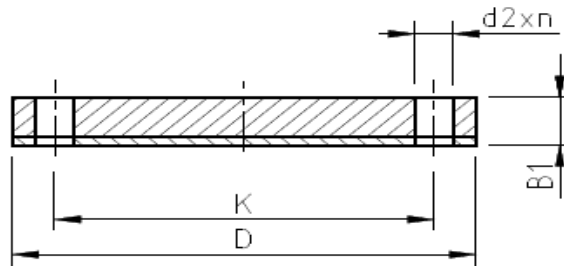
- DN = nominal diameter
- B1 = collar thickness incl. liner
- C = outside diameter collar
- D = outside diameter flange
- K = diameter bolt circle
- b = thickness of flange
- d2 = diameter bolt holes
- n = number of bolt holes
- 1) also available with 8 holes Ø18
- Drilling = according to ANSI B16.5 150Lbs
- For spool building, flanges are directly moulded to pipe or fitting



DN	STUB END with L.J. FLANGE   PN 16 - ANSI 150 <sup>o</sup> DRILLING						FRP		STEEL GALVANISED		DN
	C	B1	H	D	K	d2 x n	b	PN	b	PN	
(inch)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm x pc)	(mm)	(barg)	(mm)	(barg)	(inch)
25	61	20	160	107.9	79.4	16 x 4	17	16	14	16	1
32	70	20	160	117.5	88.9	16 x 4	17	16	16	16	1½"
40	80	21	160	127.0	98.4	16 x 4	17	16	17	16	1½"
50	98	22	180	152.4	120.6	19 x 4	20	16	18	16	2"
65	117	24	180	177.8	139.7	19 x 4	-	-	19	16	2½"
80	130	24	180	190.5	152.4	19 x 4	-	-	19	16	3"
100	169	26	200	228.6	190.5	19 x 8	-	-	19	16	4"
125	189	29	220	254.0	215.9	22 x 8	-	-	19	16	5"
150	212	30	240	279.4	241.3	22 x 8	-	-	19	16	6"
200	270	37	260	342.9	298.4	22 x 8	-	-	20	16	8"
250	328	41	280	406.4	361.9	25 x 12	-	-	23	16	10"
300	398	44	320	482.6	431.8	25 x 12	-	-	25	16	12"
350	438	46	360	533.4	476.2	28 x 12	-	-	28	16	14"
400	503	48	400	596.9	539.7	28 x 16	-	-	33	16	16"
450	538	51	460	635.0	577.8	32 x 16	-	-	33	16	18"
500	593	57	480	698.5	635.0	32 x 20	-	-	37	16	20"
600	708	60	560	812.6	749.3	35 x 20	-	-	37	16	24"
700	820	67	640	927.1	863.6	35 x 28	-	-	37	16	28"
800	928	69	700	1,060.5	977.9	41 x 28	-	-	40	16	32"
900	1,035	77	780	1,168.4	1,085.8	41 x 32	-	-	35	16	36"
1000	1,148	80	860	1,289.1	1,200.2	41 x 36	-	-	35	16	40"

**REMARKS:**

- DN = nominal diameter
- B1 = collar thickness incl. liner
- C = outside diameter collar
- D = outside diameter flange
- K = diameter bolt circle
- b = thickness of flange
- d2 = diameter bolt holes
- n = number of bolt holes
- Drilling = according to ANSI B16.5 150Lbs
- For spool building, flanges are directly moulded to pipe or fitting



DN	PN 10 - DIN PN 10 DRILLING				PN 16 - DIN PN 16 DRILLING				H	DN
	D	K	B1	d2 x n	D	K	B1	d2 x n		
(inch)	(mm)	(mm)	(mm)	(mm x pc)	(mm)	(mm)	(mm)	(mm x pc)	(mm)	(inch)
25	SEE DIN PN 16				115	85	24	14 x 4	160	1
32					140	100	24	18 x 4	160	1½"
40					150	110	25	18 x 4	160	1½"
50					165	125	26	18 x 4	180	2"
65					185	145	28	18 x 4 <sup>1)</sup>	180	2½"
80					200	160	28	18 x 8	180	3"
100					220	180	31	18 x 8	200	4"
125					250	210	34	18 x 8	220	5"
150					285	240	36	22 x 8	240	6"
200					340	295	40	22 x 8	340	295
250	395	350	44	22 x 12	405	355	49	26 x 12	280	10"
300	445	400	48	22 x 12	460	410	52	26 x 12	320	12"
350	505	460	50	22 x 16	520	470	55	26 x 16	360	14"
400	565	515	52	25 x 16	580	525	57	30 x 16	400	16"
450	615	565	55	25 x 20	640	585	61	30 x 20	460	18"
500	670	620	57	25 x 20	715	650	68	33 x 20	480	20"
600	780	725	60	30 x 20	840	770	72	36 x 20	560	24"
700	895	840	62	30 x 24	-	-	-	-	640	28"
800	1,015	950	64	33 x 24	-	-	-	-	700	32"
900	1,115	1,050	67	33 x 28	-	-	-	-	780	36"
1000	1,230	1,160	69	36 x 28	-	-	-	-	860	40"

**REMARKS:**

DN = nominal diameter

B1 = collar thickness incl. liner

D = outside diameter flange

K = diameter bolt circle

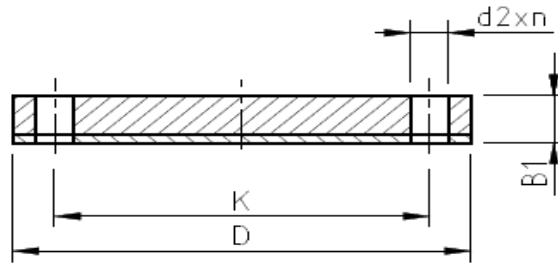
d2 = diameter bolt holes

n = number of bolt holes

1) also available with 8 holes Ø18

Drilling = according to EN 1029-2 / DIN 2501 - PN 10 and PN 16

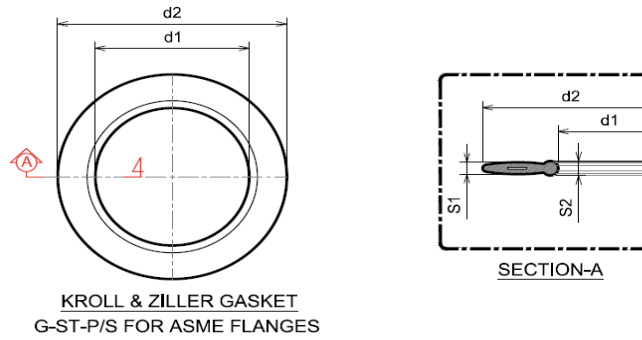
# BLIND FLANGE DETAILS



DN	PN 10 - ANSI 150#DRILLING				PN 16 - ANSI 150#DRILLING				H	DN
	D	K	B1	d2 x n	D	K	B1	d2 x n		
(inch)	(mm)	(mm)	(mm)	(mm x pc)	(mm)	(mm)	(mm)	(mm x pc)	(mm)	(inch)
25	SEE PN 16   150"				108.0	79.4	24	16 x 4	160	1
32					117.5	88.9	24	16 x 4	160	1½"
40					127.0	98.4	25	16 x 4	160	1½"
50					152.4	120.6	26	19 x 4	180	2"
65					177.8	139.7	28	19 x 4	180	2½"
80					190.5	152.4	28	19 x 4	180	3"
100					228.6	190.5	31	19 x 8	200	4"
125					254.0	215.9	34	22 x 8	220	5"
150					279.4	241.3	36	22 x 8	240	6"
200					342.9	298.4	44	22 x 8	260	8"
250					406.4	361.9	49	25 x 12	280	10"
300					482.6	431.8	52	25 x 12	320	12"
350	533.4	476.2	50	28 x 12	533.4	476.2	55	28 x 12	360	14"
400	596.9	539.7	52	28 x 16	596.9	539.7	57	28 x 16	400	16"
450	635.0	577.8	55	32 x 16	635.0	577.8	61	32 x 16	460	18"
500	698.5	635.0	57	32 x 20	698.5	635.0	68	32 x 20	480	20"
600	812.6	749.3	60	35 x 20	812.6	749.3	72	35 x 20	560	24"
700	927.1	863.6	62	35 x 28	-	-	-	-	640	28"
800	1,060.5	977.9	64	41 x 28	-	-	-	-	700	32"
900	1,168.4	1,085.8	67	41 x 32	-	-	-	-	780	36"
1000	1,289.1	1,200.2	69	41 x 36	-	-	-	-	860	40"

**REMARKS:**

- DN = nominal diameter
- B1 = collar thickness incl. liner
- D = outside diameter flange
- K = diameter bolt circle
- d2 = diameter bolt holes
- n = number of bolt holes
- Drilling = according to ANSI B16.5 150Lbs



FLANGE DIA ( mm )	d1 ( mm x pc )	d2 ( mm )	GASKET THICKNESS		DRILLING STANDARD	DN ( inch )
			S1 ( mm )	S2 ( mm )		
25	33	64	3	4	ASME B16.5, 150#	1
32	42	73	3	4	ASME B16.5, 150#	1¼"
40	48	83	3	4	ASME B16.5, 150#	1½"
50	60	102	4	5	ASME B16.5, 150#	2"
65	73	121	4	5	ASME B16.5, 150#	2½"
80	89	133	4	5	ASME B16.5, 150#	3"
100	115	171	5	6	ASME B16.5, 150#	4"
125	140	193	5	6	ASME B16.5, 150#	5"
150	168	219	6	8	ASME B16.5, 150#	6"
200	219	276	6	8	ASME B16.5, 150#	8"
250	273	337	6	8	ASME B16.5, 150#	10"
300	325	406	6	8	ASME B16.5, 150#	12"
350	356	448	7	10	ASME B16.5, 150#	14"
400	406	512	7	10	ASME B16.5, 150#	16"
450	457	547	7	10	ASME B16.5, 150#	18"
500	508	604	7	10	ASME B16.5, 150#	20"
600	610	715	7	10	ASME B16.5, 150#	24"
700	720	829	8	11	ASME B16.47 Series A, 150#	28"
800	820	937	8	11	ASME B16.47 Series A, 150#	32"
900	920	1045	8	11	ASME B16.47 Series A, 150#	36"
1000	1020	1159	8	11	ASME B16.47 Series A, 150#	40"

**REMARKS:**

KROLL & ZILLER GASKET PROFILE : G-ST-P/S

MATERIAL : EPDM

### 3 Standards & Quality

Pipes and Fittings: Available in various diameters and pressure ratings, meeting DIN 16966/16965, ISO 14692, and ASME B16.5 standards.

To ensure the highest standards of performance and reliability, our composite and dual laminate piping systems undergo extensive testing and quality inspection, including:

**Material Testing:** Verification of raw materials, including thermoplastic liners and FRP reinforcements, to ensure compliance with industry specifications (ASTM D792, ASTM D543).

**Dimensional and Visual Inspection:** Each component is checked for adherence to design tolerances, surface quality, and structural integrity (ISO 14692, ASTM D3567).

**Hydrostatic Testing:** Pipes and fittings are subjected to pressurized water tests to confirm their ability to withstand operational pressures without leakage (ASTM D1599, ISO 10639).

**Mechanical Testing:** Tensile strength, flexural strength, and impact resistance tests are performed to assess the mechanical properties of the piping system (ASTM D638, ASTM D790).

**Chemical Resistance Testing:** Evaluation of liners and resins against corrosive substances to validate their resistance to aggressive environments (ASTM C581, ISO 175).

**Environmental and Thermal Testing:** Pipes are subjected to thermal cycling and UV exposure tests to assess their durability in extreme conditions (ASTM D2992, ASTM G154).

**Adhesion and Bond Strength Testing:** Ensuring the integrity of laminate bonding between thermoplastic liners and FRP reinforcement layers (ASTM D3165, ASTM D4541).

All testing procedures comply with relevant international standards such as ISO 14692, ASTM D2992, ASME B31.3, EN 13121, ASTM D638, ASTM D790, and ASTM D543, guaranteeing high-quality and durable piping solutions.

## 4 Applications

Composite and dual laminate piping systems are designed to meet the needs of a variety of industries, ensuring reliable performance in the most demanding environments. Our products are widely used in:

**Chemical Processing:** Resistant to corrosive chemicals, acids, and solvents, making them ideal for chemical production and transfer systems.

**Power Generation:** Suitable for cooling water systems, flue gas desulfurization, and chemical handling in power plants.

**Water and Wastewater Treatment:** Corrosion-resistant properties make them ideal for desalination plants, sewage treatment facilities, and industrial wastewater applications.

**Oil and Gas:** Used for offshore and onshore pipelines, process piping, and produced water systems due to their high-pressure and corrosion-resistant capabilities.

**Marine and Shipbuilding:** Lightweight and durable for ballast water systems, exhaust scrubbers, and seawater cooling lines.

**Mining and Metallurgy:** Handling aggressive slurries, leachates, and processing chemicals in mining operations.

**Food and Beverage Processing:** Ensuring hygienic and corrosion-free transport of food-grade materials and process fluids.

## 5 Performance & Durability

### Corrosion Resistance:

The following table provides an overview of the chemical resistance of various thermoplastic liners used in composite piping systems. The ratings indicate the material's compatibility with specific chemicals under standard conditions:

Chemical / Substance	PVC	CPVC	PP	PE	PVDF	ECTFE
Hydrochloric Acid (HCl)	Good	Excellent	Fair	Fair	Excellent	Excellent
Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )	Fair	Good	Poor	Poor	Excellent	Excellent
Nitric Acid (HNO <sub>3</sub> )	Poor	Poor	Fair	Poor	Good	Excellent
Sodium Hydroxide (NaOH)	Excellent	Excellent	Excellent	Excellent	Fair	Good
Acetic Acid	Good	Excellent	Good	Fair	Excellent	Excellent
Methanol	Good	Good	Fair	Fair	Excellent	Excellent
Sodium Hypochlorite (Bleach)	Fair	Excellent	Poor	Poor	Excellent	Excellent
Ammonia	Poor	Fair	Good	Excellent	Good	Excellent
Chlorine Gas (Wet)	Poor	Fair	Poor	Poor	Excellent	Excellent
Hydrogen Peroxide (H <sub>2</sub> O <sub>2</sub> )	Poor	Fair	Poor	Poor	Excellent	Excellent
Acetone	Poor	Poor	Good	Good	Excellent	Excellent
Benzene	Poor	Poor	Poor	Poor	Good	Excellent
Ethanol	Good	Good	Fair	Fair	Excellent	Excellent
Toluene	Poor	Poor	Poor	Poor	Good	Excellent
Xylene	Poor	Poor	Poor	Poor	Good	Excellent
Diesel Oil	Good	Good	Excellent	Excellent	Excellent	Excellent
Gasoline	Fair	Good	Good	Good	Excellent	Excellent

**Legend:**

**Excellent** = Highly resistant, suitable for long-term exposure.

**Good** = Moderate resistance, suitable for intermittent exposure.

**Fair** = Limited resistance, may degrade over time.

**Poor** = Not recommended for use.

### Reference Standards for Chemical Resistance

The chemical resistance data is derived from internationally recognized standards and manufacturer guidelines, including:

**ISO 175** – Plastics: Determination of the effects of liquid chemicals.

**ASTM D543** – Standard practices for evaluating the resistance of plastics to chemical reagents.

**ASTM D638** – Tensile properties of plastics in chemical environments.

**ASTM C581** – Chemical resistance of thermoset materials used in reinforced plastic structures.

**Manufacturer Technical Datasheets** – Chemical compatibility data from leading thermoplastic and FRP manufacturers.

### Commitment to Excellence

HYDROSTATIC PROPERTIES				
DESCRIPTION	SYMB	VALUE	UNIT	TEST METHOD
Short Term Tensile Strength, Biaxial, Hoop	<b><math>\sigma_{tr}</math></b>	282	N/mm <sup>2</sup>	ASTM D 1599
Short Tensile Strength, Biaxial, Axial	<b><math>\sigma_{ta}</math></b>	141	N/mm <sup>2</sup>	ASTM D 1599
Long Term Hydrostatic Design Basis	<b><math>\sigma_{LTHS}</math></b>	129	MPa	ASTM D 2992-B
97,5% Lower Confidence Limit	<b>HDB, LCL, <math>\sigma_{qs}</math></b>	110	MPa	ASTM D 2992-B
Regression Gradient	<b>Gdefault</b>	0,059	-	ASTM D 2992-B
Hydrostatic Design Stress at NPR	<b>HDS, <math>\sigma_{npr}</math></b>	62	MPa	ISO 14692
Based on:	<b>f2</b>	0,67	-	
	<b>f2test</b>	0,89	-	
	<b>f3</b>	0,845	-	

ISO 14692 FAILURE ENVELOPE				
DESCRIPTION	SYMB	VALUE	UNIT	TEST METHOD
LCL Lower Confidence Limit or Qualified Stress	$\sigma_{qs}$	110	Mpa	ASTM D 2992-B
Short Term Hoop Strength at 2:1 Stress Ratio	$\sigma_{sh(2:1)}$	240	Mpa	ASTM D 1599
Scaling Factor	<b>f<sub>scale</sub></b>	0,46	-	
Short Term Axial Strength at 0:1 Stress Ratio	$\sigma_{sa(0:1)}$	80	Mpa	ASTM D 2105
Short Term Axial Strength at 2:1 Stress Ratio	$\sigma_{sa(2:1)}$	120	Mpa	ASTM D 1599

MECHANICAL PROPERTIES				
DESCRIPTION	SYMB	VALUE	UNIT	TEST METHOD
Hoop Bending Stress	$\sigma_{bh}$	120	N/mm <sup>2</sup>	ASTM D 2412
Hoop Bending Modulus	<b>E<sub>bh</sub></b>	25	N/mm <sup>2</sup>	ASTM D 2412
Axial Bending Stress	$\sigma_{ba}$	80	N/mm <sup>2</sup>	
Axial Bending Modulus	<b>E<sub>ba</sub></b>	12.5	N/mm <sup>2</sup>	ASTM D 2925
Hoop Tensile Stress	$\sigma_{th}$	240	N/mm <sup>2</sup>	ASTM D 2290
Hoop Tensile Modulus	<b>E<sub>th</sub></b>	22	N/mm <sup>2</sup>	ASTM D 2290
Short Term Axial Tensile Stress	$\sigma_{ta}$	80	N/mm <sup>2</sup>	ASTM D 2105
Axial Tensile Modulus	<b>E<sub>ta</sub></b>	12	N/mm <sup>2</sup>	ASTM D 2105
Shear Modulus	<b>G</b>	11	N/mm <sup>2</sup>	

MECHANICAL PROPERTIES				
DESCRIPTION	SYMB	VALUE	UNIT	TEST METHOD
Equivalent Ring Flexural Modulus of Elasticity	<b>E<sub>h</sub></b>	28	N/mm <sup>2</sup>	
Poissons Ratio Axial Load/Hoop Contraction	<b>ρ<sub>g<sub>v</sub>k</sub></b>	0,3	-	ASTM D 2105 (mod)
Poissons Ratio Hoop Load/Axial Contraction	<b>u<sub>xh</sub></b>	0,55	-	
Barcol Hardness	<b>u<sub>xh</sub></b>	40	-	ASTM D 2583

PHYSICAL PROPERTIES				
DESCRIPTION	SYMB	VALUE	UNIT	TEST METHOD
Expansion Coefficient, axial	<b>σ</b>	18.10-6	1/°C	ASTM D 696
Density	<b>ρ<sub>g<sub>v</sub>k</sub></b>	1,9	kg/dm <sup>3</sup>	ASTM D 792
K-Value	<b>k</b>	0,01	mm	
Heat Conductivity	<b>λ</b>	0,26	W/mK	ASTM C 177