

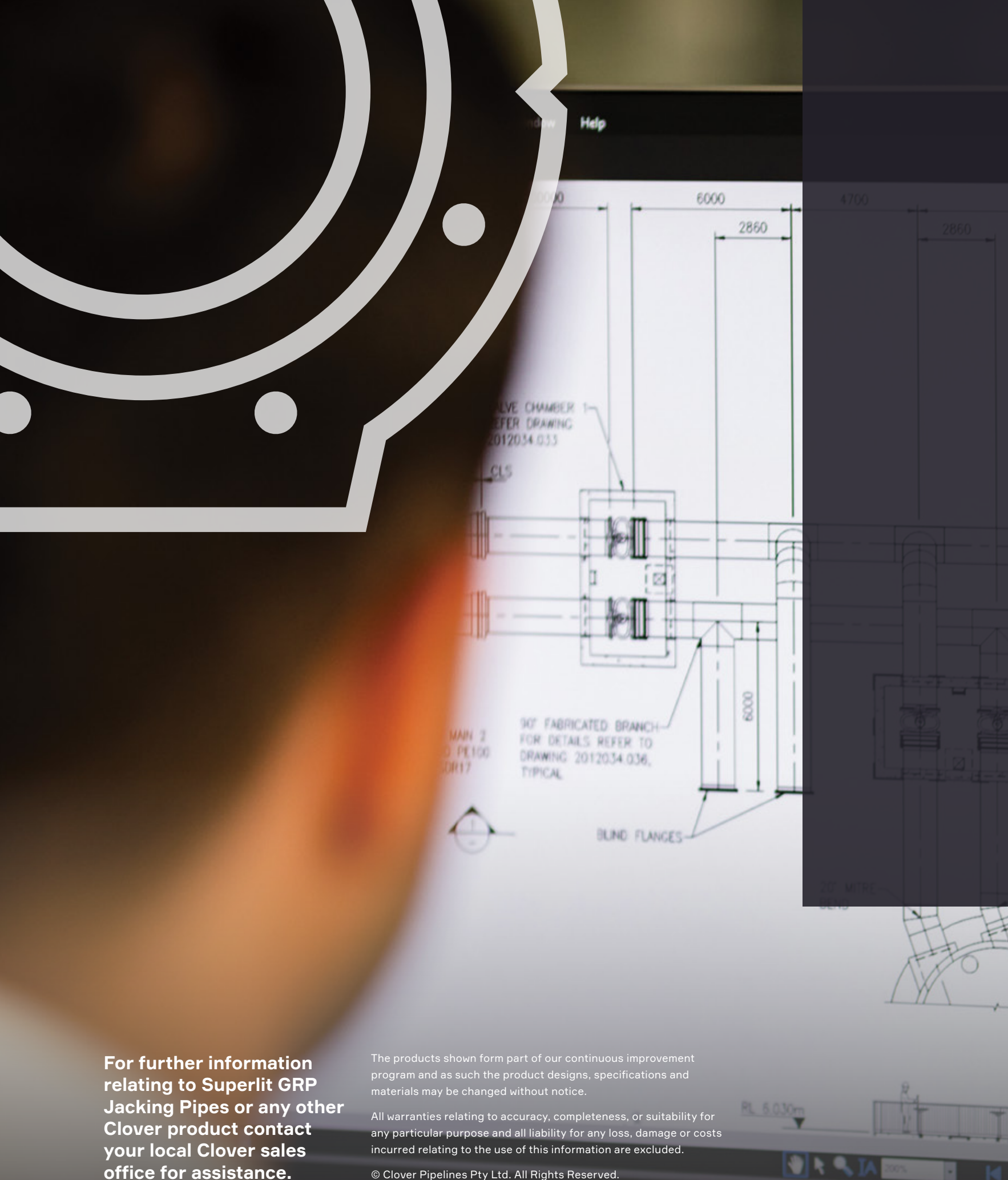
SUPERLIT GRP JACKING PIPE SYSTEM



ISO25780 "GLASS-REINFORCED THERMOSETTING PLASTICS (GRP) SYSTEMS
BASED ON UNSATURATED POLYESTER (UP) RESIN - PIPES WITH FLEXIBLE
JOINTS INTENDED TO BE INSTALLED USING JACKING TECHNIQUES"

**GLASS REINFORCED POLYESTER
(GRP) JACKING PIPE SYSTEM**

Version 3.0



For further information relating to Superlit GRP Jacking Pipes or any other Clover product contact your local Clover sales office for assistance.

The products shown form part of our continuous improvement program and as such the product designs, specifications and materials may be changed without notice.

All warranties relating to accuracy, completeness, or suitability for any particular purpose and all liability for any loss, damage or costs incurred relating to the use of this information are excluded.

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WE ARE CLOVER, AN INTEGRATED PIPELINE INFRASTRUCTURE BUSINESS

Led by a passionate team of industry professionals, we combine strategic project consultation, product innovation and service excellence. We work with local and global partners to specify world-leading pipelines across Australia and the Asia Pacific region.

Future facing pipeline infrastructure

We believe in new ways of doing— at Clover, we do things differently. We don't rest on the past, or the present, we're committed to consistent innovation that supports existing communities and establishes new ones.

Australia's most complete pipeline infrastructure provider.

We partner with our clients to offer holistic design-led packages that go beyond supply and delivery—bridging the gap between the plan, source and supply of pipeline infrastructure systems.

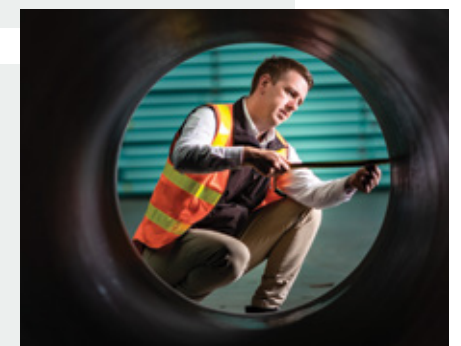
PLAN

Clover's inhouse engineering team combines specialist technical knowledge, creative thinking and on-the-job experience, to offer our clients a range of project planning and design consultation services.



SOURCE

Constantly pushing to challenge what's achievable, Clover harnesses an extensive global network of product partners to bring our clients the competitive advantage that comes with choice, availability and cutting edge innovation.



SUPPLY

In a project based industry, timing is everything. At Clover, our approach to supply and distribution is based around a dedication to consistency, responsiveness and service excellence.



Why use Trenchless technology?

With today's growing urban areas, it is at times impractical to utilise traditional open trench excavation and disrupt surface conditions to install, replace or repair underground piping systems.

Clover's Superlit trenchless technologies offer significant advantages to contractors and the community when compared to traditional open trench pipe installations:

- No trenches means installation savings;
- Minimal surface disruption and reduced community impact;
- All weather installation, rain, hail or shine;
- Minimal noise and vibration due to underground installation;
- Low soil transference and replacement;
- Small installation space required;
- Faster installation; and
- Less excavation material, reduced costs associated with disposal of excavated spoil.



Superlit Continuous Filament Wound (CFW) Manufacturing Process

Production Process

Clover Superlit Continuous Filament Wound (CFW) jacking pipes are manufactured using glass fibres, thermosetting resin and sand. The process uses a fully automatic computer controlled system that feeds raw materials onto a continuously advancing mandrel starting from the inside surface of the pipe until the required wall thickness is obtained.

This system precisely determines, measures and applies exact quantities of each of the raw materials throughout the production process. The precision and flexibility of the process enables the production of pipes to suit an extensive range of applications and conditions.

Process parameters, temperature and thickness are constantly monitored during production to ensure quality control of the finished product.

Technical Data

Superlit Continuous Filament Wound (CFW) Glass Reinforced Polyester (GRP) Jacking Pipes are manufactured to ISO25780 for potable, non-potable, sewer, stormwater and industrial applications.

Applications

- Trenchless pipe installations
- Gravity pipelines & low pressure applications
- Relining & pipeline rehabilitation
- Potable & non potable water applications
- Wastewater & irrigation systems
- Stormwater systems
- Rail under bores & culvert systems
- Industrial & petrochemical applications
- Electrical & cable ducts

Ordering Information

When ordering Superlit GRP jacking pipe products users must specify the following parameters:

- Pipe diameter
- Pipe stiffness
- Maximum jacking force
- Pipe length
- Coupling material
- Pressure (Gravity or up to PN10)

Technical support

We have an infrastructure project team that has the experience and expertise to assist you with your project needs. Our team will not only help you choose the right products for the job, they can also assist with the design and specification of those products.

Features and Benefits

- Long service life. Reduced maintenance costs
- Lengths can be varied to suit application
- Lightweight materials: lower transport costs, significant installation & handling savings
- Superior jacking capabilities: high compression strength, lowest jacking force required for any drive length. Ability to maximise bore lengths and reduce number of required shafts
- Flush coupling: provides a smooth flush external surface for minimal interference during installation
- Range of coupling materials: GRP and Stainless Steel
- Superior hydraulic performance: smooth internal bore means less friction loss, larger internal bore for higher flow rates
- Corrosion resistant materials: suitable for high pH applications and aggressive environments
- Excellent abrasion and UV resistance
- Non-conductive materials: not affected by induced currents or earth leakage
- No cathodic protection required

Design & Installation

The Superlit GRP jacking pipe range is considered a flexible pipe system. For information on the installation of Superlit GRP jacking pipe, please refer to the Superlit Design & Installation Manuals.

Technical Data

Superlit GRP Jacking Pipe Range

- Size Range: DN300 – DN3000
- Stiffness rating: SN20,000 to SN1,000,000
- Lengths: 1m to 5.8m (Standard length 2m)
- Product Range: Pipe, manhole connectors and an extensive range of fabricated fittings
- Manufactured in accordance with the ISO25780 standard
- Pipe Dimensions: Refer to Product Dimensions table (page 10-14)

Design Data

Flow Roughness Coefficient:

Hazen-William C = 150
Manning n = 0.009
Colebrook-White k = 0.01 mm

Poissons Ratio:

Typically 0.22 to 0.29

Thermal Expansion Coefficient:

24 to 30 x 1/10⁻⁶ mm/mm/C^o

Jacking Force Safety Factor:

3.5

Ultimate Compressive Strength:

85N/mm²

Superlit GRP Pipe Wall

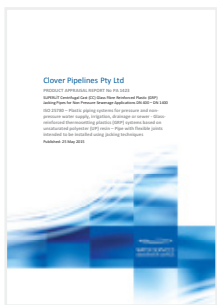
Superlit has developed a system to optimise the distribution of glass fibres across the pipe wall facilitating greater accuracy in pipe design and in determining the long-term behavioural pipe properties.



Each layer of the pipe wall construction has a specific function and vary subject to requirements such as stiffness, jacking force, wall thickness and pressure.

Certifications & Appraisals

Clover Pipelines supports a comprehensive quality assurance program and maintains an ISO 9001: 2015 accreditation. Our GRP product range is manufactured under strict quality guidelines and our products are third party certified to meet the following Australian and International standards:



WSAA Appraisal 18/16

SUPERLIT Filament Wound Glass Fibre Reinforced Plastic (GRP) Jacking Pipes for non-pressure sewerage applications DN 300 – DN 3000.



ISO 25780 Certificate

Plastics piping systems for pressure and non-pressure water supply across irrigation, drainage or sewerage systems.



ISO 9001 Certificate

Design, purchasing, warehousing and distribution of pipes, conduits, valves and associated fittings for the water supply, sewerage, drainage, electrical, communication, mining, rural and gas industries.

Stormwater & Sewer Access Applications

Clover's GRP Manhole solution is manufactured to AS/NZS 3571 for a range of commercial and custom sewer applications. Made from premium glass-reinforced polymers with superior service life to ensure optimum performance.

Features:

- Superlit GRP coupling system with full face EPDM seal for guaranteed seal integrity
- Minimal ongoing maintenance
- Long life corrosion resistant material
- Lightweight design for reduced installation time

Clover's GRP manhole solutions can be customised to suit specific project requirements. We can build into the design optional covers, access ladders, foot wells, overflows and storage chambers. Speak to a Clover sales representative to find out more.



GRP Tank, Storage & Access Systems

Clover's GRP Tank, Storage and Access Systems are used in a variety of industrial applications. Some of these include the retention of storm water prior to filtration and permanent onsite water capture for re-use in irrigation. GRP Tanks and Systems are manufactured from premium glass reinforced polymers for cost effective solutions to corrosion problems.

Features:

- Lightweight design for reduced installation time
- Long service life
- Minimal ongoing maintenance
- Low roughness coefficient
- Chemical resistance
- Expandability as required



PRODUCT RANGE

GRP Jacking Pipe SN 20,000 - 80,000
Stainless Steel Coupling

Refer to page 11 for SN 100,000 - 1,000,000

PIPE STIFFNESS SN (N/m²)																								
OD (mm)	20,000				32,000				40,000				50,000				64,000				80,000			
	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax
	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN
345	326.4	9.3	20	18	323.5	10.8	23	50	321.8	11.6	24	69	319.4	12.8	27	96	317.2	13.9	29	120	315.2	14.9	31	141
376	355.8	10.1	23	39	352.6	11.7	27	78	350.6	12.7	29	102	348.0	14.0	32	133	345.8	15.1	34	160	343.6	16.2	37	186
427	404.0	11.5	30	84	400.4	13.3	35	133	398.0	14.5	38	166	395.4	15.8	41	202	392.8	17.1	44	237	390.2	18.4	47	272
478	452.2	12.9	38	138	448.0	15.0	44	203	445.6	16.2	47	240	442.6	17.7	51	285	440.8	18.6	54	313	436.8	20.6	59	373
515	487.2	13.9	44	183	482.8	16.1	50	256	480.0	17.5	55	302	476.8	19.1	59	355	474.6	20.2	63	390	470.4	22.3	69	459
530	501.6	14.2	46	198	497.0	16.5	53	277	494.0	18.0	58	328	490.8	19.6	63	382	487.4	21.3	68	439	484.4	22.8	73	489
550	520.4	14.8	50	228	515.7	17.2	57	311	513.0	18.5	62	359	509.2	20.4	68	426	505.8	22.1	73	485	502.6	23.7	78	540
618	584.8	16.6	63	330	579.5	19.3	72	435	576.0	21.0	79	505	572.2	22.9	86	580	568.4	24.8	92	654	565.0	26.5	98	720
650	615.0	17.5	70	385	609.0	20.5	81	511	606.0	22.0	87	574	601.8	24.1	95	661	597.8	26.1	102	743	594.0	28.0	109	821
718	679.6	19.2	84	459	673.0	22.5	98	612	669.6	24.2	105	690	664.8	26.6	115	800	660.4	28.8	125	900	656.0	31.0	134	1,000
760	718.0	21.0	97	576	712.6	23.7	110	708	708.8	25.6	118	801	703.6	28.2	130	927	699.0	30.5	140	1,038	694.4	32.8	150	1,148
820	776.0	22.0	110	676	769.0	25.5	127	862	764.6	27.7	138	978	759.2	30.4	151	1,119	754.0	33.0	163	1,254	749.4	35.3	174	1,373
860	814.0	23.0	121	767	806.0	27.0	141	989	802.0	29.0	151	1,099	796.4	31.8	165	1,253	790.8	34.6	179	1,406	785.8	37.1	192	1,541
924	874.0	25.0	141	853	866.0	29.0	163	1,092	862.0	31.0	174	1,211	855.6	34.2	191	1,399	850.0	37.0	206	1,563	844.0	40.0	222	1,738
960	908.0	26.0	153	950	900.0	30.0	175	1,198	895.0	32.5	189	1,352	889.0	35.5	206	1,536	883.0	38.5	223	1,718	877.0	41.5	239	1,900
1,026	971.0	27.5	172	1,118	962.0	32.0	200	1,417	957.0	34.5	215	1,581	950.0	38.0	236	1,810	943.6	41.2	255	2,018	938.0	44.0	271	2,199
1,099	1,040.0	29.5	198	1,344	1,030.0	34.5	231	1,699	1,025.0	37.0	247	1,875	1,017.6	40.7	270	2,135	1,011.0	44.0	292	2,364	1,004.0	47.5	314	2,607
1,127	1,066.6	30.2	208	1,431	1,056.2	35.4	243	1,810	1,051.0	38.0	260	1,998	1,043.0	42.0	286	2,285	1,036.6	45.2	307	2,513	1,029.8	48.6	329	2,754
1,229	1,163.0	33.0	248	1,789	1,153.0	38.0	284	2,187	1,146.0	41.5	309	2,463	1,138.0	45.5	338	2,776	1,130.2	49.4	366	3,080	1,123.0	53.0	391	3,358
1,290	1,220.0	35.0	276	2,049	1,209.0	40.5	318	2,508	1,202.4	43.8	343	2,781	1,194.4	47.8	373	3,110	1,186.6	51.7	402	3,428	1,178.4	55.8	432	3,761
1,348	1,275.0	36.5	301	2,276	1,264.0	42.0	344	2,755	1,257.0	45.5	372	3,058	1,248.0	50.0	408	3,445	1,240.0	54.0	439	3,786	1,231.6	58.2	471	4,143
1,399	1,323.4	37.8	323	2,483	1,311.4	43.8	373	3,026	1,304.2	47.4	402	3,349	1,295.0	52.0	440	3,759	1,286.6	56.2	474	4,131	1,278.2	60.4	508	4,501
1,434	1,357.0	38.5	337	2,613	1,344.0	45.0	393	3,216	1,337.0	48.5	422	3,538	1,327.6	53.2	461	3,967	1,318.8	57.6	498	4,367	1,310.0	62.0	534	4,764
1,499	1,418.6	40.2	368	2,901	1,405.0	47.0	429	3,560	1,398.0	50.5	459	3,897	1,388.0	55.5	503	4,375	1,379.0	60.0	542	4,802	1,369.0	65.0	585	5,274
1,536	1,453.4	41.3	388	2,982	1,439.6	48.2	450	3,667	1,432.0	52.0	485	4,041	1,422.0	57.0	529	4,531	1,412.0	62.0	574	5,017	1,402.0	67.0	618	5,500
1,638	1,550.0	44.0	440	3,474	1,536.0	51.0	508	4,216	1,527.0	55.5	552	4,689	1,516.0	61.0	604	5,263	1,506.4	65.8	650	5,761	1,496.0	71.0	699	6,297
1,720	1,628.0	46.0	484	3,878	1,612.0	54.0	565	4,768	1,603.2	58.4	609	5,253	1,592.0	64.0	666	5,867	1,582.0	69.0	715	6,412	1,572.0	74.0	765	6,953
1,842	1,743.0	49.5	557	4,582	1,726.0	58.0	650	5,594	1,717.0	62.5	698	6,126	1,705.0	68.5	763	6,831	1,694.0	74.0	822	7,472	1,683.0	79.5	880	8,109
1,944	1,839.4	52.3	621	5,199	1,822.0	61.0	721	6,292	1,812.0	66.0	778	6,916	1,800.0	72.0	846	7,659	1,787.0	78.5	920	8,459	1,774.0	85.0	992	9,254
2,046	1,936.0	55.0	688	5,840	1,918.0	64.0	797	7,031	1,907.0	69.5	863	7,753	1,894.0	76.0	940	8,600	1,882.0	82.0	1,011	9,378	1,870.0	88.0	1,082	10,150
2,160	2,044.0	58.0	766	6,305	2,026.0	67.0	881	7,562	2,014.0	73.0	957	8,394	2,000.0	80.0	1,045	9,358	1,987.0	86.5	1,126	10,248				
2,250	2,129.0	60.5	832	6,943	2,110.0	70.0	958	8,325	2,097.0	76.5	1,044	9,263	2,083.0	83.5	1,136	10,267	2,069.6	90.2	1,223	11,222				
2,453	2,321.0	66.0	989	8,469	2,300.0	76.5	1,142	10,134	2,286.0	83.5	1,243	11,235	2,273.0	90.0	1,336	12,252								
2,553	2,416.0	68.5	1,069	9,241	2,393.0	80.0	1,242	11,138	2,379.0	87.0	1,347	12,285	2,369.0	92.0	1,422	13,099								
2,658	2,514.5	71.5	1,161	10,150	2,492.5	82.5	1,334	12,040	2,477.5	90.0	1,451	13,319												
2,758	2,610.0	74.0	1,247	10,995	2,586.6	85.7	1,438	13,081																
2,858	2,704.0	77.0	1,345	11,964	2,680.4	88.8	1,544	14,144																
2,962	2,803.0	79.5	1,439	12,895																				
3,065	2,901.0	82.0	1,536	13,856																				

PRODUCT RANGE

GRP Jacking Pipe SN 100,000 - 1,000,000
Stainless Steel Coupling

Refer to page 10 for SN 20,000 - 80,000

PIPE STIFFNESS SN (N/m²)																												
OD (mm)	100,000				128,000				160,000				200,000				320,000				640,000				1,000,000			
	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax
	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN
345	312.6	16.2	33	169	310.0	17.5	36	197	306.8	19.1	39	231	304.0	20.5	42	260	296.8	24.1	49	334	285.4	29.8	59	448	276.6	34.2	67	533
376	340.8	17.6	40	219	338.0	19.0	43	251	334.4	20.8	46	293	331.0	22.5	50	331	323.4	26.3	58	417	311.0	32.5	70	552	301.6	37.2	79	651
427	387.0	20.0	51	315	384.0	21.5	55	354	379.8	23.6	60	409	376.0	25.5	64	459	367.4	29.8	74	568	353.2	36.9	90	744	342.4	42.3	102	873
478	433.2	22.4	64	427	429.6	24.2	69	480	425.0	26.5	75	547	421.0	28.5	80	605	411.2	33.4	93	745	395.4	41.3	113	964	383.4	47.3	128	1,124
515	466.6	24.2	75	520	462.8	26.1	80	580	457.4	28.8	88	666	453.6	30.7	93	725	443.0	36.0	108	888	426.0	44.5	131	1,141	413.0	51.0	149	1,329
530	480.4	24.8	79	556	476.4	26.8	85	621	471.2	29.4	92	706	467.0	31.5	99	773	456.0	37.0	115	948	438.4	45.8	139	1,218	425.0	52.5	157	1,416
550	498.4	25.8	85	612	494.2	27.9	91	684	489.0	30.5	100	772	484.8	32.6	106	842	473.0	38.5	124	1,036	455.0	47.5	150	1,322	441.0	54.5	170	1,537
618	560.0	29.0	107	817	555.2	31.4	116	909	549.6	34.2	125	1,015	544.6	36.7	134	1,109	531.6	43.2	156	1,349	511.0	53.5	190	1,717	496.0	61.0	213	1,976
650	589.0	30.5	119	923	584.0	33.0	128	1,023	578.0	36.0	139	1,143	572.8	38.6	148	1,245	559.2	45.4	172	1,510	537.6	56.2	210	1,916	521.4	64.3	237	2,210
718	651.0	33.5	144	1,112	645.2	36.4	156	1,241	638.0	40.0	170	1,399	632.8	42.6	181	1,513	617.6	50.2	211	1,839	594.0	62.0	255	2,329	576.0	71.0	288	2,691
760	688.8	35.6	162	1,281	682.8	38.6	175	1,422	675.0	42.5	192	1,604	669.6	45.2	203	1,728	653.8	53.1	236	2,087	628.8	65.6	286	2,637	609.4	75.3	324	3,049
820	743.0	38.5	189	1,537	736.8	41.6	203	1,694	729.2	45.4	221	1,885	722.4	48.8	236	2,054	705.4	57.3	274	2,471	678.0	71.0	334	3,121	658.0	81.0	376	3,580
860	779.6	40.2	207	1,707	773.0	43.5	223	1,883	764.4	47.8	244	2,110	758.0	51.0	259	2,277	740.0	60.0	301	2,740	711.0	74.5	368	3,462				
924	837.2	43.4	240	1,934	830.2	46.9	258	2,134	821.6	51.2	281	2,378	814.0	55.0	300	2,591	795.0	64.5	348	3,116	764.0	80.0	424	3,945				
960	869.8	45.1	259	2,115	862.8	48.6	278	2,324	853.6	53.2	303	2,594	845.6	57.2	324	2,828	826.0	67.0	376	3,390	794.0	83.0	457	4,279				
1,026	930.0	48.0	295	2,456	922.0	52.0	318	2,710	912.0	57.0	347	3,024	904.0	61.0	370	3,274	882.4	71.8	430	3,936								
1,099	995.8	51.6	339	2,888	988.2	55.4	363	3,147	977.0	61.0	398	3,524	968.6	65.2	423	3,805	945.4	76.8	493	4,567								
1,127	1,021.2	52.9	357	3,057	1,013.0	57.0	383	3,343	1,002.0	62.5	418	3,724	992.6	67.2	447	4,045	969.4	78.8	519	4,826								
1,229	1,114.0	57.5	423	3,704	1,104.6	62.2	456	4,061	1,093.0	68.0	496	4,499	1,082.6	73.2	531	4,887												
1,290	1,169.0	60.5	467	4,140	1,160.0	65.0	500	4,499	1,147.0	71.5	547	5,014	1,136.0	77.0	587	5,445												
1,348	1,221.6	63.2	510	4,563	1,211.0	68.5	550	5,006	1,198.0	75.0	600	5,543	1,187.0	80.5	641	5,993												
1,399	1,267.8	65.6	549	4,955	1,257.0	71.0	592	5,423	1,243.0	78.0	647	6,024	1,232.0	83.5	690	6,491												
1,434	1,299.2	67.4	578	5,247	1,289.0	72.5	620	5,700	1,274.8	79.6	677	6,325	1,264.0	85.0	720	6,795												
1,499	1,359.0	70.0	628	5,742	1,348.0	75.5	675	6,253	1,333.0	83.0	738	6,943	1,321.0	89.0	788	7,489												
1,536	1,392.0	72.0	662	5,979	1,380.0	78.0	714	6,550	1,366.0	85.0	775	7,210																
1,638	1,485.0	76.5	750	6,859	1,472.0	83.0	811	7,519	1,460.0	89.0	866	8,122																
1,720	1,559.0	80.5	829	7,651	1,546.0	87.0	892	8,344																				
1,842	1,670.0	86.0	948	8,857																								

PRODUCT RANGE

GRP Jacking Pipe SN 20,000 - 80,000
GRP Coupling

Refer to page 13 for SN 100,000 - 1,000,000

PIPE STIFFNESS SN (N/m²)																								
OD (mm)	20,000				32,000				40,000				50,000				64,000				80,000			
	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax
	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN
345	323.0	11.0	23	11	323.0	11.0	23	11	321.8	11.6	24	24	319.4	12.8	27	50	317.2	13.9	29	74	315.2	14.9	31	96
376	352.6	11.7	27	17	352.6	11.7	27	17	350.6	12.7	29	41	348.0	14.0	32	72	345.8	15.1	34	98	343.6	16.2	37	124
427	404.0	11.5	30	12	400.4	13.3	35	62	398.0	14.5	38	95	395.4	15.8	41	130	392.8	17.1	44	166	390.2	18.4	47	201
478	452.2	12.9	38	59	448.0	15.0	44	124	445.6	16.2	47	161	442.6	17.7	51	207	440.8	18.6	54	234	436.8	20.6	59	294
515	487.2	13.9	44	98	482.8	16.1	50	171	480.0	17.5	55	217	476.8	19.1	59	270	474.6	20.2	63	305	470.4	22.3	69	374
530	501.6	14.2	46	111	497.0	16.5	53	190	494.0	18.0	58	241	490.8	19.6	63	295	487.4	21.3	68	352	484.4	22.8	73	402
550	520.4	14.8	50	137	515.7	17.2	57	220	513.0	18.5	62	268	509.2	20.4	68	335	505.8	22.1	73	394	502.6	23.7	78	449
618	584.8	16.6	63	276	579.5	19.3	72	382	576.0	21.0	79	451	572.2	22.9	86	526	568.4	24.8	92	601	565.0	26.5	98	667
650	615.0	17.5	70	277	609.0	20.5	81	403	606.0	22.0	87	466	601.8	24.1	95	553	597.8	26.1	102	635	594.0	28.0	109	713
718	679.6	19.2	84	387	673.0	22.5	98	540	669.6	24.2	105	619	664.8	26.6	115	728	660.4	28.8	125	829	656.0	31.0	134	928
760	718.0	21.0	97	454	712.6	23.7	110	587	708.8	25.6	118	679	703.6	28.2	130	805	699.0	30.5	140	916	694.4	32.8	150	1,026
820	776.0	22.0	110	485	769.0	25.5	127	670	764.6	27.7	138	786	759.2	30.4	151	927	754.0	33.0	163	1,062	749.4	35.3	174	1,181
860	814.0	23.0	121	566	806.0	27.0	141	788	802.0	29.0	151	898	796.4	31.8	165	1,052	790.8	34.6	179	1,204	785.8	37.1	192	1,340
924	874.0	25.0	141	730	866.0	29.0	163	969	862.0	31.0	174	1,087	855.6	34.2	191	1,276	850.0	37.0	206	1,440	844.0	40.0	222	1,614
960	908.0	26.0	153	822	900.0	30.0	175	1,070	895.0	32.5	189	1,224	889.0	35.5	206	1,408	883.0	38.5	223	1,590	877.0	41.5	239	1,771
1,026	971.0	27.5	172	981	962.0	32.0	200	1,279	957.0	34.5	215	1,444	950.0	38.0	236	1,673	943.6	41.2	255	1,881	938.0	44.0	271	2,062
1,099	1,040.0	29.5	198	1,196	1,030.0	34.5	231	1,552	1,025.0	37.0	247	1,728	1,017.6	40.7	270	1,987	1,011.0	44.0	292	2,217	1,004.0	47.5	314	2,459
1,127	1,066.6	30.2	208	1,279	1,056.2	35.4	243	1,658	1,051.0	38.0	260	1,846	1,043.0	42.0	286	2,134	1,036.6	45.2	307	2,362	1,029.8	48.6	329	2,603
1,229	1,163.0	33.0	248	1,624	1,153.0	38.0	284	2,021	1,146.0	41.5	309	2,297	1,138.0	45.5	338	2,611	1,130.2	49.4	366	2,914	1,123.0	53.0	391	3,193
1,290	1,220.0	35.0	276	1,875	1,209.0	40.5	318	2,334	1,202.4	43.8	343	2,607	1,194.4	47.8	373	2,936	1,186.6	51.7	402	3,254	1,178.4	55.8	432	3,587
1,348	1,275.0	36.5	301	2,094	1,264.0	42.0	344	2,573	1,257.0	45.5	372	2,876	1,248.0	50.0	408	3,263	1,240.0	54.0	439	3,605	1,231.6	58.2	471	3,961
1,399	1,323.4	37.8	323	2,295	1,311.4	43.8	373	2,837	1,304.2	47.4	402	3,160	1,295.0	52.0	440	3,571	1,286.6	56.2	474	3,943	1,278.2	60.4	508	4,312
1,434	1,357.0	38.5	337	2,420	1,344.0	45.0	393	3,022	1,337.0	48.5	422	3,344	1,327.6	53.2	461	3,774	1,318.8	57.6	498	4,173	1,310.0	62.0	534	4,570
1,499	1,418.6	40.2	368	2,699	1,405.0	47.0	429	3,358	1,398.0	50.5	459	3,695	1,388.0	55.5	503	4,173	1,379.0	60.0	542	4,600	1,369.0	65.0	585	5,071
1,536	1,453.4	41.3	388	2,413	1,439.6	48.2	450	3,098	1,432.0	52.0	485	3,472	1,422.0	57.0	529	3,962	1,412.0	62.0	574	4,448	1,402.0	67.0	618	4,931
1,638	1,550.0	44.0	440	2,757	1,536.0	51.0	508	3,499	1,527.0	55.5	552	3,972	1,516.0	61.0	604	4,546	1,506.4	65.8	650	5,044	1,496.0	71.0	699	5,579
1,720	1,628.0	46.0	484	3,240	1,612.0	54.0	565	4,130	1,603.2	58.4	609	4,615	1,592.0	64.0	666	5,229	1,582.0	69.0	715	5,774	1,572.0	74.0	765	6,315
1,842	1,743.0	49.5	557	3,898	1,726.0	58.0	650	4,910	1,717.0	62.5	698	5,442	1,705.0	68.5	763	6,146	1,694.0	74.0	822	6,788	1,683.0	79.5	880	7,425
1,944	1,839.4	52.3	621	4,476	1,822.0	61.0	721	5,569	1,812.0	66.0	778	6,193	1,800.0	72.0	846	6,937	1,787.0	78.5	920	7,737	1,774.0	85.0	992	8,531
2,046	1,936.0	55.0	688	5,079	1,918.0	64.0	797	6,269	1,907.0	69.5	863	6,991	1,894.0	76.0	940	7,839	1,882.0	82.0	1,011	8,617	1,870.0	88.0	1,082	9,389
2,160	2,044.0	58.0	766	5,794	2,026.0	67.0	881	7,051	2,014.0	73.0	957	7,883	2,000.0	80.0	1,045	8,847	1,987.0	86.5	1,126	9,736				
2,250	2,129.0	60.5	832	6,410	2,110.0	70.0	958	7,792	2,097.0	76.5	1,044	8,730	2,083.0	83.5	1,136	9,734	2,069.6	90.2	1,223	10,689				
2,453	2,321.0	66.0	989	6,977	2,300.0	76.5	1,142	8,642	2,286.0	83.5	1,243	9,743	2,273.0	90.0	1,336	10,760								
2,553	2,416.0	68.5	1,069	7,687	2,393.0	80.0	1,242	9,584	2,379.0	87.0	1,347	10,731	2,369.0	92.0	1,422	11,545								
2,658	2,515.0	71.5	1,161	8,531	2,493.0	82.5	1,334	10,421	2,478.0	90.0	1,451	11,700												
2,758	2,610.0	74.0	1,247	9,314	2,586.6	85.7	1,438	11,400																
2,858	2,704.0	77.0	1,345	10,221	2,680.4	88.8	1,544	12,402																
2,962	2,803.0	79.5	1,439	11,088																				
3,065	2,901.0	82.0	1,536	11,986																				

PRODUCT RANGE

GRP Jacking Pipe SN 100,000 - 1,000,000
GRP Coupling

Refer to page 12 for SN 20,000 - 80,000

PIPE STIFFNESS SN (N/m²)																												
OD (mm)	100,000				128,000				160,000				200,000				320,000				640,000				1,000,000			
	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax	ID	e	Mass	Fmax
	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN	mm	mm	kg/m	kN
345	312.6	16.2	33	124	310.0	17.5	36	152	306.8	19.1	39	186	304.0	20.5	42	215	296.8	24.1	49	289	285.4	29.8	59	403	276.6	34.2	67	488
376	340.8	17.6	40	157	338.0	19.0	43	190	334.4	20.8	46	232	331.0	22.5	50	270	323.4	26.3	58	356	311.0	32.5	70	491	301.6	37.2	79	589
427	387.0	20.0	51	243	384.0	21.5	55	283	379.8	23.6	60	338	376.0	25.5	64	387	367.4	29.8	74	497	353.2	36.9	90	672	342.4	42.3	102	801
478	433.2	22.4	64	348	429.6	24.2	69	401	425.0	26.5	75	469	421.0	28.5	80	527	411.2	33.4	93	667	395.4	41.3	113	885	383.4	47.3	128	1,046
515	466.6	24.2	75	435	462.8	26.1	80	495	457.4	28.8	88	581	453.6	30.7	93	640	443.0	36.0	108	803	426.0	44.5	131	1,056	413.0	51.0	149	1,244
530	480.4	24.8	79	468	476.4	26.8	85	534	471.2	29.4	92	618	467.0	31.5	99	686	456.0	37.0	115	860	438.4	45.8	139	1,130	425.0	52.5	157	1,329
550	498.4	25.8	85	521	494.2	27.9	91	593	489.0	30.5	100	681	484.8	32.6	106	751	473.0	38.5	124	945	455.0	47.5	150	1,231	441.0	54.5	170	1,446
618	560.0	29.0	107	763	555.2	31.4	116	855	549.6	34.2	125	961	544.6	36.7	134	1,055	531.6	43.2	156	1,295	511.0	53.5	190	1,664	496.0	61.0	213	1,923
650	589.0	30.5	119	814	584.0	33.0	128	915	578.0	36.0	139	1,035	572.8	38.6	148	1,137	559.2	45.4	172	1,401	537.6	56.2	210	1,808	521.4	64.3	237	2,102
718	651.0	33.5	144	1,040	645.2	36.4	156	1,169	638.0	40.0	170	1,328	632.8	42.6	181	1,441	617.6	50.2	211	1,767	594.0	62.0	255	2,258	576.0	71.0	288	2,619
760	688.8	35.6	162	1,159	682.8	38.6	175	1,300	675.0	42.5	192	1,482	669.6	45.2	203	1,606	653.8	53.1	236	1,965	628.8	65.6	286	2,515	609.4	75.3	324	2,928
820	743.0	38.5	189	1,345	736.8	41.6	203	1,502	729.2	45.4	221	1,694	722.4	48.8	236	1,863	705.4	57.3	274	2,279	678.0	71.0	334	2,930	658.0	81.0	376	3,388
860	779.6	40.2	207	1,506	773.0	43.5	223	1,682	764.4	47.8	244	1,909	758.0	51.0	259	2,076	740.0	60.0	301	2,539	711.0	74.5	368	3,261				
924	837.2	43.4	240	1,810	830.2	46.9	258	2,010	821.6	51.2	281	2,254	814.0	55.0	300	2,467	795.0	64.5	348	2,992	764.0	80.0	424	3,821				
960	869.8	45.1	259	1,987	862.8	48.6	278	2,195	853.6	53.2	303	2,466	845.6	57.2	324	2,699	826.0	67.0	376	3,261	794.0	83.0	457	4,151				
1,026	930.0	48.0	295	2,318	922.0	52.0	318	2,572	912.0	57.0	347	2,887	904.0	61.0	370	3,136	882.4	71.8	430	3,798								
1,099	995.8	51.6	339	2,740	988.2	55.4	363	2,999	977.0	61.0	398	3,377	968.6	65.2	423	3,657	945.4	76.8	493	4,419								
1,127	1,021.2	52.9	357	2,906	1,013.0	57.0	383	3,192	1,002.0	62.5	418	3,572	992.6	67.2	447	3,894	969.4	78.8	519	4,675								
1,229	1,114.0	57.5	423	3,538	1,104.6	62.2	456	3,896	1,093.0	68.0	496	4,333	1,082.6	73.2	531	4,722												
1,290	1,169.0	60.5	467	3,966	1,160.0	65.0	500	4,325	1,147.0	71.5	547	4,840	1,136.0	77.0	587	5,271												
1,348	1,221.6	63.2	510	4,382	1,211.0	68.5	550	4,824	1,198.0	75.0	600	5,361	1,187.0	80.5	641	5,812												
1,399	1,267.8	65.6	549	4,767	1,257.0	71.0	592	5,235	1,243.0	78.0	647	5,835	1,232.0	83.5	690	6,302												
1,434	1,299.2	67.4	578	5,054	1,289.0	72.5	620	5,507	1,274.8	79.6	677	6,131	1,264.0	85.0	720	6,602												
1,499	1,359.0	70.0	628	5,539	1,348.0	75.5	675	6,050	1,333.0	83.0	738	6,740	1,321.0	89.0	788	7,287												
1,536	1,392.0	72.0	662	5,411	1,380.0	78.0	714	5,981	1,366.0	85.0	775	6,641																
1,638	1,485.0	76.5	750	6,142	1,472.0	83.0	811	6,802	1,460.0	89.0	866	7,405																
1,720	1,559.0	80.5	829	7,013	1,546.0	87.0	892	7,706																				
1,842	1,670.0	86.0	948	8,173																								



CHEMICAL RESISTANCE GUIDE

CHEMICAL	STANDARD PIPE	SPECIAL PIPE
Acetic Acid		x
Acrylic Acid		x
Alcohol Ethyl	x	x
Alcohol Isopropyl	x	x
Alcohol Methyl Isobutyl		x
Alcohol Secondary Butyl		x
Alun	x	x
Aluminium Chloride	x	x
Aluminium Fluoride	x	x
Aluminium Hydroxide		x
Aluminium Nitrate	x	x
Aluminium Potassium Sulfate	x	x
Ammonia Aqueous		x
Ammonia Gas		x
Ammonium Bicarbonate		x
Ammonium Bisulfate		x
Ammonium Carbonate		x
Ammonium Chloride	x	x
Ammonium Citrate		x
Ammonium Fluoride		x
Ammonium Hydroxide		x
Ammonium Nitrate	x	x
Ammonium Persulfate		x
Ammonium Phosphate	x	x
Ammonium Sulfate	x	x
Aniline Sulfate		x
Barium Carbonate		x
Barium Chloride	x	x
Barium Hydroxide		x
Barium Sulphate	x	x
Beer	x	x
Benzine Sulphonic Acid		x
Benzoic Acid		x
Cadium Chloride		x
Calcium Bisulfite		x
Calcium Carbonate		x
Calcium Chlorate		x
Calcium Chloride	x	x
Calcium Hydroxide		x
Calcium Nitrate	x	x
Calcium Sulfate	x	x
Calcium Sulfite		x
Cane Sugar Liquid		x
Caprylic Acid		x
Carbon Dioxide	x	x
Carbon Monoxide, gas form	x	x
Chlorine, Dry gas		x

CHEMICAL	STANDARD PIPE	SPECIAL PIPE
Chlorine, wet gas		x
Citric Acid	x	x
Copper Chloride	x	x
Copper Cyanide		x
Copper Flouride		x
Copper N traie:	x	x
Copper Sulphate	x	x
Crude Oil, sour	x	x
Crude Oil, sweet	x	x
Diesel Fuel	x	x
Ethylene Glycol	x	x
Ferric Chloride	x	x
Ferric Nitrate	x	x
Ferric Sulphate	x	x
Ferrous Chloride	x	x
Ferrous Nitrate	x	x
Ferrous Sulphate	x	x
Flobonic Acid	x	x
Fluosillic Acid	x	x
Formic Acid	x	x
Fuel Oil	x	x
Gas, natural		x
Gluconic Acid		x
Glucose	x	x
Glycerine	x	x
Heptane		x
Hexane		x
Hexylene Clycol		x
Hydraulic Fluid		x
HydrohSoric Acid		x
Hydroyanid Acid		x
Hydrofluosillic Acid		x
Hydrogen Bronide, wet gas		x
Hydrogen Chloride, dry gas		x
Hydrogen Chloride, wet gas		x
Hydrogen Sulfide, liquid	x	x
Hydrogen Flouride, vapour		x
Hydrosulfide Bleach		x
Hydrochlorous Acid		x
Isopropyl Amine		x
Isopropyl Palmitate		x
Kerosene		x
Lactic Acid		x
Laurel Chloride		x
Laurie Acid		x
Lead Acetate		x

CHEMICAL RESISTANCE GUIDE

CHEMICAL	STANDARD PIPE	SPECIAL PIPE
Chlorine, dry gas		x
Lithium Bromide		x
Lithium Sulfate		x
Magnesium Bisulfit		x
Magnesium Carbonate		x
Magnesium Chloride	x	x
Magnesium Hydroxide		x
Magnesium Sulfate	x	x
Maelic Acid		x
Mercuric Chloride	x	x
Mercurous Chloride	x	x
Mineral Oils	x	x
Motor Oil		x
Myristic Acid		x
Naptha		x
Napthalene		x
Nickel Chloride	x	x
Nickel Nitrate	x	x
Nickel Sulfate	x	x
Octanoic Acid		x
Oleic Acid		x
Oxalic Acid		x
Perchloretylene		x
Phosphoric Acid	x	x
Phosphorous Pentoxide		x
Phtalic Acid		x
Potassium Alum Sulfate	x	x
Potassium Bicarbonate		x
Potassium Bromide	x	x
Potassium Carbonate		x
Potassium Chloride	x	x
Potassium Dichromate		x
Potassium Ferrocyanid		x
Potassium Hydroxide		x
Potassium Nitrate	x	x
Potassium Persulfate		x
Potassium Sulphate	x	x
Propylene Glycol		x
Salicylic Acid		x
Sebacic Acid		x
Soaps	x	x

CHEMICAL	STANDARD PIPE	SPECIAL PIPE
Levulinic Acid		x
Sodium Acetate		x
Sodium Aluminate		x
Sodium Benzoate		x
Sodium Bicarbonate		x
Sodium Bifluoride		x
Sodium Bisulfate	x	x
Sodium Bisulfite	x	x
Sodium Bromide	x	x
Sodium Chlorate		x
Sodium Chloride	x	x
Sodium Chlorite		x
Sodium Chromate		x
Sodium Cyanide		x
Sodium Dichromate		x
Sodium Diphosphate		x
Sodium Ferricyanide		x
Sodium Ferrocyanide		x
Sodium Flouride		x
Sodium Flouro Silicate		x
Sodium Laryl Sulfate		x
Sodium Nitrate	x	x
Sodium Nitrite	x	x
Sodium Silicate		x
Sodium Sulfate	x	x
Sodium Sulfide		x
Sodium Sulfite	x	x
Stannic Chloride		x
Stearic Acid	x	x
Sugar Cane Liquor		x
Sulfuric Acid	x	x
Tartaric Acid		x
Trichlor Acetic Acid		x
Trisodium Phosphate		x
Vegetable Oils	x	x
Vinegar	x	x
Water, demineralised	x	x
Water, distilled	x	x
Water, fresh	x	x
Water, sea	x	x
Zinc Chlorate		x

The chemical resistance of Superlit GRP products depends on a number of factors: resin selection; the temperature of the material being transported in the pipeline; and the concentration of chemicals contained in the material. This guide should be used as a general overview and should not be used as a design guide.

Clover's technical team can provide assistance regarding design considerations where chemical resistance is required and can design and manufacture pipes for specific conditions. Where the table indicates both standard and special pipes for a particular chemical this implies that the standard pipe is suitable for lower concentrations of the chemical at lower temperatures.



Clover Pipelines Pty Ltd



solutions@cloverpipe.com.au

www.cloverpipe.com.au

 Printed on 100% recycled paper

VIC +61 3 8373 8000

NSW +61 2 8279 8000

WA +61 8 6166 6800

SA +61 8 8120 4600

QLD +61 7 3073 7000

TAS +61 3 6111 9500

NT +61 8 7999 8400

INT +61 3 8373 8000