

English

Ginde[®]

INSTALLATION GUIDE

**[Aluminum plastic composite pipe]
Description of product · Engineering technical specifications**



INSTALLATION GUIDE – Ginde Multi Layer Composite Pipe

Scope

The purpose of this installation guide is **not** to present information on codes of practices, standards, legislation, regulations and by-laws, but rather to provide details on the general principles for handling, storage, product technical specifications, installation methods and testing of Ginde’s multi layer composite pipe and fittings.

The knowledge with regards to codes of practices, standards, legislation, regulations and by-laws as set out by the SABS, Local Authorities and/or CETA is to be applied and practised by the respective qualified installers. The onus is on the installer to certify the allowable correctness of an installation i.e. plumbing-, gas-, air-conditioning, water articulation, etc.

Ginde do not take any responsibility for the allowable correctness or workmanship of any installation.

Planning and Design

1. All planning, installation and commissioning work should be carried out in accordance with the national standards and South African codes for the specific installation as well as Ginde technical & installation information.
2. Ginde product information:

Product Name	Color	Specification	Inner Diameter (mm)	Outer Diameter (mm)	Design Pressure (Mpa)	Maximum Temperature (°C)	Burst Pressure (Mpa)	Unit size (m)	Weight per Unit (kg)
Water Pipe	White	1014-R	10	14	1,0	95	≥ 7.0	200	17.5
		1216-R	12	16	1,0	95	≥ 6.0	200	22
		1418-R	14	18	1,0	95	≥ 5.0	200	24
		1620-R	16	20	1,0	95	≥ 5.0	200	31.5
		2025-R	20	25	1,0	95	≥ 4.0	100	23
		2632-R	26	32	1,0	95	≥ 4.0	100	34
		3240-R	32	40	1,0	95	≥ 4.0	6	3.1
		4150-R	41	50	1,0	95	≥ 3.8	6	4.5
		5163-R	51	63	1,0	95	≥ 3.8	6	7.7
		6075-R	60	75	1,0	95	≥ 3.8	6	10.8
Gas Pipe	Light Stone	1014-Q	10	14	1,0	40	≥ 7.0	200	17.5
		1216-Q	12	16	1,0	40	≥ 6.0	200	22
		1418-Q	14	18	1,0	40	≥ 5.0	200	24
		1620-Q	16	20	1,0	40	≥ 5.0	200	31.5
		2025-Q	20	25	1,0	40	≥ 4.0	100	23
		2632-Q	26	32	1,0	40	≥ 4.0	100	34
		3240-Q	32	40	1,0	40	≥ 4.0	6	3.1
		4150-Q	41	50	1,0	40	≥ 3.8	6	4.5
		5163-Q	51	63	1,0	40	≥ 3.8	6	7.7
		6075-Q	60	75	1,0	40	≥ 3.8	6	10.8

Thermal Conductivity	0.45 W/(mk)
Coefficient of thermal expansion	0.025 mm/(mk)
Bending radius	≥ 5D (D refers to outer diameter of pipe)
Medium Temperature	-40 ~ 95 °C
Gas (Oxygen) permeability	0
Inner wall of pipe	smooth, small fluid resistance, and roughness is 0.0004 mm

- Fittings are categorized in types i.e. straight-, elbow-, tee-, etc. and are nickel plated brass fittings with double layer o-ring system with stainless steel crimp sleeve or nickel plated brass clamp.
- Use the suitable o-rings for the application. EPDM (black colour) o-rings to be used in water installations and NBR (red colour) o-rings to be used for gas installations.
- Ginde products are SABS certified (SANS21003), Australian AS 4176 certified, and comply with various other standards e.g. German, British, Russia, Chinese, etc.
- Use the Hydraulic Calculation Table in the Appendix at the end of the guide to determine the pressure loss when designing the pipe system.

Handling and Storage of Product

- Pipes and fittings should be treated carefully during transportation, load and unload. Do not throw, fall, roll or drag any of the products.
- Store away from any polluted areas, and do not store with oil or chemicals.
- Do not store in direct sunlight. Keep away from heat sources. Pay attention to fire safety.
- Pipes should be stored on a flat surface. Avoid pressure which may distort the pipe or cause mechanical damages.
- Product should be stored and piled in the original packaging. The stacking height for piles should be:
 - Pipes: less than 2 meter high,
 - Fittings: less than 0.8 meter high.
- Marking on packages will be visible and reading Ginde.
- Before any installation, acknowledge the mark on the pack as well as on the product.

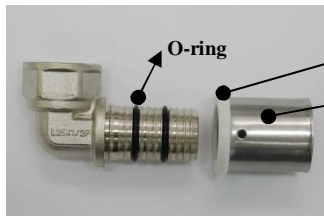
Connecting the Ginde Pipe to the Ginde Fitting

- Cut the pipe to the required length with the special pipe scissor or cutter.



- Ream the pipe, by pushing the reamer into pipe, in order to cut the pipe end straight as well as cutting chamfers on the inside and outside of the pipe end.
- Inspect the stainless steel sleeve for any cracks and fit over the pipe to be flush with the pipe end.

4. Inspect the fitting:
 - a. For cracks,
 - b. If the white collar is: fitted, is intact and is without any lacerations,
 - c. If 2 o-rings: are fitted, are intact and are without any cracks or lacerations,
 - d. Is the correct colour o-ring fitted for the application?



O-rings for water installations



O-rings for gas installations



5. Carefully push the fitting into the pipe until it clips into the white collar without dislocating the o-rings or without moving the sleeve away from the pipe end.
6. Crimp the sleeve with only a REMS crimping tool by:
 - a. Locating the tool's jaws tight against the collar,
 - b. Compress the sleeve only one time, by closing the REMS crimping tool until the handles meet and making a "clicking" sound.

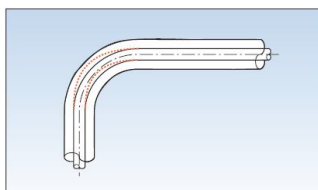
Clamp style fittings to be tightened with a wrench.



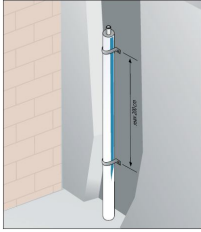
7. Test the crimp with the Crimp tester tool.
8. During the installation stage, care shall be taken to ensure that the bore of a pipe is not restricted by the entry of any material. While pipe fitting is in progress, all open ends shall be temporarily capped or plugged pending extension or completion of the installation.

Provision for expansion & fitment between structures

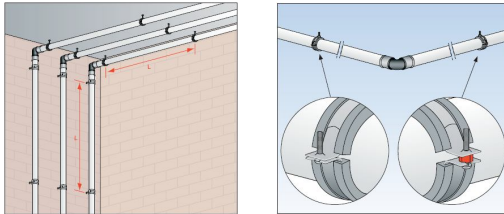
1. The pipeline will expand with an increase in temperature. This phenomenon is applicable to all pipe types and although it does not have an adverse effect on the performance of the pipe and joint, it must be taken into account when installing hot water systems.
2. For both, the straight laying or non-straight laying, the pipeline with a pipe diameter less than or equal to 32mm, the pipeline expansion compensation is not required.
3. To accommodate the expansion of the pipe within the structure, you must provide insulated expansion bends at least every 10m. When this has been insured, the pipe can be buried or build into the structure.



- It is preferred to always provide the pipes with a protective sleeve, or even better insulation. The sleeve has a protective function, while the insulation not only protects and thermally insulates the pipe; it also prevents the formation of condensation. To determine the insulation thickness the following rule can apply: $1,5 \times \Delta L$ (change in length).



- Pipe brackets must be used when fixing pipelines to the surface. The brackets can be synthetic or metal with a synthetic inner lining for protection of the pipe. The specified maximum distances between brackets must be adhered to.



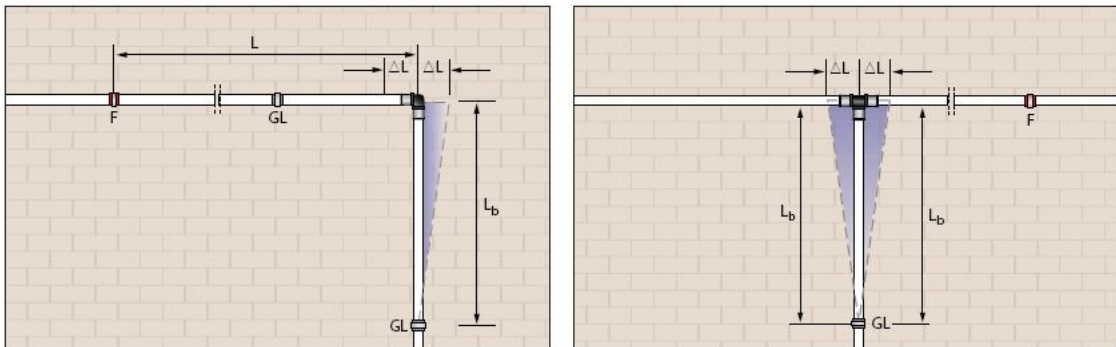
Spacing between the fixing and supporting brackets

Nominal Diameter DE (mm)	Vertical Pipe Spacing (mm)	Horizontal pipe Spacing (mm)	Nominal Diameter DE (mm)	Vertical Pipe Spacing (mm)	Horizontal pipe Spacing (mm)
12	500	600	32	1100	800
14	600	400	40	1300	1000
16	700	500	50	1600	1200
18	800	500	63	1800	1400
20	900	600	75	2000	1600
25	1000	700			

6. SUPPORT (BRACKETS) OR HOLDER BATS MUST BE FITTED 50MM EITHER SIDE OF ALL FITTINGS INSTALLED.

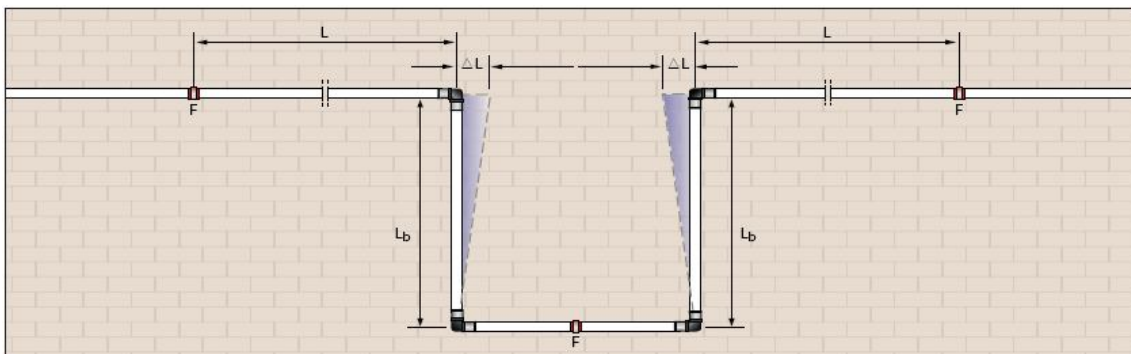
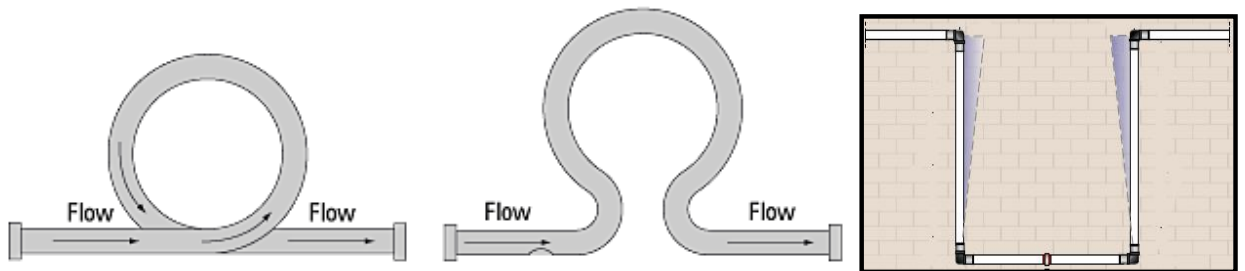
- The pipe brackets have a twofold purpose; firstly to support the pipe network, and secondly it accommodates the thermal length changes of the pipeline with sliding and fixed points, usually with correctly calculated expansion bends and expansion loops. The sliding points must be such that the pipe continuously has clearance. The sliding point may not become a fixed point when the pipe expands.

8. The correct placing of sliding points and fixed points is very important when expansion bends and expansion loops are used. In all cases where the pipeline changes direction, expansion bends must be provided for.



L = length of the pipe
 L_b = length of the expansion bend
 ΔL = change in length
 F = fixed point
 GL = sliding point
 Expansion bend for L (L_b)

9. When a long pipe does not change direction expansion loops are required. An expansion loop is also called a lyra-, omega- or horseshoe bend. The drawings below clarify what an expansion loop is. The expansion loop is in principle formed by 2 expansion bends. A fixed point must be provided at the top or bottom in the middle of the loop.



10. The minimum length for the expansion bend can be calculated on the basis of the following formula:

$$\Delta L = L * \alpha * \Delta T$$

where: α = coefficient of linear expansion in mm/mK ($\alpha = 0.025$)

ΔT = temperature difference in K

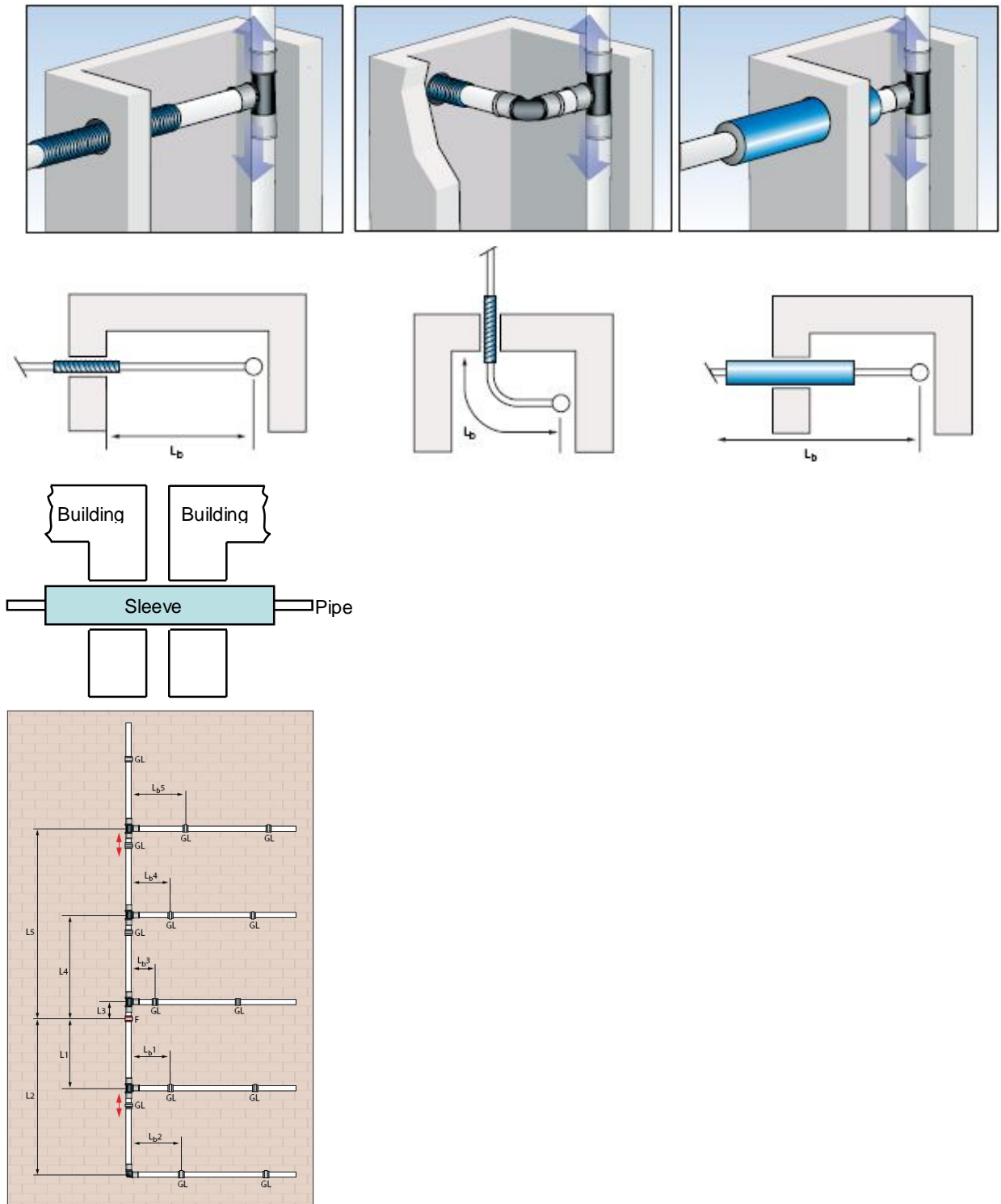
$$L_b = C * \sqrt{(D * \Delta L)}$$

where: C = material constant = 33

D = outside diameter of the pipe

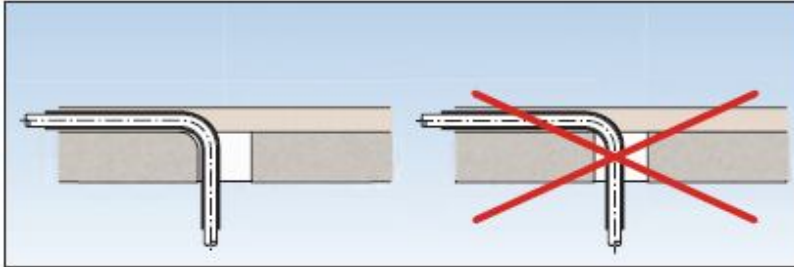
$\sqrt{\quad}$ = square root

11. It must also be ensured that pipes can freely move when piping runs from floors to a riser pipe in a shaft or when piping runs between rooms/buildings through walls or structures. Also here, the change in length due to expansion must be provided for. It can be accommodated by expansion bends or loops.



12. If the riser pipe is longer than 10m a fixed point must also be provided. It is recommended to have this point in the middle of the pipe because expansion forces generated are smaller.

13. When pipes are fitted through holes in wall or ceilings, the pipe must at least be protected with a sleeve. In addition, the pipes may never be fitted around a sharp edge in order to prevent kinking or chafing. It is advised to round off the edges.



Insulation

1. Thermal insulation may be required to reduce heat loss through the pipe.
2. The fluid (water) flowing inside the pipe should be prevented from freezing at all times.
3. The insulation material shall be of the snap-on preformed glass fibre or other approved isolation material with a density of at least 60 kg/m^3 . The thickness shall be as follows:

Service	Nominal Pipe Size (up to 50mm)
Cold Water	15mm
Hot Water	25mm

4. Equipment and piping must firstly be pressured test before any insulation shall be installed.
5. It is not always possible to completely prevent static water from freezing. In these cases would it be necessary to circulate warm water periodically through the pipe system.

Protection from Ultra Violet rays

1. In the event where the piping system is exposed to direct sunlight, such an installation should be protected against ultra violet exposure.
2. This protection can be done by covering the pipe. The pipe can also be painted with a UV resistant paint to protect it. It is important to apply an undercoat such as Plascon's Melamine Primer or Rust-Oleum's Pegalink-Universal Adhesion primer before the final UV resistant coat is applied.

Layout of pipework for water installations

1. Refer to codes of practices, standards, legislation, regulations and by-laws that might be applicable to do water installations, but particular to:
 - a. SANS 10252 Part 1 for water supply installations for buildings cracks,
 - b. SANS 10254 for the installation, maintenance, replacement and repair of fixed electric storage water heating systems,
 - c. SANS 10400 for the application of the National Building Regulations,
 - d. Etc.
2. The following requirements shall be considered and applied in addition to any similar specification details that might be introduced by the installer:
 - a. Connecting pipes shall be firmly anchored to prevent water hammer and the dislodgement of joints,
 - b. Unless otherwise approved, pipes laid underground shall have a soil cover over the outside, of at least 450mm but not more than 1m for any pipe of nominal diameter less than 75mm,
 - c. Where any portion of a pipe is concealed in a floor, concrete slab or wall, the following shall apply:

- i. Adequate measure shall be taken to protect such a portion from external pressure or from the transmission of any load to it,
- d. No pipe shall be installed within the cavity of any cavity wall, nor shall pipe pass through concrete expansion or concrete joints,
- e. Ginde pipe may not be used as the safety valve pipe on geysers.

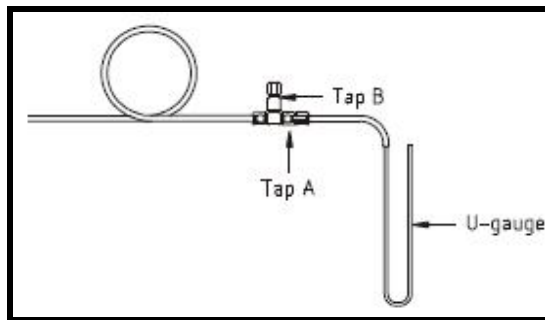
Layout of pipework for gas installations

1. Refer to codes of practices, standards, legislation, regulations and by-laws that might be applicable to do gas installations, but particular to:
 - a. SANS 10087 for handling, storage, distribution and maintenance of liquefied petroleum gas in domestic, commercial, and industrial installations,
 - b. SANS 10400 for the application of the National Building Regulations,
 - c. Etc.
2. The following requirements shall be considered and applied in addition to any similar specification details that might be introduced by the installer:
 - a. Usage above ground in subject to the pipe being protected from direct sunlight,
 - b. When embedded in walls or floors, no joints shall be allowed in the embedded sections,
 - c. Pipes shall not pass through the cavity of cavity walls or through lift shafts, flues, ceiling voids or air ducts unless they are designed and constructed in accordance with an approved standard applicable to critical locations,
 - d. No joints are allowed in the pipe section passing through cavity walls. Where pipes pass through walls that might or might not be regarded as cavity walls, such pipes shall be sleeved,
 - e. Contact with solvents shall be avoided,
 - f. The pipe shall not be closer than 150mm to any heat source,
 - g. The pipe shall not be used for liquid supply installations,
 - h. The maximum supply pressure shall not exceed 150kPa,
 - i. The pipe shall not be used as a pigtail or connected directly to a cylinder or appliances such as fireplaces or where the appliance needs to be moved on a regular basis.

Testing and acceptance of the installation

1. Visual checks must be carried out for each section of the pipe to ensure all press joints have been secured completely. After the whole pipeline is connected; a hydraulic test should be done for the system. Flushing the system should occur prior to and after pressure testing. Precaution shall be taken to avoid hazardous accumulation of gas when a gas installation system is purged.
2. Construction acceptance should be according to the following regulations:
 - a. Product type used and diameter complies with the design specification, and are laid in the correct position according to design requirements,
 - b. The pipe should be firmly fixed. The position and spacing between the fixing and supporting brackets should be to the table listed below.
 - c. Sign an acceptance record after passing the test.
3. The hydraulic test for water installations could be according to the following, but has to comply in the first instance to what is required by the SABS, Local Authorities and/or CETA:
 - a. The test pressure is 1.5 times the operating pressure of the pipeline, but should not be less than 0.6 MPa,
 - b. The hydraulic test method:
 - I. Block every water distribution point of the section for the hydraulic test. Inject water slowly. Vent the air in the pipe at the same time,
 - II. Water tightness test is carried out after the pipe is filled with water,
 - III. Pressurise the system with a pressure test pump. Pressurising time should not be less than 10 minutes,

- IV. Stop to apply pressure when the required test pressure is reached, but keep the pressure for 1 hour. Inspect for any leaks at the joints,
 - V. After the pressure was kept for 1 hour, continue to pressurise up to the test pressure again. Inspect the pressure drop, it should be less than 0.05 MPa in 15 minutes,
 - VI. Once the above tests were passed, pressurise the system again up to the test pressure. Keep the pressure for 3 hours. The pressure should be above 0.6 MPa and there should be no leaks.
- c. Fill in the hydraulic test report and sign “PASS” for the hydraulic test.
4. The hydraulic test for gas installations shall be tested in accordance with an acceptable method. The pipe can be tested separately first, or the installation can be tested as a whole. The test has to comply in the first instance to what is required by the SABS, Local Authorities and/or CETA. The gas installation of the low-pressure stage (as a whole) can be tested by U-gauge, as follow:
- a. See figure below for the test arrangement,



- b. The test requires a U-gauge and a fitting, one end of which has a tap and a tube nozzle for connecting the fitting to the U-gauge. The other end of the fitting is for coupling to the supply line under test,
 - c. Make sure that all taps in the gas pipe system (including taps A and B) are closed,
 - d. By opening the container valve, admit gas to the system,
 - e. Open each tap on each appliance (in turn), purge the system of air, taking care to keep a flame near enough to the issuing gas-and-air stream to ignite it when the mixture becomes rich enough, and then close the tap,
 - f. Ensure that the pressure regulator operates at the design pressure of the appliances,
 - g. Open tap A,
 - h. Close the container valve,
 - i. Allow 10 min for temperature stabilization,
 - j. Note the U-gauge reading,
 - k. Close tap A,
 - l. After 10 min, again open tap A, and note the U-gauge reading. Any drop in pressure will indicate that there is a leak,
 - m. If this U-gauge reading is lower than that noted in point (i) above, by more than 25 mm water gauge, there is a leak in the system and the appliance(s), connections, taps, etc., should be carefully examined, and soapy water should be used to detect the leak,
 - n. Once the test in completed satisfactory without any leaks, a certificate of compliance should be issued.
5. Sign-off project completed.

Reference specifications and standards

The latest revision of any Specification referred to in this specification, will be applicable.

Where a specification or standard is not specifically referred to, it will be assumed that the relevant SABS, ISO, BSS, DIN or equivalent American standard, listed in order of preference will apply.

The SI – Metric System of Units will apply. Refer to SABS – M33A: The International Metric System: Guide to the use of the SI in South Africa.

Appendix

Hydraulic calculation table for Ginde PEX-AL-PEX water pipe

Water pipe	DA 14 DB10		DA 16 DB 12		DA 18 DB 14		DA 20 DB 16		DA 25 DB 20	
	Vs l/s	V m/s	R Pa/m	V m/s	R Pa/m	V m/s	R Pa/m	V m/s	R Pa/m	V m/s
0.01	0.13	40	0.99	22	0.06	11	0.05	7	0.03	2
0.02	0.25	127	0.18	69	0.13	34	0.11	21	0.06	6
0.03	0.38	252	0.27	136	0.19	66	0.16	41	0.10	12
0.04	0.51	411	0.35	221	0.26	107	0.21	66	0.13	20
0.05	0.84	603	0.44	323	0.32	156	0.26	97	0.16	29
0.06	0.76	826	0.53	441	0.39	213	0.32	132	0.19	40
0.07	0.89	1078	0.62	575	0.45	278	0.37	172	0.22	52
0.08	1.02	1358	0.71	723	0.52	349	0.42	216	0.25	65
0.09	1.15	1666	0.80	886	0.58	428	0.48	191	0.29	80
0.10	1.27	2002	0.88	1063	0.65	513	0.53	317	0.32	95
0.15	1.91	4065	1.33	2149	0.97	1035	0.79	639	0.48	191
0.20	2.56	6740	1.77	3552	1.30	1708	1.06	1054	0.64	315
0.25	3.13	9992	2.21	5255	1.62	2524	1.32	1556	0.80	464
0.30	3.82	13798	2.65	7243	1.95	3476	1.59	2141	0.95	638
0.35	4.46	18138	3.09	9507	2.27	4559	1.85	2807	1.11	835
0.40	5.09	22999	3.54	12039	2.60	5770	2.12	3552	1.27	1055
0.45	5.73	28368	3.98	14833	2.92	7105	2.38	4372	1.43	1298
0.50	6.37	34235	4.42	17883	3.25	8562	2.65	5267	1.59	1562
0.55	7.00	40591	4.86	21185	3.57	10138	2.91	6235	1.75	1848
0.60			5.31	24733	3.90	11831	3.18	7274	1.91	2155
0.65			5.75	28524	4.22	13640	3.44	8384	2.07	2483
0.70			6.19	32556	4.55	15563	3.71	9564	2.23	2830
0.75			6.63	36825	4.87	17598	3.97	10813	2.39	3198
0.80			7.07	41327	5.20	19744	4.24	12129	2.55	3586
0.85					5.52	21999	4.50	13512	2.71	3993
0.90					5.85	24363	4.77	14962	2.86	4420
0.95					6.17	26835	5.03	16477	3.02	4866
1.00					6.50	29413	5.30	18057	3.18	5330
1.05					6.82	32097	5.56	19702	3.34	5814
1.10					7.15	34886	5.83	21411	3.50	6316
1.15							6.09	23184	3.66	6837
1.20							6.36	25019	3.82	7376
1.25							6.62	26917	3.98	7933
1.30							6.89	28877	4.14	8505
1.35									4.30	9101
1.40									4.40	9712
1.45									4.62	10471
1.50									4.77	10988
1.55									4.93	11652
1.60									5.09	12333
1.65									5.25	13032
1.70									5.41	13747
1.75									5.57	14481
1.80									5.73	15231
1.85									5.89	15998
1.90									6.05	16782

Hydraulic calculation table for Ginde PEX-AL-PEX water pipe (continue)

Water pipe Vs l/s	DA 32 DB 26		DA 40 DB 32		DA 50 DB 41		DA 63 DB 51		DA 75 DB 60	
	V m/s	R Pa/m	V m/s	R Pa/m	V m/s	R Pa/m	V m/s	R Pa/m	V m/s	R Pa/m
0.10	0.19	28	0.12	10	0.08	3	0.05	1	0.04	1
0.20	0.38	91	0.25	34	0.15	11	0.10	4	0.07	2
0.30	0.57	184	0.37	69	0.23	21	0.15	8	0.11	4
0.40	0.75	303	0.50	113	0.30	35	0.20	12	0.14	6
0.50	0.94	448	0.62	167	0.38	52	0.24	18	0.18	8
0.60	1.13	617	0.75	230	0.45	71	0.29	25	0.21	12
0.70	1.32	810	0.87	301	0.53	93	0.34	33	0.25	15
0.80	1.51	1025	0.99	381	0.61	117	0.39	42	0.28	19
0.90	1.70	1263	1.12	369	0.68	144	0.44	51	0.32	24
1.00	1.88	1522	1.24	565	0.76	173	0.49	61	0.35	28
1.10	2.07	1802	1.37	669	0.83	205	0.54	73	0.39	34
1.20	2.26	2103	1.49	780	0.91	239	0.59	85	0.42	39
1.30	2.45	2424	1.62	899	0.98	276	0.64	97	0.46	45
1.40	2.64	2766	1.74	1025	1.06	314	0.69	111	0.5	51
1.50	2.83	3128	1.87	1159	1.14	355	0.73	125	0.53	58
1.60	3.01	3509	1.99	1300	1.21	398	0.78	140	0.57	65
1.70	3.20	3910	2.11	1448	1.29	443	0.83	156	0.6	72
1.80	3.39	4330	2.24	1603	1.36	490	0.88	173	0.64	80
1.90	3.58	4769	2.36	1765	1.44	540	0.93	190	0.67	88
2.00	3.77	5227	2.49	1934	1.51	591	0.98	208	0.71	96
2.10	3.96	5704	2.61	2110	1.59	645	1.03	227	0.74	105
2.20	4.14	6199	2.74	2292	1.67	700	1.08	247	0.78	114
2.30	4.33	6713	2.86	2482	1.74	758	1.13	267	0.81	123
2.40	4.52	7245	2.98	2678	1.82	818	1.17	288	0.85	133
2.50	4.71	7796	3.11	2881	1.89	879	1.22	310	0.88	143
2.60	4.90	8364	3.23	3090	1.97	943	1.27	332	0.92	153
2.70	5.09	8950	3.36	3306	2.05	1009	1.32	355	0.95	163
2.80	5.27	9554	3.48	3528	2.12	1076	1.37	379	0.99	174
2.90	5.46	10176	3.61	3757	2.20	1140	1.42	403	1.03	185
3.00	5.65	10815	3.73	3993	2.27	1217	1.47	428	1.06	197
3.10	5.84	11472	3.85	4234	2.35	1291	1.52	454	1.1	209
3.20	6.03	12155	3.98	4482	2.42	1366	1.57	481	1.13	221
3.30	6.22	12838	4.10	4737	2.50	1444	1.62	508	1.17	233
3.40	6.40	13547	4.23	4998	2.58	1523	1.66	535	1.2	246
3.50	6.59	14273	4.35	5265	2.65	1604	1.71	564	1.24	259
3.60	6.78	15016	4.48	5538	2.73	1687	1.76	593	1.27	272
3.70			4.60	5817	2.80	1772	1.81	623	1.31	286
3.80			4.72	6103	2.88	1858	1.86	653	1.34	300
3.90			4.85	6395	2.95	1947	1.91	684	1.38	314
4.00			4.97	6693	3.03	2037	1.96	716	1.41	329
4.10			5.10	6997	3.11	2129	2.01	748	1.45	344
4.20			5.22	7307	3.18	2223	2.06	781	1.49	359
4.30			5.35	7623	3.26	2319	2.10	815	1.52	374
4.40			5.47	7945	3.33	2417	2.15	849	1.56	390
4.50			5.60	8273	3.41	2517	2.20	884	1.59	406
5.00			6.22	10003	3.79	3041	2.45	1067	1.77	490
5.50			6.84	11881	4.17	3609	2.69	1266		
6.00					4.54	4222	2.94	1480		
6.50					4.92	4877	3.18	1709		
7.00					5.30	5574	3.43	1953		
7.50					6.06	6313	3.67	2211		
8.00					6.68	7940	3.92	2484		
8.50							4.16	2771		
9.00							4.41	3071		
9.50							4.65	3386		
10.00							4.90	3715		

Hydraulic calculation table for Ginde PEX-AL-PEX Gas pipe

Intake Pressure = 1 bar

Gas pipe Vs Nm ³ /h	DA 14 DB10		DA 16 DB 12		DA 18 DB 14		DA 20 DB 16		DA 25 DB 20	
	V m/s	R Pa/m	V m/s	R Pa/m	V m/s	R Pa/m	V m/s	R Pa/m	V m/s	R Pa/m
0.036	0.065	0.08	0.044	0.03	0.033	0.02	0.025	0.01	0.016	0.00
0.072	0.131	0.28	0.089	0.12	0.065	0.06	0.051	0.03	0.033	0.01
0.108	0.196	0.57	0.133	0.24	0.098	0.11	0.076	0.06	0.049	0.02
0.144	0.261	0.95	0.178	0.39	0.131	0.19	0.102	0.10	0.065	0.04
0.180	0.326	1.40	0.222	0.58	0.163	0.28	0.127	0.15	0.082	0.05
0.216	0.392	1.93	0.267	0.80	0.196	0.38	0.153	0.21	0.098	0.07
0.252	0.448	2.49	0.311	1.05	0.229	0.50	0.178	0.27	0.114	0.09
0.288	0.512	3.15	0.356	1.32	0.261	0.64	0.204	0.34	0.131	0.12
0.324	0.576	3.87	0.400	1.36	0.294	0.78	0.229	0.42	0.147	0.15
0.360	0.640	4.66	0.445	1.96	0.327	0.94	0.255	0.51	0.163	0.18
0.540	0.961	9.47	0.667	3.98	0.490	1.91	0.382	1.04	0.245	0.36
0.720	1.281	15.68	0.889	6.59	0.654	3.17	0.510	1.72	0.326	0.59
0.900	1.601	23.19	1.112	9.74	0.817	4.68	0.637	2.55	0.408	0.88
1.080	1.921	31.94	1.334	13.41	0.980	6.44	0.765	3.52	0.489	1.21
1.260	2.242	41.86	1.557	17.58	1.144	8.44	0.892	4.65	0.571	1.59
1.440	2.562	52.92	1.779	22.22	1.307	10.67	1.020	5.86	0.653	2.01
1.620	2.882	65.08	2.001	27.32	1.470	13.12	1.147	7.22	0.734	2.48
1.800	3.203	78.31	2.224	32.86	1.634	15.78	1.275	8.71	0.816	2.99
1.980	3.523	92.60	2.446	38.85	1.797	18.65	1.402	10.31	0.897	3.53
2.160			2.669	45.26	1.961	21.73	1.529	12.04	0.979	4.12
2.340			2.891	52.10	2.124	25.00	1.657	13.89	1.060	4.75
2.520			3.114	59.34	2.287	28.48	1.784	15.86	1.142	5.42
2.700			3.336	66.99	2.451	32.15	1.912	17.94	1.224	6.13
2.880			3.559	75.04	2.614	36.00	2.039	20.14	1.305	6.87
3.060					2.778	40.05	2.167	22.45	1.387	7.65
3.240					2.941	44.28	2.294	24.88	1.468	8.47
3.420					3.104	48.69	2.422	27.41	1.550	9.33
3.600					3.268	53.28	2.549	30.06	1.631	10.22
3.780					3.431	58.06	2.667	32.83	1.713	11.15
3.960					3.595	63.01	2.804	35.70	1.795	12.12
4.140							2.932	38.68	1.876	13.12
4.320							3.059	41.77	1.958	14.16
4.500							3.187	44.97	2.039	15.24
4.680							3.314	48.28	2.121	16.35
4.860									2.202	17.49
5.040									2.284	18.67
5.220									2.366	19.89
5.400									2.447	21.14
5.580									2.529	22.42
5.760									2.610	23.74
5.940									2.692	25.09
6.120									2.773	26.48
6.300									2.855	27.90
6.480									2.937	29.36
6.660									3.018	30.85
6.840									3.100	32.37

Hydraulic calculation table for Ginde PEX-AL-PEX Gas pipe (continue)										
Intake Pressure = 1bar										
Gas pipe	DA 32 DB 26		DA 40 DB 32		DA 50 DB 41		DA 63 DB 51		DA 75 DB 60	
	Vs Nm ³ /h	V m/s	R Pa/m	V m/s	R Pa/m	V m/s	R Pa/m	V m/s	R Pa/m	V m/s
0.360	0.095	0.05	0.063	0.02	0.039	0.01	0.025	0.00	0.018	0.00
0.720	0.189	0.17	0.125	0.06	0.078	0.02	0.050	0.01	0.036	0.00
1.080	0.284	0.34	0.188	0.13	0.116	0.04	0.075	0.01	0.054	0.01
1.440	0.379	0.56	0.250	0.21	0.155	0.07	0.100	0.02	0.073	0.01
1.800	0.474	0.83	0.313	0.31	0.194	0.10	0.125	0.03	0.091	0.02
2.160	0.568	1.14	0.375	0.43	0.233	0.13	0.151	0.05	0.109	0.02
2.520	0.663	1.50	0.438	0.56	0.272	0.18	0.176	0.06	0.127	0.03
2.880	0.758	1.89	0.500	0.71	0.311	0.22	0.201	0.08	0.145	0.04
3.240	0.853	2.33	0.563	0.87	0.349	0.27	0.226	0.10	0.163	0.04
3.600	0.947	2.80	0.625	1.04	0.388	0.33	0.251	0.12	0.181	0.05
3.960	1.042	3.31	0.688	1.23	0.427	0.39	0.276	0.14	0.199	0.06
4.320	1.137	3.85	0.751	1.44	0.466	0.45	0.301	0.16	0.218	0.07
4.680	1.232	4.43	0.813	1.65	0.505	0.52	0.326	0.18	0.236	0.08
5.040	1.326	5.05	0.876	1.88	0.543	0.59	0.351	0.21	0.254	0.10
5.400	1.421	5.70	0.938	2.12	0.582	0.67	0.376	0.24	0.272	0.11
5.760	1.516	6.38	1.001	2.38	0.621	0.75	0.401	0.27	0.290	0.12
6.120	1.611	7.10	1.063	2.64	0.660	0.84	0.426	0.30	0.308	0.14
6.480	1.705	7.85	1.126	2.92	0.699	0.93	0.425	0.33	0.326	0.15
6.840	1.800	8.63	1.188	3.21	0.738	1.02	0.477	0.36	0.344	0.16
7.200	1.895	9.44	1.251	3.52	0.776	1.12	0.502	0.39	0.363	0.18
7.560	1.990	10.28	1.313	3.83	0.815	1.22	0.527	0.43	0.381	0.20
7.920	2.084	11.96	1.376	4.15	0.854	1.32	0.552	0.46	0.399	0.21
8.280	2.179	12.06	1.438	4.49	0.893	1.43	0.577	0.50	0.417	0.23
8.640	2.274	13.00	1.501	4.84	0.932	1.54	0.602	0.54	0.435	0.25
9.000	2.369	13.97	1.564	5.20	0.970	1.66	0.627	0.58	0.453	0.27
9.360	2.463	14.96	1.626	5.57	1.009	1.77	0.652	0.62	0.471	0.28
9.720	2.558	15.99	1.689	5.95	1.048	1.90	0.677	0.67	0.489	0.30
10.080	2.653	17.04	1.751	6.34	1.087	2.02	0.702	0.71	0.508	0.32
10.440	2.748	18.12	1.814	6.74	1.126	2.15	0.728	0.76	0.526	0.34
10.800	2.842	19.24	1.876	7.16	1.156	2.29	0.753	0.80	0.544	0.37
11.160	2.937	20.38	1.939	7.58	1.203	2.42	0.778	0.85	0.562	0.39
11.520	3.032	21.55	2.001	8.02	1.242	2.57	0.803	0.90	0.580	0.41
11.880	3.127	22.74	2.064	8.46	1.281	2.71	0.828	0.95	0.598	0.43
12.240	3.221	23.97	2.126	8.92	1.320	2.86	0.853	1.00	0.616	0.45
12.600	3.316	25.22	2.189	9.38	1.359	3.01	0.878	1.06	0.634	0.48
12.960	3.411	26.50	2.252	9.86	1.397	3.16	0.903	1.11	0.653	0.50
13.320			2.314	10.34	1.436	3.32	0.928	1.16	0.671	0.53
13.680			2.377	10.84	1.475	3.48	0.953	1.22	0.689	0.55
14.040			2.439	11.34	1.514	3.65	0.978	1.28	0.707	0.58
14.400			2.502	11.86	1.553	3.82	1.004	1.34	0.725	0.60
14.760			2.564	12.39	1.592	3.99	1.029	1.40	0.743	0.63
15.120			2.627	12.92	1.630	4.16	1.054	1.46	0.761	0.66
15.480			2.689	13.47	1.669	4.34	1.079	1.52	0.779	0.69
15.840			2.752	14.02	1.708	4.52	1.104	1.58	0.798	0.71
16.200			2.815	14.59	1.747	4.71	1.129	1.65	0.816	0.74
18.000			3.127	17.55	1.941	5.69	1.254	1.99	0.906	0.89
19.800			3.440	20.75	2.135	6.74	1.380	2.35		
21.600					2.329	7.88	1.505	2.75		
23.400					2.523	9.10	1.631	3.17		
25.200					2.717	10.40	1.756	3.62		
27.000					2.911	11.78	1.882	4.09		
28.800					3.106	13.24	2.007	4.60		
30.600							2.133	5.12		
32.400							2.258	5.68		
34.200							2.383	6.26		
36.000							2.509	6.86		

The above tables are calculated and not measured. E&OE.

- WRAS - Water Regulation Advisory Scheme Certificate passed
- Certificate for Product Exemption from Quality Surveillance Inspection passed
- ISO9001 International Quality System Certificate passed
- ISO14001 International Environmental Management System Certificate passed
- GOST - Russian National Standard Certificate passed
- Ukraine National Certification Association passed
- SABS - Certificate of South African Bureau of Standards
- JASWIC - Joint Acceptance Scheme for Water Installation Components
- AENOR - Certificate of Spanish Technical Certification Committee of Plastics
- Certificate of Standards Association of Australia
- PZH - Hygiene Certification of the National Institute of Hygiene in Warsaw passed
- DVGW - Certificate of Germany Association of the Gas and Water Industry Technical Scientific Association
- SKZ - Testing Laboratory Accredited by German Accreditation System for Testing GMBH
- Certificate of the Slovak National Institute of Hygiene
- Certificate of Hungary National Plastics Testing Agency
- Certificate of NSF International Organization
- SGS-Inspection Certificate



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