




ALPINAL



Ductile iron pipeline
system for artificial snow
DN 80 to DN 500

Comprehensive pipe systems

PAM
SAINT-GOBAIN

ALPINAL



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“Winter” sports

become emancipated from the seasons

The democratization of winter sports has contributed to the economic development of valleys with high and medium-sized mountains. Many have developed into leisure and health centres around one main point of attraction: snow! Controlling the snow has therefore become an economic and tourist issue, resulting in the increasing use of artificial snow in many resorts.

This option is becoming more popular on account of climate change. To maintain a constant offer of quality in the midst of climatic risks, most resorts in France and throughout the world are turning to total or partial man-made snow in their area. This solution stems from the availability of the basic materials: air and water. The latter is transported in ALPINAL ductile iron pipes from the valley to the snow-blowers installed at the top of the slopes.

The water used for producing snow is taken from lower down, usually from artificial reservoirs called “hill lakes”, the main purpose of which is to supply the snow-blowers. It is then transported to the snow-blowers located at the top of the snow slopes through a pipeline system that can be up to several kilometres in length.



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Pipes submitted to severe tests

An



asset for the ALPINAL ductile iron range

Usually laid on mountain sides on uneven routes varying considerably in altitude, the water supply pipes of the snow-blowers must withstand high pressures and accept flow rates of up to 25 m³/hour depending on the type of snow maker.

Often difficult to access, they must be able to function continuously for many years without requiring any particular maintenance.

Such high demands work in favour of the ALPINAL system, the pipes of which have all the physical and mechanical properties of ductile iron:

- * exceptional tensile strength and bending.
- * high elongation capacity.
- * legendary robustness in the most difficult ground.

Well known for their high safety coefficient, for years the ductile iron pipes of the ALPINAL range have been responding ideally to snow professionals looking for a robust system combining a long life with excellent resistance to static and dynamic pressures.



The birth of a snow flake: a delicate alchemy

In order to be able to be converted into snow, the drops of water must be pulverized in air at an ideal temperature of about -10 °C. When these conditions change, the closer to zero it gets, the less favourable the conditions.

Because of this extreme sensitivity, temperature, humidity and wind speed probes are installed in sensitive locations. All these data allow the snowmakers to run the computer-controlled facilities.





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Long-

standing alliance with the environment

Ductile iron: a “green” material for mountains

Born from the combination of iron, fire and carbon, ductile iron is a fine, totally recyclable material with a robustness which is an additional asset for protecting the environment. The pipes of the ALPINAL range, made of ductile iron, find their natural place in fragile mountainous areas, the protection of which is a priority for Saint-Gobain PAM.

A long-lasting material: a guarantee for preserving the areas

Once laid, ductile iron pipes are there for a long time. They often last over a century with no need for new interventions that can be detrimental to the ecosystems of the mountain.

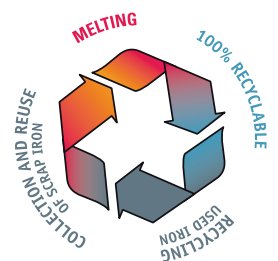
Fully leaktight

The artificial snow production units function in a closed circuit in a way that prevents water being drawn from the natural environment. Leak prevention thanks to a ductile iron network that is 100% leaktight optimizes the energy consumption of the snow system.

A 100% recyclable material

Made up of natural materials (iron, carbon and silicon), the ALPINAL ductile iron pipes cause no risk of soil pollution and they can be recycled “ad infinitum”.

A fine product manufactured using recycled scrap iron: to reduce the extraction of raw materials from the natural environment.



ALPINAL
The professional's ally



For non-stop “a la carte” snow

Artificial snow: a new approach for a made-to-measure offer

Due to its simplicity of laying, its resistance to high pressures and its robustness, the ALPINAL system is helping to change the concept of “artificial snow”.

Generally installed to combat climatic hazards, “snow factories” are increasingly designed as a production tool for a marketing concept meant to captivate a public with highly diversified expectations.

From 7 to 77 years of age: made-to-measure snow on demand

From tobogganing to snow-boarding, including snowshoeing, traditional Alpine skiing, cross-country skiing and aerial skiing, there are almost as many recreational or sports activities connected to snow as there are people. The advantage of artificial snow is that it offers everyone the desired quality of snow in the right place on demand: more powdery for the beginners’ slope, harder for amateur speed and competition skiing.

The resorts need to permanently improve the quality of the snow and the comfort of the slopes through a diversified offer during a season that has to last as long as possible.





ALPINAL

Suita

able response for a rapidly growing need in France and throughout the world

Due to its modular structure and easy installation, the ALPINAL system allows snow professionals to rapidly increase the number of snow-blowers to respond to this personalized leisure demand that has been constantly progressing for 20 years.

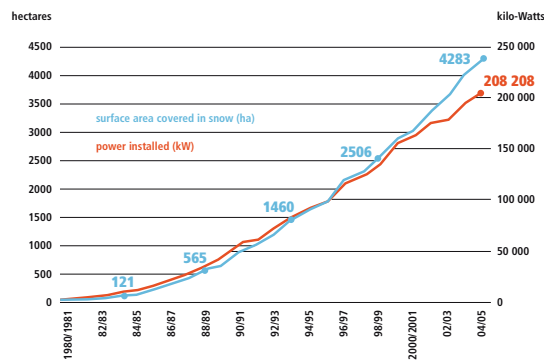
According to the ODT*, the technical snow surface area rose from 121 hectares in 1984 to over 4,500 hectares in 2005/2006, i.e. a 37-fold increase in less than 20 years. During the same period, the number of resorts equipped with snow-blowers went up from 25 to 191 in the 300 French resorts.

Between 15% and 20% of the skiable area is covered with artificial snow.

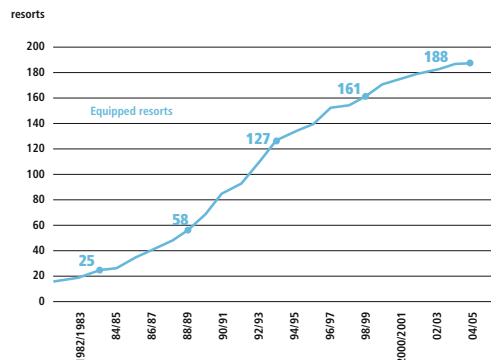
As three snow-blowers are needed to cover one hectare, the growth potential in a rapidly expanding sector can be calculated.

France has the largest skiable domain in Europe (1,618 km²), ahead of Switzerland (840 km²), Austria (790 km²) and Italy (750 km²).

* (Observation, Development and Tourist Engineering in France)



Evolution of the snow surface area and the power installed



Evolution of the number of equipped resorts

Mountainous area: group of French towns at an altitude of over 700 m (600 for the Vosges) and where the average gradient is over 20%.

Skiable area: territory equipped for practicing skiing..





ALPINAL

A leader in

the field designed for mountain events

Resistant to very high pressures

ALPINAL is an ingenious system whose efficiency and flexibility of use are linked to its modular structure.

Made up of a set of ductile iron pipes and fittings, generally anchored, the system is designed to resist the very high pressures which are essential to operate the snow-blowers installed at the summit of the slopes.

Due to its capacity to resist pressure and tension, the ALPINAL system supplies water to the cannons or the snow blowers without needing the protection of concrete thrust blocks.

DN	ALPINAL UNIVERSAL			ALPINAL UNIVERSAL VI			ALPINAL UNIVERSAL Ve		
	PFA bar	PMA bar	PEA bar	PFA bar	PMA bar	PEA bar	PFA bar	PMA bar	PEA bar
80	100	120	125	100	120	125	-	-	-
100	100	120	125	100	120	125	-	-	-
125	100	120	125	100	120	125	-	-	-
150	100	120	125	63	76	81	100	120	125
200	100	120	125	-	-	-	100	120	125
250	78	93	98	-	-	-	63	76	81
300	70	84	89	-	-	-	63	76	81
400	63	76	81	-	-	-	63	76	81
500	50	60	65	-	-	-	45	54	59

Pressure performances of the ALPINAL range

- TYTON DN80 to 300 leaktightness joint
- STANDARD DN400 to 500 leaktightness joint

See the pressure specifications on page 30

For higher pressures, please consult us.

Perfect leaktightness

The connection of the pipes is guaranteed:

- by (EPDM) elastomer seals that guarantee leaktightness
- by universal anchoring systems (with double chamber) which guarantee resistance beyond the service pressure.



ALPINAL



Exceptional endurance

Insenitive to corrosion

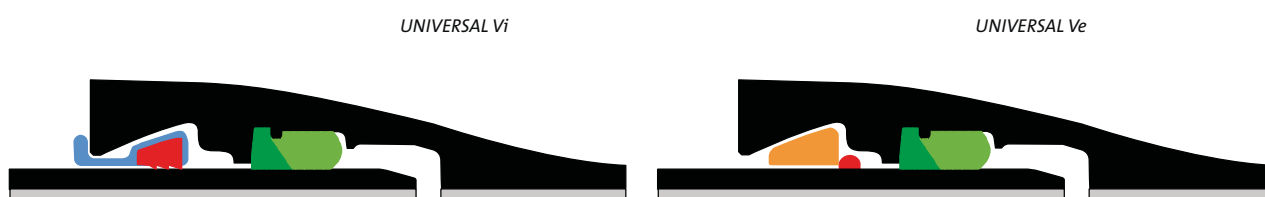
ALPINAL pipes are externally protected by a zinc coating (200 g/m^2) and are covered by a bituminous paint. This mass-produced double protective application guarantees their longevity and simplifies construction work. The pipes can be covered immediately after installation with the natural soil extracted, after the stones are removed.

From the lower slopes to the summit: a mountain dweller that opens routes

Due to its robustness and its capacity to resist tension and high pressures, the ALPINAL system opens up the most direct routes for going from the water storage area to the summit. Its resistance allows it to be very safely installed in rocky areas or on steep slopes while guaranteeing the water supply for the snow-blowers installed further up.

Thanks to the ductile iron, the ALPINAL system offers perfect stability along its entire length without being susceptible to sagging and soil movements.

Guaranteed stability thanks to the ALPINAL UNIVERSAL Ve and ALPINAL UNIVERSAL Vi self-anchored joints





ALPINAL

A special

“skiable domain” modular system

Easy to install

Composed of a set of ductile iron pipes and fittings that only required to be coupled together, the ALPINAL system is designed to be easily installed by qualified personnel.

The ALPINAL system is assembled by simply jointing the pipes, and requires neither welding nor bolting. These simple logistics allow rapid installation.

Assembly technique

The automatic self-anchored joints can withstand significant angular deflections of around 3° at fitting level. This high value allows bends with a large radius to be made without using joints. This allows some layout modifications to be introduced to adapt to both vertical and horizontal conditions.

The pipes can be assembled with the help of a mechanical digger or with jointing machines, which are also used for the fittings.

In confined areas where a trenching machine is used, pre-assembly of the pipes can be carried out.



A special complete “snow-blowers” solution

The ductile iron offer for making artificial snow production networks consists of:



- * NATURAL - DN 60 to 600 range
This range adapts perfectly to average-sized mountain locations. (See the NATURAL brochure)



- * ALPINAL - DN 80 to 500 range
The ALPINAL range completes the NATURAL range for high mountain locations or locations with extreme pressure. The thicknesses of the inner walls of the ductile iron ALPINAL pipes and fittings have been increased to bring performances up to an extremely high level.

In addition to the usual components of pipelines, pipes and fittings with different geometries, the ALPINAL range offers a full range of parts specifically designed for snow production facilities in its catalogue:

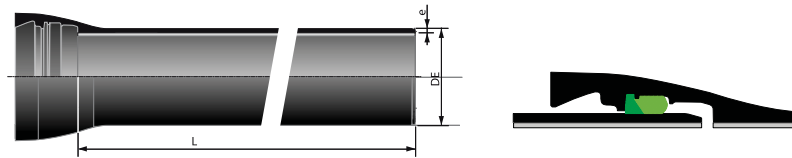
- * easy laying of the pipes in areas with steep slopes
- * connection to the snow cannons

A range of assembly fittings and accessories

- * ALPINAL anchored collar
- * Socket-spigot fittings
- * Socket-spigot fittings with weld bead
- * Tees, bends, flanged-socket fitting, duckfoot bend
- * ALPINAL duckfoot bends with a 2" female gas thread
- * Connecting part joined with a 2" female gas thread
- * Socket-spigot fitting with 2" female gas saddle joint
- * Blank flange with a 2" female gas thread
- * Tapping collar

ALPINAL UNIVERSAL pipe

- Double chamber socket
- Unanchored version



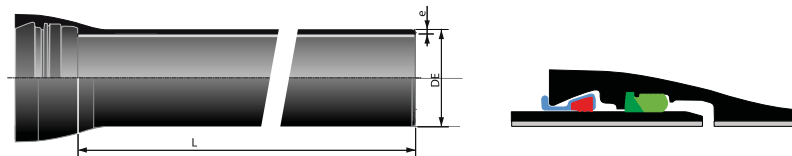
DN	type	L: average useful length m	average metric body kg/m	Pipe without gasket reference	ALP UNI - E00 set Pipe and gasket (not anchored) reference	PFA without anchorage bar
80	C100	5.97	15.8	ANA80T60	ANA80T60-E00	100
100	C100	5.97	21.3	ANB10W60	ANB10W60-E00	100
125	C100	5.97	27.3	ANB12W60	ANB12W60-E00	100
150	C100	5.97	33.5	ANB15W60	ANB15W60-E00	100
200	C100*	5.97	47.5	ANB20W60	ANB20W60-E00	100
250	C80*	5.97	63.1	ANB25W60	ANB25W60-E00	80
300	C70*	5.97	80.3	ANB30W60	ANB30W60-E00	70
400	C64*	5.97	122.7	ASB40W60	ASB40W60-E00	64
500	C50*	5.97	169.7	ASB50W60	ASB50W60-E00	50

DN 80 to 300: TYTON joint. DN 400 to 500: STANDARD joint.

* Other pressure classes available, please consult us

ALPINAL UNIVERSAL Vi anchored pipe

- Double chamber socket
- ALPINAL UNIVERSAL Vi anchoring with inserts pipe

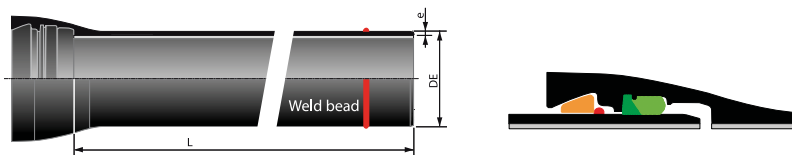


DN	type	L: average useful length m	average metric body kg/m	Pipe without gasket reference	ALP UNI Vi set Pipe and gasket (not anchored) reference	PFA with anchorage bar
80	C100	5.97	15.8	ANA80T60	ANA80T60-E06	100
100	C100	5.97	21.3	ANB10W60	ANB10W60-E06	100
125	C100	5.97	27.3	ANB12W60	ANB12W60-E06	100
150	C100	5.97	33.5	ANB15W60	ANB15W60-E06	63 ⁽¹⁾

(1) for use at higher pressures, use the ALPINAL UNIVERSAL Ve anchoring welded DN 150 pipe (see the table below)

ALPINAL UNIVERSAL Ve anchored pipe

- Double chamber socket and anchoring bead on spigot
- Bead anchoring



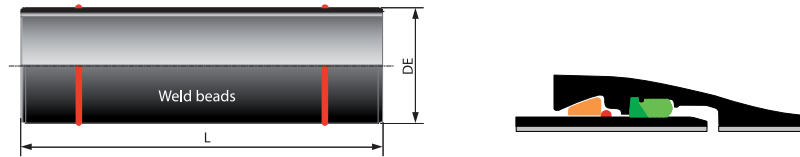
DN	type	L: average useful length m	average metric body kg/m	Pipe without gasket reference	ALP UNI Ve set Pipe and gasket (not anchored) reference	PFA with anchorage bar
150	C100	5.97	33.5	AKB15W60	AKB15W60-E07	100
200	C100*	5.97	47.5	AKB20W60	AKB20W60-E07	100
250	C80*	5.97	63.1	AKB25W60	AKB25W60-E07	63
300	C70*	5.97	80.3	AKB30W60	AKB30W60-E07	63
400	C64*	5.97	130.6	AFB40W60	AFB40W60-E07	63
500	C50*	5.97	169.7	AFB50W60	AFB50W60-E07	45

Spigot with anchoring bead. DN 80 to 300: TYTON joint with anchoring ring. DN 400 to 500: STANDARD joint with anchoring ring

* Other pressure classes available, please consult us

ALPINAL UNIVERSAL Ve straight fitting

- Only to be used with the ALPINAL UNIVERSAL Ve weld bead anchoring
- Spigot with bead: do not assemble anchor gasket with Alpinal inserts on a spigot with an anchoring bead, but fit it with a ring

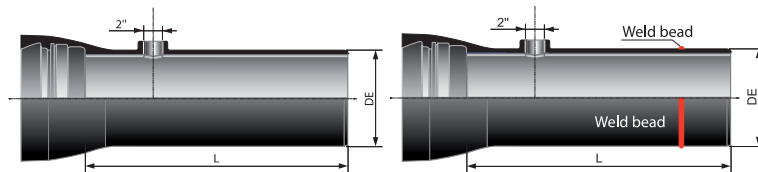


DN	type	L: average useful length	fitting body only	without gasket	PFA anchoring with weld bead
		m	kg/m	reference	bar
150	C100	1	32.0	AKB15FC0CAVV	100
200	C100	1	48.0	AKB20FC0CAVV	100
250	C80	1	59.0	AKB25FC0CAVV	63
300	C70	1	74.0	AKB30FC0CAVV	63
400	C64	1	113.7	AKB40FC0CAVV	63
500	C50	1	157.0	AKB50FC0CAVV	45

DN (150*): Incompatible with ALPINAL UNIVERSAL Vi anchoring with inserts

ALPINAL straight fitting with jointing/spigot with 2" GAS thread

- Double chamber socket
- DN 80 to 150: to be used with the ALPINAL UNIVERSAL Vi anchoring with inserts or without anchoring
- DN 150* to 300*: bead on spigot – only compatible with the ALPINAL UNIVERSAL Ve anchoring with weld bead or without anchoring



Note: the DN 150 fitting exists in both versions (with and without bead):

- PFA 63 bar ALPINAL UNIVERSAL Vi anchoring
- PFA 100 bar ALPINAL UNIVERSAL Ve anchoring with weld bead

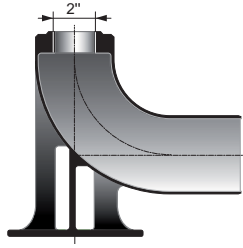


DN	L: average useful length	Fitting body only	Fitting without gasket	ALP UNI - E00 set	ALP UNI Vi set	ALP UNI Ve set	
				Fitting + TYTON gasket (not anchored)	Fitting + TYTON gasket + Vi anchoring gasket (inserts anchorage)	Fitting + TYTON gasket + Ve anchoring ring (weld bead anchorage)	PFA bar
	m	kg	reference	reference	reference	reference	PFA bar
80	0.60	15.1	ANA80EU	ANA80EU-E00	ANA80EU-E06	-	100
100	0.60	18.0	ANB10EU	ANB10EU-E00	ANB10EU-E06	-	100
125	0.60	22.5	ANB12EU	ANB12EU-E00	ANB12EU-E06	-	100
150	0.60	30.0	ANB15EU	ANB15EU-E00	ANB15EU-E06	-	63
150*	0.60	30.0	AKB15EU	AKB15EU-E00	Do not use an ALPINAL anchoring ring with inserts on a spigot with bead. Instead, fit it with a ring	AKB15EU-E07	100
200*	0.60	40.0	AKB20EU	AKB20EU-E00		AKB20EU-E07	100
250*	0.60	56.0	AKB25EU	AKB25EU-E00		AKB25EU-E07	63
300*	0.60	71.0	AKB30EU	AKB30EU-E00		AKB30EU-E07	63
DN	L: average useful length	Fitting body only	Fitting without gasket	Fitting with weld bead and delivered without gasket	ALP UNI set	ALP UNI Ve set	
		kg	reference	reference	Fitting + STANDARD gasket (not anchored)	Fitting + STANDARD gasket + UNIVERSAL Ve ring (weld bead anchorage)	PFA bar
					reference	reference	PFA bar
400	0.60	122	AFB40EU	AFB40EV	AFB40EU-E00	AFB40EV-E07	63
500	0.60	178	AFB50EU	AFB50EV	AFB50EU-E00	AFB50EV-E07	45

* spigot with an anchoring bead.

ALPINAL duckfoot bend joined to 2" GAS outlet

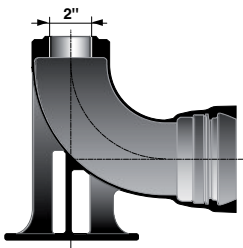
- It is essential for this to be anchored using the ALPINAL UNIVERSAL Vi anchoring with inserts
- Internal and external coating: bituminous paint



DN	fitting body only	without gasket	PFA
80	kg 25.0	reference 102926	bar 100

ALPINAL duckfoot bend with jointing and 2" GAS outlet

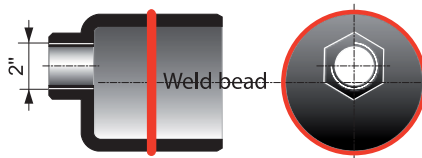
- Double chamber socket
- It is essential for this to be anchored using the ALPINAL UNIVERSAL Vi anchoring with inserts
- Internal and external coating: bituminous paint



DN	fitting body only	without gasket	ALP UNI Vi - E06 set Fitting + TYTON gasket + Vi anchoring gasket (inserts anchorage)	PFA
80	m 25.0	reference ANA80CF0L	reference ANA80CF0L-E06	bar 100

ALPINAL male plug with 2" GAS outlet

- DN 80: it is essential for this to be anchored to the ALPINAL UNIVERSAL Ve anchoring with a bead.
- DN 100* to 300* :
- with bead on spigot,
- it is essential for this to be anchored to the ALPINAL UNIVERSAL Ve anchoring with a weld bead.
- Internal and external coating: bituminous paint



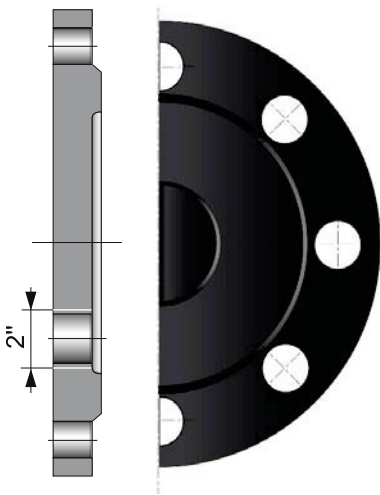
DN	fitting body only	without joint	ALP UNI Vi E06 set fitting + TYTON gasket + Vi anchoring gasket (inserts anchorage)		ALP UNI Ve E07 set fitting + TYTON gasket + Ve anchoring ring (weld bead anchorage)	
			reference	PFA bar	reference	PFA bar
80	kg 2.5	reference ANA80BH	reference ANA80BH-E06	100	-	-
100*	3.8	AKB10BH	Do not use an Alpinal anchoring gasket with inserts on a spigot with bead. Instead, fit it with a ring		AKB10BH-E07	100
125*	5.7	AKB12BH			AKB12BH-E07	100
150*	8.9	AKB15BH			AKB15BH-E07	100
200*	13.2	AKB20BH			AKB20BH-E07	100
250*	please consult us	-			-	63
300*	please consult us	-	-	63		

* spigot with an anchoring bead.

ALPINAL blank flange with a 2" GAS thread

- Dimensions of ductile iron flanges:
 - PN 10 to 40: NF EN 1092-2, ISO 7005-2
 - PN 63: NF EN 1092-2
 - PN 100: NF EN 1092-1 only for the connection dimensions
- If necessary, use a steel plug for blocking the 2" gas thread
- Internal and external coating: bituminous paint

Note: with regards to the PFA to be considered, see the PFA – PMA – PEA pressure definitions and table (cf page 30).



DN	PN	fitting body only	
		kg	without gasket reference
80	10 to 40	3.6	ABA80QN1
	63	6.9	ABA80QN5
	100	9.4	ABA80QNB
100	10 and 16	4.3	ABB10QN1
	25 and 40	4.8	ABB10QN3
	63	10.1	ABB10QN5
	100	14.3	ABB10QNB
125	10 and 16	5.6	ABB12QN1
	25 and 40	6.2	ABB12QN3
	63	18.7	ABB12QN5
	100	27.0	ABB12QNB
150	10 and 16	7.2	ABB15QN1
	25 and 40	11.1	ABB15QN3
	63	28.6	ABB15QN5
	100	42.0	ABB15QNB
200	10	-	please consult us
	16	11.0	ABB20QN2
	25	-	please consult us
	40	20.0	ABB20QN4
	63	49.0	ABB20QN5
250	100	75.0	ABB20QNB
	10	-	please consult us
	16	-	please consult us
	25	-	please consult us
	40	33.5	ABB25QN4
300	63	68.0	ABB25QN5
	100	-	please consult us
	10	26.0	ABB30QN1
	16	-	please consult us
	25	-	please consult us
400	40	51.5	ABB30QN4
	63	98.0	ABB30QN5
	100	-	please consult us
	40	152.0	ABB40QL4
500	63	165.0	ABB40QL5
	40	155.0	ABB50QL4
	63	263.0	ABB50QL5

Tapping collar

- DN 80 to 250: ductile iron
- DN 300 to 400: stainless steel
- DN 500: please consult us.

Steel screws
Zinc-coated 8/8 type

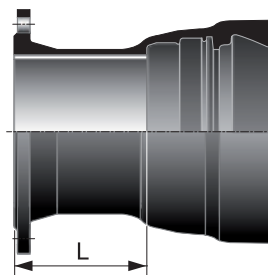


DN	material	PN	Tapping collar only	
			kg	ø 2" reference
80	Ductile iron	100	5.4	ANA80AFLDD
100	Ductile iron	100	6.0	ANB10AFLDD
125	Ductile iron	100	6.6	ANB12AFLDD
150	Ductile iron	100	7.2	ANB15AFLDD
200	Ductile iron	100	8.8	ANB20AFLDD
250	Ductile iron	100	7.0	ANB25AFLDD
300	Stainless steel	100	9.0	ANB30AFLDD
350	Stainless steel	100	10.0	ANB35AFLDD
400	Stainless steel	100	11.0	ANB40AFLDD

ALPINAL flanged-socket fitting

- Double chamber socket
- Fixed flange
- Internal lining : cement mortar
External coating : bituminous paint
- Dimensions of the ductile iron flanges:
 - PN 10 to 40: NF EN 1092-2, ISO 7005-2,
 - PN 63: NF EN 1092-2,
 - PN 100: NF EN 1092-1
only for the connection dimensions.

Note: It is not considered the flanged gasket equipment for the sets listed below (E00 - E06 - E07), with regards to the PFA to be considered, see the PFA – PMA – PEA pressure definitions and table (cf page 30).



DN	PN	L mm	fitting body only		ALP UNI - E00 set Fitting + TYTON gasket (not anchored)	ALP UNI Vi-E06 set Fitting + TYTON gasket + Vi anchoring gasket (inserts anchorage)	ALP UNI Ve-E07 set Fitting + TYTON gasket + Ve anchoring ring (weld bead anchorage)
			kg	reference	reference	reference	reference
80	10 to 40	130	9.0	ANA80BE1	ANA80BE1-E00	ANA80BE1-E06	-
	63		14.3	ANA80BE5	ANA80BE5-E00	ANA80BE5-E06	-
	100		14.3	ANA80BEB	ANA80BEB-E00	ANA80BEB-E06	-
100	10 and 16	130	12.6	ANB10BE1	ANB10BE1-E00	ANB10BE1-E06	-
	25 and 40		12.8	ANB10BE3	ANB10BE3-E00	ANB10BE3-E06	-
	63		20.3	ANB10BE5	ANB10BE5-E00	ANB10BE5-E06	-
	100		14.3	ANB10BEB	ANB10BEB-E00	ANB10BEB-E06	-
125	10 and 16	130	15.4	ANB12BE1	ANB12BE1-E00	ANB12BE1-E06	-
	25 and 40		16.0	ANB12BE3	ANB12BE3-E00	ANB12BE3-E06	-
	63		25.0	ANB12BE5	ANB12BE5-E00	ANB12BE5-E06	-
	100		25.0	ANB12BEB	ANB12BEB-E00	ANB12BEB-E06	-
150	10 and 16	135	20.2	ANB15BE1	ANB15BE1-E00	ANB15BE1-E06	ANB15BE1-E07
	25		21.2	ANB15BE3	ANB15BE3-E00	ANB15BE3-E06	ANB15BE3-E07
	40		23.3	ANB15BE4	ANB15BE4-E00	ANB15BE4-E06	ANB15BE4-E07
	63		39.3	ANB15BE5	ANB15BE5-E00	ANB15BE5-E06	ANB15BE5-E07
	100		39.3	ANB15BEB	ANB15BEB-E00	ANB15BEB-E06	ANB15BEB-E07
200	10	140	-	please consult us	-	-	-
	16		-	please consult us	-	-	-
	25		-	please consult us	-	-	-
	40		38.0	ANB20BE4	ANB20BE4-E00	-	ANB20BE4-E07
	63		63.0	ANB20BE5	ANB20BE5-E00	-	ANB20BE5-E07
	100		63.0	ANB20BEB	ANB20BEB-E00	-	ANB20BEB-E07
250	10	145	43.2	ANB25BE1	ANB25BE1-E00	-	ANB25BE1-E07
	16		-	please consult us	-	-	-
	25		46.0	ANB25BE3	ANB25BE3-E00	-	ANB25BE3-E07
	40		56.0	ANB25BE4	ANB25BE4-E00	-	ANB25BE4-E07
	63		62.0	ANB25BE5	ANB25BE5-E00	-	ANB25BE5-E07
	100		-	please consult us	-	-	-
300	10	150	-	please consult us	-	-	-
	16		57.0	ANB30BE2	ANB30BE2-E00	-	ANB30BE2-E07
	25		-	please consult us	-	-	-
	40		77.0	ANB30BE4	ANB30BE4-E00	-	ANB30BE4-E07
	63		87.0	ANB30BE5	ANB30BE5-E00	-	ANB30BE5-E07
	100		-	please consult us	-	-	-



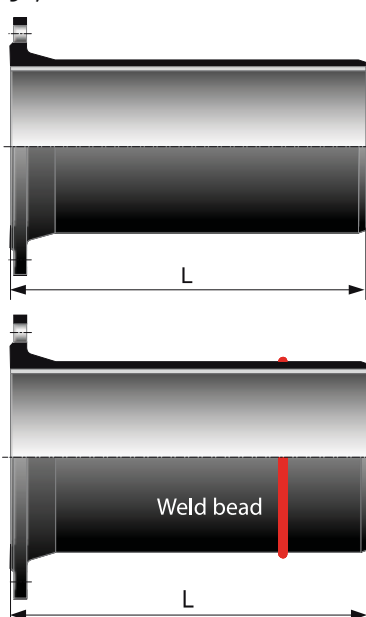
DN	PN	L mm	fitting body only		ALP UNI set-E00 Fitting + STANDARD gasket (not anchored)	ALP UNI Ve set - E07 Fitting + STANDARD gasket + UNIVERSAL Ve ring (weld bead anchorage)
			kg	reference	reference	reference
400	63	160	164.5	AFB40BE5	AFB40BE5-E00	AFB40BE5-E07
500	63	170	260.0	AFB50BE5	AFB50BE5-E00	AFB50BE5-E07

* Except flanged joint

ALPINAL Flanged-spigot fitting

- Fixed flange
- Dimensions of the ductile iron flanges:
 - PN 10 to 40: NF EN 1092-2, ISO 7005-2
 - PN 63: NF EN 1092-2
 - PN 100: NF EN 1092-1 only for the connection dimensions
- Spigot with bead: do not put an anchoring gasket with inserts onto a spigot with an anchoring bead; instead, fit it with a ring.

Note: with regards to the PFA to be considered, see the PFA – PMA – PEA pressure definitions and table (cf page 30).



DN	L mm	PN	fitting body only kg	without gasket	
				without weld bead reference	with weld bead reference
80	350	10 to 40	8.4	ANA80BU1	-
		63	15.0	ANA80BU5	-
		100	15.0	ANA80BUB	-
100	360	10 and 16	10.5	ANB10BU1	-
		25 and 40	11.0	ANB10BU3	-
		63	20.5	ANB10BU5	-
		100	20.5	ANB10BUB	-
125	370	10 and 16	13.5	ANB12BU1	-
		25 and 40	14.0	ANB12BU3	-
		63	24.5	ANB12BU5	-
		100	24.5	ANB12BUB	-
150	380	10 and 16	-	-	please consult us
		25 and 40	-	-	please consult us
		63	42.0	-	AKB15BU5
		100	40.8	-	AKB15BUB
200	400	10	-	-	please consult us
		16	15.8	-	AKB20BU2
		25	16.8	-	AKB20BU3
		40	18.8	-	AKB20BU4
		63	40.8	-	AKB20BU5
		100	40.8	-	AKB20BUB
250	420	10	-	-	please consult us
		16	-	-	please consult us
		25	35.8	-	AKB25BU3
		40	45.8	-	AKB25BU4
		63	65.5	-	AKB25BU5
		100	-	-	please consult us
300	440	10	-	-	please consult us
		16	42.7	-	AKB30BU2
		25	-	-	please consult us
		40	63.0	-	AKB30BU4
		63	85.0	-	AKB30BU5
		100	-	-	please consult us
400	480	63	153.5	AFB40BU5	-
		63	154.0	-	AFB40BV5
500	520	63	216.0	AFB50BU5	-
		63	217.0	-	AFB50BV5

ALPINAL anchored collar

- Internal lining and external coating :
blue epoxy powder



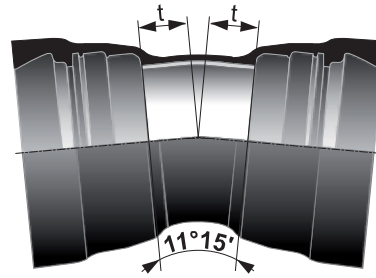
Collar fitting for anchorage

DN	L mm	PN bar	fitting body only kg	Fitting + anchorage set reference
150	214	100	33.06	ANB15MN
200	331	100	69.38	ANB20MN

DN	L mm	PFA bar	fitting body only kg	Fitting + anchorage set reference
80	160	100	7.7	ANA80MN00TT
100	160	75	9.7	ANB10MN00TT
125	165	63	12.5	ANB12MN00TT
250	175	40	30.0	ANB25MN00TT
300	180	40	38.5	ANB30MN00TT
400	590	30	59.5	ANB40MN00TT
500	620	30	107.0	ANB50MN00TT

ALPINAL 2 sockets bend

- Double chamber socket
- Internal lining : cement mortar
External coating : bituminous paint
- Angles:
 - 1/8 = 45°
 - 1/12 = 30°
 - 1/16 = 22°30'
 - 1/32 = 11°15'



Note: with regards to the PFA to be considered, see the PFA – PMA – PEA pressure definitions and table (cf page 30).



DN	angle	t	fitting body only kg	Fitting without gasket reference	ALP UNI - E00 set Fitting + TYTON gasket (not anchored)		ALP UNI Vi - E06 set Fitting + TYTON gasket + Vi anchoring gasket (inserts anchorage)		ALP UNI Ve - E07 set Fitting + TYTON gasket + Ve anchoring ring (weld bead anchorage)	
					reference	PFA bar	reference	PFA bar	reference	PFA bar
80	1/8	55.5	9.5	ANA80CB	ANA80CB-E00	100	ANA80CB-E06	100	-	-
	1/12	43.8	6.8	ANA80CC	ANA80CC-E00	100	ANA80CC-E06	100	-	-
	1/16	38.3	6.7	ANA80CD	ANA80CD-E00	100	ANA80CD-E06	100	-	-
	1/32	30.3	9.0	ANA80CE	ANA80CE-E00	100	ANA80CE-E06	100	-	-
100	1/8	64.4	14.5	ANB10CB	ANB10CB-E00	100	ANB10CB-E06	100	-	-
	1/12	49.8	14.5	ANB10CC	ANB10CC-E00	100	ANB10CC-E06	100	-	-
	1/16	42.9	14.0	ANB10CD	ANB10CD-E00	100	ANB10CD-E06	100	-	-
	1/32	32.9	13.5	ANB10CE	ANB10CE-E00	100	ANB10CE-E06	100	-	-
125	1/8		19.5	ANB12CB	ANB12CB-E00	100	ANB12CB-E06	100	-	-
	1/12		20.0	ANB12CC	ANB12CC-E00	100	ANB12CC-E06	100	-	-
	1/16		20.0	ANB12CD	ANB12CD-E00	100	ANB12CD-E06	100	-	-
	1/32		18.5	ANB12CE	ANB12CE-E00	100	ANB12CE-E06	100	-	-
150	1/8	86.6	23.0	ANB15CB	ANB15CB-E00	100	ANB15CB-E06	63	ANB15CB-E07	100
	1/12	64.7	23.0	ANB15CC	ANB15CC-E00	100	ANB15CC-E06	63	ANB15CC-E07	100
	1/16	54.3	22.5	ANB15CD	ANB15CD-E00	100	ANB15CD-E06	63	ANB15CD-E07	100
	1/32	39.3	21.0	ANB15CE	ANB15CE-E00	100	ANB15CE-E06	63	ANB15CE-E07	100
200	1/8	108.8	33.0	ANB20CB	ANB20CB-E00	100	-	-	ANB20CB-E07	100
	1/12	79.6	35.0	ANB20CC	ANB20CC-E00	100	-	-	ANB20CC-E07	100
	1/16	65.8	36.0	ANB20CD	ANB20CD-E00	100	-	-	ANB20CD-E07	100
	1/32	45.7	36.0	ANB20CE	ANB20CE-E00	100	-	-	ANB20CE-E07	100
250	1/8	131.1	52.0	ANB25CB	ANB25CB-E00	78	-	-	ANB25CB-E07	63
	1/12	94.5	49.0	ANB25CC	ANB25CC-E00	78	-	-	ANB25CC-E07	63
	1/16	77.2	47.0	ANB25CD	ANB25CD-E00	78	-	-	ANB25CD-E07	63
	1/32	52.1	44.0	ANB25CE	ANB25CE-E00	78	-	-	ANB25CE-E07	63
300	1/8	153.3	61.0	ANB30CB	ANB30CB-E00	70	-	-	ANB30CB-E07	63
	1/12	109.4	65.0	ANB30CC	ANB30CC-E00	70	-	-	ANB30CC-E07	63
	1/16	88.7	68.0	ANB30CD	ANB30CD-E00	70	-	-	ANB30CD-E07	63
	1/32	58.6	73.0	ANB30CE	ANB30CE-E00	70	-	-	ANB30CE-E07	63

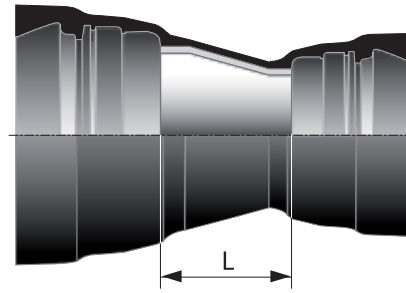


DN	angle	t	fitting body only kg	Fitting without gasket reference	ALP UNI - E00 set Fitting + STANDARD gasket (not anchored)		ALP UNI Ve - E07 set Fitting + STANDARD gasket + UNIVERSAL Ve ring (weld bead anchorage)	
					reference	PFA bar	reference	PFA bar
400	1/8	195	147.0	AFB40CB	AFB40CB-E00	63	AFB40CB-E07	63
	1/12	140	140.5	AFB40CC	AFB40CC-E00	63	AFB40CC-E07	63
	1/16	110	132.0	AFB40CD	AFB40CD-E00	63	AFB40CD-E07	63
	1/32	65	127.0	AFB40CE	AFB40CE-E00	63	AFB40CE-E07	63
500	1/8	240	265.0	AFB50CB	AFB50CB-E00	50	AFB50CB-E07	45
	1/12	170	249.5	AFB50CC	AFB50CC-E00	50	AFB50CC-E07	45
	1/16	130	233.0	AFB50CD	AFB50CD-E00	50	AFB50CD-E07	45
	1/32	75	212.0	AFB50CE	AFB50CE-E00	50	AFB50CE-E07	45

ALPINAL 2 sockets taper

- Double chamber socket
- Internal lining : cement mortar
External coating : bituminous paint

Note: with regards to the PFA to be considered, see the PFA – PMA – PEA pressure definitions and table (cf page 30).



DN	dn	L	fitting body only	Fitting without gasket	ALP UNI - E00 set Fitting + TYTON gasket (not anchored)		ALP UNI Vi - E06 set Fitting + TYTON gasket + Vi anchoring gasket (inserts anchorage)		ALP UNI Ve - E07 set Fitting + TYTON gasket + Ve anchoring ring (weld bead anchorage)	
					reference	PFA of the largest DN bar	reference	PFA of the largest DN bar	reference	PFA of the largest DN bar
100	80	90	12.3	ANB10VE0E	ANB10VE0E-E00	100	ANB10VE0E-E06	100	-	-
	125	-	14.8	ANB12VE0E	ANB12VE0E-E00	100	ANB12VE0E-E06	100	-	-
150	100	150	19.4	ANB15VE0F	ANB15VE0F-E00	100	ANB15VE0F-E06	100	-	-
	80	190	18.1	ANB15VE0E	ANB15VE0E-E00	100	ANB15VE0E-E06	63	ANB15VE0E-E07	100
	125	-	22.5	ANB15VE0G	ANB15VE0G-E00	100	ANB15VE0G-E06	63	**	100
200	80	-	-	please consult us	-	100	-	-	-	100
	100	-	-	please consult us	-	100	-	-	-	100
	125	-	-	please consult us	-	100	-	-	-	100
	150	150	29.0	ANB20VE0J	ANB20VE0J-E00	100	-	-	ANB20VE0J-E07	100 / 63*
250	80	-	-	N C	-	78	-	-	-	63
	100	350	37.2	ANB25VE0F	ANB25VE0F-E00	78	-	-	ANB25VE0F-E07	63
	125	-	-	please consult us	-	78	-	-	-	63
	150	250	38.0	ANB25VE0J	ANB25VE0J-E00	78	-	-	ANB25VE0J-E07	63
	200	150	41.0	ANB25VE0K	ANB25VE0K-E00	78	-	-	ANB25VE0K-E07	63
300	150	350	54.6	ANB30VE0J	ANB30VE0J-E00	70	-	-	ANB30VE0J-E07	63
	200	250	55.0	ANB30VE0K	ANB30VE0K-E00	70	-	-	ANB30VE0K-E07	63
	250	150	55.0	ANB30VE0L	ANB30VE0L-E00	70	-	-	ANB30VE0L-E07	63



DN	dn	L	fitting body only	Fitting without gasket	ALP UNI - E00 set Fitting + STANDARD gasket (not anchored)		ALP UNI Ve set Fitting + STANDARD gasket + UNIVERSAL Ve ring (weld bead anchorage)	
					reference	PFA of the largest DN bar	reference	PFA of the largest DN bar
400	300	260	110.0	AFB40VE0M	AFB40VE0M-E00	63	AFB40VE0M-E07	63
500	400	260	185.0	AFB50VE0N	AFB50VE0N-E00	50	AFB50VE0N-E07	45

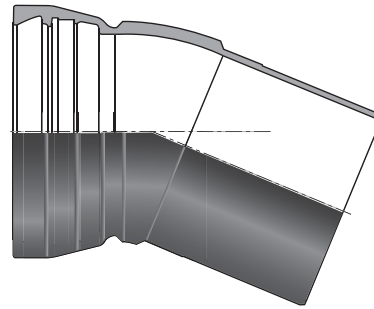
* The PFA becomes 63 bars for a mixed anchoring of the DN 200/150 taper (DN 200 with bead anchoring of PFA 100 and DN 150 with Vi ALPINAL anchoring of PFA 63).

** Please, consult us.

ALPINAL socket-spigot bend

- Double chamber socket
- Internal lining: cement mortar
- External coating : bituminous paint

Note: with regards to the PFA to be considered, see the PFA – PMA – PEA pressure definitions and table (cf page 30).



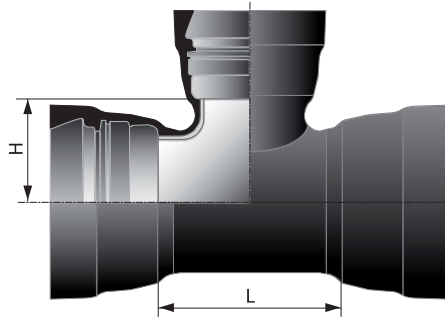
DN	angle	fitting body only kg	Fitting without gasket reference	Fitting with weld bead and delivered without gasket reference	ALP UNI - E00 set Fitting + TYTON gasket (not anchored)		ALP UNI Vi - E06 set Fitting + TYTON gasket + Vi anchoring gasket (inserts anchorage)		ALP UNI Ve - E07 set Fitting + TYTON gasket + Ve anchoring ring (weld bead anchorage)	
					reference	PFA bar	reference	PFA bar	reference	PFA bar
80	1/16	9.0	AFA80DD	AFA80DD0V	AFA80DD-E00	100	AFA80DD-E06	100	please consult us	-
	1/32	8.8	AFA80DE	AFA80DE0V	AFA80DE-E00	100	AFA80DE-E06	100	please consult us	-
100	1/16	12.7	AFB10DD	AFB10DD0V	AFB10DD-E00	100	AFB10DD-E06	100	AFB10DD0V-E07	100
	1/32	12.4	AFB10DE	AFB10DE0V	AFB10DE-E00	100	AFB10DE-E06	100	AFB10DE0V-E07	100
125	1/16	15.7	AFB12DD	AFB12DD0V	AFB12DD-E00	100	AFB12DD-E06	100	AFB12DD0V-E07	100
	1/32	15.7	AFB12DE	AFB12DE0V	AFB12DE-E00	100	AFB12DE-E06	100	AFB12DE0V-E07	100
150	1/16	21.0	AFB15DD	AFB15DD0V	AFB15DD-E00	100	AFB15DD-E06	63	AFB15DD0V-E07	100
	1/32	20.0	AFB15DE	AFB15DE0V	AFB15DE-E00	100	AFB15DE-E06	63	AFB15DE0V-E07	100
200	1/16	33.5	AFB20DD	AFB20DD0V	AFB20DD-E00	100	-	-	AFB20DD0V-E07	100
	1/32	32.5	AFB20DE	AFB20DE0V	AFB20DE-E00	100	-	-	AFB20DE0V-E07	100
250	1/16	43.7	AFB25DD	AFB25DD0V	AFB25DD-E00	78	-	-	AFB25DD0V-E07	63
	1/32	43.7	AFB25DE	AFB25DE0V	AFB25DE-E00	78	-	-	AFB25DE0V-E07	63
300	1/16	63.0	AFB30DD	AFB30DD0V	AFB30DD-E00	70	-	-	AFB30DD0V-E07	63
	1/32	58.5	AFB30DE	AFB30DE0V	AFB30DE-E00	70	-	-	AFB30DE0V-E07	63

DN	angle	fitting body only kg	Fitting without gasket reference	Fitting with weld bead and delivered without gasket reference	ALP UNI - E00 set Fitting + STANDARD gasket (not anchored)		ALP UNI Ve - E07 set Fitting + STANDARD gasket + UNIVERSAL Ve ring (weld bead anchorage)	
					reference	PFA bar	reference	PFA bar
400	1/16	118.0	AFB40DD	AFB40DD0V	AFB40DD-E00	63	AFB40DD0V-E07	63
	1/32	100.0	AFB40DE	AFB40DE0V	AFB40DE-E00	63	AFB40DE0V-E07	63
500	1/16	185.0	AFB50DD	AFB50DD0V	AFB50DD-E00	50	AFB50DD0V-E07	45
	1/32	167.0	AFB50DE	AFB50DE0V	AFB50DE-E00	50	AFB50DE0V-E07	45

ALPINAL 3 socket tee

- Double chamber socket
- Internal lining: cement mortar
- External coating : bituminous paint

Note: with regards to the PFA to be considered, see the PFA – PMA – PEA pressure definitions and table (cf page30).



DN	dn	L	H	fitting body only	without gasket	ALP UNI - E00 set fitting + TYTON gasket (not anchored)		ALP UNI Vi - E06 set fitting + TYTON gaskets + Vi anchoring gaskets (inserts anchorage)		ALP UNI Ve - E07 set fitting + TYTON gasket + Ve anchoring ring (weld bead anchorage)	
						reference	PFA of the largest DN bar	reference	PFA of the largest DN bar	reference	PFA of the largest DN bar
80	80	-	-	15.5	ANA80TE0E	ANA80TE0E-E00	100	ANA80TE0E-E06	100	-	-
100	80	170	95	20.0	ANB10TE0E	ANB10TE0E-E00	100	ANB10TE0E-E06	100	-	-
	100	190	95	23.5	ANB10TE0F	ANB10TE0F-E00	100	ANB10TE0F-E06	100	-	-
125	80	-	-	22.0	ANB12TE0E	ANB12TE0E-E00	100	ANB12TE0E-E06	100	-	-
	100	-	-	23.5	ANB12TE0F	ANB12TE0F-E00	100	ANB12TE0F-E06	100	-	-
	125	-	-	30.0	ANB12TE0G	ANB12TE0G-E00	100	ANB12TE0G-E06	100	-	-
150	80	170	120	30.5	ANB15TE0E	ANB15TE0E-E00	100	ANB15TE0E-E06	63	ANB15TE0E-E07	100
	100	195	120	32.6	ANB15TE0F	ANB15TE0F-E00	100	ANB15TE0F-E06	63	ANB15TE0F-E07	100
	125	-	-	-	please consult us	-	100	-	63	-	100
	150	255	125	37.0	ANB15TE0J	ANB15TE0J-E00	100	ANB15TE0J-E06	63	ANB15TE0J-E07	100
200	80	175	145	42.9	ANB20TE0E	ANB20TE0E-E00	100	-	-	ANB20TE0E-E07	100
	100	200	145	45.9	ANB20TE0F	ANB20TE0F-E00	100	-	-	ANB20TE0F-E07	100
	125	-	-	-	please consult us	-	100	-	-	-	100
	150	255	150	51.0	ANB20TE0J	ANB20TE0J-E00	100	-	-	ANB20TE0J-E07	100 / 63*
	200	315	155	62.9	ANB20TE0K	ANB20TE0K-E00	100	-	-	ANB20TE0K-E07	100
250	80	180	170	54.0	ANB25TE0E	ANB25TE0E-E00	78	-	-	ANB25TE0E-E07	63
	100	200	170	58.4	ANB25TE0F	ANB25TE0F-E00	78	-	-	ANB25TE0F-E07	63
	125	-	-	-	please consult us	-	78	-	-	-	63
	150	260	175	65.9	ANB25TE0J	ANB25TE0J-E00	78	-	-	ANB25TE0J-E07	63
	200	315	180	73.0	ANB25TE0K	ANB25TE0K-E00	78	-	-	ANB25TE0K-E07	63
	250	375	190	83.4	ANB25TE0L	ANB25TE0L-E00	78	-	-	ANB25TE0L-E07	63
300	80	180	195	73.8	ANB30TE0E	ANB30TE0E-E00	70	-	-	ANB30TE0E-E07	63
	100	205	195	77.8	ANB30TE0F	ANB30TE0F-E00	70	-	-	ANB30TE0F-E07	63
	125	-	-	-	please consult us	-	70	-	-	-	63
	150	260	200	86.0	ANB30TE0J	ANB30TE0J-E00	70	-	-	ANB30TE0J-E07	63
	200	320	205	96.1	ANB30TE0K	ANB30TE0K-E00	70	-	-	ANB30TE0K-E07	63
	250	435	215	99.0	ANB30TE0L	ANB30TE0L-E00	70	-	-	ANB30TE0L-E07	63
300	435	220	116.0	ANB30TE0M	ANB30TE0M-E00	70	-	-	ANB30TE0M-E07	63	



DN	dn	L	fitting body only	Fitting without gasket	ALP UNI - E00 set Fitting + STANDARD gasket (not anchored)		ALP UNI Ve - E07 set Fitting + STANDARD gasket + UNIVERSAL Ve ring (weld bead anchorage)	
					reference	PFA bar	reference	PFA bar
400	200*	330	165.5	AFB40TE0K	AFB40TE0K-E00	63	AFB40TE0K-E07	63
	250*	390	181.0	AFB40TE0L	AFB40TE0L-E00	63	AFB40TE0L-E07	63
	300*	440	197.0	AFB40TE0M	AFB40TE0M-E00	63	AFB40TE0M-E07	63
	400	560	259.0	AFB40TE0N	AFB40TE0N-E00	63	AFB40TE0N-E07	63
500	200*	680	415.0	AFB50TE0K	AFB50TE0K-E00	50	AFB50TE0K-E07	45
	250*	565	331.0	AFB50TE0L	AFB50TE0L-E00	50	AFB50TE0L-E07	45
	300*	450	301.0	AFB50TE0M	AFB50TE0M-E00	50	AFB50TE0M-E07	45
	400	450	278.0	AFB50TE0N	AFB50TE0N-E00	50	AFB50TE0N-E07	45
	500	330	257.0	AFB50TE0Q	AFB50TE0Q-E00	50	AFB50TE0Q-E07	45

* The PFA becomes 63 bars for a mixed anchoring of the DN 200/150 taper (DN 200 with bead anchoring of PFA 100 and DN 150 with Vi ALPINAL anchoring of PFA 63).

Leaktightness gasket

- ALPINAL double chamber socket
- Junction in non-anchored version.
- TYTON joint DN 80 to 300 and STANDARD joint DN 400 and DN 500: leaktightness gasket of the ALPINAL UNIVERSAL, ALPINAL UNIVERSAL Vi and ALPINAL UNIVERSAL Ve joints.
- EPDM type elastomer



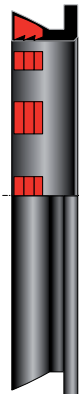
DN	joint body only kg	joint (not anchored)	
		reference	PFA** bar
80	0.122	JCA80BA	100
100	0.144	JCB10BA	100
125	0.174	JCB12BA	100
150	0.205	JCB15BA	100
200	0.342	JCB20BA	100
250	0.443	JCB25BA	78
300	0.623	JCB30BA	70
400*	1.080	JSB40BA	63
500*	1.540	JSB50BA	50

** PFA: values obtained with the use of pipes and fittings from the ALPINAL range (ALPINAL UNIVERSAL type K10 pipes for DN 80 – type K12 for DN 100 to 500 and/or ALPINAL UNIVERSAL fittings).

* standard joint.

Anchoring gasket with UNIVERSAL Vi inserts

- DN 80 to 150
- ALPINAL double chamber socket
- ALPINAL anchoring gasket: anchoring device in inserts of the ALPINAL UNIVERSAL Vi joint.
- EPDM type elastomer



DN	gasket body only kg	ALPINAL UNIVERSAL Vi anchoring gasket (inserts anchoring)	
		reference	PFA* bar
80	0.15	ANA80CA6	100*
100	0.20	ANB10CA6	100*
125	0.26	ANB12CA6	100*
150	0.31	ANB15CA5	63*
200	0.49	ANB20CA4	40*
250	0.61	ANB25CA4	40*
300	0.78	ANB30CA4	40*

* PFA: values obtained with the use of pipes and fittings from the ALPINAL range (ALPINAL UNIVERSAL type K10 pipes for DN 80 – type K12 for DN 100 to 500 and/or ALPINAL UNIVERSAL fittings).

Anchoring gasket with weld bead + UNIVERSAL Ve ring

- ALPINAL double chamber socket and spigot with anchoring bead
- ALPINAL ring: DN 150 to 500
- Ring bead anchoring system element of the ALPINAL UNIVERSAL Ve joint:
 - DN < 250 rings in ductile iron elements,
 - DN 250 and 500 ductile iron monoblock rings.
- DN 100 and 125 rings: only to be used with the ALPINAL male plug with 2" GAS orifice, see ALPINAL male plug with 2" GAS outlet
- EPDM type elastomer

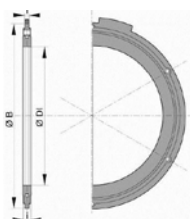


DN	ring body only kg	ALPINAL UNIVERSAL Ve anchoring ring (anchoring with bead)	
		reference	PFA* bar
80			
100	0.54	110259	100*
125	0.70	124151	100*
150	0.80	AKB15E	100*
200	1.22	AKB20E	100*
250	1.35	AKB25E	63*
300	1.73	AKB30E	63*
400	3.60	JKB40E	63*
500	4.60	JKB50E	45*

* PFA: values obtained with the use of pipes and fittings from the ALPINAL range (ALPINAL UNIVERSAL type K10 pipes for DN 80 – type K12 for DN 100 to 500 and/or ALPINAL UNIVERSAL fittings).

Gasket for flanged joint

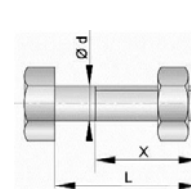
- Working networks under very high pressures
- Elastomer quality : EPDM
- Watertightness which requires less torque
- Gaskets with embedded metal reinforcement
- Washers and bolts are galvanized coated



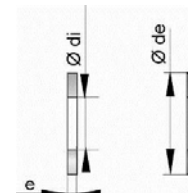
DN 80 to DN 300



DN 400 to 500



Bolts



Washers

DN	PN Bar	Number	Dimensions HM d L/X (mm)	Washers*	Bolts*	Gasket for flanged fittings
80	10 to 40	8	HM16 85/57	JXM16RGE	JXM16BG85	JBA80GV1
	63	8	HM20 110/76	JXM20RGE	JXM20BG110	Consult us
	100	8	HM24 130/93	JXM24RGE	JXM24BG104	Consult us
100	10 and 16	8	HM16 90/62	JXM16RGE	JXM16BG90	JBB10GV1
	25 and 40	8	HM20 100/72	JXM20RGE	JXM20BG100	JBB10GV1
	63	8	HM24 130/93	JXM24RGE	JXM24BG130	Consult us
	100	8	HM27 130/90	JXM27RGE	JXM27BG105	Consult us
125	10 and 16	8	HM16 90/62	JXM16RGE	JXM16BG90	JBB12GV1
	25 and 40	8	HM24 110/82	JXM24RGE	JXM24BG110	JBB12GV1
	63	8	HM27 130/90	JXM27RGE	JXM27BG130	Consult us
	100	8	HM30 140/93	JXM30RGE	JXM30BG106	Consult us
150	10 and 16	8	HM20 100/72	JXM20RGE	JXM20BG100	JBB15GV2
	25 and 40	8	HM24 110/82	JXM24RGE	JXM24BG110	JBB15GV2
	63	8	HM30 140/93	JXM30RGE	JXM30BG140	Consult us
	100	12	HM30 160/110	JXM30RGE	JXM30BG107	Consult us
200	10	8	HM20 100/72	JXM20RGE	JXM20BG100	JBB20GV2
	16	12	HM20 100/72	JXM20RGE	JXM20BG100	JBB20GV2
	25	12	HM24 110/82	JXM24RGE	JXM24BG110	JBB20GV2
	40	12	HM27 130/90	JXM27RGE	JXM27BG130	JBB20GV2
	63	12	HM33 160/100	JXM33RGE	JXM33BG160	Consult us
	100	2	HM33 / L mini 183	JXM33RGE	JXM33BG183	Consult us
250	10	12	HM20 110/76	JXM20RGE	JXM20BG110	JBB25GV2
	16	12	HM24 110/82	JXM24RGE	JXM24BG110	JBB25GV2
	25	12	HM27 130/90	JXM27RGE	JXM27BG130	JBB25GV2
	40	12	HM30 140/93	JXM30RGE	JXM30BG140	JBB25GV2
	63	12	HM33 160/100	JXM33RGE	JXM33BG160	Consult us
300	10	12	HM20 120/83	JXM20RGE	JXM20BG120	JBB30GV2
	16	12	HM24 130/93	JXM24RGE	JXM24BG130	JBB30GV2
	25	16	HM27 130/90	JXM27RGE	JXM27BG130	JBB30GV2
	40	16	HM30 140/93	JXM30RGE	JXM30BG140	JBB30GV2
	63	16	HM33 180/117	JXM33RGE	JXM33BG180	Consult us
400	10	16	HM24 140/103	JXM24RGE	JXM24BG140	JBB40GV2
	16	16	HM27 150/105	JXM27RGE	JXM27BG150	JBB40GV2
	25	16	HM33 150/100	JXM33RGE	JXM33BG150	JBB40GV2
	40	16	HM36 160/92	JXM36RGE	JXM36BG160	JBB40GV4
	63	16	HM39 / L mini 191	JXM39RGM	JXM39BG191	JBB40GV4
500	10	20	HM24 150/110	JXM24RGE	JXM24BG150	JBB50GV2
	16	20	HM30 160/110	JXM30RGE	JXM30BG160	JBB50GV2
	25	20	HM33 160/100	JXM33RGE	JXM33BG160	JBB50GV2
	40	20	HM39 180/105	JXM39RGM	JXM39BG180	JBB50GV4
	63	20	HM45/ L mini 240	JXM45RGM	JXM45BG240	JBB50GV5

* Product reference for only one washer or one bolt

Assembly accessories for the ALPINAL UNIVERSAL Ve ring

- ALPINAL double chamber socket
- ALPINAL UNIVERSAL Ve anchored joint

Ring assembly accessories

DN 150* and 200*: support bracket with lever for ring with segments (100 and 125 for male plug with 2" GAS, orifice, see ALPINAL male plug with 2" GAS outlet)

DN 250 and 300: support bracket + lever for placing the monoblock ring in the socket



DN	support bracket (*with lever)		Positioning lever (DN 250 and 300)	
	reference	reference	reference	reference
(100)	-	-	-	-
(125)	-	-	-	-
150*	-	-	-	-
200*	110280	110280	-	-
250	110839	-	-	-
300	110840	-	-	-
400	110715	-	110279	110279
500	110719	-	-	-

Accessories for dismantling ALPINAL anchored joints

- ALPINAL double chamber socket
- ALPINAL UNIVERSAL Vi anchored joint
- ALPINAL UNIVERSAL Ve anchored joint

Dismantling accessories:

DN 80 to 150 - UNI Vi: one pounding block (1) for use with steel blades (2) for releasing the inserts (Note: see the number of blades to order per DN),

DN 150 to 300 - UNI Ve: one full dismantling wedge kit for use for releasing the bead ring.

Rasps: ref 110477



DN	ALPINAL UNIVERSAL Vi (UNI Vi) anchoring gasket with Vi inserts DN 80 to 150			ALPINAL UNIVERSAL Ve (UNI Ve) Ve bead anchoring ring DN 150 to 300	
	pounding block (1) reference	steel blade (2) reference	amount to order	reference	reference
80	110680	-	4	-	-
100	-	-	-	-	-
125	110681	-	-	-	-
150	-	110682	5	110282	110282
200	-	-	8	110283	110283
250	110683	-	10	110284	110284
300	-	-	12	110285	110285
400	-	-	-	110715	110715
500	-	-	-	110719	110719

Coatings for ALPINAL pipes and fittings

- ALPINAL UNIVERSAL pipes with socket
 - Internal coating: blast furnace spun-cast cement mortar
 - External coating: zinc (200 g/m²) + VBI coating
- ALPINAL UNIVERSAL fittings
 - Internal coating: cement mortar (unless indicated otherwise)
 - External coating: VBI varnish coating

Definitions and table of pressures

	10	16	25	40	63	70	78	100
PFA flange PFA's bar	PN10	PN16	PN25	PN40	PN63	to be combined with PN100 flanges		PN100
PMA bar	12	20	30	48	76	84	93	120
PEA bar	17	25	35	53	81	89	98	125

■ **PFA:** Maximum admissible operating pressure. Internal pressure, not including the water hammer, that a component can safely continuously support in permanent hydraulic mode.

■ **PMA:** Maximum allowable working pressure. Maximum internal pressure, including the water hammer, that a component can safely support when working.

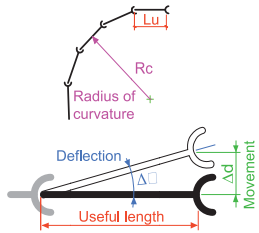
■ **PEA:** Maximum allowable test pressure. Maximum hydrostatic pressure than can be applied on site to a component of a newly installed pipeline.

Comment on the pressures to be used: if a fitting is equipped with different assemblies with different diameters or a mixture of both (e.g. on taper, tee, socket, spigot, etc. – different assemblies: UNIVERSAL Ve, flange, etc. – different diameters: DN, dn on taper, tee, etc.), the PFA, PMA and PEA should be kept as low as possible.

Angular deflections of the pipes and fittings with an ALPINAL UNIVERSAL socket

Pipes DN 80 to 500 with a useful length (UL) of 6 m

- For an $\Delta\theta$ angular deflection of 3°
 - mini-radius of curvature R_c : ≈ 115 m
 - Δd movement: ≈ 31 cm
- For an $\Delta\theta$ angular deflection of 2°
 - mini-radius of curvature R_c : ≈ 172 m
 - Δd movement: ≈ 21 cm



DN	ALPINAL UNIVERSAL not anchored junction angular deflection allowed at laying stage		ALPINAL UNIVERSAL Vi anchored junction with inserts angular deflection allowed at laying stage		ALPINAL UNIVERSAL Ve anchored junction with weld bead angular deflection allowed at laying stage	
	pipes degrees	fittings degrees	pipes degrees	fittings degrees	pipes degrees	fittings degrees
80					-	-
100			3°	3°	-	-
125					-	-
150	3°	3°				
200			-	-		
250			-	-	3°	3°
300			-	-		
400			-	-		
500	2°	2°	-	-	2°	2°

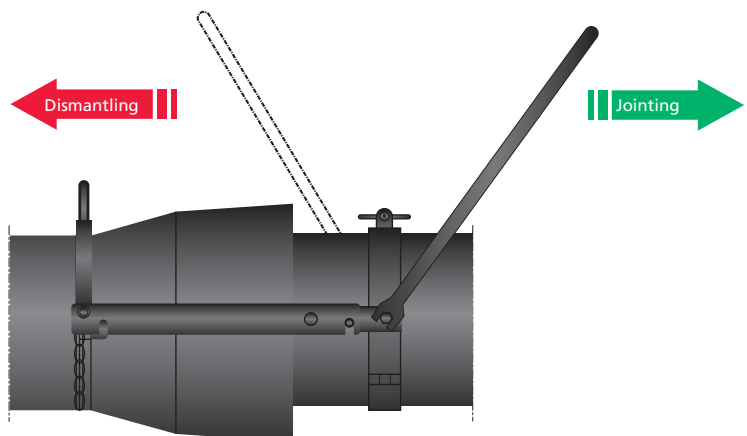
Assembly instructions: please consult our regional managements

Assembly devices for ALPINAL UNIVERSAL pipes and fittings

- DN 80 to 300
- For the joints: ALPINAL UNIVERSAL, ALPINAL UNIVERSAL Vi, ALPINAL UNIVERSAL Ve
- The use of the "V301" device makes it easier to assemble the ALPINAL UNIVERSAL junctions and, in the case of anchored joints (ALPINAL UNIVERSAL Vi and Ve), it makes it easier to extend them.

DN	V301 assembly device	
	body kg	Junctions ALPINAL UNIVERSAL, ALPINAL UNIVERSAL Vi, ALPINAL UNIVERSAL Ve reference
80	13.8	AKA80X
100	14.0	AKB10X
125	15.0	AKB12X
150	15.5	AKB15X
200	17.1	AKB20X
250	18.1	AKB25X
300	20.5	AKB30X
400		please consult us
500		please consult us

Note: (tensile) lengthening of the anchored joints is done by "withdrawing" the spigot from the socket.



Selection of constructions carried out in France and Europe

Year	Place		DN	Linear (m)	pressure (bar)
1999/2003	VAL CENIS	(Savoy)	150 to 300	6500	40 to 60
2000/2003	LES ARCS	(Savoy)	100 to 400	12000	40 to 60
2000	PORTE-PUYMORENS	(Eastern Pyrenees)	100 to 150	2800	55
2001/2003	VAL D'ISÈRE	(Savoy)	80 to 200	9200	40 to 80
2001	FORMIGUÈRES	(Eastern Pyrenees)	80 to 150	3500	50
2002/2003	MORZINE	(Upper Savoy)	100 to 300	4800	40
2002/2003	LA PLAGNE	(Savoy)	100 to 300	11000	40 to 60
2002	LES MÉNUIRES	(Savoy)	200 to 250	1600	40
2002	MÉGÈVE	(Upper Savoy)	60 to 200	3650	40
2002	LES ROUSSES	(The Jura)	80 to 200	1000	40
2002	SAINT-LARY	(Upper Pyrenees)	100 to 300	11000	65
2002	LA MONGIE	(Upper Pyrenees)	100 to 250	9500	65
2003	TIGNES	(Savoy)	100 to 300	8400	40 to 100
2003	LES SEPT LAUX	(The Isère)	100 to 200	2950	40 to 80
2003	SUPER-LIORAN	(Cantal)	125 to 150	2200	64
2003	AURON	(Alpes maritimes)	100 to 250	3050	80
2005	ALP D'HUEZ	(The Isère)	450	410	25
2005	VILLARD RECLAS	(The Isère)	100 to 400	6700	40 to 100
2005	CHAMPAGNY	(Savoy)	125 to 200	3050	
2005	LES BRASSES	(Upper Savoy)	125	1000	40
2006	AUTRANS	(The Isère)	150 to 200	4520	
2006	LES ARCS	(Savoy)	150 to 350	4600	45 to 100
2006	VAL THORENS	(Savoy)	200	3900	
2007	AURIS EN OISANS	(The Isère)	100 to 300	7780	60
2007	TRANCHE FERME	(The Puy-de-Dôme)	125 to 200	1910	
2007	SUPER LIORAN	(The Puy-de-Dôme)	125 to 150	800	
2007	LES ENVERS	(Savoy)	100 to 200	5000	40 to 60
2007	ST JEAN D'AUPS	(Upper Savoy)	125 to 200	3000	40 to 80
2007	MOLINES / SAINT VERAN	(Upper Alps)	250 to 100	4200	30
2007	ORCIERES MERLETTE	(Upper Alps)	250 to 125	4500	50
2007	VARIS	(Upper Alps)	250 to 100	5000	25
2007	SERRE CHEVALIER	(Upper Alps)	250 to 150	2600	45
2007	RISOUL	(Upper Alps)	250 to 100	5200	65
2007	MONTGENEVRE	(Upper Alps)	200	1100	40
2007	LES ORRES	(Upper Alps)	150 to 80	2600	40
2007	BESCHNEIUNG ABTENAU	(Austria)	80 to 150	920	40 to 100
2007	STUBAIER GLETSCHER/NEUSTIFT	(Austria)	150	500	63
2007	BERGERALM, STEINACH	(Austria)	100 to 150	970	63 to 100
2008	LA GOURETTE	(The Pyrénées- atlantique)	200 to 250	2000	40 to 60
2008	AURIS EN OISANS	(The Isère)	100 to 300	5280	60
2008	VALMOREL	(Savoy)	150 to 300	2350	
2008	COURCHEVEL	(Savoy)	150 to 250	6650	
2008	AIGUILLES	(Upper Alps)	125 to 80	900	25
2008	ORCIERES MERLETTE	(Upper Alps)	250 to 100	1200	50
2008	VARIS	(Upper Alps)	150 to 100	2000	40
2008	SERRE CHEVALIER	(Upper Alps)	250 to 100	3800	40
2008	RISOUL	(Upper Alps)	250	6500	65
2008	MONTGENEVRE	(Upper Alps)	250 to 125	4700	35
2008	LES ORRES	(Upper Alps)	200 to 100	3200	30
2008	ARVIEUX	(Upper Alps)	150 to 100	700	25
2008	SAINT LEGER LES MELEZES	(Upper Alps)	125 to 100	500	25
2008	LÜNERSEE/TSCHAGGUNS	(Austria)	150 to 250	2300	63 to 100
2008	BESCHN. GERLOS/GERLOS	(Austria)	80 to 150	4000	63 to 100
2008	BESCHNEIUNG HOCHFÜGEN/HOCHFÜGEN	(Austria)	80 to 200	4600	40 to 100
2009	VARIS	(Upper Provence Alps)	250 to 80	2300	40
2009	SERRE CHEVALIER	(Upper Alps)	250 to 150	3600	40
2009	ALLOS	(Upper Alps)	200 to 125	2500	65
2009	MONTGENEVRE	(Upper Alps)	200	3500	55
2009	HOCHZILLERTAL	(Austria)	80 to 400	9000	40 to 100
2009	VSETIN	(Czech Republic)	80	2700	100
2009	GSTAAD-ROUGEMONT	(Switzerland)	80 to 400	28000	40 to 100

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