



PIPES

APE MULTILAYER

Site
BRESCIA

1964

**APE RACCORDERIE
IS FOUNDED**

with the name
"Minuterie Metalliche
di Pe Angelo"

Commercial
presence
in over

50
COUNTRIES

Today, with

52,000 m²

it is one of the few
manufacturing companies

APE[®]
RACCORDERIE

on the national
and international market for

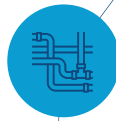
almost 60 years

**MANUFACTURERS OF ENTIRE
HEATING AND SANITARY SYSTEMS**

Fittings that
can be tightened
or crimped



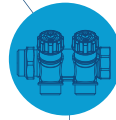
Multilayer
pipe



Floor, wall and ceiling
radiant systems



Distribution
manifolds



All products
and systems are
certified by major
international bodies



FITTINGS

PIPES

GAS

THERM



PIPES

PIPES



kiwa 
BRL K536-E



Certificates valid for diameters Ø16- Ø20- Ø26- Ø32- Ø40- Ø50- Ø63



Certificate valid for diameters Ø26- Ø32- Ø40- Ø50- Ø63



Certificate valid for diameters Ø16- Ø20- Ø26- Ø32



Certificate valid for diameters Ø16- Ø20- Ø25- Ø32

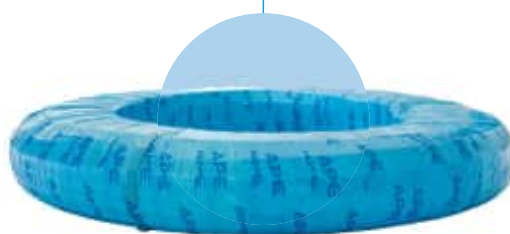
APE MULTILAYER PIPE

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APE MULTILAYER PIPE

Multilayer plain pipe

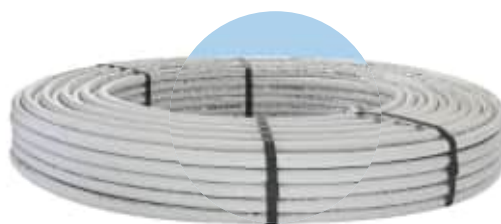
MULTILAYER PLAIN PIPE PEXB/AL/PEXB



COIL STRETCH FILM PACKAGED

Product code	Size (mm)	Coil length (m)	Q.ty for pallet (m)	Pallet dimension (cm)
9MN021620100F	16 x 2.0	100	2200	78 x 78 x H.235
9MN021620200F	16 x 2.0	200	2600	78 x 78 x H.235
9MN031820100F	18 x 2.0	100	1500	78 x 78 x H.230
9MN031820200F	18 x 2.0	200	2000	78 x 78 x H.230
9MN022020100F	20 x 2.0	100	1400	78 x 78 x H.230
9MN032020100F*	20 x 2.0	100	1400	78 x 78 x H.230
9MN04263050F	26 x 3.0	50	500	78 x 78 x H.235
9MN45323050F	32 x 3.0	50	600	100 x 100 x H.230

(*) Aluminium 0,3 mm



STRAPPED COIL

Product code	Size (mm)	Coil length (m)	Q.ty for pallet (m)	Pallet dimension (cm)
9MN021620500R	16 x 2.0	500	3000	78 x 78 x H.250
9MN022020300R	20 x 2.0	300	1800	100 x 100 x H.230

APE MULTILAYER PIPE

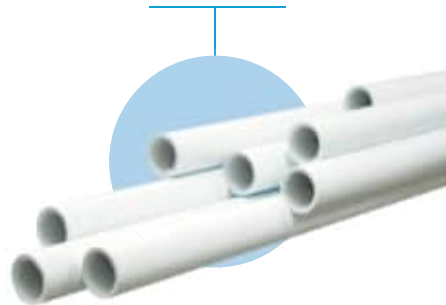
Multilayer plain pipe



CARDBOARD PACKGING

Product code	Size (mm)	Coil length (m)	Q.ty for pallet (m)	Pallet dimension (cm)
9MN021620100C	16 x 2.0	100	1900	78 x 78 x H.235
9MN022020100C	20 x 2.0	100	1300	78 x 78 x H.235

MULTILAYER PIPE STRAIGHT LENGTH PEXB/AL/PEXB



Product code	Size (mm)	Bars lenght (m)	Stack quantity (m) (nr)		Basket quantity (m)
9MN021620BR4	16 x 2.0	4	100	25	7500
9MN031820BR4	18 x 2.0	4	100	25	4500
9MN032020BR4	20 x 2.0	4	100	25	2800
9MN042630BR4	26 x 3.0	4	40	10	2800
9MN453230BR4	32 x 3.0	4	40	10	1800
9MN054035BR	40 x 3.5	4	20	5	1200
9MN065040BR	50 x 4.0	4	20	5	800
9MN096345BR	63 x 4.5	4	12	3	600
9MN107550BR	75 x 5.0	4	12	3	480

APE MULTILAYER PIPE

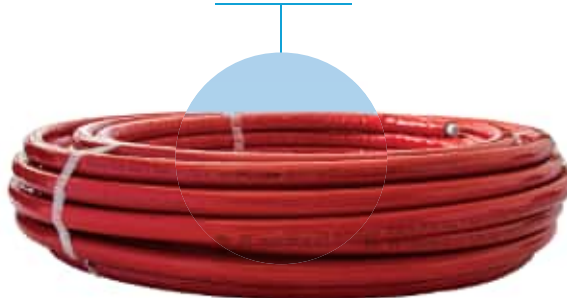
Coated pipe

GRAY COATED MULTILAYER PIPE PEXB/AL/PEXB FOR HEATING AND DOMESTIC USE



Product code	Size (mm)	Sheath thickness (mm)	Coil length (m)	Q.ty for pallet (m)	Pallet dimension (cm)
9MR02162050F	16 x 2.0	6	50	800	78 x 78 x H.230
9MR021620100F	16 x 2.0	6	100	900	78 x 78 x H.240
9MR03182050F	18 x 2.0	6	50	650	78 x 78 x H.230
9MR03202050F	20 x 2.0	9	50	500	78 x 78 x H.230
9MR02202050SF	20 x 2.0	6	50	600	78 x 78 x H.230
9MR04263050F	26 x 3.0	9	50	350	78 x 78 x H.240
9MR04263050SF	26 x 3.0	6	50	500	78 x 78 x H.240
9MR45323025F	32 x 3.0	9	25	300	100 x 100 x H.230
9MR45323025SF	32 x 3.0	6	25	350	100 x 100 x H.230

RED COATED MULTILAYER PIPE PEXB/AL/PEXB FOR HEATING AND PLUMBING



Product code	Size (mm)	Sheath thickness (mm)	Coil length (m)	Q.ty for pallet (m)	Pallet dimension (cm)
9MR02162050FR	16 x 2.0	6	50	800	78 x 78 x H.230
9MR021620100FR	16 x 2.0	6	100	900	78 x 78 x H.240
9MR03202050FR	20 x 2.0	9	50	500	78 x 78 x H.230
9MR02202050SFR	20 x 2.0	6	50	600	78 x 78 x H.230
9MR04263050FR	26 x 3.0	9	50	350	78 x 78 x H.240
9MR04263050SFR	26 x 3.0	6	50	500	78 x 78 x H.240
9MR45323025FR	32 x 3.0	9	25	300	100 x 100 x H.230
9MR45323025SF	32 x 3.0	6	25	350	100 x 100 x H.230

APE MULTILAYER PIPE

Coated pipe

BLUE COATED MULTILAYER PIPE PEXB/AL/PEXB FOR HEATING AND PLUMBING



Product code	Size (mm)	Sheath thickness (mm)	Coil length (m)	Q.ty for pallet (m)	Pallet dimension (cm)
9MR02162050FB	16 x 2.0	6	50	800	78 x 78 x H.230
9MR021620100FB	16 x 2.0	6	100	900	78 x 78 x H.240
9MR03202050FB	20 x 2.0	9	50	500	78 x 78 x H.230
9MR02202050SFB	20 x 2.0	6	50	600	78 x 78 x H.230
9MR04263050FB	26 x 3.0	9	50	350	78 x 78 x H.240
9MR04263050SFB	26 x 3.0	6	50	500	78 x 78 x H.240
9MR45323025FB	32 x 3.0	9	25	300	100 x 100 x H.230
9MR45323025SFB	32 x 3.0	6	25	350	100 x 100 x H.230

WHITE COATED MULTILAYER PIPE PEXB/AL/PEXB FOR AIR CONDITIONING

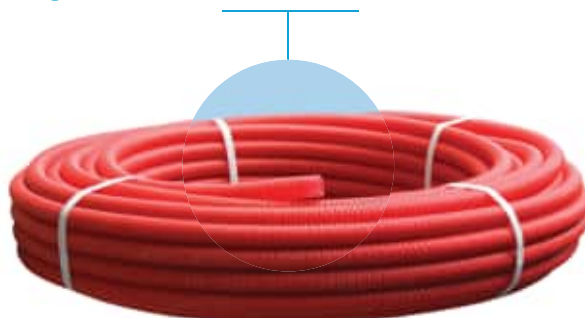


Product code	Size (mm)	Sheath thickness (mm)	Coil length (m)	Q.ty for pallet (m)	Pallet dimension (cm)
9MRC02162050F	16 x 2.0	10	50	500	78 x 78 x H.230
9MRC03202050F	20 x 2.0	13	50	400	100 x 100x H.230
9MRC04263050F	26 x 3.0	13	50	350	100 x 100 x H.230
9MRC45323025F	32 x 3.0	13	25	200	100 x 100 x H.230

APE MULTILAYER PIPE

Sheathed pipe

RED SHEATHED MULTILAYER PIPE PEXB/AL/PEXB



Product code	Size (mm)	Coil length (m)	Q.ty for pallet (m)	Pallet dimension (cm)
9CR02162050FR	16 x 2.0	50	750	78 x 78 x H.230
9CR02202050FR	20 x 2.0	50	700	78 x 78 x H.230
9CR04263050FR	26 x 3.0	50	450	100 x 100 x H.230

BLUE SHEATHED MULTILAYER PIPE PEXB/AL/PEXB



Product code	Size (mm)	Coil length (m)	Q.ty for pallet (m)	Pallet dimension (cm)
9CR02162050FB	16 x 2.0	50	750	78 x 78 x H.230
9CR02202050FB	20 x 2.0	50	700	78 x 78 x H.230
9CR04263050FB	26 x 3.0	50	450	100 x 100 x H.230

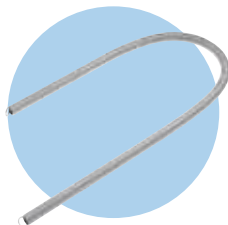
TOOLS



Product code	Description
UTM5110001	Pipecutter Ø12-63



Product code	Description
UTM5110002	Pipe shears Ø14-32



Product code	Description
UTM1010100	Pipe bending spring Ø 16
UTM1010150	Pipe bending spring Ø 18
UTM1010200	Pipe bending spring Ø 20
UTM1010300	Pipe bending spring Ø 26



Product code	Description
UTM5020100	Multilayer pipe calibrator 16x2.0
UTM5020150	Multilayer pipe calibrator 18x2.0
UTM5020200	Multilayer pipe calibrator 20x2.0
UTM5030300	Multilayer pipe calibrator 26x3.0
UTM5030400	Multilayer pipe calibrator 32x3.0
UTM5035500	Multilayer pipe reamer 40x3.5
UTM5040600	Multilayer pipe reamer 50x4.0
UTM5045700	Multilayer pipe reamer 63x4.5
UTM5150800	Multilayer pipe reamer 75x5.0
UTM5010001	Handle for calibrator
UTM5010002	Case for calibrator



Product code	Description
UTM5110003	Chamfering tool, calibrator for 4 diameters in hardened steel: Ø16x2 - Ø20x2 - Ø26x3 - Ø32x3

TECHNICAL SPECIFICATIONS

APE MULTILAYER



INTRODUCTION

Ape Raccorderie, a leading manufacturer in the Italian and foreign plumbing and heating fittings industry, produces water and gas distribution systems in its own factories. The APE RACCORDERIE system certified by major international bodies consists of both screw and press fittings and the APE MULTILAYER pipe. The entire production chain is guaranteed by the high levels of expertise and professionalism of the Ape Raccorderie quality system that ensures a high quality standard of a MADE IN ITALY product. The APE MULTILAYER pipe is suitable for conveying both technical water and water for sanitary and drinking use; it has passed all UNI EN ISO 21003 tests obtaining the following certificates: **KIWA** no. K66358 and no. K94485, **DVGW** DW-8501CN0176, DW-8501CS0266 and DW-8501CR0411, **WRAS** no. 250304017, **ATG** 3212, **AENOR** 001/007418, 001/007419, **AFNOR** no. 101160 Holder 045, **KOMO** K25301 and **DIN CERTCO** 3V370 MVR. The APE MULTILAYER pipe is built with a double inner and outer layer made of cross-linked polyethylene according to Method B (PEXb/AL/PEXb) and an aluminium alloy intermediate layer. The pipe exploits the technical characteristics of aluminium, ensuring a high level of structural mouldability and creating a complete barrier to oxygen.

Applications

The APE MULTILAYER system has a wide range of possible applications - a single pipe to meet the most diverse installation requirements. APE MULTILAYER can be used in different fields - from water field, for the adduction of water from the water mains, to thermal field, for the realisation of air conditioning and heating systems; in the sanitary field, for the realisation of cold and hot water distribution networks. The APE MULTILAYER pipe is adaptable to all application fields - domestic, industrial and tertiary sectors in general.

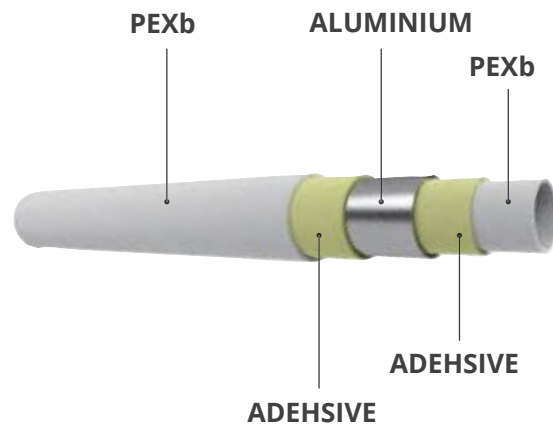
Ape Pipes product range

APE MULTILAYER boasts a wide range of products to best satisfy the requirements of any plumbing system. The MULTILAYER (PEXb/AL/PEXb) pipe is available in diameters from 16 to 75 mm. The pipe is also available in the same diameters with an insulating sleeve suitable both for heating and air conditioning, as well as in a sheathed version for the countries of northern Europe. The pipes satisfy the requirement of UNI EN ISO 21003 for conveying hot and cold potable fluids for human consumption, for radiator heating, air conditioning, radiant floor panel systems and other facilities.

>1< 001m	APE Raccorderie srl	Multilayer	PEXb/AL/PEXb	16x2	Made in Italy	Tmax=95° P=10bar		DVGW	DW-8501CN0176 DW-8501CR0411	DW-8501CS0266	
Metres	Company	System name	Materials	Dimension		Tmax / Pmax	Barcode	DVGW certification			KIWA certification

APE MULTILAYER

APE MULTILAYER (PEXb/Al/PEXb) pipe, UNI EN ISO 21003 and DIN 4726 compliant. This pipe consists of a double inner and outer layer of crosslinked polyethylene PEXb (silane method - B) bound by a special adhesive to a longitudinally welded (TIG butt welded) intermediate aluminium alloy layer. This structure is highly shapeable, provides a complete barrier to oxygen, ensures total hygiene and high corrosion resistance since fluids come in contact only with the inner PEXb layer.

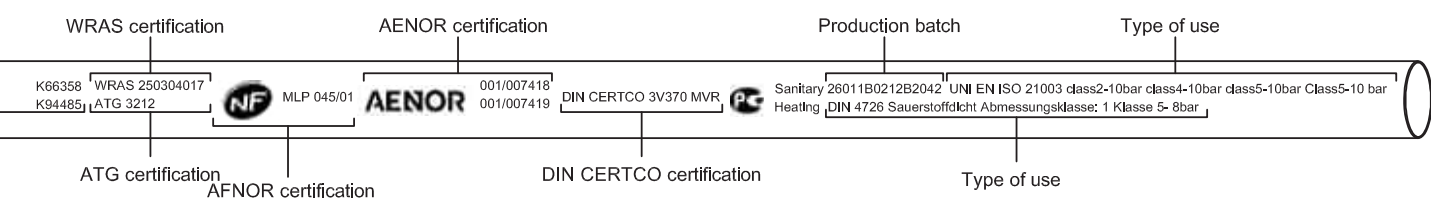


DIMENSIONAL CHARACTERISTICS COLI

Outer diameter	mm	16	18	20	26	32	40	50	63	75
Inner diameter	mm	12	14	16	20	26	33	42	54	65
Weight	g/m	94	129	143	265	343	571	727	1120	1500
Total thickness	mm	2	2	2	3	3	3,5	4	4,5	5

TECHNICAL SPECIFICATIONS

Outer diameter	mm	16	18	20	26	32	40	50	63	75
Volume of water	l/m	0,113	0,154	0,201	0,314	0,531	0,855	1,385	2,290	3,317
Internal roughness	µm	7								
Thermal conductivity at 20°C	W/ mK	0,43								
Coefficient of expansion	mm/ m°C	0,026								
Degree of crosslinking	%	> 65%								
Oxygen permeability	mg/l	0								
Colour		White								



TECHNICAL SPECIFICATIONS

APE MULTILAYER



TECHNICAL SPECIFICATIONS

Type		PEXb/Al/PEXb Multilayer pipe
Field of application		Plumbing in civil, industrial and commercial applications.
Fluid		Potable water, technical water, and water glycol (*).
Continuous use temperature	°C	95
Max peak temperature	°C	110
Maximum operating pressure at 95°C	bar	10
Maximum operating pressure at 20°C	bar	30
Duration at 95°C and 10 bar	years	50
Storage		Avoid prolonged exposure to direct sunlight
Minimum bend radius		5 times the diameter

(*) In the case of water glycol, in order to define the minimum operating temperature, it is necessary to know the elements of the mixture and the various concentrations, never exceed the value of 30%

THERMAL CONDUCTIVITY OF HOT WATER PIPE (UNI EN 1264)

Materials	Thermal conductivity (a 40°C) (W/(mK))	Oxygen permeability (mg/l)
PEX pipe	0,35	<0,1
multilayer pipe	0,43	=0
PP pipe	0,22	<0,3
PB pipe	0,22	<0,3
steel pipe	52	=0
copper pipe	390	=0



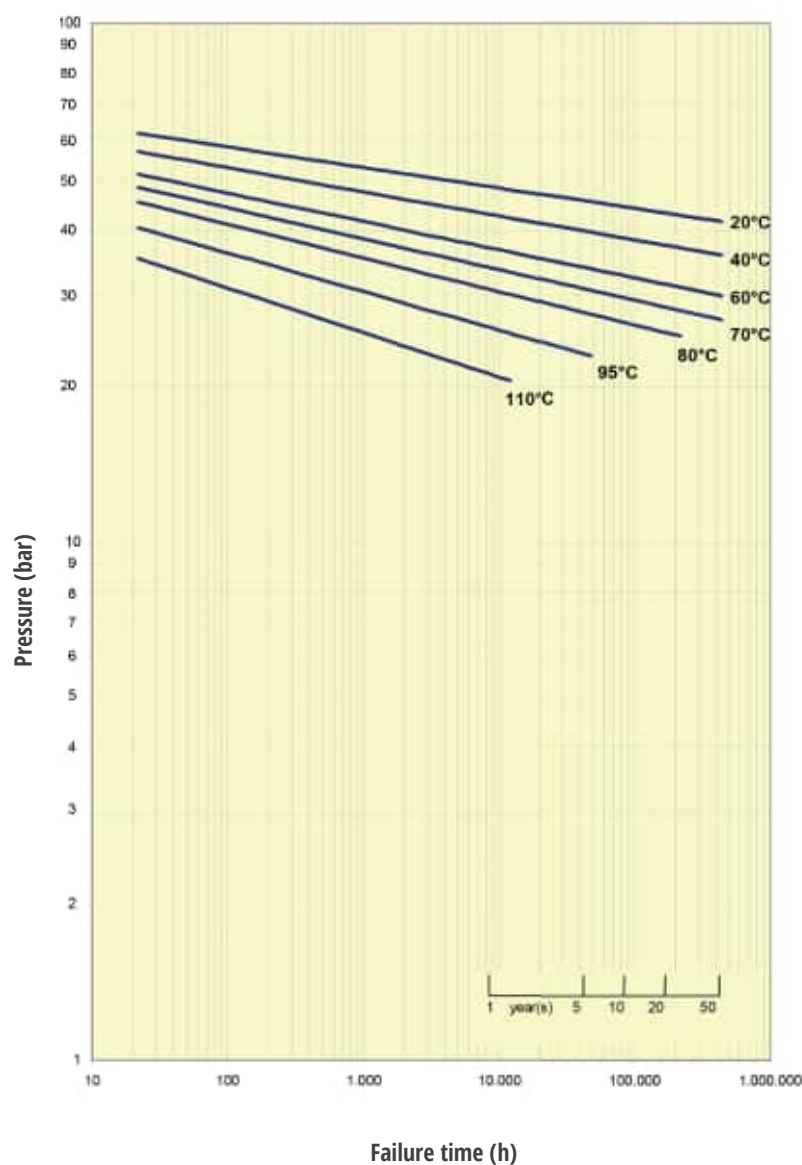
CLASSIFICATION OF SERVICE CONDITIONS UNI - EN ISO 21003

Application class	Design temperature T_d [°C]	Time b at T_d [years]	T_{max} [°C]	Time at T_{max} [years]	T_{mal} [°C]	Time at T_{mal} [h]	Typical field of application
1	60	49	80	1	95	100	Hot water supply (60°C)
2	70	49	80	1	95	100	Hot water supply (70°C)
4 (*)	20 + 40 + 60	2,5 20 25	70	2,5	100	100	Underfloor heating and low-temperature radiators
5 (**)	20 + 60 + 80	14 25 10	90	1	100	100	High-temperature radiators

(*) A country may select either class 1 or 2 in conformity with its national regulations.

(**) Where more than one design temperature for time and associated temperature appears for any class, they should be aggregated.

REGRESSION CURVES DIAMETER 16X2



TECHNICAL SPECIFICATIONS

APE MULTILAYER



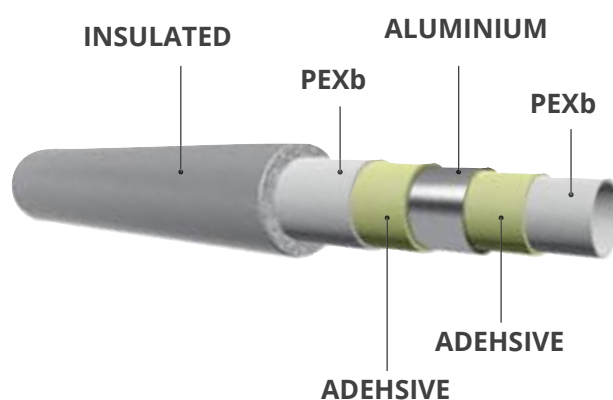
INSULATED MULTILAYER

for heating and plumbing / air conditioning

APE MULTILAYER (PEXb/Al/PEXb) is an insulated multilayer pipe for heating and cooling applications. This pipe consists of a double inner and outer layer of crosslinked polyethylene PEXb (silane method - B) bound by a special adhesive to a longitudinally welded (TIG butt welded) intermediate aluminium alloy layer and a closed cell polyethylene foam insulating sheath (PE-LD) protected by a scratch resistant PE-LD layer. The pipe is highly shapeable, provides a complete barrier to oxygen, ensures total hygiene and high corrosion resistance since fluids come in contact only with the inner PEXb layer.

Sheath thermal conductivity at 40°C: 0.04 W/mK. The thickness of the pipe insulating layers are compliant with D.P.R. no. 412 1993. The insulated pipe complies with the Ministerial Decree of 5 March 2005, as subsequently amended and supplemented.

Reaction to fire Class B_L-s1, d0.



DIMENSIONAL CHARACTERISTICS

Outer Diameter	mm	16	18	20	20	26	32
Sheath thickness for heating	mm	6	6	6	9	9	9
Diameter pipe + sheath (heating)	mm	28	30	32	38	44	50
Sheath thickness for cooling	mm	10	10	13	13	13	13
Diameter pipe + sheath (cooling)	mm	36	38	46	46	52	58

TECHNICAL SPECIFICATIONS

Outer Diameter	mm	16	18	20	26	32
Volume of water	l/m	0,113	0,154	0,201	0,314	0,531
Internal roughness	µm	7				
Sheath thermal conductivity at 40°C	W/mK	0,0397				
Sheath density	kg/m ³	35 to 45				
Degree of crosslinking	%	> 65%				
Oxygen permeability	mg/l	0				

Colour

Gray for heating; red and blue for domestic use;
white for cooling

TECHNICAL SPECIFICATIONS

Pipe material		PEXb/Al/PEXb Multilayer pipe
Sheath material		closed-cell polyethylene foam PE-LD
Scratch-resistant finish layer		closed-cell polyethylene foam PE-LD
Field of application		Plumbing in civil, industrial and commercial applications.
Fluid		Potable water, technical water, and water glycol (*).
Continuous use temperature	°C	95
Max. peak temperature	°C	110
Maximum operating pressure at 95°C	bar	10
Maximum operating pressure at 20°C	bar	30
Duration at 95°C and 10 bar	years	50
Resistance to diffusion of water vapour	μ	5482
Reaction to fire Class		B _L -s1, d0
Presence of HCFC - CFC		No
Storage		Avoid prolonged exposure to direct sunlight
Minimum bend radius (**)		5 times the diameter

(*) In the case of water glycol, in order to define the minimum operating temperature, it is necessary to know the elements of the mixture and the various concentrations, never exceed the value of 30%

(**) Take the thickness of the sheath into account when bending a pipe with a bender.

TECHNICAL SPECIFICATIONS

APE MULTILAYER



CALCULATION OF INSULATION THICKNESS OF DISTRIBUTION NETWORKS ACCORDING TO ITALIAN PRESIDENTIAL DECREE DPR 412/93.

Sheath thermal conductivity		Outer Diameter (mm)					
W/m	°C	<20	da 20 a 39	da 40 a 59	da 60 a 79	da 80 a 99	>100
0,030		13	19	26	33	37	40
0,032		14	21	29	36	40	44
0,034		15	23	31	39	44	48
0,036		17	25	34	43	47	52
0,038		18	28	37	46	51	56
0,040		20	30	40	50	55	60
0,042		22	32	43	54	59	64
0,044		24	35	46	58	63	69
0,046		26	38	50	62	68	74
0,048		28	41	54	66	72	79
0,050		30	44	58	71	77	84

Ape Multilayer

NOTES:

Vertical pipe lines must be placed inside the building and the minimum insulation thickness values given in the table, **are to be multiplied by 0.5.**

For pipes running within structures that do not face outdoors or unheated rooms, the thickness values given in the table, **are to be multiplied by 0.3.**

CASE A: Pipes running in unheated spaces

λ (Ape Multilayer insulation) = 0.040

Ø26 Pipe -> minimum insulation thickness 30 mm

CASE B: Pipes running in external walls

λ (Ape Multilayer insulation) = 0.040

Ø26 Pipe -> minimum insulation thickness 30 mm x 0.5 = 15 mm

CASE C: Pipes running in heated spaces

λ (Ape Multilayer insulation) = 0.040

Ø26 Pipe -> minimum insulation thickness 30 mm x 0.3 = 9 mm

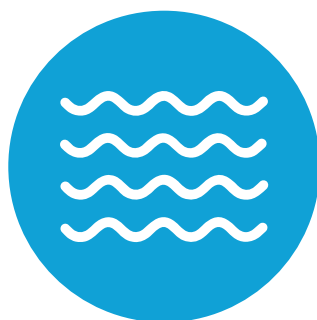
CARATTERISTICHE

APE MULTILAYER



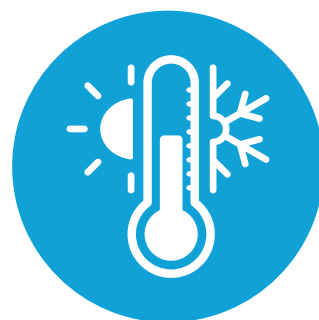
CONSTANT DIAMETER

The section of the curve remains constant even with broad variation in the radius of curvature: if bent, the pipe remains shaped thanks to the aluminium core.



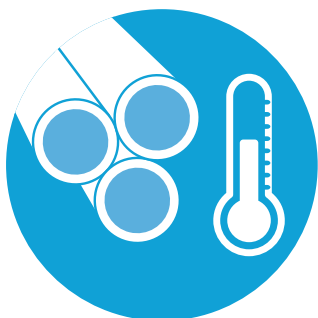
FLOW

The head loss is very limited thanks to the minimal roughness of the internal layer. Moreover PEXb does not allow the formation of mineral deposits or rust.



LOW CONDUCTIVITY

The heat conductivity of the pipe is very low (0.43 W/m.K) and its dispersion is approximately 1/1000 of that of copper.



THERMAL EXPANSION

The thermal expansion (0.026 mm/m°C) is comparable to that of metal pipe.



LOW INFLAMMABILITY

The middle metal layer renders the tube not very inflammable and, in the event of smoke, density and emissions are not noxious.



HIGH INNER RESISTANCE

The PE-X inner layer is corrosion and mineral deposit proof, and it does not allow rust particles, mineral scales or flaking resulting from galvanic corrosion to attach. PE-X is particularly resistant to abrasion.



LIGHTNESS

The specific weights of the materials used are very low and give the MULTYLAYER pipe impressive lightness.



HIGH SOUND ABSORPTION

The internal and external coating of PE-X pipes renders them highly sound absorbing with respect to traditional metal pipes.



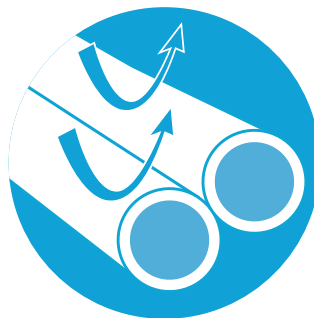
LONG DURATION

The materials, if used correctly (pressure up to 10 bar, temperature 0-95°C) ensure a lifespan of more than 50 years.



HYGIENE

The materials used for the pipes and fittings are non-toxic and highly indicated for potable water conduction systems.



RESISTANCE TO EXTERNAL AGENTS

The aluminium middle layer prevents the passage of gaseous molecules, the risk of corrosion from oxygen infiltration and damage due to UV ray exposure.

PRODUCTION AND QUALITY CONTROL

DIAGRAM OF PRODUCTION LINE



1ST EXTRUDER
equipped with
gravimetric control
system (inner layer
formation)



1ST COOLING TANKS

HEATING UNIT

6

inner layer
thickness check

inner layer external
diameter check

PULLING UNIT

inner pipe

DIVERTER



**BRACCIO
DI CARICO**

3

tape welder

aluminium

5

**ALUMINIUM
BUER UNIT**

4

TAPE UNROLLER

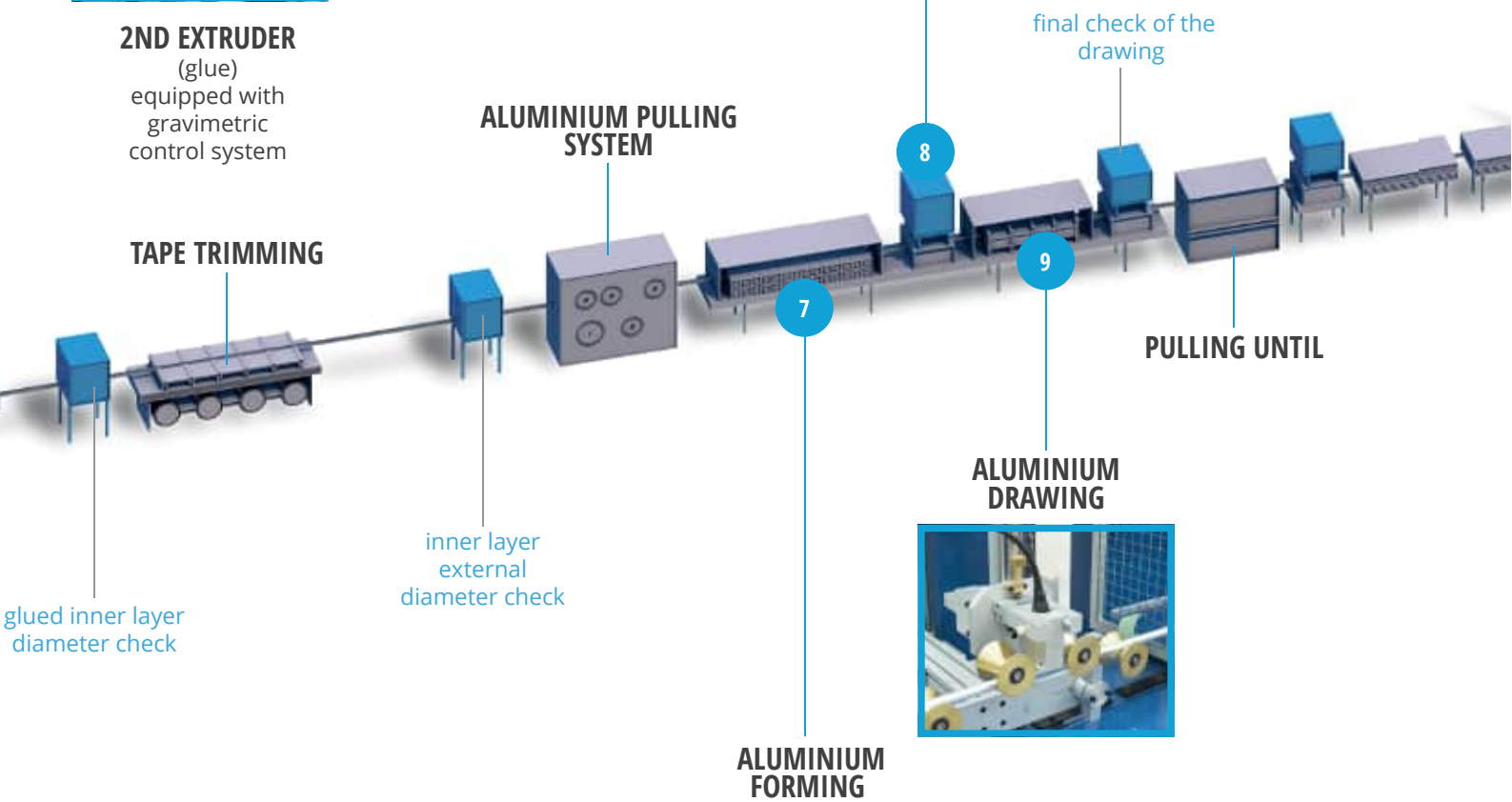




2ND EXTRUDER
(glue)
equipped with
gravimetric
control system

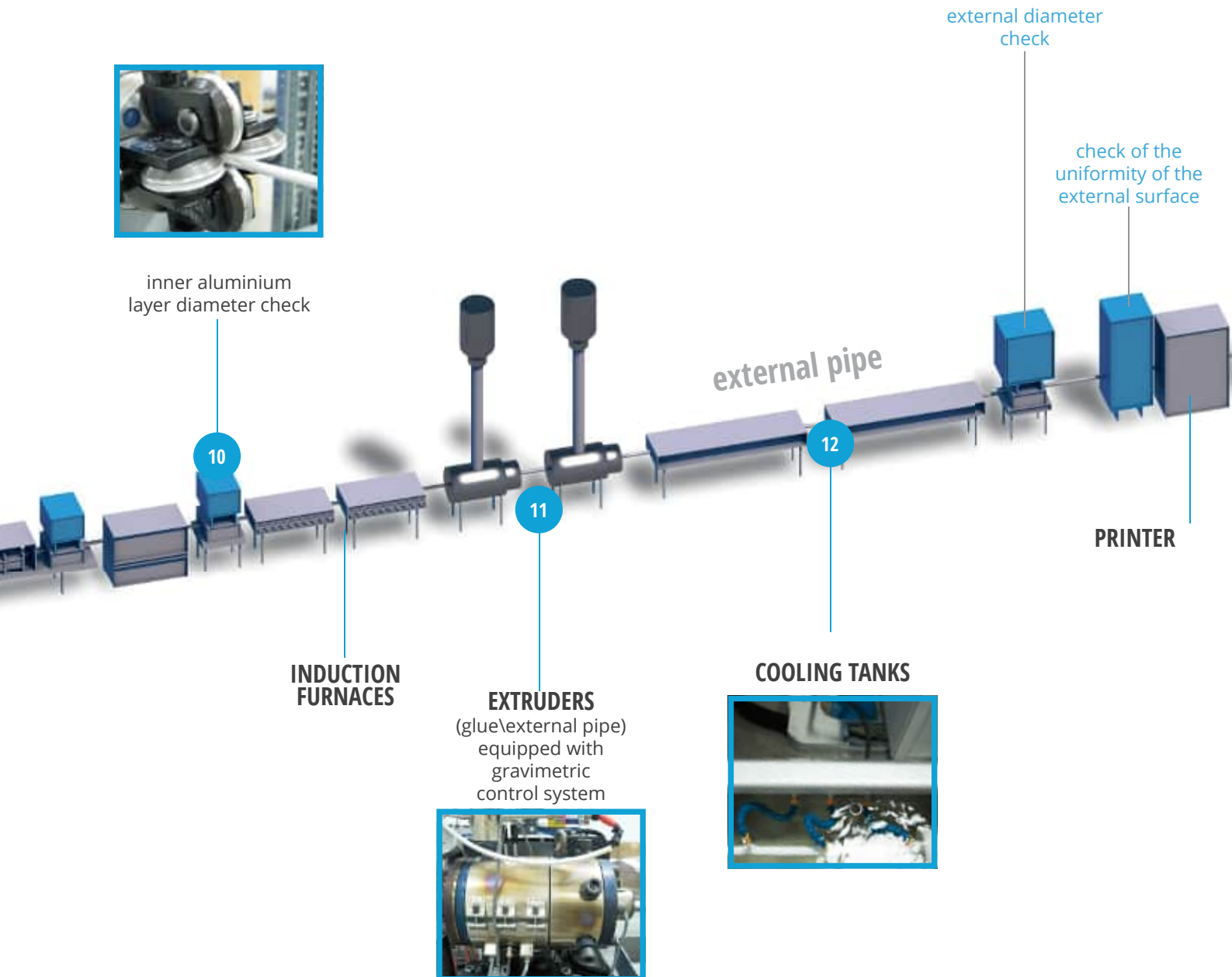


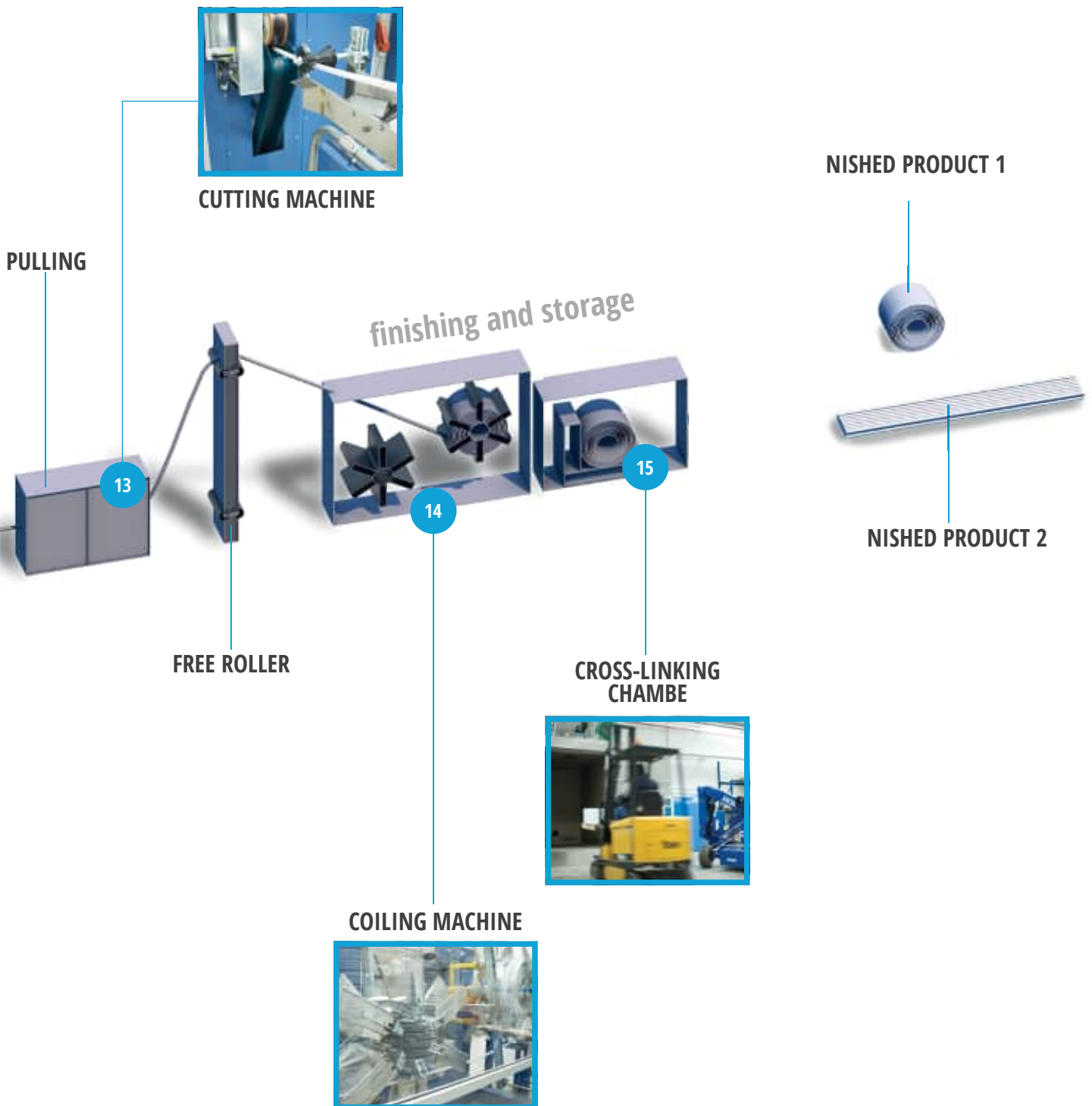
**ALUMINIUM
WELDING UNIT**
check of parameters and
visual verification of the
same with telecameras



PRODUCTION AND QUALITY CONTROL

DIAGRAM OF PRODUCTION LINE









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