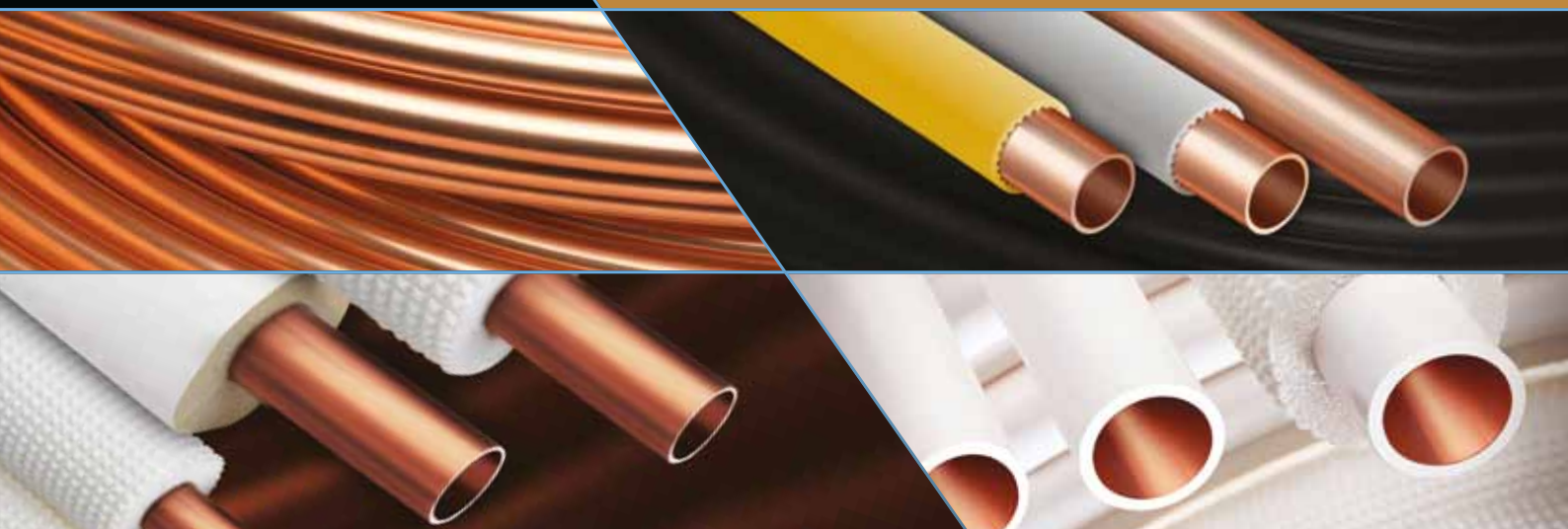


HALCOR

BUILDING INSTALLATIONS



HALCOR

HALCOR is a leading Group of companies that specializes in the production, processing and marketing of copper, copper alloys and zinc products. It has a dynamic commercial presence in the European and global markets. For more than 75 years, HALCOR has been offering innovative and added-value solutions that meet contemporary client demands in fields such as plumbing, HVAC&R, architecture, automotive, naval construction and engineering, telecommunications, industrial production.

HALCOR is a Group of nineteen companies, based in Greece, Bulgaria, Cyprus, France, Germany, Italy, Romania and the United Kingdom, operating nine production plants in Greece, Bulgaria and Romania. The Group develops and distributes a wide range of products, including copper and copper-alloy rolled and extruded products and cables with HALCOR being the sole producer of copper tubes in Greece.

High quality in production is achieved through strict controls applied throughout the production process. With a consistent quality focus, the company implements an ISO 9001:2008 Certified Quality Management System and utilizes high technologies and employs expert staff.

As a result of the Group's strategic investments in research and development, HALCOR is recognized as one of the leading copper producers globally, setting new standards in copper processing. The company maintains a consistent focus on quality and environmental protection, and a strong commitment to the principles of sustainable development. In this context, all production facilities in the Group's plants utilize advanced technologies to bring in the market innovative products that are energy efficient and environmentally friendly.



INDEX

page

05

TALOS®
COPPER TUBES

page

10

TALOS®
COPPER TUBES
Fire Extinguishing
Networks

page

12

TALOS MED™
COPPER TUBES

page

14

TALOS® PLASTIC
COATED
COPPER TUBES

page

16

TALOS GAS™
COPPER TUBES

page

18

TALOS
ECUTHERM™
COPPER TUBES

page

22

TALOS ACR
ECUTHERM 2™
COPPER TUBES

page

24

CUSMART®
COPPER TUBES

page

30

TALOS
ECUTHERM™
SOLAR
COPPER TUBES

page

32

TALOS
GEOTHERM™
COPPER TUBES



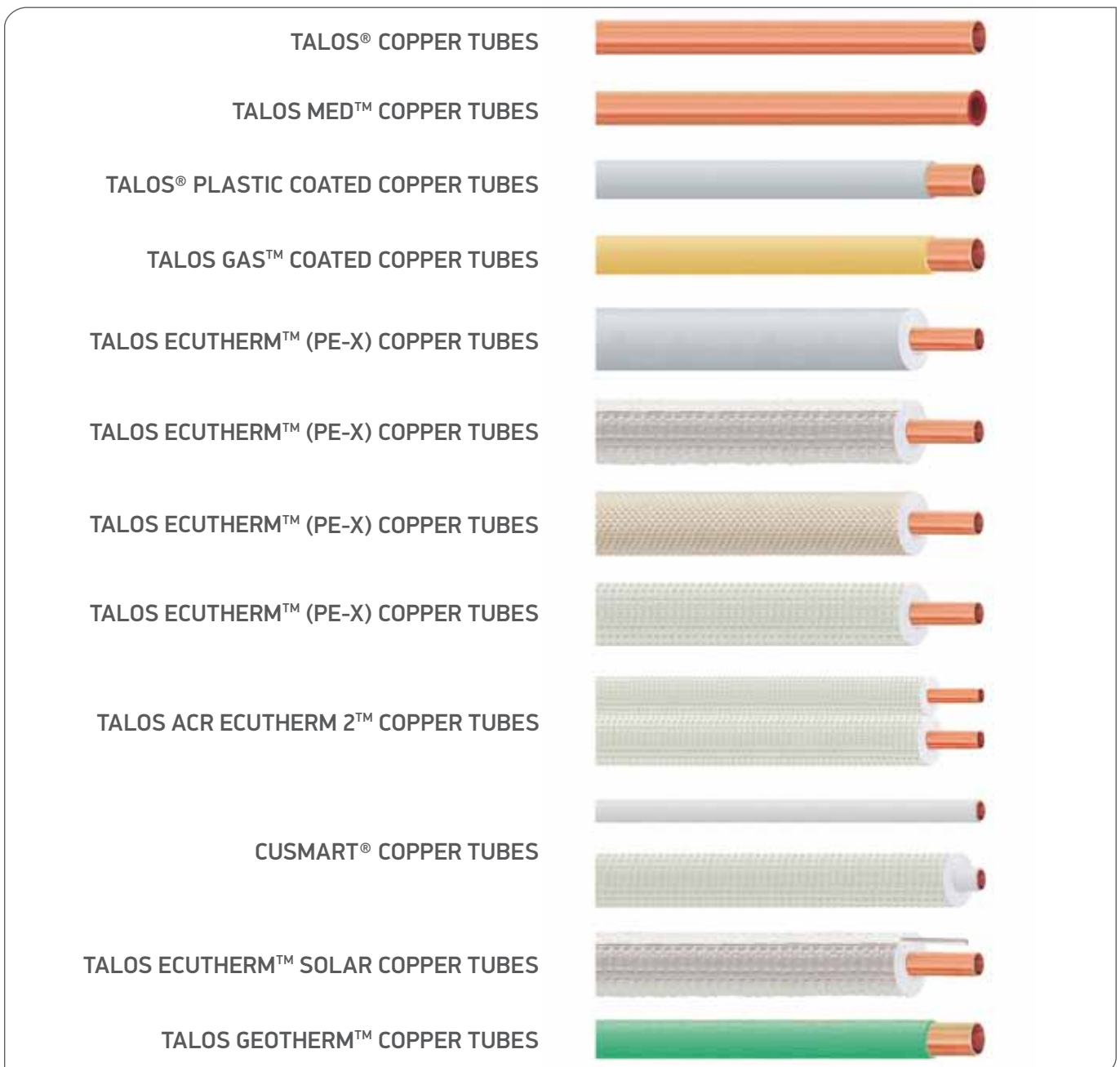
Versatility with the Dependability of Copper

TALOS® copper tubes, with their high quality of manufacturing provide:

- Long lifetime
- Resistance to pressure, temperature and fire
- Low thermal expansion and enhanced shape stability
- Complete impermeability
- Potable water hygiene
- Style and space saving
- Cost-effectiveness

TALOS® copper tubes are widely used in a variety of construction installations, such as potable water and hot water supply, central heating, natural gas, air conditioning, fire extinguishing networks, medical gas networks, etc.

They are manufactured according to harmonised European standards such as EN 1057 and EN 13349 for coated pipes for sanitary and gas applications, EN 12735 for air conditioning systems, EN 13348 for medical applications, etc.



- WATER SUPPLY
- HEATING
- NATURAL GAS
- COOLING

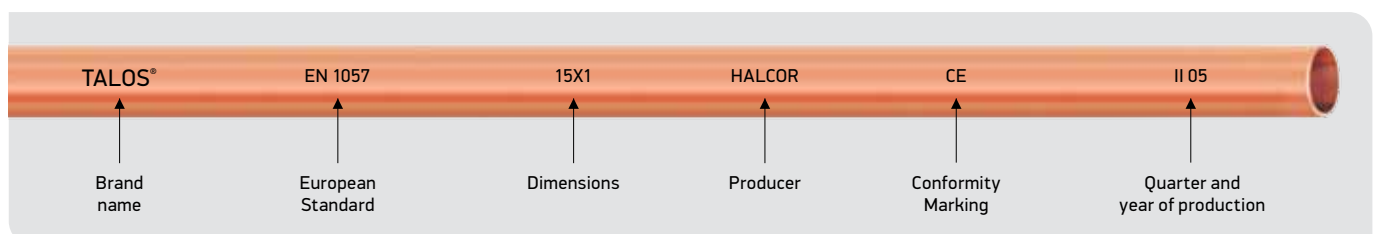
TALOS® Tubes Advantages

- TALOS® copper tubes are easy to install with cost-effectiveness and provide safe and secure operation.
- TALOS® copper tubes are resistant to high operating pressures and temperatures.
- TALOS® copper tubes are completely air- and water-tight and retain their physical and mechanical properties unchanged over time.
- They are stable and self-supporting.
- TALOS® copper tubes are covered by a 30-year manufacturer's warranty.

TALOS® Half Hard Copper Tubes Special Advantages

- Ease cold bending
- Reduction of necessary fittings
- Easier construction of networks
- Faster installation and higher workmanship
- Overall lower installation costs

Minimum Marking



Material

Copper phosphorus deoxidised (DHP-Cu) with min. copper content 99,90% and P=0,015% - 0,040%.

Specifications

EN 1057

Quality Marks

BSI, AFNOR, NSAI, AENOR, RAL / DVGW, KIWA / GASTEC-QA, SITAC, STF VTT, GOST, VIK.

Mechanical Properties

Temper	EN 1057 Classification	Minimum Tensile strength N/mm ²	Minimum elongation A%
Soft	R-220	220	40
Half hard	R-250	250	20 or 30*
Hard	R-290	290	3

* depending on the dimension

Standard Dimensions**STRAIGHT HALF HARD**

Diameter x thickness d x s (mm)	Internal diameter (mm)	Nominal copper weight (kg/m)	External surface area (m ² /m)	Filling volume (l/m)	Packing		Maximum allowed operating pressure bar
					Straight lengths	Pieces per bundle	
10 x 0,70	8,6	0,182	0,031	0,058	3m	900	87
10 x 1,00	8,0	0,252	0,031	0,050	4m	250	129
12 x 0,70	10,6	0,221	0,038	0,088	3m	800	72
12 x 1,00	10,0	0,308	0,038	0,079	4m	400	105
15 x 0,70	13,6	0,280	0,047	0,145	3m	600	57
15 x 0,80	13,4	0,318	0,047	0,141	3m	600	65
15 x 1,00	13,0	0,391	0,047	0,133	4m	600	83
18 x 0,80	16,4	0,384	0,057	0,211	3m	450	54
18 x 1,00	16,0	0,475	0,057	0,201	4m	450	68
22 x 0,80	20,4	0,474	0,069	0,327	3m	300	44
22 x 1,00	20,0	0,587	0,069	0,314	4m	300	55
22 x 1,50	19,0	0,860	0,069	0,284	4m	80	85
28 x 0,90	26,2	0,682	0,088	0,539	3m	200	39
28 x 1,00	26,0	0,755	0,088	0,531	4m	200	43
28 x 1,50	25,0	1,111	0,088	0,491	4m	100	66
35 x 1,20	32,6	1,134	0,110	0,835	3m	100	41
35 x 1,50	32,0	1,405	0,110	0,804	4m	50	52
42 x 1,20	39,6	1,369	0,132	1,232	3m	90	34
42 x 1,50	39,0	1,699	0,132	1,195	4m	90	43
54 x 1,20	51,6	1,772	0,170	2,091	3m	60	26
54 x 2,00	50,0	2,908	0,170	1,963	4m	30	45
66,7 x 1,20	64,3	2,198	0,210	3,247	3m	25	21
66,7 x 2,00	62,7	3,618	0,210	3,088	3m	25	36
76,1 x 1,50	73,1	3,129	0,239	4,197	3m	20	23
76,1 x 2,00	72,1	4,44	0,239	4,083	3m	20	31



Standard Dimensions

STRAIGHT HARD

Diameter x thickness d x s (mm)	Internal diameter (mm)	Nominal copper weight (kg/m)	External surface area (m ² /m)	Filling volume (l/m)	Packing		Maximum allowed operating pressure bar
					Straight lengths	Pieces per bundle	
10 x 0,80	8,4	0,206	0,031	0,055	5m	500	101
10 x 1,00	8,0	0,252	0,031	0,050	5m	400	129
12 x 0,80	10,4	0,251	0,038	0,085	5m	400	83
12 x 1,00	10,0	0,308	0,038	0,079	5m	300	105
14 x 0,80	12,4	0,295	0,044	0,121	5m	300	70
14 x 1,00	12,0	0,363	0,044	0,113	5m	300	89
15 x 0,80	13,4	0,318	0,047	0,141	5m	300	65
15 x 1,00	13,0	0,391	0,047	0,133	3m & 5m	260	83
16 x 1,00	14,0	0,419	0,050	0,154	5m	240	77
18 x 0,80	16,4	0,385	0,057	0,211	3m	450	54
18 x 1,00	16,0	0,475	0,057	0,201	5m	200	68
22 x 0,90	20,2	0,531	0,069	0,320	5m	200	49
22 x 1,00	20,0	0,587	0,069	0,314	5m	150	55
28 x 0,90	26,2	0,682	0,088	0,539	3m	200	39
28 x 1,00	26,0	0,755	0,088	0,531	4m	200	43
28 x 1,50	25,0	1,111	0,088	0,491	4m	60	66
35 x 1,00	33,0	0,950	0,110	0,855	3m	100	34
35 x 1,50	32,0	1,405	0,110	0,804	4m	50	52
35 x 2,00	31,0	1,844	0,110	0,755	4m	50	70
42 x 1,00	40,0	1,146	0,132	1,257	3m	90	28
42 x 1,20	39,6	1,368	0,132	1,232	3m & 4m	90	34
42 x 1,50	39,0	1,700	0,132	1,195	4m	40	43
54 x 1,00	52,0	1,484	0,170	2,124	3m	60	22
54 x 1,20	51,6	1,771	0,170	2,091	3m & 4m	60	26
54 x 1,50	51,0	2,202	0,170	2,043	4m	60	33
54 x 2,00	50,0	2,908	0,170	1,963	4m	30	45
64 x 2,00	60,0	3,467	0,201	2,827	3m	25	37
66,7 x 1,20	64,3	2,198	0,210	3,247	5,8m	25	21
66,7 x 2,00	62,7	3,618	0,210	3,088	3m	25	36
76,1 x 1,50	73,1	3,129	0,239	4,197	5m	20	23
76,1 x 2,00	72,1	4,144	0,239	4,083	3m	20	31
88,9 x 2,00	84,9	4,859	0,279	5,661	4m	15	27
108 x 2,00	104,0	5,928	0,339	8,495	5m	10	22
108 x 2,50	103,0	7,375	0,339	8,332	4m	10	27



Standard Dimensions**SOFT COILS**

Diameter x thickness d x s (mm)	Internal diameter (mm)	Nominal copper weight (kg/m)	External surface area (m ² /m)	Filling volume (l/m)	Packing		Maximum allowed operating pressure bar		
					Straight lengths	Pieces per bundle			
6 x 1,00	4,0	0,140	0,019	0,013	Coils (m) long	Coils per pallet	232		
8 x 0,60	6,8	0,124	0,025	0,036			50	28	94
8 x 1,0	6,0	0,196	0,025	0,028			50	28	166
10 x 0,70	8,6	0,182	0,031	0,058			50	24	87
10 x 1,00	8,0	0,252	0,031	0,050			50	24	129
12 x 1,00	10,0	0,308	0,038	0,079			50	20	105
14 x 1,00	12,0	0,363	0,044	0,113			50	14	89
15 x 1,00	13,0	0,391	0,047	0,133			50	30	83
15 x 1,50	12,0	0,566	0,047	0,113			50	14	129
16 x 1,00	14,0	0,419	0,050	0,154			50	12	77
18 x 1,00	16,0	0,475	0,057	0,201			25	40	68
22 x 1,00	20,0	0,587	0,069	0,314			25	30	55
22 x 1,50	19,0	0,860	0,069	0,284			25	31	85
28 x 1,50	25,0	1,111	0,088	0,491			25	12	66

Non-standard dimensions are manufactured upon request.



• FIRE
EXTINGUISHING
NETWORKS



Maximum Fire protection and Safety

TALOS® copper tubes are the fastest and most cost-effective choice, for the construction of permanent fire extinguishing water supply networks and automatic sprinkler systems. TALOS® copper tubes for fire extinguishing networks, provide substantial advantages:

- Smooth surface with minimal pressure loss due to low friction, resulting in smaller tube sizes for specific water supply requirements.
- Various options in joining methods
- Easy to transport, install and support, even in limited spaces.
- High thermal conductivity that ensures prevention of extreme temperature peaks.
- Completely air and water tight and practically maintenance free.
- Excellent corrosion resistance, compared to other metals
- Extreme temperature resistance (copper melting point 1083°C)
- Fully recyclable

TALOS® copper tubes are the ideal material for the construction of fire extinguishing installations in different areas, such as: Hospitals, Factories, Warehouses, Schools, Museums, Restaurants, Hotels, Sports facilities, Offices, Shops, Car Parks, Houses. TALOS® copper tubes are covered by a 30-year manufacturer's warranty.

Material

Copper phosphorus deoxidised (minimum copper content 99,90%, phosphorus concentration P=0,015% - 0,04%, classified as CW024A, or Cu-DHP, according to the European alloy coding system.

Specifications

EN 1057

TALOS® copper tubes comply fully with the EN 1057 standard for water supply and permanent fire extinguishing networks.

Quality Marks

BSI, AFNOR, NSAI, AENOR, RAL / DVGW, KIWA / GASTEC-QA, SITAC, STF VTT, GOST, VIK.

Mechanical Properties

Temper	EN 1057 Classification	Minimum Tensile strength N/mm ²	Minimum elongation A%
Soft	R-220	220	40
Half hard	R-250	250	20 or 30*
Hard	R-290	290	3

* depending on the dimensions

Standard Dimensions

Diameter x thickness d x s (mm)	Internal diameter (mm)	Nominal copper weight (kg/m)	External surface area (m ² /m)	Filling volume (l/m)	Packing	
					Type	Pieces per bundle
15 x 1,00	13,0	0,391	0,047	0,133	Straight lengths of 4m	600
18 x 1,00	16,0	0,475	0,057	0,201		450
22 x 1,00	20,0	0,587	0,069	0,314		300
28 x 1,00	26,0	0,755	0,088	0,531		200
35 x 1,50	32,0	1,405	0,110	0,804		50
42 x 1,50	39,0	1,699	0,132	1,195		40
54 x 1,50	51,0	2,202	0,170	2,043		60
54 x 2,00	50,0	2,908	0,170	1,963		30
64 x 2,00	60,0	3,467	0,201	2,827		25
66,7 x 2,00	62,7	3,618	0,210	3,088		25
76,1 x 2,00	72,1	4,144	0,239	4,083		20
88,9 x 2,00	84,9	4,859	0,279	5,661		15
108 x 2,50	103,0	7,375	0,339	8,332		10



- MEDICAL GAS DISTRIBUTION NETWORKS



Cleanliness and Resistance

In the sensitive healthcare areas and installations, it is imperative to use materials that safeguard cleanliness, neat appearance and durability. TALOS MED[™] copper tubes, can withstand high operating pressures with unlimited durability, thanks to the natural strength of copper, hence they are the ideal choice for the construction of medical gases distribution networks. TALOS MED[™] copper tubes are manufactured according to the requirements of standard EN 13348. They are supplied with end caps to prevent contamination by foreign matter intrusion during storage or transportation.

Material

Copper phosphorus deoxidised (DHP-Cu) with minimum copper content 99,90% and P= 0,015% - 0,040%.

Specifications

EN 13348

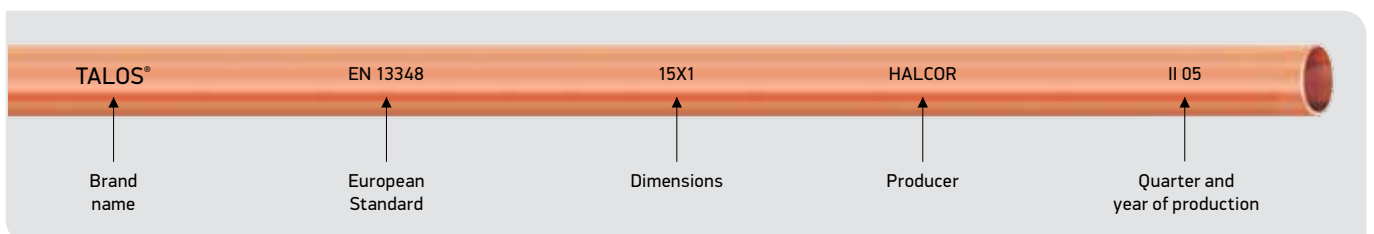
Quality Marks

BSI.

Mechanical Properties

Temper	EN 13348 Classification	Minimum Tensile strength N/mm ²	Minimum elongation A%
Soft	R-220	220	40
Half Hard	R-250	250	30
Hard	R-290	290	3

Minimum Marking



Standard Dimensions

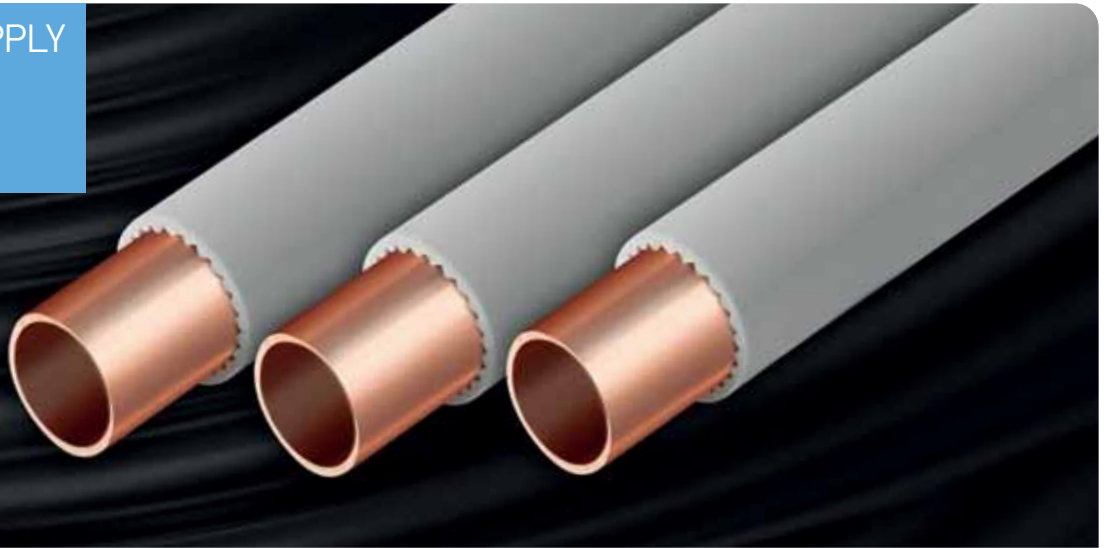
Diameter x thickness d x s (mm)	Internal diameter (mm)	Nominal copper weight (kg/m)	External surface area (m ² /m)	Filling volume (l/m)	Packing
6 x 1,00	4,0	0,140	0,019	0,013	Straight lengths of 5m
8 x 1,00	6,0	0,196	0,025	0,028	
10 x 1,00	8,0	0,252	0,031	0,050	
12 x 1,00	10,0	0,308	0,038	0,079	
15 x 1,00	13,0	0,391	0,047	0,133	
18 x 1,00	16,0	0,475	0,057	0,201	
22 x 1,00	20,0	0,587	0,069	0,314	
28 x 1,00	26,0	0,755	0,088	0,531	
35 x 1,50	32,0	1,405	0,110	0,804	
42 x 1,50	39,0	1,700	0,132	1,195	
54 x 2,00	50,0	2,908	0,170	1,963	
64 x 2,00	60,0	3,476	0,201	2,827	
66,7 x 2,00	62,7	3,618	0,210	3,088	
76,1 x 2,00	72,1	4,144	0,239	4,083	
88,9 x 2,00	84,9	4,857	0,279	5,661	
108 x 2,50	103,0	7,375	0,339	8,332	



PLASTIC COATED COPPER TUBES

TALOS®

- WATER SUPPLY
- HEATING
- COOLING



Material

Copper phosphorus deoxidised (DHP-Cu) with min. copper content 99,90% and P=0,015% - 0,040%.

Specifications

Copper Tube: EN 13349, EN 1057
Plastic Sheathing: Classified as Class E according to EN 13501-1 fire resistance classification system.

Quality Marks

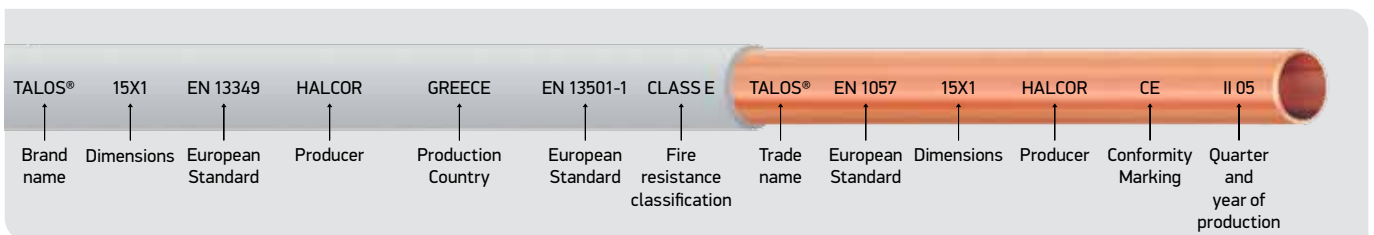
Copper tube: AFNOR, RAL / DVGW, BSI, AENOR, NSAI, DVGW, KIWA / GASTEC-QA, SITAC, STF VTT, GOST VIK.

Mechanical Properties

Temper	EN 1057 Classification	Minimum Tensile strength N/mm ²	Minimum elongation A%
Soft	R-220	220	40
Half hard	R-250	250	20 or 30*
Hard	R-290	290	3

* Depending on the dimension.

Minimum Marking



Standard Dimensions**SOFT COILS**

Copper tube ext. diam. x thickness dxs (mm)	Overall ext. diameter D (mm)	Tube filling volume (l/m)	Nominal copper weight (kg/m)	Thermal* capacity (Kcal/h)	Min. bending radius manually (mm)	Min. bending radius with bending tool (mm)	Packing in coils (m) long
12 x 1,00	16	0,079	0,308	4.400	100	-	25 or 50
15 x 1,00	19	0,133	0,391	7.500	120	-	
16 x 1,00	20	0,154	0,420	8.700	130	-	
18 x 1,00	23	0,200	0,475	11.300	145	-	25
22 x 1,00	27	0,315	0,537	17.700	175	-	25 or 50 25
15 x 0,80	19	0,141	0,318	8.000	125	-	
18 x 0,80	23	0,211	0,385	11.900	150	-	

STRAIGHT HARD

15 x 1,00	19	0,133	0,391	7.600	-	55	Straight lengths of 4m
16 x 1,00	20	0,154	0,420	8.600	-	60	
18 x 1,00	23	0,191	0,563	11.200	-	70	
22 x 1,00	27	0,314	0,587	17.400	-	80	

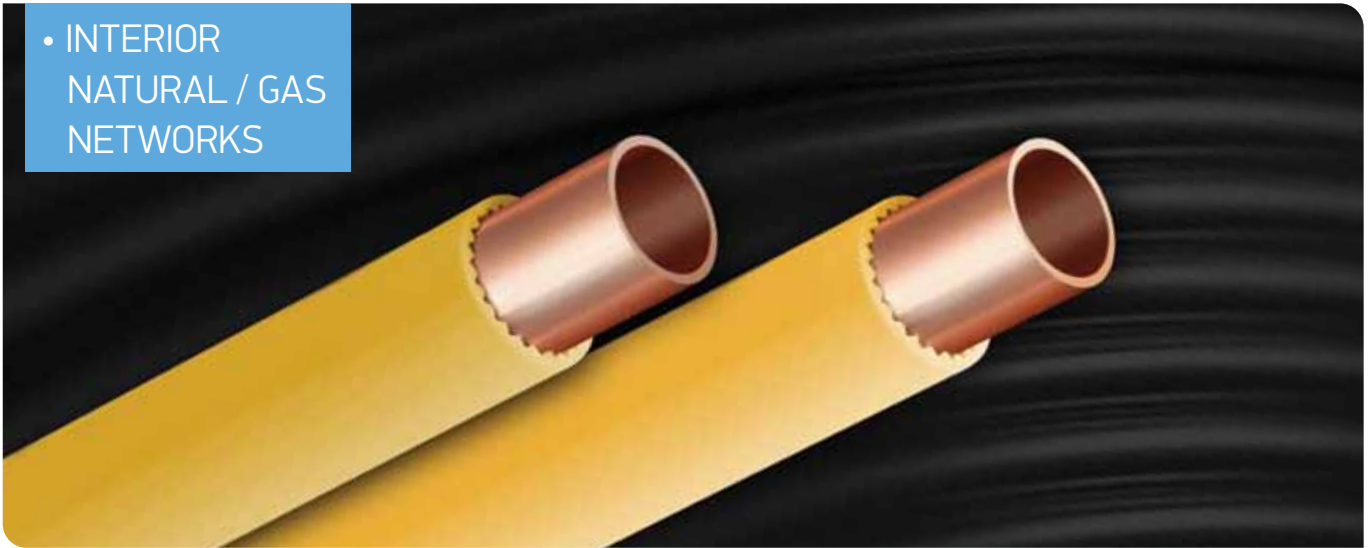
* For a temperature drop of 20°C and a flow rate of 0,8 m/sec.



PLASTIC COATED COPPER TUBES



- INTERIOR NATURAL / GAS NETWORKS



Material

Copper phosphorus deoxidised (DHP-Cu) with min. copper content 99,90% and P=0,015% - 0,040%.

Quality Marks

Copper tube: AFNOR, RAL, BSI, AENOR, NSAI, SITAC, STF VTT, KIWA / GASTEC-QA, GOST VIK.

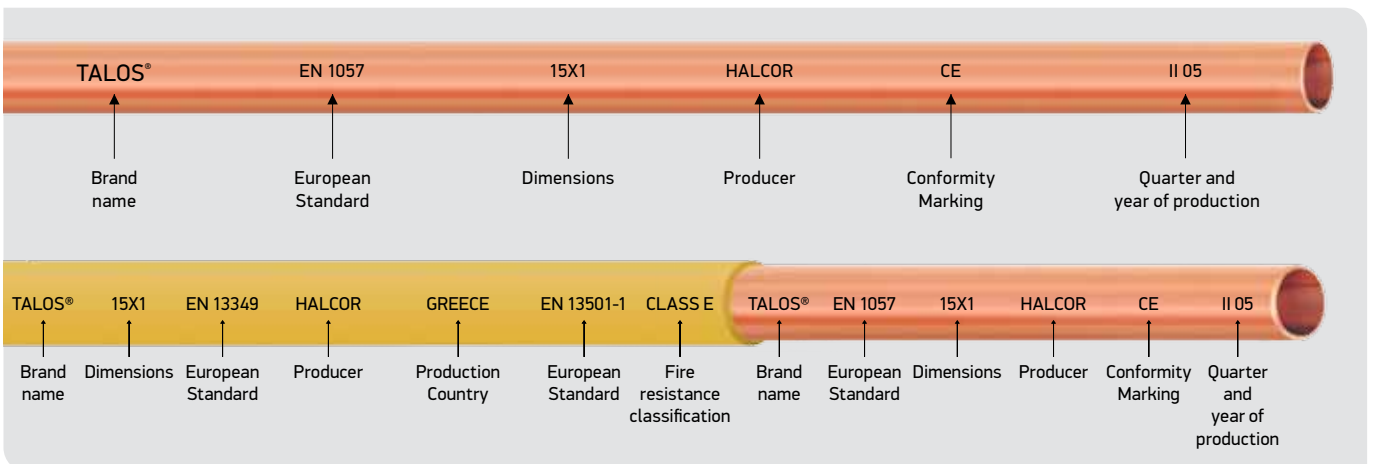
Specifications

Copper Tube: EN 1057, EN 13349
 Plastic Sheathing: Classified as Class E according to EN 13501-1 fire resistance classification system.

Mechanical Properties

Temper	EN 1057 Classification	Minimum Tensile strength N/mm ²	Minimum elongation A%
Soft	R-220	220	40
Half hard	R-250	250	20
Hard	R-290	290	3

Minimum Marking



Standard Dimensions

STRAIGHT

Diameter x thickness d x s (mm)	Internal diameter (mm)	Nominal copper weight (kg/m)	External surface area (m ² /m)	Filling volume (l/m)	Min. bending radius with bending tool EN 1057 (mm)	Packing	
						Type	Pieces per bundle
10x1,00	8,0	0,252	0,031	0,050	40	Straight lengths of 4m	250
12x1,00	10,0	0,308	0,038	0,079	45		400
15x1,00	13,0	0,391	0,047	0,133	55		600
15x1,20	12,6	0,463	0,047	0,125	-		125
18x1,00	16,0	0,475	0,057	0,201	70		450
18x1,20	15,6	0,564	0,057	0,191	-		100
22x1,00	20,0	0,587	0,069	0,314	-		300
22x1,5	19,0	0,860	0,069	0,284	-		80
28x1,50	25,0	1,111	0,088	0,491	-		60
35x1,50	32,0	1,405	0,110	0,804	-		50
35x2,00	31,0	1,845	0,110	0,755	-		50
42x1,50	39,0	1,699	0,132	1,195	-		40
42x2,00	38,00	2,236	0,132	1,134	-		40
54x2,00	50,0	2,908	0,170	1,963	-		30
64x2,00	60,0	3,467	0,201	2,827	-		25
76,1x2,00	72,1	4,144	0,239	4,083	-		20
88,9x2,00	84,9	4,859	0,279	5,661	-		15
108x2,50	103,0	7,375	0,339	8,332	-		10

COATED IN COILS

Copper tube ext. diam. x thickness dxs (mm)	Overall ext. diameter D (mm)	Tube filling volume (l/m)	Nominal copper weight (kg/m)	Min. bending radius manually (mm)	Min. bending radius with bending tool EN 1057 (mm)	Packing in coils (m) long
15 x 1,00	19	0,133	0,391	120	-	25 or 50
15 x 1,20	19	0,125	0,463	120	-	50
18 x 1,00	22	0,201	0,475	145	-	25 or 50
18 x 1,20	22	0,191	0,564	145	-	25
22 x 1,00	26	0,314	0,587	175	-	25

BRAZING ALLOYS USED FOR COPPER TUBES AND FITTINGS

Filler Alloy code (acc. to EN 1044)	AG 106	AG 203	AG 104	CP 105	CP 203
Filler Alloy code (acc. to DIN 8513)	L-Ag34Sn	L-Ag44	L-Ag45Sn	L-Ag2P	L-CuP6
Melting Range (°C)	630 - 730	675 - 735	640 - 680	645 - 825	710 - 890
Working Temperature (°C)	710	730	670	740	760
Flux (acc. to EN 1045)	FH 10	FH 10	FH 10	without(*)	without(*)
Flux (acc. to DIN 8511-1)	F-SH 1	F-SH 1	F-SH 1	without(*)	without(*)

(*) If the fittings are made of alloy and not pure copper, then a FH 10 flux is required.

Cu tubes in Natural Gas installations should be joined to fittings (according to standards EN 1254-1 & EN 1254-5) or components, using filler alloys with high melting point. The acceptable alloys have been standardized (see for example standard EN 1044 replaced by EN ISO 17672).



- WATER SUPPLY
- HEATING
- AIR CONDITIONING
- REFRIGERATION
- SOLAR SYSTEMS
- INDUSTRIAL NETWORKS



Advanced Technology that saves Energy and protects the Environment.

- Significant and continuous energy savings
- Safe network operation
- Reduction of installation time
- High resistance to mechanical stress
- Ease of forming
- External or embedded installations
- Resistance to extreme atmospheric conditions

TALOS ECUTHERM[™] pre-insulated copper tubes are advanced technological products of high added value and significantly superior in effectiveness compared to conventional insulation methods.

The unique advantages offered by the TALOS ECUTHERM[™] copper tubes, such as copper resistance and durability, coupled with high performance pre-insulation (Engineering Foams), result in significant energy savings. With a competitive market price and low installation cost, TALOS ECUTHERM[™] copper tubes are the ideal choice for every modern application.

High Performance Technological Product

The insulating material used in the manufacturing of TALOS ECUTHERM[™] copper tubes is an extruded high quality cross-linked polyethylene (PEF) suitably expanded to form a foam with closed microcells, free of FCFC and fibrous substances. A layer of thin polyethylene coating is adhered to the foamy crosslinked substrate, providing a skin of improved operational features and esthetic appearance.

The closed microcells of the insulating material, combined with the protective outer polyethylene skin, form an integral barrier to aggressive environments, rendering the tube suitable for a variety of applications, such as heating, cooling, air-conditioning and a multitude of plumbing installations.

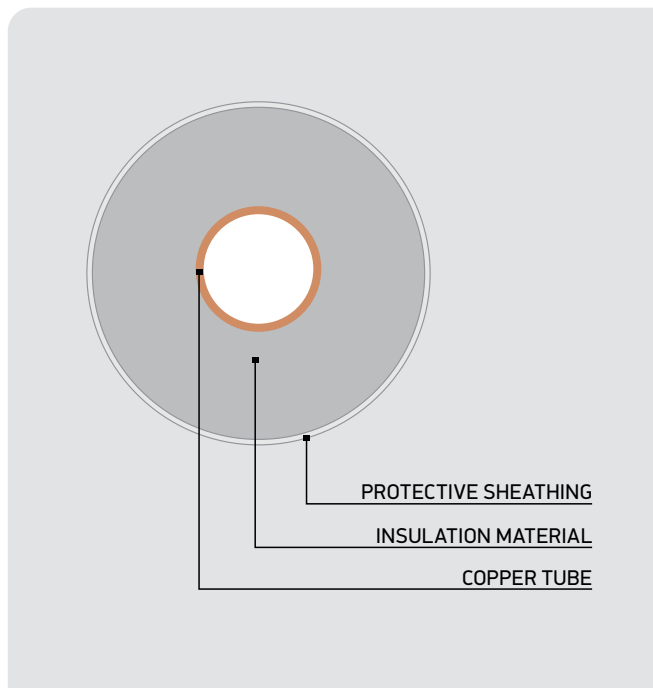
The TALOS ECUTHERM[™] (PE-X) copper tubes are produced in compliance to the requirements of standards that apply in most of the European Union countries, as regards insulation properties, chemical characteristics and resistance to fire. They exhibit low λ coefficient, determining its heat conductivity properties and very good μ coefficient which determines its resistance to penetration of moisture.

The TALOS ECUTHERM[™] (PE-X) copper tubes are available in coils of 25 & 50 meter lengths and insulation thickness of 6, 9 and 13mm, suiting a variety of insulation needs.

Reliability that only TALOS[®] copper tubes can provide.

TALOS[®] copper tubes are manufactured according to (a) the Harmonised European Standard EN 1057 for use in plumbing installations and (b) the Harmonised European Standard EN 12735- 1 for use in air conditioning and refrigeration installations. TALOS[®] copper tubes meet the current requirements, imposed by the new green refrigerants (R -410A, etc.), adopted by major refrigeration and air conditioning unit manufacturers. TALOS[®] copper tubes have been awarded most major international quality marks. TALOS[®] copper tubes, with their high quality of manufacture, provide:

- Long lifetime
- Resistance to pressure, temperature and fire
- Complete network impermeability
- Hygienic, safe, and bacteria-free potable water
- Quality and reliability of installation
- Versatile applications
- Comprehensive range of sizes
- Aesthetic result and space saving



Copper Tube Material

Copper phosphorus deoxidised (DHP-Cu) with min. copper content 99,90% and P=0,015% - 0,040%.

Specifications

TALOS ECUTHERM: WATER PIPES: EN 1057

TALOS ACR ECUTHERM: REFRIGERATION PIPES EN 12735-1

Quality Marks

WATER PIPES: RAL / DVGW, BSI, AFNOR, AENOR, CSTB (Avis Technique), NSAI, KIWA / GASTEC-QA, SITAC, STF VTT, GOST VIK.

REFRIGERATION PIPES: TÜV, GL.

Mechanical Properties

Temper	EN 1057 / EN 12735 Classification	Minimum Tensile strength N/mm ²	Minimum elongation A%
Soft	R-220	220	40





Insulation Technical Properties

MATERIAL	PE-X foam
DENSITY ACCORDING TO DIN 53420 ASTM D 1667	30-33 Kg/m ³
THERMAL CONDUCTIVITY COEFFICIENT ($\bar{\alpha}$) ACCORDING TO ASTM C 335	0,039 W/m.K
VAPOUR-WATER DIFFUSION RESISTANCE COEFFICIENT (μ) ACCORDING TO ISO 12572	> 9.000
WORKING TEMPERATURE	-80°C to +110°C
FIRE RESISTANCE	EN 13501-1 Class B or Class E, DIN 4102, B2, BS 476, NF P 92 501-M1
RESISTANCE TO CHEMICAL AGENTS ACC. TO ASTM 543-56 T	Very good
SOUND ABSORPTION ACC. TO DIN 4109 300-2500Hz	~60%
DIMENSIONAL STABILITY ACCORDING TO ISO 2796 FOR TEMPERATURES UP TO 100°C	<5%

Values are listed, as obtained under standard laboratory conditions and may be amended, without prior notice.

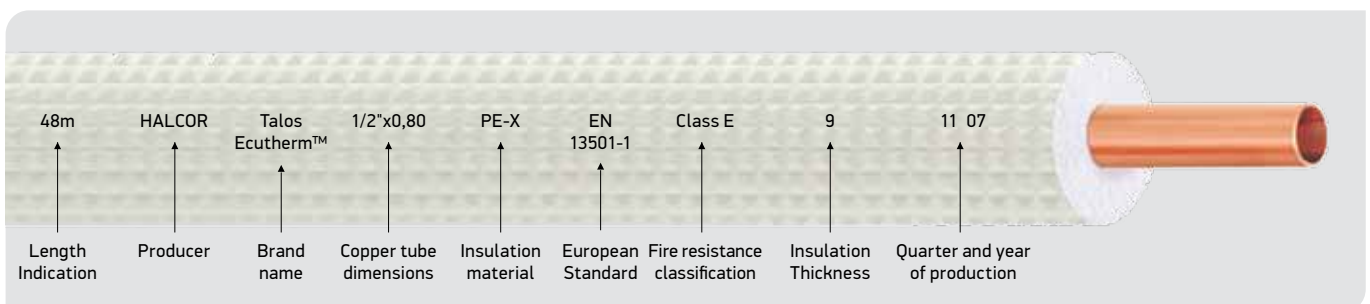
TALOS ECUTHERM™ Standard Dimensions according to EN 1057

Copper tube external diameter	mm	6	8	10	12	15	16	18	22
Copper tube wall thickness	mm	0,80	0,80	0,80	1,00	1,00	1,00	1,00	1,00
Overall external diameter with 9mm thick insulation	mm	24	26	28	30	33	34	36	40
Maximum permitted operating pressure	bar	178	129	101	105	83	77	68	55

TALOS ACR ECUTHERM™ Standard Dimensions according to EN 12735-1

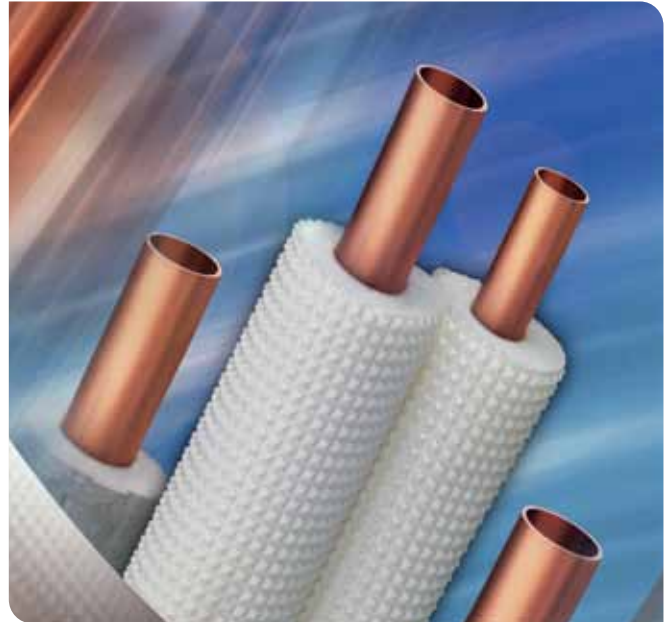
Copper tube external diameter	Inch	1/4-3/8	1/4-1/2	1/4-5/8	1/4-3/4	3/8-1/2	3/8-5/8	3/8-3/4	1/2-3/4
	mm	6,35-9,52	6,35-12,7	6,35-15,88	6,35-19,05	9,52-12,7	9,52-15,88	9,52-19,05	12,7-19,05
Copper tube wall thickness	mm	0,80-0,80	0,80-0,80	0,80-1,00	0,80-1,00	0,80-0,80	0,80-1,00	0,80-1,00	0,80-1,00
Overall external diameter with 9mm thick insulation	mm	24,4-27,5	24,4-30,7	24,4-33,9	24,4-37,10	27,5-30,7	27,5-33,9	27,5-37,1	30,7-37,1
Maximum permitted working pressure	bar	234	167	130	106	78	78	64	55

Marking



TALOS ECUTHERM™ 1/2" & 5/8"
Indicative Calculation Of Insulation Thickness

Air conditioning and refrigeration units, operate in temperatures lower than ambient temperature; therefore, this difference must be compensated by the appropriate insulation thickness, to prevent vapour condensation. The thickness of the insulation (with reference to Mollier's diagram), is calculated taking into consideration the temperature of the fluid (or gas) inside the pipes, ambient temperature and the relative humidity of the air.



TEMPERATURE INSIDE THE TUBE (°C)	INSULATION THICKNESS (mm)											
	AMBIENT TEMPERATURE (°C) AND RELATIVE HUMIDITY (%)											
	25°C			30°C			35°C			40°C		
	50%	60%	70%	50%	60%	70%	50%	60%	70%	50%	60%	70%
+15		6 6	6 6	6 6	6 6	6 6	6 6	6 6	9 9	6 6	6 6	9 9
+10	6 6	6 6	6 6	6 6	6 6	9 9	6 6	6 6	9 9	6 6	6 6	9 9
+5	6 6	6 6	9 9	6 6	6 6	9 9	6 6	6 6	9 9	6 6	9 9	9 9
0	6 6	6 6	9 9	6 6	6 6	9 9	6 6	9 9	9 9	6 6	9 9	13 13
-5	6 6	6 9	9 9	6 6	9 9	13 13	6 6	9 9	13 13	6 6	9 9	13 13
-10	6 6	9 9	9 13	6 6	9 9	13 13	6 6	9 9	13 13	9 9	9 9	13 13
-20	6 9	9 9	13 13	9 9	9 9	13 13	9 9	9 13	13 13	9 9	13 13	13 13

1/2 inch - 12,7 mm

5/8 inch - 15,88 mm

- AIR CONDITIONING
- REFRIGERATION



Clear Advantage in Refrigeration and Air Conditioning

TALOS ACR ECUTHERM 2[™] pre-insulated copper tubes, manufactured by HALCOR are an innovation that ensures significant advantages for refrigeration and air conditioning installers.

- Simplified installation process and reduction of installation time
- Reduction of overall network installation cost
- Reliable operation of installations and significant energy savings
- Competitive purchase price
- Aesthetic result and space saving

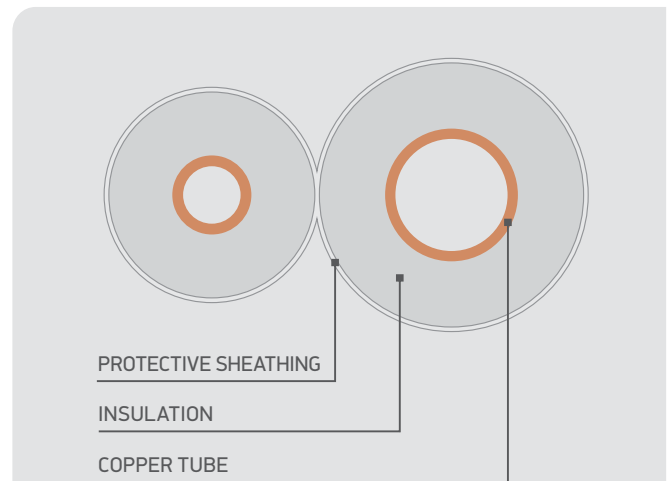
Pair Combinations for any Application

TALOS ACR ECUTHERM 2[™] copper tubes are manufactured in pairs, firmly connected along their entire length, and in eight standard size combinations which cover sufficiently the usual connectivity requirements of any refrigeration or air conditioning unit. TALOS ACR ECUTHERM 2[™] copper tube pairs, form a single unit which is installed easily and fast, ensuring professional results.

Certified Quality

TALOS ACR ECUTHERM 2[™] pre-insulated copper tubes, have been certified by the German quality assurance organization RWTUV, with regard to trials and manufacturing tests.

The quality and reliability of such products, is ensured through the implementation of a Quality Assurance System, according to standard ISO 9001: 2000, certified by TÜV Hellas.



PAIR DIAMETERS

1/4" + 3/8"

1/4" + 1/2"

1/4" + 5/8"

1/4" + 3/4"

3/8" + 1/2"

3/8" + 5/8"

3/8" + 3/4"

1/2" + 3/4"

Appropriate also for the new Green Refrigeration Units

According to the new Harmonised European Standard EN 12735-1, as well as current market requirements, laid down by the use of new green refrigerants, including R-410A, already adopted by all major manufacturers of refrigeration and air conditioning units the following standardisation is applied to TALOS ACR ECUTHERM 2[™] copper tubes:

- For an external diameter of 1/4" to 1/2", the wall thickness is standardised at 0.80 mm.
- For an external diameter of 5/8" to 3/4", the wall thickness is standardised at 1.00 mm.

Copper Tube Material

Copper phosphorus deoxidised (DHP-Cu), having minimum copper content 99,90% and P=0,015% - 0,040%.

Quality Marks

REFRIGERATION PIPES: TÜV, GL.

Mechanical Properties

Temper	EN 12735 Classification	Minimum Tensile strength N/mm ²	Minimum elongation A%
Soft	R-220	220	40

Insulation Technical Properties

MATERIAL	PE-X foam
DENSITY ACCORDING TO DIN 53420 ASTM D 1667	30-33 Kg/m ³
THERMAL CONDUCTIVITY COEFFICIENT (λ) ACCORDING TO ASTM C 335	0,039 W/m.K
VAPOUR-WATER DIFFUSION RESISTANCE COEFFICIENT (μ) ACCORDING TO ISO 12572	> 9.000
WORKING TEMPERATURE	-80°C to +110°C
FIRE RESISTANCE	EN 13501-1 Class B or Class E, DIN 4102, B2, BS 476, NF P 92 501-M1
RESISTANCE TO CHEMICAL AGENTS ACC. TO ASTM 543-56 T	Very good
SOUND ABSORPTION ACC. TO DIN 4109 300-2500Hz	~60%
DIMENSIONAL STABILITY ACCORDING TO ISO 2796 FOR TEMPERATURES UP TO 100°C	<5%

Values are listed, as obtained under standard laboratory conditions and may be amended, without prior notice.

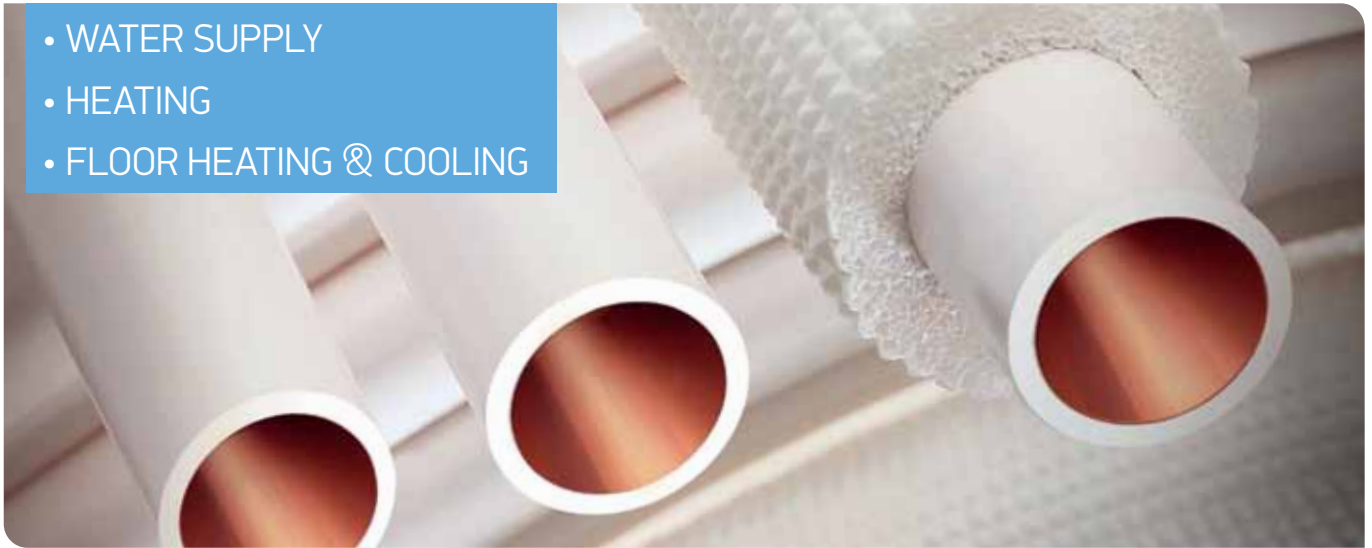
Standard Pair Dimensions (Coils 15m, 25m, 30m Long)

Copper tube external diameter	Inch	1/4-3/8	1/4-1/2	1/4-5/8	1/4-3/4	3/8-1/2	3/8-5/8	3/8-3/4	1/2-3/4
	mm	6,35-9,52	6,35-12,7	6,35-15,88	6,35-19,05	9,52-12,7	9,52-15,88	9,52-19,05	12,7-19,05
Copper tube wall thickness	mm	0,80-0,80	0,80-0,80	0,80-1,00	0,80-1,00	0,80-0,80	0,80-1,00	0,80-1,00	0,80-1,00
Overall external diameter with 9mm thick insulation	mm	24,4-27,5	24,4-30,7	24,4-33,9	24,4-37,10	27,5-30,7	27,5-33,9	27,5-37,1	30,7-37,1
Maximum permitted working pressure	bar	167-106	167-78	167-78	167-64	106-78	106-78	106-64	78-64

Other sizes and special packaging in pallets or cardboard boxes are available upon request.



- WATER SUPPLY
- HEATING
- FLOOR HEATING & COOLING



The Smart side of Technology

HALCOR has invested in research and technology to create a new innovative solution in copper tube systems, proving its leading position in the copper processing industry. CUSMART® are flexible copper tubes with a special compound coating (patent pending). The online production method ensures unique uniformity and incomparable technical properties. Specially designed tubes for every purpose and a full range of mechanical fittings result in plumbing systems of superior technology. The CUSMART® flexible copper tube system is the future!

Superior beyond any comparison Multiple Applications

CUSMART® flexible copper tubes are unsurpassed in every technical aspect, offering great installation ease. Their exceptional flexibility allows cold bending and even manual shaping without “memory” effects. The use of CUSMART® flexible copper tubes in plumbing cuts down on installation time and cost, offering uncompromised security. CUSMART® flexible copper tubes preserve their physical and technical properties throughout their whole lifetime and are covered by a 20-year manufacturer’s warranty.

Product Description

CUSMART® flexible copper tubes are coated with a special white colored compound for enhanced endurance at temperatures up to 95 °C. CUSMART® flexible copper tubes are suitable for the following applications:

- Heating networks
- Underfloor heating and cooling systems
- Water supply networks

Superior Technical Properties

Specification and test results of CUSMART® flexible copper tubes meet the requirements of DVGW VP 652 and EL0T 1425/1426. CUSMART® tubes are assessed and certified for their suitability in drinking water installations from the NSF organization according to NSF/ANSI 61. CUSMART® flexible copper tubes are made of special high endurance, halogen-free compounds with fire retardant properties according to DIN 4102/B2 and EN 13501/E.

CUSMART® Superiority in every aspect

Long lifetime

The long lifetime is attributable to the mechanical properties of copper, which remain unchanged over time.

A special process for ensuring hygiene

This is thanks to a special process that is compliant with EN 1057 for drinking water and clean internal surface. The natural antibacterial properties of copper prevent the growth of pathogens on the internal walls of the tube, which ensures water hygiene.

High pressure and temperature fluctuation resistance

The tubes maintain their mechanical properties even during major temperature fluctuations and are highly frost resistant in comparison with other conventional products. They can withstand much greater operating pressure than that encountered in the water supply networks of buildings, which guarantees safety and reliability.

Unique flexibility and final shape stability

Their special properties allow cold bending even manually and in very tight bends without "shape memory effects".

Exceptional thermal conductivity

The combination of copper and special coating compounds ensures suitable thermal conductivity in every application: low for water supply and heating and high for underfloor heating.

Minimum thermal expansion

Compared to other materials, copper has a much lower thermal expansion coefficient ($\alpha=0,0168 \text{ mm}/(\text{m} \cdot ^\circ\text{K})$).

Cost-effective system

The completeness, simplicity and easy application with alternative joining methods (press and compression fittings) ensure reduced installation cost.

Impermeability - 100% Oxygen Barrier

They are completely impermeable and oxygen-tight. Leakage control is performed electronically without faults, according to EN 1057. They are also superior to tubes with seams since welding alters the structure of metal and results in reduced endurance.

Recyclable product

The manufacturing materials used are recyclable, which helps to promote environmental protection and the conservation of natural resources.

UV resistance and maximum corrosion resistance

The adhesion between the tube and coating ensures total corrosion resistance and protection under adverse weather conditions.

Significant energy savings with industrial insulation

The external industrial foam insulation limits heat loss to a minimum, which results in significant energy savings.

Quality Marks

DVGW, NSF.

Mechanical Properties

Temper	Minimum Tensile strength N/mm ²	Minimum elongation A%
Soft	220	40



The CUSMART® all-inclusive flexible copper tube system includes a full range of CUSMART FITTINGS (press and compression fittings), as well as tools, ensuring reliable results in every application.



Technical Properties of CUSMART® Copper Tubes

NOMINAL DIMENSIONS (mm)		14x2	16x2	18x2	20x2	26x3	32x3
OUTSIDE DIAMETER - (od) (mm)		14	16	18	20	26	32
WALL THICKNESS2		2	2	2	2	3	3
INSIDE DIAMETER (id) (mm)		10	12	14	16	20	26
INSIDE DIAMETER CROSS-SECTION (cm ²)		0,785	1,131	1,5	2,011	3,142	5,309
WATER VOLUME (l/m)		0,0785	0,1131	0,154	0,2011	0,3142	0,5309
MAXIMUM WORKING TEMPERATURE (°C)		95	95	95	95	95	95
THERMAL CONDUCTIVITY COEFFICIENT W/(m • °K)		0,40	0,40	0,40	0,40	0,40	0,40
MAXIMUM WORKING PRESSURE (bar)		35	32	27	25	25	23
MINIMUM BENDING RADIUS WITH BENDING TOOL (mm)		39	45	53	64	89	128
MINIMUM BENDING RADIUS WITH EXTERNAL BENDING SPRING=4x od (mm)		56	64	72	80	104	128
MINIMUM BENDING RADIUS MANUAL=6x od (mm)		84	96	108	120	156	192
PACKAGING	STRAIGHT LENGTHS (m)	3	3	3	3	3	3
	COILS (m)	100/50	100/50	100/50	100/50	25/50	25

Different dimensions and lengths are available upon request.

Technical Properties of Industrial Insulation CUSMART® Copper Tubes

NOMINAL DIMENSIONS (mm)		14x2	16x2	18x2	20x2	26x3	32x3
TOTAL OUTSIDE DIAMETER (INSULATION THICKNESS: 9 mm)		32	34	36	38	44	50
PACKAGING - COIL (m)		100/50	100/50	100/50	100/50	25/50	25

Insulation Technical Properties

MATERIAL	PE-X foam
DENSITY ACCORDING TO DIN 53420 ASTM D 1667	30-33 Kg/m ³
THERMAL CONDUCTIVITY COEFFICIENT (λ) ACCORDING TO ASTM C 335	0,039 W/m.K
VAPOUR-WATER DIFFUSION RESISTANCE COEFFICIENT (μ) ACCORDING TO ISO 12572	> 9.000
WORKING TEMPERATURE	-80°C to +110°C
FIRE RESISTANCE	EN 13501-1 Class B or Class E, DIN 4102, B2, BS 476, NF P 92 501-M1
RESISTANCE TO CHEMICAL AGENTS ACC. TO ASTM 543-56 T	Very good
SOUND ABSORPTION ACC. TO DIN 4109 300-2500Hz	~60%
DIMENSIONAL STABILITY ACCORDING TO ISO 2796 FOR TEMPERATURES UP TO 100°C	<5%

Values are listed, as obtained under standard laboratory conditions and may be amended, without prior notice.

Significant and Uninterrupted Energy Saving.

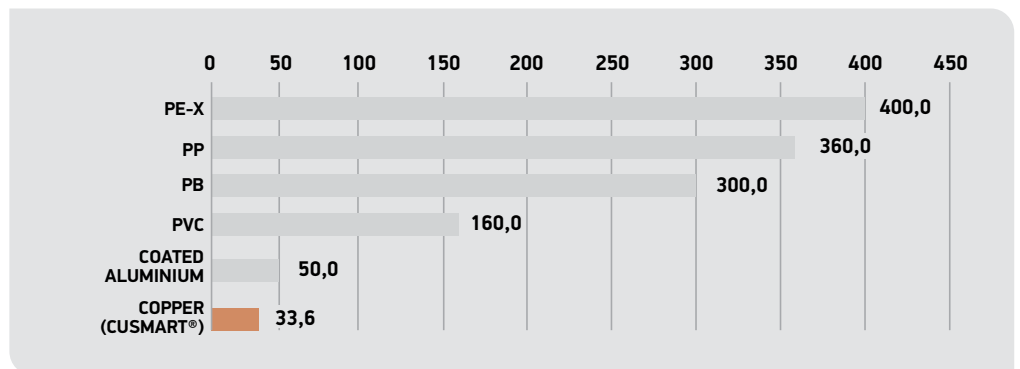
CUSMART® flexible tubes with external industrial insulation are suitable for all heating and hot water supply plumbing networks inside and outside buildings. The insulation is a cross-linked polyethylene (PE-X) foam structured in closed type microcells. Energy saving is a result of the spectacular reduction of temperature loss to over 50% compared to similar networks without insulation.

The CUSMART® all-inclusive flexible copper tube system includes a full range of CUSMART FITTINGS (press and compression fittings), as well as tools, ensuring reliable results in every application.

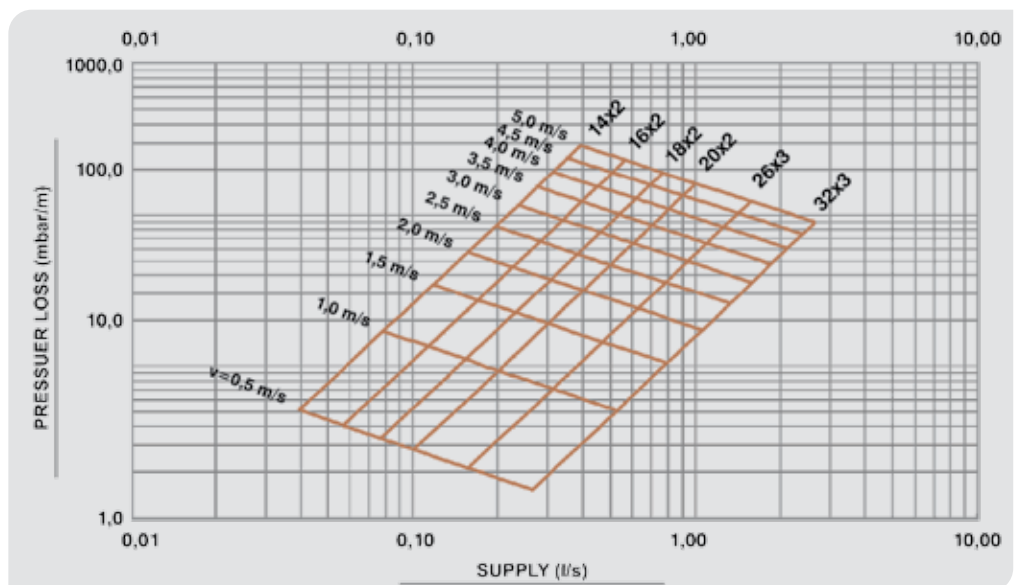




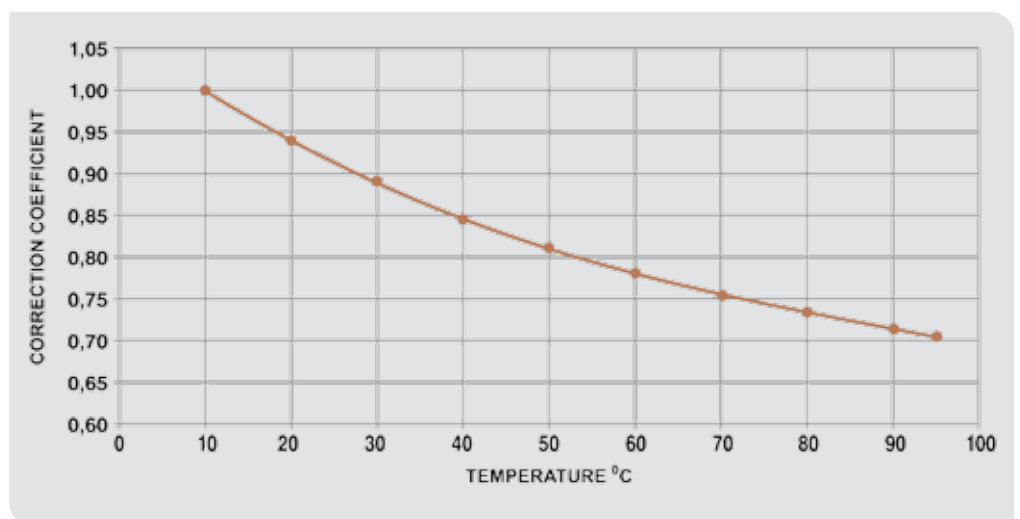
Comparative Diagram for Linear Expansion of the Tube (mm)
 $\Delta T = 40^{\circ}C, L=50 M$

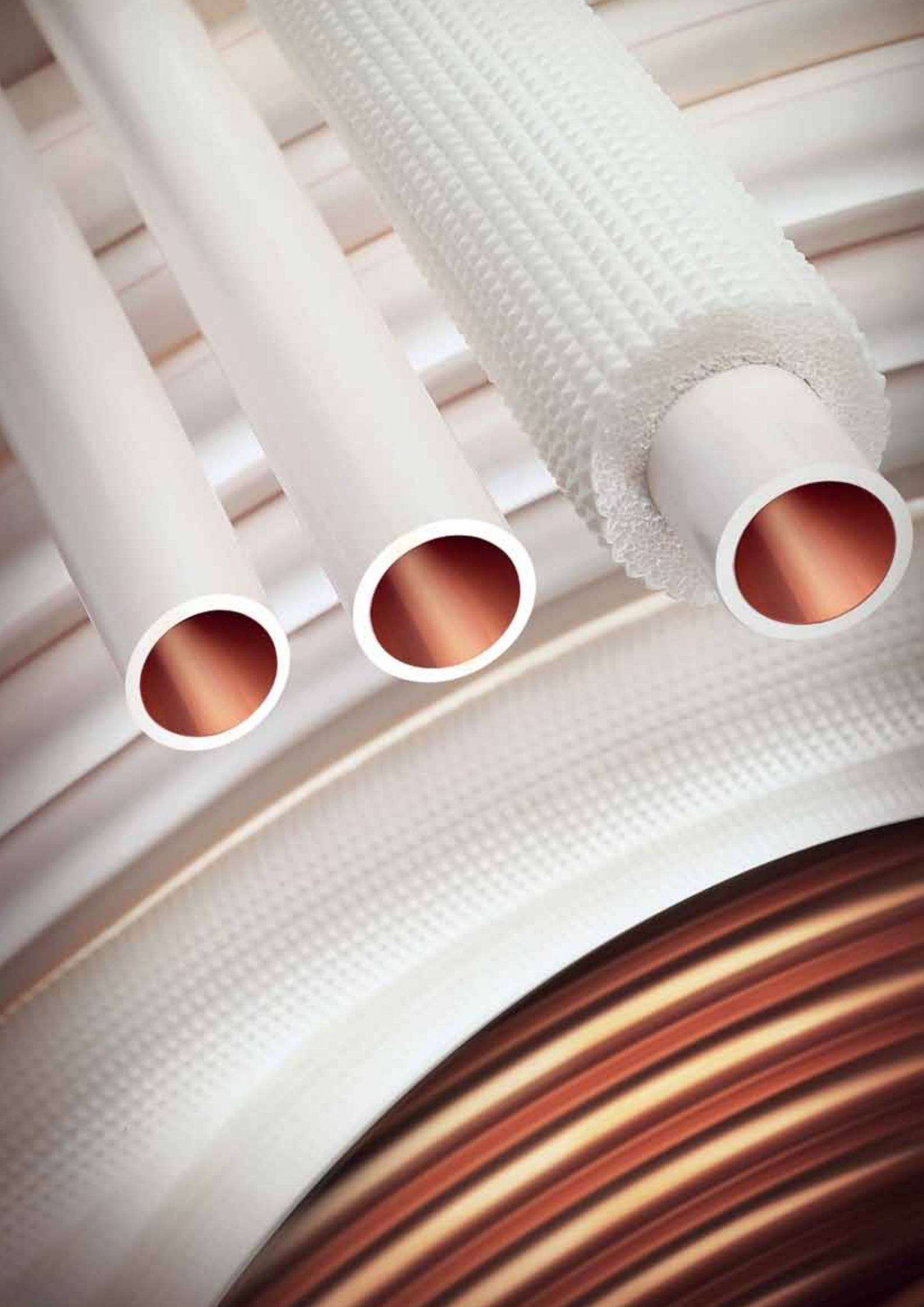


Pressure Loss Diagram at 10°C

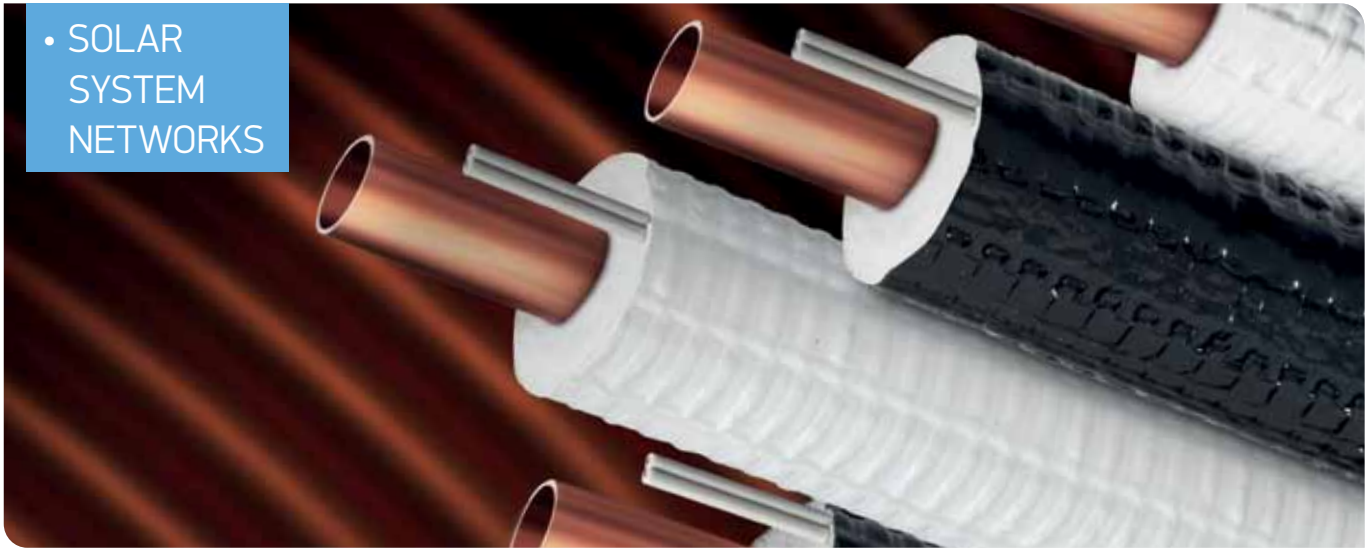


Correction Coefficient for Pressure Loss according to Temperature



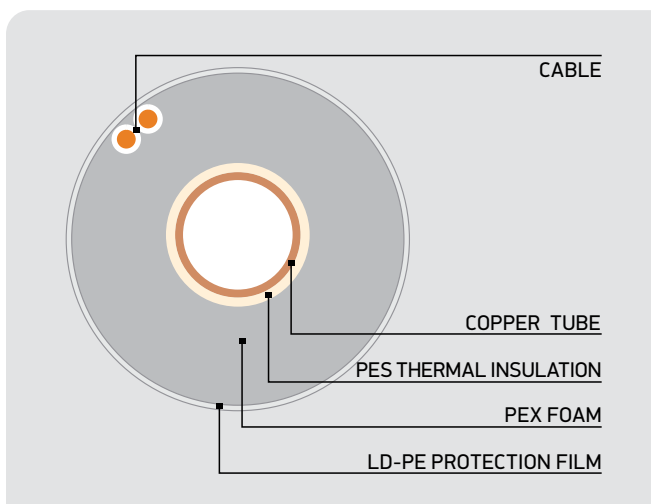


• SOLAR
 SYSTEM
 NETWORKS



Due to its superior physical and chemical properties, engineers have always relied on copper for thermo hydraulic systems. The exploration of solar energy has also unveiled this red metal's advantages in solar systems, the most important being its high thermal conductivity. These systems are easy to install, efficient (both in energy consumption and maintenance) and reliable (comparably long life-cycle). The use of factory-insulated TALOS ECUTHERM™ SOLAR copper tubes now greatly improves the solar system by offering even more advantages to copper tubes.

TALOS ECUTHERM™ SOLAR copper tubes are manufactured in pairs (one for supply and one for return), in standardized dimensions which sufficiently cover the usual requirements of solar systems. The two pieces are attached throughout their length, while the tubes also include an incorporated cable for the connection of temperature sensors. For easy connection, separation between the two lines is also possible.



Modern Technology in Solar Installations

The unique advantages of copper with regards to strength and durability combined with the high-efficiency factory insulation make up an integral assembly that is easy and fast to install, ensuring professional results and offering high energy saving. Given this competitive advantage and the low cost of installation, TALOS ECUTHERM™ SOLAR copper tubes constitutes the optimum choice for any modern structure.

Factory insulated TALOS ECUTHERM™ SOLAR copper tubes by HALCOR represent an innovation which guarantees significant advantages for Solar System installers.

- Simplification of installation process and reduction of working time
- Safe operation of networks with high strength in mechanical strain and weather conditions
- Reduction of total cost of construction for the networks
- Reliable operation of installation and significant energy saving
- 30 year warranty for the copper tube

Reliability offered only by TALOS Copper Tubes

TALOS copper tubes are manufactured according to European and U.S. Specifications and have been certified by most international quality organizations (RAL/DVGW, BSI, AFNOR, AENOR, CSTB, NSAI).



High Performance Technological Product

TALOS ECUTHERM™ SOLAR copper tubes are coated with external industrial insulation of crosslinked polyethylene (PE-X) foam, structured in closed type microcells. The closed type microcells of the insulation, combined with the external protection film, create an integral resistance barrier,

offering the required technical characteristics for use in solar installations.

Copper Tube Technical Characteristics

Phosphorus deoxidized copper (DHP-CU) in soft temper (R220), according to EN 1057.

Insulation Technical Properties

FOAM MATERIAL	PE-X
DENSITY ACCORDING TO DIN 53420 ASTM D 1667	30-33 Kg/m ³
THERMAL CONDUCTIVITY COEFFICIENT ($\bar{\alpha}$) ACCORDING TO ASTM C 335	0,039 W/m.K
VAPOUR-WATER DIFFUSION RESISTANCE COEFFICIENT (μ) ACCORDING TO DIN 52615	> 9.000
WORKING TEMPERATURE	-80°C bis +150oC
FIRE RESISTANCE	Class E, EN 13501
RESISTANCE TO CHEMICAL AGENTS ACC. TO ASTM 543-56 T	Very good
SOUND ABSORPTION ACC. TO DIN 4109 300-2500Hz	~60%
PROTECTIVE FILM (White or Black Color)	30µm UV RESISTANT

Values are listed, as obtained under standard laboratory conditions and may be amended, without prior notice.

Standardized Dimensions (Roll Lengths 10, 15, 20, 25 meters) TALOS ECUTHERM™ SOLAR

Outside diameter of copper tube	mm	10	11	12	15	18	22
Wall Thickness	mm	0,50	0,60	0,60	0,70	0,75	0,90
Total diameter with 13mm thick insulation	mm	36	37	38	41	44	48
Maximum working pressure	bar	61	67	61	57	50	49
Bend Radius	4xOD						

Outside diameter of copper tube	mm	10	11	12	15	18	22
Wall Thickness	mm	1,0	1,0	1,0	1,0	1,0	1,0
Total diameter with 13mm thick insulation	mm	36	37	38	41	44	48
Maximum working pressure	bar	129	116	105	83	68	55
Bend Radius	4xOD						

Standardized Dimensions TALOS ECUTHERM™ SOLAR 2

12/12, 15/15, 18/18, 22/22

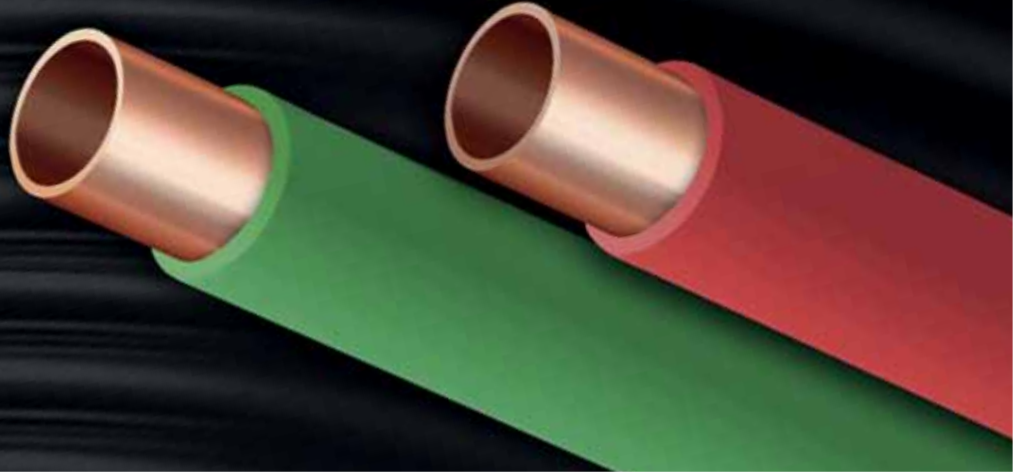
Cable Technical Characteristics

CONDUCTOR MATERIAL	COPPER
FLEXIBILITY OF CONDUCTOR	FLEXIBLE, CLASS E
COLOR	WHITE
NO. OF POLES	2
NOMINAL VOLTAGE V_0/V	300/300
NOMINAL CROSS SECTION OF CONDUCTOR	2X0,75mm ²

PLASTIC COATED COPPER TUBES

TALOS
GEOHERM™

• GEOTHERMAL
HEATING
AND COOLING



Geothermal Heat Pumps

Geothermal heat pumps are electrically powered systems that use the earth's energy to provide heating, cooling, as well as, hot water for homes and commercial buildings. Unlike conventional systems that burn a fuel to generate heat, geothermal heat pumps use electricity to move heat from the earth into the building, allowing much higher efficiencies. Research indicates that geothermal systems reduce the cost of heating and cooling an average of 30%-to-60% when compared to conventional systems. This is feasible by taking advantage of the relatively constant temperature of the earth below its surface. Because the ground is almost always at a more favorable temperature than the ambient air, savings from geothermal systems occur in both the summer and winter seasons.

Direct Exchange (DX) Geothermal

DX geothermal systems use the earth as an energy reservoir, taking advantage of the constant 12°C temperature about 1,5m below the surface. Copper tubes run underground and circulate the refrigerant that exchanges heat directly with the soil through the walls of the copper tubing. The refrigerant absorbs and gives off heat more easily because of the highly conductive copper. By running tubes underground, the refrigerant is always exposed to a temperature of 12°C, unlike other systems that are exposed to much hotter and colder outside air temperatures.

Copper Tubing is Key to Success of DX Geothermal Systems

The direct exchange (DX) geothermal heat pump utilizes buried copper tubing filled with circulating refrigerant to exchange the heat in a building with the earth. The direct exchange technology is

25%-35% more efficient than traditional geothermal systems. The reason is the reduced number of thermal heat transfers, hence the term direct exchange. DX systems use an electrical compressor to circulate refrigerant through individual ground loops made from copper. The less efficient, traditional systems use electrical pumps to circulate water/antifreeze solutions through buried plastic pipes. DX geothermal systems do not require an additional pump to move the refrigerant through the ground or any intermediate heat exchanger. Moreover, copper-based DX systems are able to reach high efficiencies while using a relatively shorter and smaller set of buried copper tubing, therefore reducing installation costs.

Advantages of DX Systems with Copper Coils over other Geothermal Systems

- DX geothermal systems have the refrigerant run directly through the copper coil in the earth. This eliminates the need for plastic water pipe and circulating pump found in water-source geothermal heat pumps.
- DX systems use ground loops made of copper tubing that tend to be more efficient, since there is no intermediate heat exchanger.
- Heat is transferred directly between the refrigerant and the ground, and the amount of piping can be reduced by 1/3 to 1/2 compared to other geothermal systems. DX systems also require about ½ the amount of holes and thus are the optimum choice for installations where the amount of space for the ground loop is limited.
- Installation of copper loops is flexible because they can be installed horizontally, vertically, or diagonally as space requires.
- Copper tubing has a long history of use in air conditioning and refrigeration. Copper tubes are able to resist high ope-

rating pressures with unlimited durability, thanks to the natural strength of copper.

- Copper tubing is strong, ductile, and resistant to corrosion and is available in many different diameters and in long coil lengths. Copper connections can be brazed, the tubing may be bent, and copper tubing is economically available.

Specifications

TALOS GEOTHERM™ copper tubes are manufactured according to the EN 12735 standard for Air-Conditioning and Refrigeration applications. TALOS GEOTHERM™ copper tubes are certified to meet the PED 97/23 requirements, as well as, the German regulation AD 2000/W0 for pressure vessels.

Geothermal copper coils are end-sealed to maintain internal cleanness and can be optionally supplied with an external polyolefin protective coating. Additionally, the coils can be supplied pre-charged with nitrogen gas to ensure their absolute gas-tightness and facilitate the installation procedure.

Material

Copper phosphorus deoxidised (minimum) copper content 99,90%, phosphorus concentration P=0,015%-0,04%, classified as CW024A, or Cu-DHP, according to the European alloy coding system. Protective coating made from polyolefin with a max. operating temperature of 95°C.

Quality Certificates

TUV, AD 2000/W0, GL

Standard Dimensions

Copper tube external diameter X Wall thickness (mm)	Nominal copper Weight (kg/m)	Maximum Operating Pressure (bar)
9,52 x 0,4	0,102	57
9,52 x 0,5	0,126	72
9,52 x 0,6	0,150	87
9,52 x 0,7	0,173	103
9,52 x 0,8	0,195	119
12,7 x 0,6	0,203	64
12,7 x 0,7	0,235	76
12,7 x 0,8	0,266	87
15,88 x 0,8	0,337	69
19,05 x 0,8	0,408	57
19,05 x 1,0	0,505	72

Other dimensions are available upon request.

Mechanical Properties

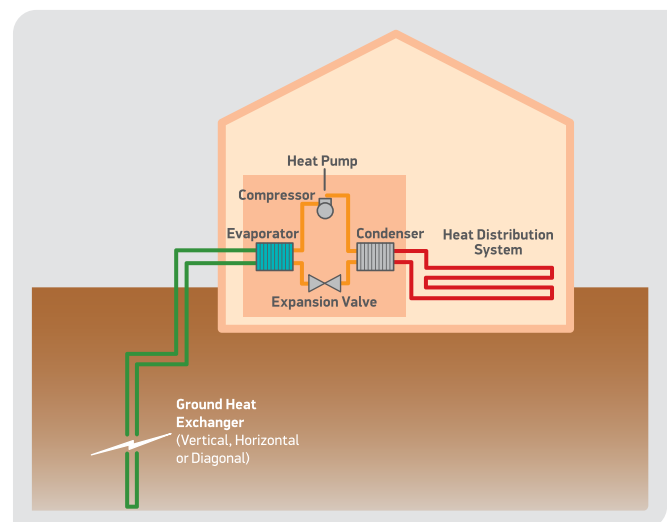
Temper	Tensile strength, R_m (N/mm ²) (min)	Yield strength, $R_{p0,2\%}$ (N/mm ²)	Elongation A% (min)
R220 (acc. to 12735-1)	220	-	40
Y040 (acc. to 12735-2)	220	40-90	40

Form of Delivery

PNC or Bunch Coils of 25 – 150 m

LWC of 75 - 580 kg

Packaged on pallets or in carton boxes



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