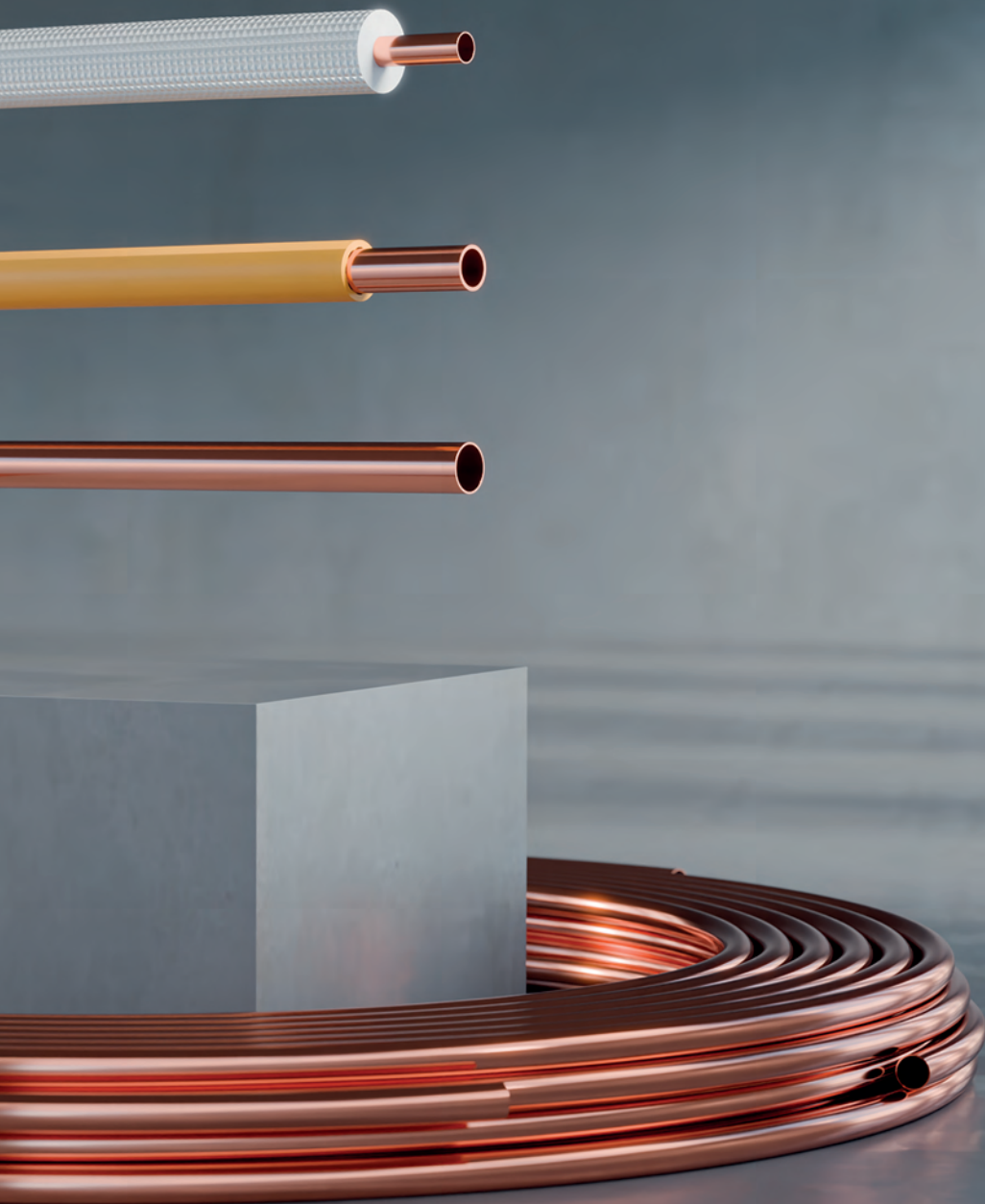


TUBES FOR BUILDING INSTALLATIONS



HALCOR

Evolving Beyond Copper

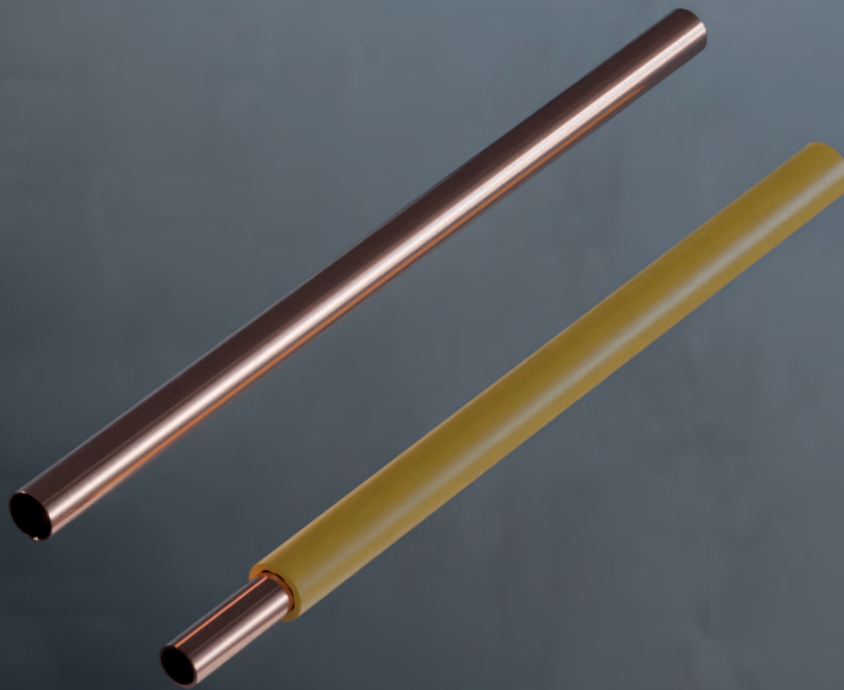
HALCOR

Evolving Beyond Copper

COPPER & ALLOYS
EXTRUSION DIVISION:



ELVALHALCOR



Halcor is the Copper & Alloys Extrusion Division of ElvalHalcor S.A. and the largest* producer of copper tubes in Europe, the Middle East and Africa (EMEA).

By implementing long-term investments, it supplies dynamically developing countries with a broad range of sustainable products and cutting-edge solutions.

With more than 85 years of experience in the metal processing industry, Halcor is a reliable partner for industries that manufacture equipment and fittings, as well as commercial companies that market products to meet the customers' needs all over the world.

A strong network of privately owned commercial subsidiaries across Europe, combined with technical support services, allows Halcor to deliver customised solutions to the industry with flexibility and reliability.

Halcor specialises in developing solutions for a broad spectrum of applications, primarily for HVAC&R, industrial, electrical and construction applications, the automotive industry and for renewable energy sources.

Its commitment to being a leader in innovation is reflected both in its investment in Research & Development and in its advanced production processes.

Halcor has highly automated production lines for manufacturing and packaging products that incorporate state-of-the-art technology for top performance and sustainability.

Halcor's principal message is "Evolving Beyond Copper", which reflects its constant focus on growing all its activity sectors.

*Based on Cu2 Consulting data.

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⇒ Water Supply ⇒ Natural Gas

⇒ Heating ⇒ Cooling

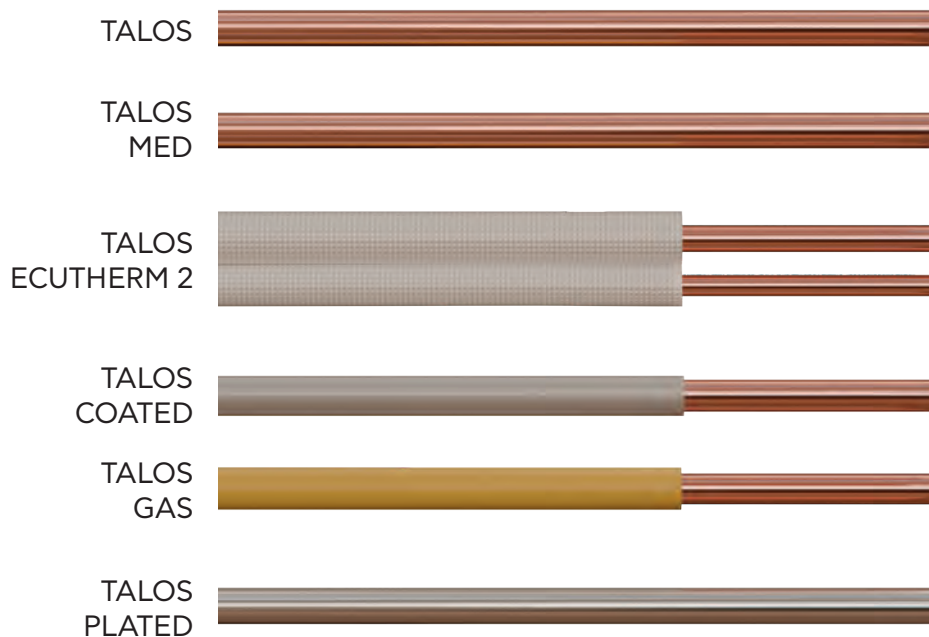
Versatility with the Reliability of Copper

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.
- ⇒ 100% recyclability, without loss of properties.
- ⇒ Potable water hygiene.
- ⇒ Style and space saving.

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 European standards, such as EN 1057 and EN 13349 for coated pipes for sanitary and gas applications, EN 12735-1 for air conditioning systems, EN 13348 for medical applications, etc.



Copper is an ideal material for tubes used in water installations, due to its inherent properties. One primarily advantageous property of copper as material for plumbing systems is its ability to resist corrosion.

The corrosion resistance of copper tubes is largely due to the interaction of water flowing inside the tube, which features a thin layer of copper oxide {CuO}. In fact, copper has high affinity with oxygen hence quickly after manufacture of the tube a thin layer of copper oxide {CuO} is formed, which adheres to the metal surface. Water molecules react with the oxide during normal use and they form a copper hydroxide {Cu(OH)₂}, which again has almost similar affinity with the underlying metallic copper. This newly formed layer of copper hydroxide is in fact the protective substance, offering chemical and mechanical stability.

In real world, submicron irregularities (peaks and troughs) are always present on metallic surfaces even when "mirror finish" is attained. A measure of the magnitude of these irregularities is the roughness parameter Ra, which for copper tubes is <0.5µm. Lubricating oils used in the tube manufacturing process could be trapped in such irregularities. Such traps interrupt the continuity of the protective layer, thus reduce the effectiveness of the above mechanism. The objective for a "durable" tube will be the complete removal of any trace of oil even when trapped in subsurface cavity.

The cleaning method applied in TALOS copper tubes is simple and effective. Air is enriched with pre-calculated amount of oxygen and is forced into the tubes at temperatures that exceed the lubricant's flash point. The result of this cleaning process is a tube surface fully covered with copper oxide, whilst the lubricants have been decomposed and "burned" by the excess of oxygen. This in effect facilitates the formation of the copper hydroxide {Cu(OH)₂}, when water is introduced in the installation.

This cleaning process by "inner surface oxidation" has been a state of the art in the industry and has been applied by established manufacturers of copper tubes. In certain cases, the same process was applied with the use of a mixture of neutral (noble) gases and oxygen. Evidently the end result of the aforementioned oxidising gases, i.e. the formation of an oxide layer, "guarantees" the effective removal of the tube drawing lubricants and ensures the generation of a healthy continuous film of protective hydroxide layer. European as well as international norms have recognised the value of "tube cleanliness" and have specified a "maximum level" of remaining organic matter (in effect oil residues). In particular, European norm EN1057 specifies that a level of 0.20mg/dm² is not to be exceeded. The effectiveness of the TALOS cleaning process for removal of oils has been tested and certified by well recognised quality organisations. The measured levels are much lower than "the upper limit" of the European norms EN1057.



Microscopic view (x5000) of well developed copper hydroxide {Cu(OH)₂} protective layer formed on the inner surface of TALOS copper tube.

⇒ Water Supply ⇒ Natural Gas

⇒ Heating ⇒ Cooling

TALOS Tubes Advantages

TALOS copper tubes for the sanitary and heating industry provide substantial 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.
- ⇒ TALOS copper tubes are stable and reliable.
- ⇒ TALOS copper tubes, according to EN 1057, are covered by a 30-year manufacturer's warranty.

TALOS Half Hard Copper Tubes Special Advantages

- ⇒ Ease of cold bending.
- ⇒ Reduction of necessary fittings.
- ⇒ Easier construction of networks.
- ⇒ Faster installation and higher workmanship.

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, ASTM B88.

Quality Marks

BSI, AFNOR, NSAI, NSF, AENOR, RAL/DVGW, KIWA/GASTEC, RISE, STF VTT, OFI, SINTEF.

Mechanical Properties

TEMPER	EN 1057 DESIGNATION	MIN. TENSILE STRENGTH R _m (MPa)	MIN. 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

TALOS	EN 1057	15x1	HALCOR	CE	III 26
↑	↑	↑	↑	↑	↑
Brand Name	European Standard	Dimensions	Producer	Conformity Marking	Quarter & Year of Production



Standard Dimensions

SOFT COILS							
DIAMETER X THICKNESS d x s	INNER DIAMETER	NOMINAL COPPER WEIGHT	OUTER SURFACE AREA	FILLING VOLUME	PACKAGING		MAXIMUM ALLOWABLE PRESSURE
					Length of Coil	Coils per pallet	
mm	mm	kg/m	m ² /m	l/m	m		bar
6x1.00	4.0	0.140	0.019	0.013	50	40	226
8x0.60	6.8	0.124	0.025	0.036	50	28	97
8x1.00	6.0	0.196	0.025	0.028	50	28	163
10x0.70	8.6	0.182	0.031	0.058	50	24	90
10x1.00	8.0	0.252	0.031	0.050	50	24	127
12x1.00	10.0	0.308	0.038	0.079	50	20	104
14x1.00	12.0	0.363	0.044	0.113	50	14	88
15x1.00	13.0	0.391	0.047	0.133	50	30	82
15x1.50	12.0	0.566	0.047	0.113	50	14	127
16x1.00	14.0	0.419	0.050	0.154	50	12	77
18x1.00	16.0	0.475	0.057	0.201	25	40	66
22x1.00	20.0	0.587	0.069	0.314	25	30	54
22x1.50	19.0	0.860	0.069	0.284	25	31	82
28x1.50	25.0	1.111	0.088	0.491	25	12	64

⇒ Non-standard dimensions are manufactured upon request.

⇒ The values of the Maximum Allowable Pressure refer to the material condition R200. A safety factor of 3.0 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.

⇒ Water Supply ⇒ Natural Gas

⇒ Heating ⇒ Cooling

Standard Dimensions

STRAIGHT HALF HARD							
DIAMETER X THICKNESS d x s	INNER DIAMETER	NOMINAL COPPER WEIGHT	OUTER SURFACE AREA	FILLING VOLUME	PACKAGING		MAXIMUM ALLOWABLE PRESSURE
					Straight Lengths	Pieces per Bundle	
mm	mm	kg/m	m ² /m	l/m	m		bar
10x0.70	8.6	0.182	0.031	0.058	3	900	90
10x1.00	8.0	0.252	0.031	0.050	4	250	127
12 x 0.70	10.6	0.221	0.038	0.088	3	800	74
12x1.00	10.0	0.308	0.038	0.079	4	400	104
15x0.70	13.6	0.280	0.047	0.145	3	600	58
15x0.80	13.4	0.318	0.047	0.141	3	600	67
15x1.00	13.0	0.391	0.047	0.133	4	600	82
18x0.80	16.4	0.384	0.057	0.211	3	450	56
18x1.00	16.0	0.475	0.057	0.201	4	450	66
22x0.80	20.4	0.474	0.069	0.327	3	300	45
22x1.00	20.0	0.587	0.069	0.314	4	300	54
22x1.50	19.0	0.860	0.069	0.284	4	80	82
28x0.90	26.2	0.682	0.088	0.539	3	200	40
28x1.00	26.0	0.755	0.088	0.531	4	200	42
28x1.50	25.0	1.111	0.088	0.491	4	100	64
35x1.20	32.6	1.134	0.110	0.835	3	100	40
35x1.50	32.0	1.405	0.110	0.804	4	50	50
42x1.20	39.6	1.369	0.132	1.232	3	90	33
42x1.50	39.0	1.699	0.132	1.195	4	90	42
54x1.20	51.6	1.772	0.170	2.091	3	60	26
54x2.00	50.0	2.908	0.170	1.963	4	30	43
66.7x1.20	64.3	2.198	0.210	3.247	3	25	21
66.7x2.00	62.7	3.618	0.210	3.088	3	25	35
76.1x1.50	73.1	3.129	0.239	4.197	3	20	23
76.1x2.00	72.1	4.440	0.239	4.083	3	20	30

⇒ The values of the Maximum Allowable Pressure refer to the material condition R200.
A safety factor of 3.0 is used. The minus tolerance of the wall thickness is considered.
No further processing is taken into account. For temperature up to 100°C.

Standard Dimensions

STRAIGHT HARD							
DIAMETER X THICKNESS d x s	INNER DIAMETER	NOMINAL COPPER WEIGHT	OUTER SURFACE AREA	FILLING VOLUME	PACKAGING		MAXIMUM ALLOWABLE PRESSURE
					Straight Lengths	Pieces per Bundle	
mm	mm	kg/m	m ² /m	l/m	m		bar
10x0.80	8.4	0.206	0.031	0.055	5	500	103
10x1.00	8.0	0.252	0.031	0.050	5	400	127
12x0.80	10.4	0.251	0.038	0.085	5	400	85
12x1.00	10.0	0.308	0.038	0.079	5	300	104
14x0.80	12.4	0.295	0.044	0.121	5	300	72
14x1.00	12.0	0.363	0.044	0.113	5	300	88
15x0.80	13.4	0.318	0.047	0.141	5	300	67
15x1.00	13.0	0.391	0.047	0.133	3 & 5	260	82
16x1.00	14.0	0.419	0.050	0.154	5	240	77
18x0.80	16.4	0.385	0.057	0.211	3	450	56
18x1.00	16.0	0.475	0.057	0.201	5	200	66
22x0.90	20.2	0.531	0.069	0.320	5	200	51
22x1.00	20.0	0.587	0.069	0.314	5	150	54
28x0.90	26.2	0.682	0.088	0.539	3	200	40
28x1.00	26.0	0.755	0.088	0.531	4	200	42
28x1.50	25.0	1.111	0.088	0.491	4	60	64
35x1.00	33.0	0.950	0.110	0.855	3	100	33
35x1.50	32.0	1.405	0.110	0.804	4	50	50
35x2.00	31.0	1.844	0.110	0.755	4	50	68
42x1.00	40.0	1.146	0.132	1.257	3	90	28
42x1.20	39.6	1.368	0.132	1.232	3 & 4	90	33
42x1.50	39.0	1.700	0.132	1.195	4	40	42
54x1.00	52.0	1.484	0.170	2.124	3	60	21
54x1.20	51.6	1.771	0.170	2.091	3 & 4	60	26
54x1.50	51.0	2.202	0.170	2.043	4	60	32
54x2.00	50.0	2.908	0.170	1.963	4	30	43
64x2.00	60.0	3.467	0.201	2.827	3	25	36
66.7x1.20	64.3	2.198	0.210	3.247	5.8	25	21
66.7x2.00	62.7	3.618	0.210	3.088	3	25	35
76.1x1.50	73.1	3.129	0.239	4.197	5	20	23
76.1x2.00	72.1	4.144	0.239	4.083	3	20	30
88.9x2.00	84.9	4.859	0.279	5.661	4	15	26
108x2.00	104.0	5.928	0.339	8.495	5	10	21
108x2.50	103.0	7.375	0.339	8.332	4	10	27

⇒ The values of the Maximum Allowable Pressure refer to the material condition R200.
A safety factor of 3.0 is used. The minus tolerance of the wall thickness is considered.
No further processing is taken into account. For temperature up to 100°C.

Medical Gas Distribution Networks

Cleanliness and Resistance

In the sensitive healthcare areas and installations, it is imperative to use materials that safeguard cleanliness and have a 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 (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 13348

Quality Marks

TÜV NORD

Mechanical Properties

TEMPER	EN 13348 DESIGNATION	MIN. TENSILE STRENGTH R _m (MPa)	MIN. ELONGATION, A (%)
Soft	R-220	220	40
Half Hard	R-250	250	30
Hard	R-290	290	3

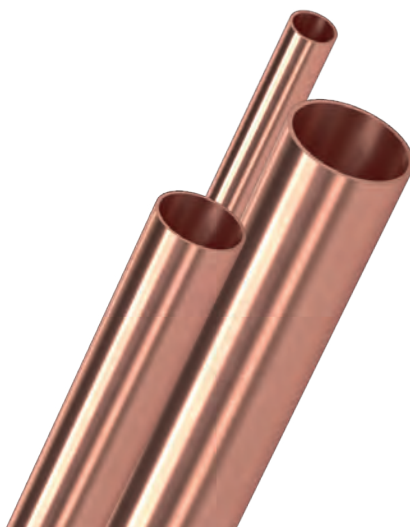
Minimum Marking

TALOS	EN 13348	15x1	HALCOR	CE	III 26
Brand Name	European Standard	Dimensions	Producer	Conformity Marking	Quarter & Year of Production

Standard Dimensions

STRAIGHT LENGTHS						
DIAMETER X THICKNESS d x s	INNER DIAMETER	NOMINAL COPPER WEIGHT	OUTER SURFACE AREA	FILLING VOLUME	PACKAGING	MAXIMUM ALLOWABLE PRESSURE
mm	mm	kg/m	m ² /m	l/m	m	bar
6x1.00	4.0	0.140	0.019	0.013	Straight lengths of 5m	226
8x1.00	6.0	0.196	0.025	0.028		163
10x1.00	8.0	0.252	0.031	0.050		127
12x1.00	10.0	0.308	0.038	0.079		104
15x1.00	13.0	0.391	0.047	0.133		82
18x1.00	16.0	0.475	0.057	0.201		66
22x1.00	20.0	0.587	0.069	0.314		54
28x1.00	26.0	0.755	0.088	0.531		42
35x1.50	32.0	1.405	0.110	0.804		50
42x1.50	39.0	1.700	0.132	1.195		42
54x2.00	50.0	2.908	0.170	1.963		43
64x2.00	60.0	3.476	0.201	2.827		36
66.7x2.00	62.7	3.618	0.210	3.088		35
76.1x2.00	72.1	4.144	0.239	4.083		30
88.9x2.00	84.9	4.857	0.279	5.661		26
108x2.50	103.0	7.375	0.339	8.332		27

⇒ The values of the Maximum Allowable Pressure refer to the material condition R200. A safety factor of 3.0 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.



⇒ Water Supply

⇒ Heating

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 ACR 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 ACR 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 ACR ECUTHERM copper tubes are the ideal choice for every modern application.

⇒ Air Conditioning

⇒ Refrigeration

High Performance Technological Product

The insulating material used in the manufacturing of TALOS ACR ECUTHERM copper tubes is an extruded high-quality polyethylene foam suitably expanded to form a foam with closed microcells, free of CFCs and fibrous substances, and is cross-linked (PE-X) to provide increased strength depending on the requirements of the application.

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.

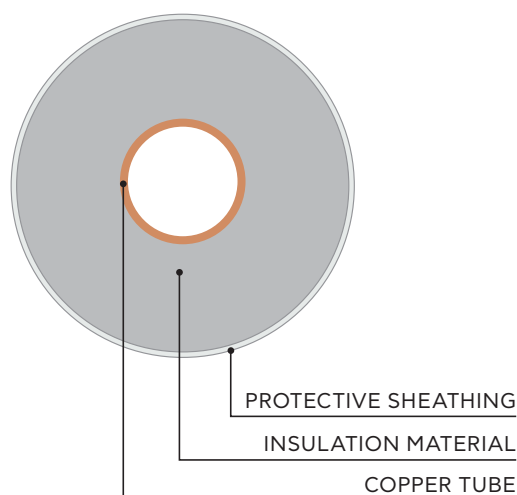
TALOS ACR ECUTHERM copper tubes are produced in compliance to the requirements of standards that apply in most of the European Union countries, as regards insulation properties, chemical characteristics and reaction to fire. They exhibit low λ coefficient, determining its heat conductivity properties and high μ coefficient, which determines its resistance to penetration of moisture.

TALOS ACR ECUTHERM copper tubes are available in coils of 25 & 50 meter lengths and insulation thickness of 6, 9, 10, 13 and 19mm, 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 or (b) the European Standard EN 12735-1 for use in air conditioning and refrigeration installations. TALOS ACR ECUTHERM copper tubes meet the requirements imposed by new generations of refrigerants which are adopted by major refrigeration and air conditioning unit manufacturers. 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 (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

TALOS ECUTHERM water pipes: EN 1057.
TALOS ACR ECUTHERM refrigeration pipes: EN 12735-1.

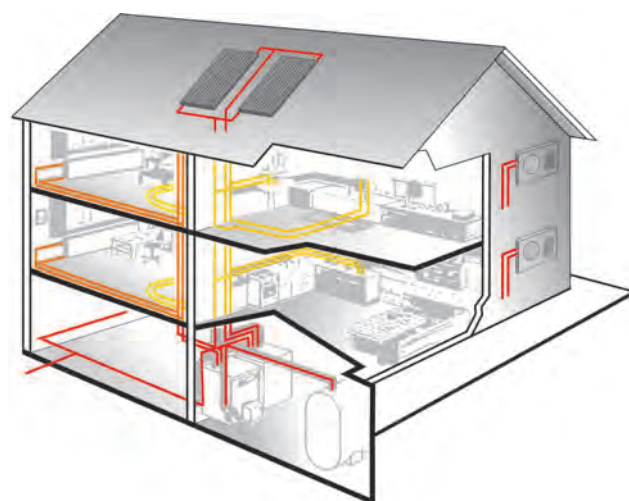
Quality Marks

Water pipes: RAL/DVGW, BSI, AFNOR, AENOR, CSTB (Avis Technique), NSAI, KIWA/GASTEC-QA, RISE, STF VTT, GOST, NSF.

Refrigeration pipes: TÜV, UL, NSF.

Mechanical Properties

TEMPER	EN 1057 / EN 12735 DESIGNATION	MIN. TENSILE STRENGTH R _m (MPa)	MIN. ELONGATION, A (%)
Soft	R-220	220	40



⇒ Water Supply

⇒ Air Conditioning

⇒ Heating

⇒ Refrigeration

Insulation Technical Properties



Cross-linked
Polyethylene



RESISTANCE

Material	PE-X or PE foam
Density according to DIN 53420 ASTM D 1667	30-33kg/m ³
Thermal conductivity coefficient (λ) according to EN ISO 8497	0.0357W/mK (0°C) 0.0389W/mK (40°C)
Vapour-water diffusion resistance coefficient (μ) according to EN 13469	12,500
Working temperature	-80°C to +110°C
Reaction to fire	EN 13501-1 Class B or Class E, DIN 4102, B2, BS 476, NF P 92 501-M1
Resistance to chemical agents according to ASTM 543-56 T	Very good
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 Dimensions according to EN 1057

Copper tube outer 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 outer diameter with 9mm thick insulation	mm	24	26	28	30	33	34	36	40
Maximum Allowable Pressure	bar	182	132	103	104	82	77	66	54

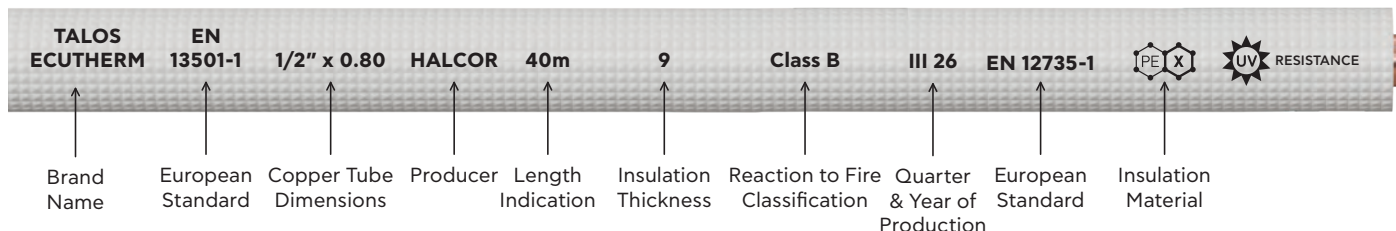
⇒ The values of the Maximum Allowable Pressure refer to the material condition R200. A safety factor of 3.0 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.

Standard Dimensions according to EN 12735-1

Copper tube outer diameter	inch	3/16	1/4	5/16	3/8	1/2	5/8	3/4	7/8
	mm	4.76	6.35	7.94	9.52	12.70	15.87	19.05	22.22
Copper tube wall thickness	mm	0.80	0.80	0.80	0.80	0.80	1.00	1.00	1.00
Overall outer diameter with 9mm thick insulation	mm	22.76	24.35	25.94	27.52	30.70	33.87	37.05	40.23
Maximum Allowable Pressure	bar	238	171	133	109	80	77	62	53

⇒ Maximum Pressure Calculation according to EN 14276:2020, which complies with the European Directive PED 2014/68/EU (Pressure Equipment Directive).

Marking



TALOS ECUTHERM 1/2" & 5/8"

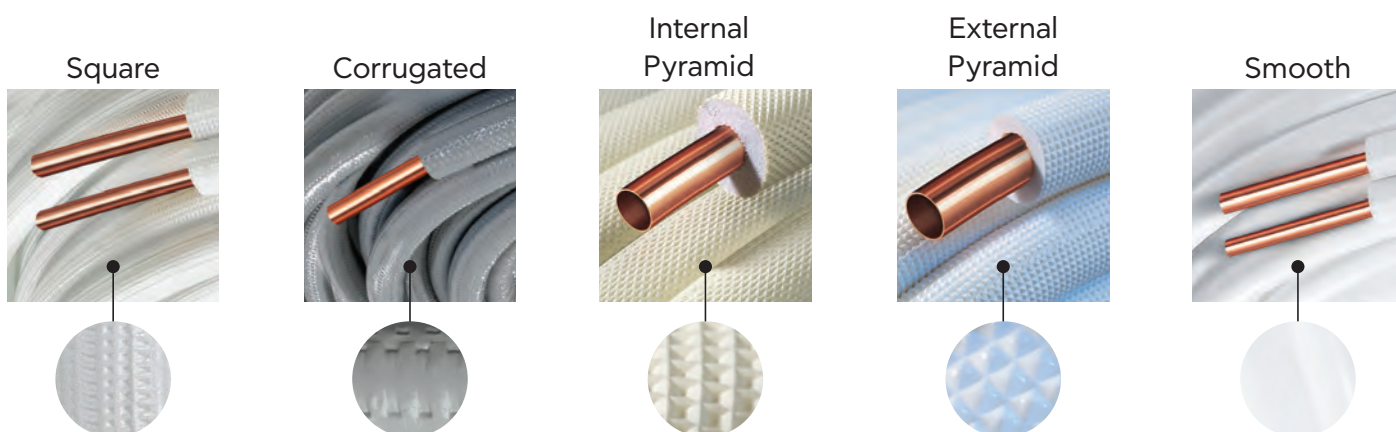
Indicative Calculation of Insulation Thickness

Air conditioning and refrigeration units, operate in temperatures lower than ambient temperature. This temperature difference may lead to unwanted vapour condensation on the insulation outer

surface; therefore it must be compensated by the appropriate insulation thickness. 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	9	6	6	9
+10	6	6	6	6	6	9	6	6	9	6	6	9
+5	6	6	9	6	6	9	6	9	9	6	9	9
0	6	6	9	6	6	9	6	9	13	6	9	13
-5	6	9	9	6	9	13	6	9	13	6	9	13
-10	6	9	13	6	9	13	6	9	13	9	9	13
-20	6	9	13	9	9	13	9	13	13	9	13	13

1/2 inch - 12.7mm 5/8 inch - 15.88mm



Insulation thickness capability: 6mm - 19mm

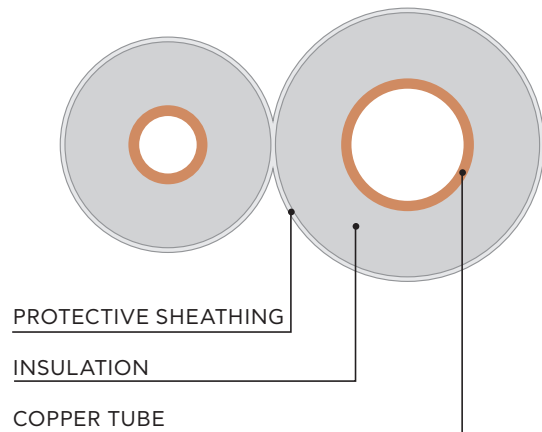
Air Conditioning

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 organisation 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: 2015, certified by TÜV Hellas.

According to the European Standard EN 12735-1, as well as current market requirements, driven by the use of new generation of refrigerants and 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 0.80mm.
- ➞ For an external diameter of 5/8" to 3/4", the wall thickness is standardised at 1.00mm.

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"

Copper Tube 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.

Quality Marks

Refrigeration pipes: TÜV, NSF, UL.

Mechanical Properties

TEMPER	EN 1057 / EN 12735 DESIGNATION	MIN. TENSILE STRENGTH R _m (MPa)	MIN. ELONGATION, A (%)
Soft	R-220	220	40

Insulation Technical Properties



Material	PE-X or PE foam
Density according to DIN 53420 ASTM D 1667	30-33kg/m ³
Thermal conductivity coefficient (λ) according to EN ISO 8497	0.0357W/mK (0°C) 0.0389W/mK (40°C)
Vapour-water diffusion resistance coefficient (μ) according to EN 13469	12,500
Working temperature	-80°C to +110°C
Reaction to fire	EN 13501-1 Class B or Class E, DIN 4102, B2, BS 476, NF P 92 501-M1
Resistance to chemical agents according to ASTM 543-56 T	Very good
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)

	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
Copper tube outer diameter	mm	6.35-9.52	6.35-12.7	6.35-15.87	6.35-19.05	9.52-12.7	9.52-15.87	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 outer 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 Allowable Pressure	bar	171-109	171-80	171-77	171-62	109-80	109-77	109-62	80-62

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

⇒ Maximum Allowable Pressure calculation according to EN 14276:2020, which complies with the European Directive PED 2014/68/EU (Pressure Equipment Directive).

TALOS COATED plastic-coated copper tubes are designed to provide additional exterior protection in plumbing building installations. In particular, the plastic coating offers protection against mechanical abrasion during installation, protection against the weather, as well as protection against aggressive environments either above or below the ground.

Material

Copper phosphorus deoxidised (minimum copper content 99.90%, phosphorus concentration P=0.15% - 0.04%, classified as CW024A, or Cu-DHP, according to the European alloy coding system.

Specifications

Copper tube: EN 1057, EN 13349.

Plastic sheathing: Classified as Class E according to EN 13501-1 classification system.

Quality Marks

BSI, AFNOR, NSAI, NSF, AENOR, RAL/DVGW, KIWA/GASTEC, RISE, STF VTT, OFI, SINTEF.

Mechanical Properties

TEMPER	EN 1057 DESIGNATION	MIN. TENSILE STRENGTH Rm (MPa)	MIN. 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

TALOS	EN 13349	15x1	HALCOR	GREECE	EN 13501-1	CLASS B	TALOS	EN 13349	15x1	HALCOR	CE	III 26
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Brand Name	European Standard	Dimensions	Producer	Production Country	European Standard	Reaction to fire classification	Trade Name	European Standard	Dimensions	Producer	Conformity Marking	Quarter & Year of Production

Standard Dimensions

SOFT COILS								
COPPER TUBE OUTER DIAMETER X THICKNESS d x s	OVERALL OUTER DIAMETER D	TUBE FILLING VOLUME	NOMINAL COPPER WEIGHT	THERMAL* CAPACITY	MIN. BENDING RADIUS FOR HAND BENDING	MIN. BENDING RADIUS WITH BENDING TOOL	PACKAGING IN COILS	MAXIMUM ALLOWABLE PRESSURE
mm	mm	l/m	kg/m	Kcal/h	mm	mm	m long	bar
12x1.00	16	0.079	0.308	4,400	100	-	25 or 50	104
15x1.00	19	0.133	0.391	7,500	120	-		82
16x1.00	20	0.154	0.420	8,700	130	-		77
18x1.00	23	0.200	0.475	11,300	145	-	25	66
22x1.00	27	0.315	0.537	17,700	175	-		54
15x0.80	19	0.141	0.318	8,000	125	-	25 or 50	67
18x0.80	23	0.211	0.385	11,900	150	-		56

STRAIGHT LENGTHS								
COPPER TUBE OUTER DIAMETER X THICKNESS d x s	OVERALL OUTER DIAMETER D	TUBE FILLING VOLUME	NOMINAL COPPER WEIGHT	THERMAL* CAPACITY	MIN. BENDING RADIUS FOR HAND BENDING	MIN. BENDING RADIUS WITH BENDING TOOL	PACKAGING IN COILS	MAXIMUM ALLOWABLE PRESSURE
mm	mm	l/m	kg/m	Kcal/h	mm	mm	m long	bar
15x1.00	19	0.133	0.391	7,600	-	55	Straight lengths of 4m	82
16x1.00	20	0.154	0.420	8,600	-	60		77
18x1.00	23	0.191	0.563	11,200	-	70		66
22x1.00	27	0.314	0.587	17,400	-	-		54

⇒ * For a temperature drop of 20°C and a water velocity of 0.80m/sec.

⇒ The values of the Maximum Allowable Pressure refer to the material condition R200. A safety factor of 3.0 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.

Interior Natural Gas Networks

TALOS GAS plastic coated copper tubes are the ideal choice for natural gas installations. In particular, the plastic coating offers external protection against the elements, as well as mechanical abrasion during installation, thus providing a safe and durable solution for the transportation of natural gas.

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

Copper tube: EN 13349, EN 1057.

Plastic sheathing: Classified as Class E according to EN 13501-1 classification system.

Quality Marks

BSI, AFNOR, NSAI, NSF, AENOR, RAL/DVGW, KIWA/GASTEC, RISE, STF VTT, OFI, SINTEF.

Mechanical Properties

TEMPER	EN 1057 DESIGNATION	MIN. TENSILE STRENGTH Rm (MPa)	MIN. ELONGATION, A (%)
Soft	R-220	220	40
Half Hard	R-250	250	20
Hard	R-290	290	3

Minimum Marking

TALOS	EN 13349	15x1	HALCOR	GREECE	EN 13501-1	CLASS B	TALOS	EN 1057	15x1	HALCOR	CE	III 26
Brand Name	European Standard	Dimensions	Producer	Production Country	European Standard	Reaction to fire classification	Trade Name	European Standard	Dimensions	Producer	Conformity Marking	Quarter & Year of Production

Brazing Alloys used for Copper Tubes and Fittings

FILLER ALLOY CODE (according to EN 1044)	AG 106	AG 203	AG 104	CP 105	CP 203
FILLER ALLOY CODE (according 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 (according to EN 1045)	FH 10	FH 10	FH 10	without (*)	without (*)
FLUX (according 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.

Standard Dimensions

COATED IN COILS							
COPPER TUBE OUTER DIAMETER X THICKNESS d x s	OVERALL OUTER DIAMETER D	TUBE FILLING VOLUME	NOMINAL COPPER WEIGHT	MIN. BENDING RADIUS FOR HAND BENDING	MIN. BENDING RADIUS WITH BENDING TOOL EN 1057	PACKAGING IN COILS	MAXIMUM ALLOWABLE PRESSURE
mm	mm	l/m	kg/m	mm	mm	m long	bar
15x1.00	19	0.133	0.391	120	-	25 or 50	82
15x1.20	19	0.125	0.463	120	-	50	100
18x1.00	22	0.201	0.475	145	-	25 or 50	66
18x1.20	22	0.191	0.564	145	-	25	80
22x1.00	26	0.314	0.587	175	-	25	54

STRAIGHT LENGTHS								
DIAMETER X THICKNESS d x s	INNER DIAMETER	NOMINAL COPPER WEIGHT	OUTER SURFACE AREA	FILLING VOLUME	MIN. BENDING RADIUS WITH BENDING TOOL EN 1057	PACKAGING		MAXIMUM ALLOWABLE PRESSURE
						Type	Pieces per bundle	
mm	mm	kg/m	m ² /m	l/m	mm	m		bar
10x1.00	8.0	0.252	0.031	0.050	40	Straight lengths of 4m	250	127
12x1.00	10.0	0.308	0.038	0.079	45		400	104
15x1.00	13.0	0.391	0.047	0.133	55		600	82
15x1.20	12.6	0.463	0.047	0.125	-		125	100
18x1.00	16.0	0.475	0.057	0.201	70		450	66
18x1.20	15.6	0.564	0.057	0.191	-		100	80
22x1.00	20.0	0.587	0.069	0.314	-		300	54
22x1.50	19.0	0.860	0.069	0.284	-		80	82
28x1.50	25.0	1.111	0.088	0.491	-		60	64
35x1.50	32.0	1.405	0.110	0.804	-		50	50
35x2.00	31.0	1.845	0.110	0.755	-		50	68
42x1.50	39.0	1.699	0.132	1.195	-		40	42
42x2.00	38.0	2.236	0.132	1.134	-		40	56
54x2.00	50.0	2.908	0.170	1.963	-		30	43
64x2.00	60.0	3.467	0.201	2.827	-		25	36
76.1x2.00	72.1	4.144	0.239	4.083	-		20	30
88.9x2.00	84.9	4.859	0.279	5.661	-		15	26
108x2.50	103.0	7.375	0.339	8.332	-		10	27

⇒ Copper 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 standardised (see for example standard EN 1044 replaced by EN ISO 17672).

⇒ The values of the Maximum Allowable Pressure refer to the material condition R200. A safety factor of 3.0 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.

Solar System Networks

Due to its superior physical and chemical properties, engineers have always relied on copper for thermohydraulic 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.

TALOS ECUTHERM SOLAR copper tubes are manufactured in pairs (one for supply and one for return), in standardised 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 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 constitute 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, manufactured according to EN 1057.

Reliability offered only by TALOS Copper Tubes

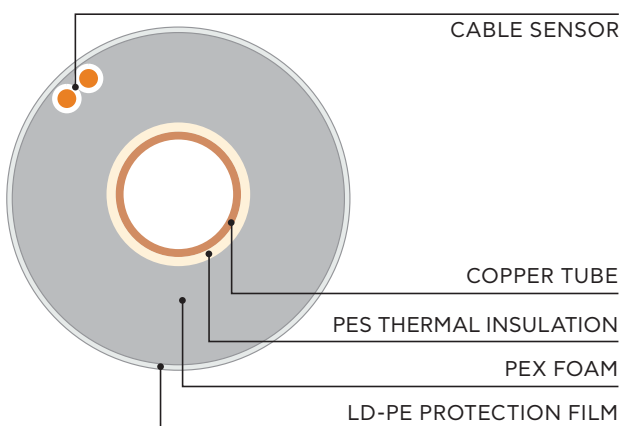
TALOS copper tubes are manufactured according to European and U.S. specifications and have been certified by most international quality organisations (RAL, DVGW, BSI, AFNOR, AENOR, CSTB, NSAI, NSF, RISE, SINTEF, OFI, STF VTT).

High Performance Technological Product

TALOS ECUTHERM SOLAR copper tubes are coated with a 3-layer system. To begin with, a high temperature resistant PES insulation layer is positioned on the outer of the copper tube. An industrial insulation of cross-linked polyethylene (PE-X) foam structured in closed micro-cells provides thermal insulation. An external covering creates an integral resistance barrier against the external environment.

Copper Tube Technical Characteristics

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



Insulation Technical Properties



Foam Material	PES/PE-X
Density according to DIN 53420 ASTM D 1667	30-33kg/m ³
Thermal conductivity coefficient (λ) according to EN ISO 8497	0.0357W/mK (0°C) 0.0389W/mK (40°C)
Vapour-water diffusion resistance coefficient (μ) according to EN 13469	12,500
Working temperature	-80°C to +150°C
Reaction to fire	EN 13501-1
Resistance to chemical agents according to ASTM 543-56 T	Very good
Protective film (white or black color)	300µm UV resistance

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

Standardised Dimensions (Roll Lengths 10m, 15m, 20m, 25m) TALOS ECUTHERM SOLAR

Outer 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 Allowable Pressure (at 150°C)	bar	55	60	55	51	45	45
Bend radius	4xOD						

Outer 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 Allowable Pressure (at 150°C)	bar	111	100	91	72	58	47
Bend radius	4xOD						

⇒ The values of the Maximum Allowable Pressure refer to the material condition R200. A safety factor of 3.0 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.

Standardised Dimensions TALOS ECUTHERM SOLAR 2 Cable Technical Characteristics

(12/12, 15/15, 18/18, 22/22)

CONDUCTOR MATERIAL	COPPER
Flexibility of conductor	Flexible, Class E
Color	White
No. of poles	2
Nominal voltage Vo/V	300/300
Nominal cross section of conductor	2x0.75mm ²

The Smart Side of Technology

Halcor has invested in research and technology to create innovative solution in copper tube systems, proving its leading position in the copper processing industry.

CUSMART are patented flexible copper tubes with a special compound coating. 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.

Superior beyond any Comparison with 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 ELOT 1425/1426. CUSMART tubes are assessed and certified for their suitability in drinking water installations from the NSF organisation, according to NSF/ANSI/CAN 61. CUSMART flexible copper tubes are made of special high endurance, compound with fire retardant properties, according to 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

RAL, NSF.

Mechanical properties

TEMPER	MIN. TENSILE STRENGTH RM (MPa)	MIN. ELONGATION, A (%)
Soft	220	40

Technical Properties of Industrial Insulation CUSMART Copper Tubes

Nominal dimensions (mm)	14x2	16x2	18x2	20x2	26x3	32x3
Total outer diameter (insulation thickness: 9mm)	32	34	36	38	44	50
Packaging - Coil (m)	100/50	100/50	100/50	100/50	25/50	25

Technical Properties of CUSMART Copper Tubes

Nominal dimensions (mm)	14x2	16x2	18x2	20x2	26x3	32x3
Outer diameter - (od) (mm)	14	16	18	20	26	32
Wall thickness (mm)	2	2	2	2	3	3
Inner diameter (id) (mm)	10	12	14	16	20	26
Inner 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 co-efficient (W/m•°K)	0.40	0.40	0.40	0.40	0.40	0.40
Maximum Allowable Pressure (bar)	35	34	29	26	26	27
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
	Coils (m)	100/50	100/50	100/50	100/50	25/50

⇒ Different dimensions and lengths are available upon request.

⇒ The values of the maximum allowable pressure refer to the material condition R200.
A safety factor of 3.0 is used. The minus tolerance of the wall thickness is considered.
No further processing is taken into account. For temperatures up to 100°C.

Insulation Technical Properties

Foam material	PE-X or PE
Density according to DIN 53420 ASTM D 1667	30-33kg/m ³
Thermal conductivity coefficient (λ) according to EN ISO 8497	0.0357W/mK (0°C) 0.0389W/mK (40°C)
Vapour-water diffusion resistance coefficient (μ) according to EN 13469	12,500
Working temperature	-80°C to +110°C (+90°C for PE foam)
Reaction to fire	EN 13501-1 Class B or Class E, DIN 4102, B2, BS 476, NF P 92 501-M1
Resistance to chemical agents according to ASTM 543-56 T	Very good
Dimensional stability according to ISO 2796 for temperatures up to 100°C	<5%

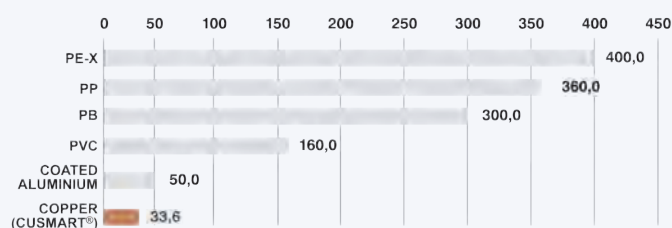
⇒ Values are listed, as obtained under standard laboratory conditions and may be amended, without prior notice.

Significant and Uninterrupted Energy Saving

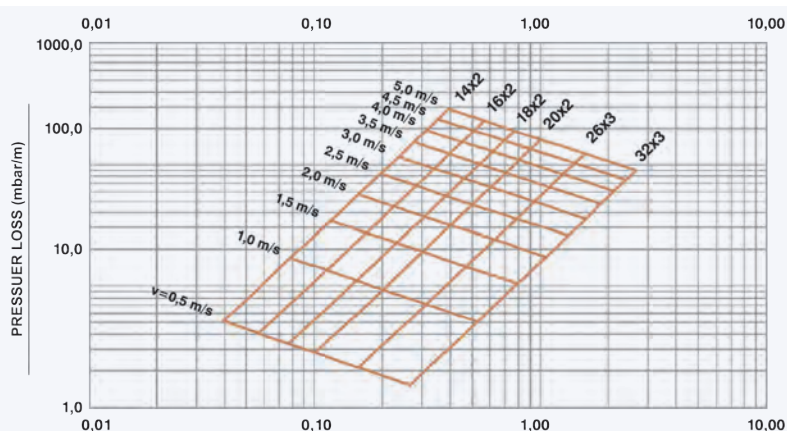
CUSMART flexible tubes with external industrial insulation are suitable for all heating and hot water supply plumbing networks inside and outside buildings. The insulation is a polyethy-

lene 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.

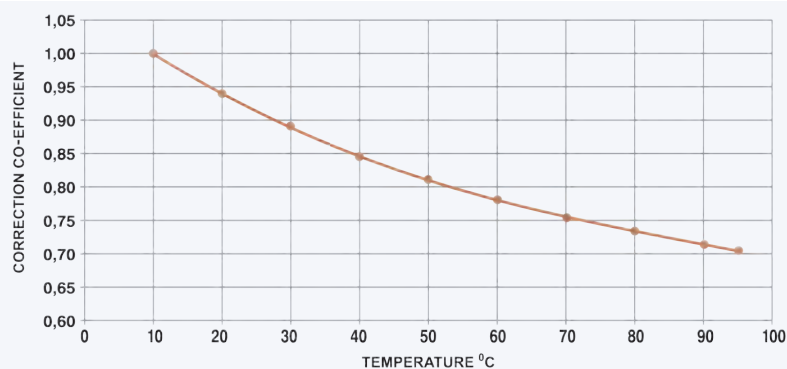
Comparative Diagram for Linear Expansion of the Tube (mm) $\Delta T=40^{\circ}\text{C}$, $L=50\text{M}$



Pressure Loss at 10°C



Pressure Loss Correction Factor in relation to Temperature



⇒ Halcor reserves the right to amend any of the above-mentioned technical properties without prior notice.

Product Description

TALOS PLATED copper tubes have been developed for use in sanitary and heating installations. These metal plated copper tubes provide unique aesthetics and are suitable for both new build and renovation work. There is no need to conceal the tubes, and the result delivers a smart finish, which is easy to keep clean. TALOS PLATED copper tubes possess excellent resistance to internal, as well as external corrosion due to the inherent properties of copper and the tough external coating. The metallic coating ensures a brightly polished, mirror-like surface that is long lasting and is well matched with other plated accessories found in contemporary bathroom and heating installations. TALOS PLATED copper tubes are supplied in half hard or soft temper that enables easy bending. This makes TALOS PLATED copper tubes quick to install, saving time and money.

Product Features

- ➞ Long lasting plated surface that offers a modern chrome look, which fits perfectly with contemporary taps, radiators, towel rails and bathroom fittings.

- ➞ Suitable for all exposed plumbing installations, in both horizontal and vertical runs.
- ➞ Half-hard or soft temper to retain the bendable qualities of copper tube.
- ➞ Supplied in a variety of straight lengths to save waste.

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

Mechanical properties: EN 1057 / Internal cleanliness: EN 1057.

Company standard: TB010.

HALF HARD OR SOFT IN STRAIGHT LENGTHS			
OUTER DIAMETER*	WALL THICKNESS	LENGTH**	MAXIMUM ALLOWABLE PRESSURE
mm	mm	m	bar
10	0.7-1.0	1 / 1.2 / 2 / 2.75 / 3	90-127
12	0.7-1.0	1 / 1.2 / 2 / 2.75 / 3	74-104
14	0.7-1.0	1 / 1.2 / 2 / 2.75 / 3	63-88
15	0.7-1.0	1 / 1.2 / 2 / 2.75 / 3	58-82
16	0.7-1.0	1 / 1.2 / 2 / 2.75 / 3	55-77
18	0.7-1.0	1 / 1.2 / 2 / 2.75 / 3	48-66
22	0.7-1.0	1 / 1.2 / 2 / 2.75 / 3	39-54
32	0.7-1.0	1 / 1.2 / 2 / 2.75 / 3	27-36

➞ * Additional diameters and tempers are available upon request.

➞ ** Additional lengths are available upon request. Soft temper available in certain lengths only.

➞ The values of the Maximum Allowable Pressure refer to the material condition R200. A safety factor of 3.0 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.



This product is made of material from well-managed FSC®-certified forests, recycled materials, and other controlled sources.

HALCOR

Evolving Beyond Copper

COPPER & ALLOYS
EXTRUSION DIVISION:



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