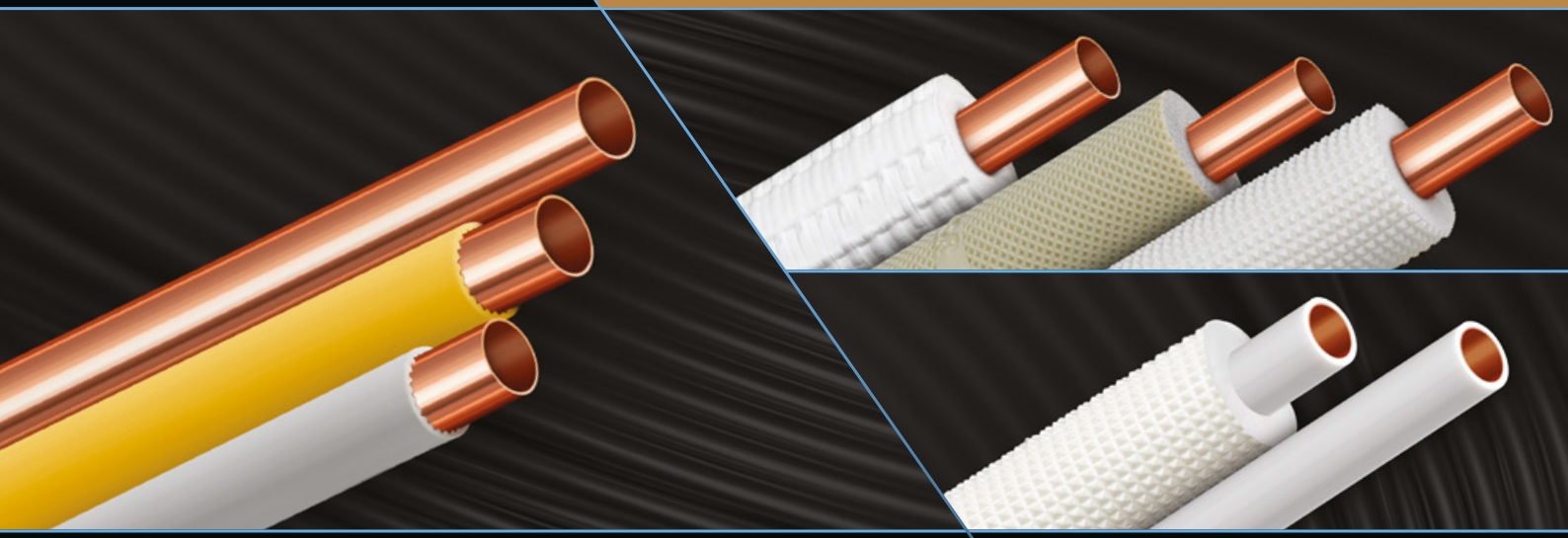
HALCOR

BUILDING INSTALLATIONS



HALCOR

Member of **Copper Alliance**

Halcor is the copper tubes division of ElvalHalcor S.A., a leading copper industry that specializes in the production, processing and marketing of copper and copper alloys products with dynamic commercial presence in the European and global markets. For more than 80 years, Halcor has been offering innovative and added-value solutions that meet contemporary client demands in fields, such as plumbing, HVAC&R, renewable energy, architecture, engineering and industrial production.

Halcor and the copper subsidiaries Fitco, Sofia Med and HC ISITMA consist the copper segment of ElvalHalcor S.A. and they operate a total of five production plants in Greece, Bulgaria and Turkey. Halcor and the copper subsidiaries develop and distribute a wide range of products, including copper, brass and copper-alloy rolled and extruded products 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, Halcor implements an ISO 9001:2008 Certified Quality Management System and leverages high technologies and expert staff.

As a result of the strategic investments in research & development, Halcor is recognized as one of the leading copper producers globally, setting new standards in copper processing. Halcor 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 leverage advanced technologies to bring in the market innovative products that are energy efficient and environmentally friendly.

TÜV HELLAS

TÜV AUSTRIA HELLAS

Cu+

ELVALHALCOR
HELLENIC COPPER AND ALUMINIUM INDUSTRY S.A.

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COPPER TUBES

TALOS®

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.

TALOS® COPPER TUBES

TALOS® MED™ COPPER TUBES

TALOS® PLASTIC COATED COPPER TUBES

TALOS® GAS™ COATED COPPER TUBES

TALOS® ECUTHERM™ COPPER TUBES

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TALOS® ECUTHERM™ COPPER TUBES

TALOS® ECUTHERM™ COPPER TUBES

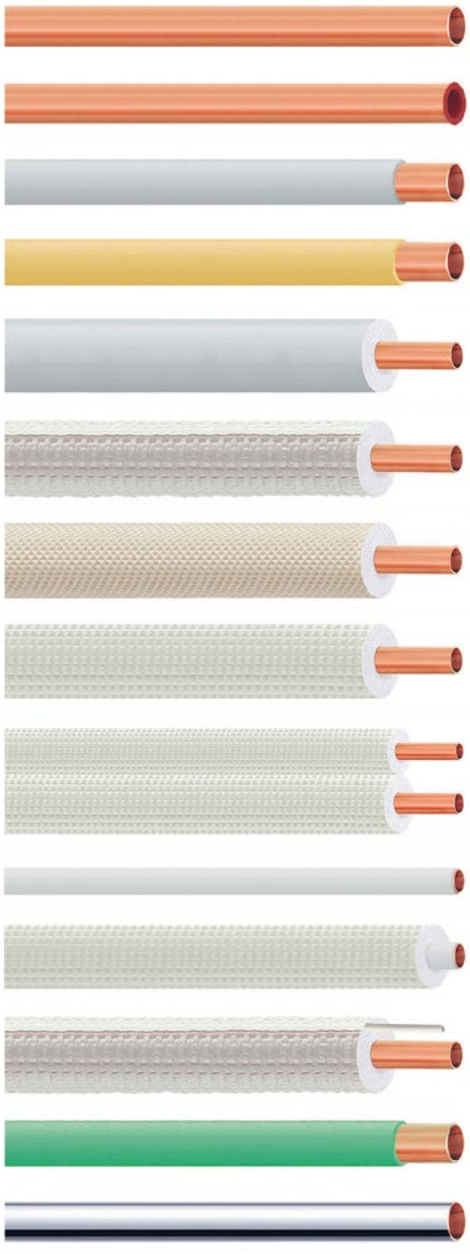
TALOS® ACR ECUTHERM 2™ COPPER TUBES

CUSMART® COPPER TUBES

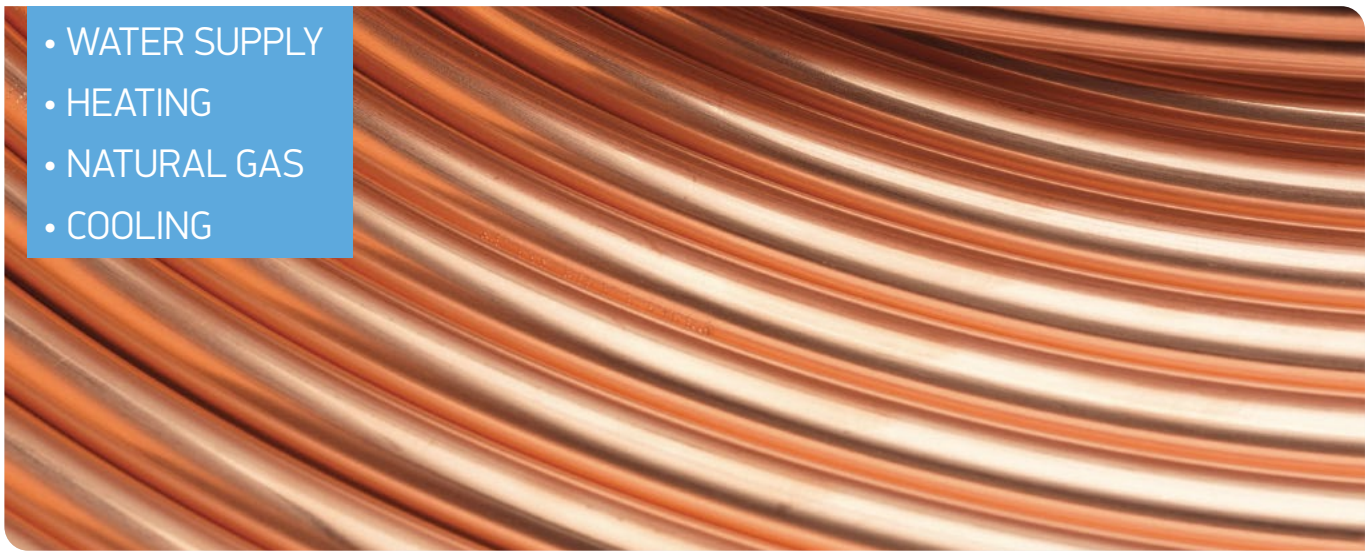
TALOS® ECUTHERM™ SOLAR COPPER TUBES

TALOS® GEOTHERM™ COPPER TUBES

TALOS® PLATED™ COPPER TUBES



COPPER TUBES
TALOS®



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.
- 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

Material

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

Specifications

EN 1057

Quality Marks

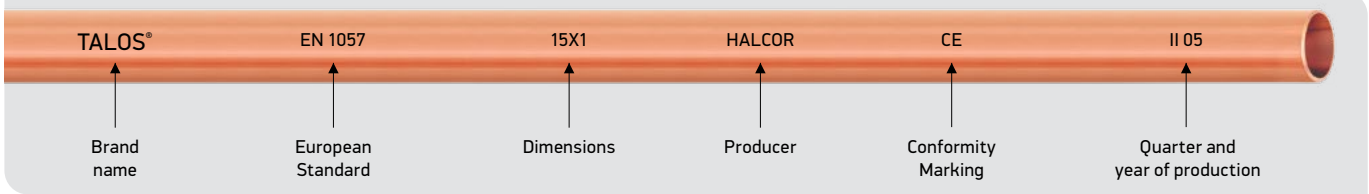
BSI, AFNOR, NSAI, AENOR, RAL / DVGW, KIWA / GASTEC-QA, SITAC, STF VTT, GOST, VIK.

Mechanical Properties

Temper	EN 1057 Classification	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



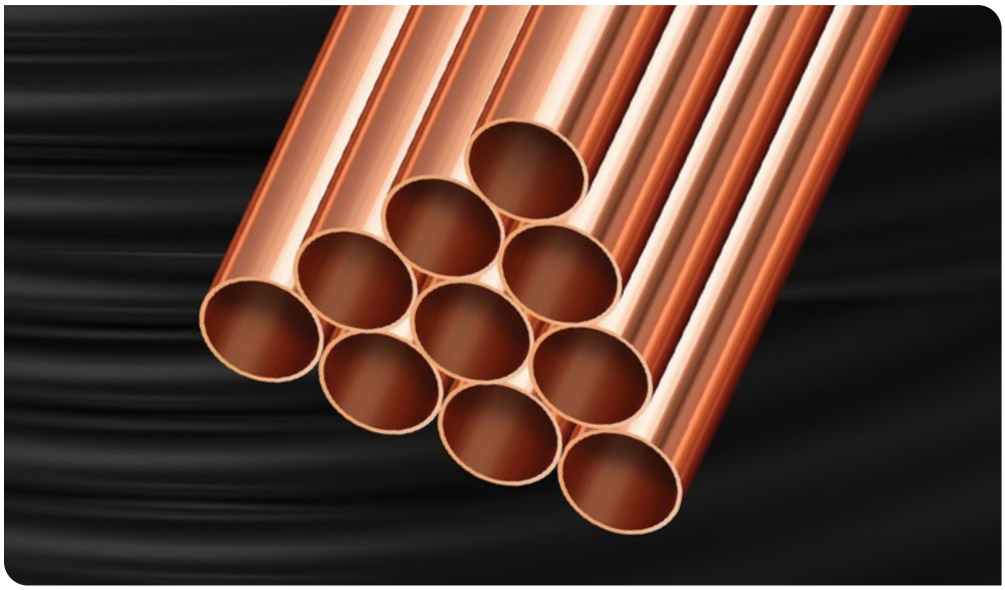
COPPER TUBES
TALOS®

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		Working pressure (bar)
					Straight lengths	Pieces per bundle	
10 x 0,70	8,6	0,182	0,031	0,058	3m	900	83
10 x 1,00	8,0	0,252	0,031	0,050	4m	250	118
12 x 0,70	10,6	0,221	0,038	0,088	3m	800	69
12 x 1,00	10,0	0,308	0,038	0,079	4m	400	97
15 x 0,70	13,6	0,280	0,047	0,145	3m	600	55
15 x 0,80	13,4	0,318	0,047	0,141	3m	600	63
15 x 1,00	13,0	0,391	0,047	0,133	4m	600	76
18 x 0,80	16,4	0,384	0,057	0,211	3m	450	52
18 x 1,00	16,0	0,475	0,057	0,201	4m	450	62
22 x 0,80	20,4	0,474	0,069	0,327	3m	300	42
22 x 1,00	20,0	0,587	0,069	0,314	4m	300	50
22 x 1,50	19,0	0,860	0,069	0,284	4m	80	76
28 x 0,90	26,2	0,682	0,088	0,539	3m	200	37
28 x 1,00	26,0	0,755	0,088	0,531	4m	200	39
28 x 1,50	25,0	1,111	0,088	0,491	4m	100	59
35 x 1,20	32,6	1,134	0,110	0,835	3m	100	38
35 x 1,50	32,0	1,405	0,110	0,804	4m	50	47
42 x 1,20	39,6	1,369	0,132	1,232	3m	90	31
42 x 1,50	39,0	1,699	0,132	1,195	4m	90	39
54 x 1,20	51,6	1,772	0,170	2,091	3m	60	24
54 x 2,00	50,0	2,908	0,170	1.963	4m	30	41
66,7 x 1,20	64,3	2,198	0,210	3,247	3m	25	19
66,7 x 2,00	62,7	3,618	0,210	3,088	3m	25	33
76,1 x 1,50	73,1	3,129	0,239	4,197	3m	20	21
76,1 x 2,00	72,1	4,44	0,239	4,083	3m	20	29

The values of the maximum working pressure refer to the material condition R220. A safety factor of 3.5 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.



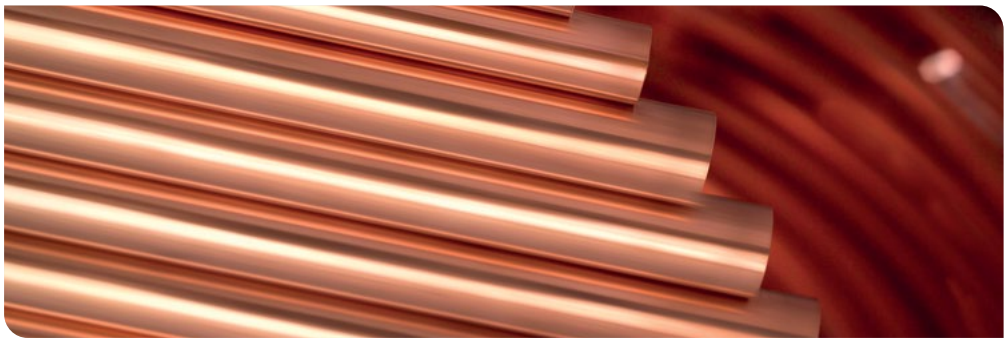
COPPER TUBES
TALOS®

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		Working pressure (bar)
					Straight lengths	Pieces per bundle	
10 x 0,80	8,4	0,206	0,031	0,055	5m	500	96
10 x 1,00	8,0	0,252	0,031	0,050	5m	400	118
12 x 0,80	10,4	0,251	0,038	0,085	5m	400	79
12 x 1,00	10,0	0,308	0,038	0,079	5m	300	97
14 x 0,80	12,4	0,295	0,044	0,121	5m	300	67
14 x 1,00	12,0	0,363	0,044	0,113	5m	300	82
15 x 0,80	13,4	0,318	0,047	0,141	5m	300	63
15 x 1,00	13,0	0,391	0,047	0,133	3m & 5m	260	76
16 x 1,00	14,0	0,419	0,050	0,154	5m	240	71
18 x 0,80	16,4	0,385	0,057	0,211	3m	450	52
18 x 1,00	16,0	0,475	0,057	0,201	5m	200	62
22 x 0,90	20,2	0,531	0,069	0,320	5m	200	48
22 x 1,00	20,0	0,587	0,069	0,314	5m	150	50
28 x 0,90	26,2	0,682	0,088	0,539	3m	200	37
28 x 1,00	26,0	0,755	0,088	0,531	4m	200	39
28 x 1,50	25,0	1,111	0,088	0,491	4m	60	59
35 x 1,00	33,0	0,950	0,110	0,855	3m	100	31
35 x 1,50	32,0	1,405	0,110	0,804	4m	50	47
35 x 2,00	31,0	1,844	0,110	0,755	4m	50	64
42 x 1,00	40,0	1,146	0,132	1,257	3m	90	26
42 x 1,20	39,6	1,368	0,132	1,232	3m & 4m	90	31
42 x 1,50	39,0	1,700	0,132	1,195	4m	40	39
54 x 1,00	52,0	1,484	0,170	2,124	3m	60	20
54 x 1,20	51,6	1,771	0,170	2,091	3m & 4m	60	24
54 x 1,50	51,0	2,202	0,170	2,043	4m	60	30
54 x 2,00	50,0	2,908	0,170	1,963	4m	30	41
64 x 2,00	60,0	3,467	0,201	2,827	3m	25	34
66,7 x 1,20	64,3	2,198	0,210	3,247	5,8m	25	19
66,7 x 2,00	62,7	3,618	0,210	3,088	3m	25	33
76,1 x 1,50	73,1	3,129	0,239	4,197	5m	20	21
76,1 x 2,00	72,1	4,144	0,239	4,083	3m	20	29
88,9 x 2,00	84,9	4,859	0,279	5,661	4m	15	24
108 x 2,00	104,0	5,928	0,339	8,495	5m	10	20
108 x 2,50	103,0	7,375	0,339	8,332	4m	10	25

The values of the maximum working pressure refer to the material condition R220. A safety factor of 3.5 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.



COPPER TUBES
TALOS®

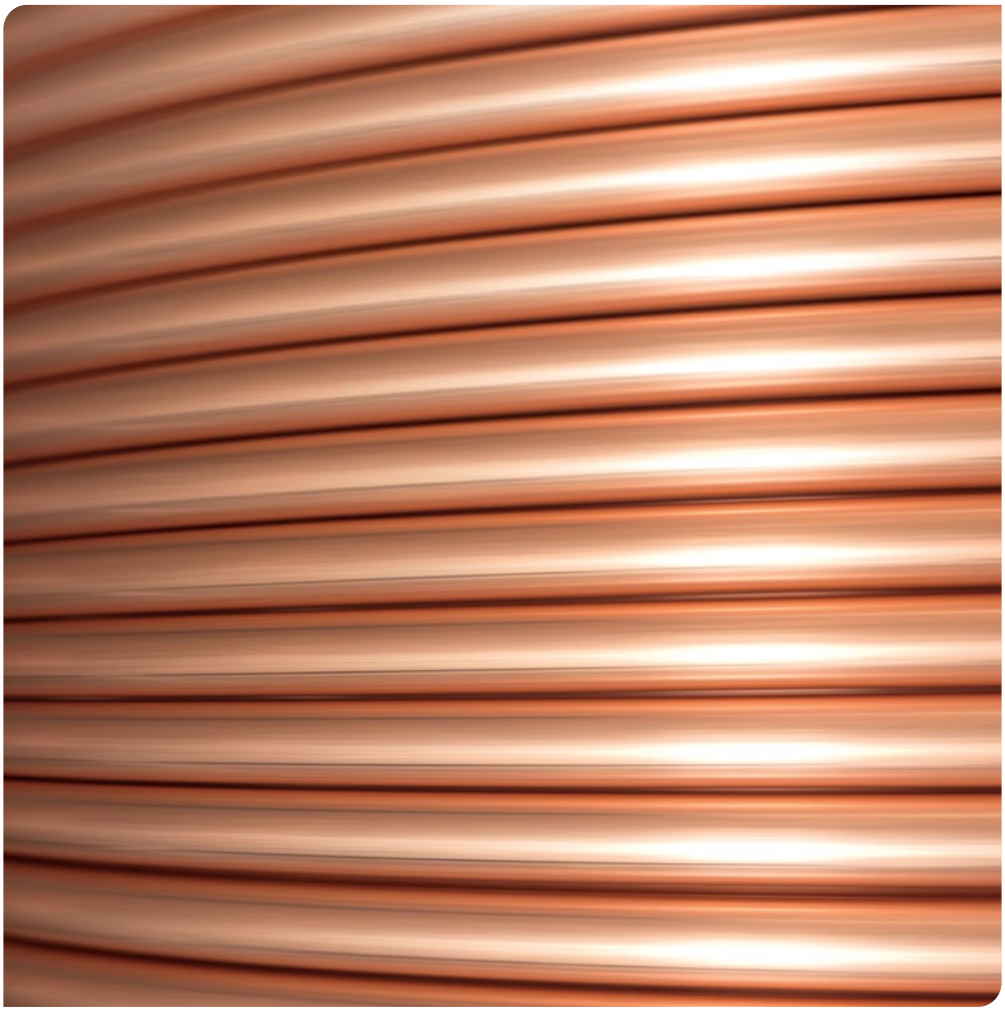
Standard Dimensions

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		Working pressure (bar)
					Straight lengths	Pieces per bundle	
					Coils (m) long	Coils per pallet	
6 x 1,00	4,0	0,140	0,019	0,013	50	40	206
8 x 0,60	6,8	0,124	0,025	0,036	50	28	90
8 x 1,0	6,0	0,196	0,025	0,028	50	28	150
10 x 0,70	8,6	0,182	0,031	0,058	50	24	83
10 x 1,00	8,0	0,252	0,031	0,050	50	24	118
12 x 1,00	10,0	0,308	0,038	0,079	50	20	97
14 x 1,00	12,0	0,363	0,044	0,113	50	14	82
15 x 1,00	13,0	0,391	0,047	0,133	50	30	76
15 x 1,50	12,0	0,566	0,047	0,113	50	14	118
16 x 1,00	14,0	0,419	0,050	0,154	50	12	71
18 x 1,00	16,0	0,475	0,057	0,201	25	40	62
22 x 1,00	20,0	0,587	0,069	0,314	25	30	50
22 x 1,50	19,0	0,860	0,069	0,284	25	31	76
28 x 1,50	25,0	1,111	0,088	0,491	25	12	59

The values of the maximum working pressure refer to the material condition R220. A safety factor of 3.5 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.

Non-standard dimensions are manufactured upon request.



COPPER TUBES
TALOS®

• 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 1083ºC)
- 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	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 dimensions

COPPER TUBES
TALOS®

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		Working pressure (bar)
					Type	Pieces per bundle	
15 x 1,00	13,0	0,391	0,047	0,133	Straight lengths of 4m	600	76
18 x 1,00	16,0	0,475	0,057	0,201		450	62
22 x 1,00	20,0	0,587	0,069	0,314		300	50
28 x 1,00	26,0	0,755	0,088	0,531		200	39
35 x 1,50	32,0	1,405	0,110	0,804		50	47
42 x 1,50	39,0	1,699	0,132	1,195		40	39
54 x 1,50	51,0	2,202	0,170	2,043		60	30
54 x 2,00	50,0	2,908	0,170	1,963		30	41
64 x 2,00	60,0	3,467	0,201	2,827		25	34
66,7 x 2,00	62,7	3,618	0,210	3,088		25	33
76,1 x 2,00	72,1	4,144	0,239	4,083		20	29
88,9 x 2,00	84,9	4,859	0,279	5,661		15	24
108 x 2,50	103,0	7,375	0,339	8,332		10	25

The values of the maximum working pressure refer to the material condition R220. A safety factor of 3.5 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.

COPPER TUBES

TALOS® MED™

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

Specifications

EN 13348

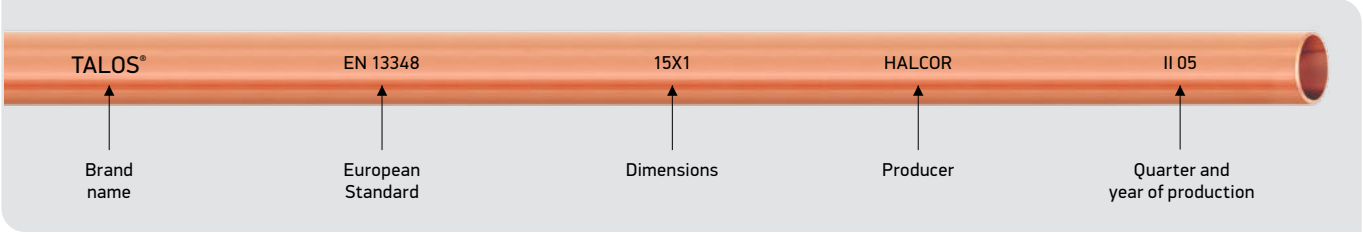
Quality Marks

BSI

Mechanical Properties

Temper	EN 13348 Classification	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



COPPER TUBES

TALOS® MED™

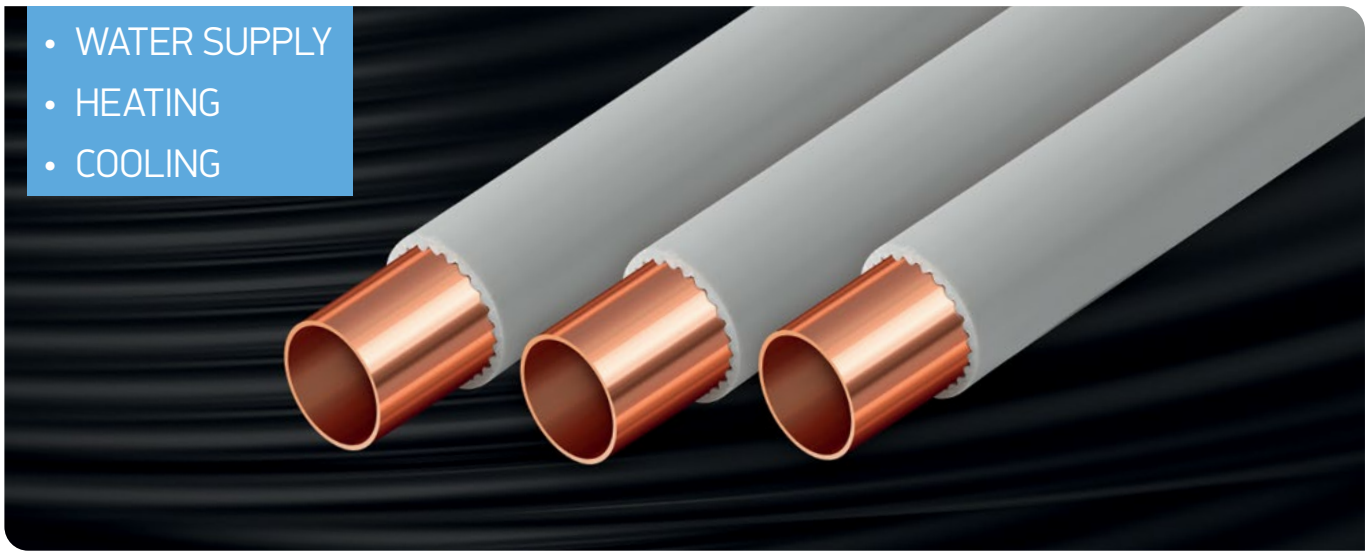
Standard Dimensions

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	Working pressure (bar)
6 x 1,00	4,0	0,140	0,019	0,013	Straight lengths of 5m	206
8 x 1,00	6,0	0,196	0,025	0,028		150
10 x 1,00	8,0	0,252	0,031	0,050		118
12 x 1,00	10,0	0,308	0,038	0,079		97
15 x 1,00	13,0	0,391	0,047	0,133		76
18 x 1,00	16,0	0,475	0,957	0,201		62
22 x 1,00	20,0	0,587	0,069	0,314		50
28 x 1,00	26,0	0,755	0,088	0,531		39
35 x 1,50	32,0	1,405	0,110	0,804		47
42 x 1,50	39,0	1,700	0,132	1,195		39
54 x 2,00	50,0	2,908	0,170	1,963		41
64 x 2,00	60,0	3,476	0,201	2,827		34
66,7 x 2,00	62,7	3,618	0,210	3,088		33
76,1 x 2,00	72,1	4,144	0,239	4,083		29
88,9 x 2,00	84,9	4,857	0,279	5,661		24
108 x 2,50	103,0	7,375	0,339	8,332		25

The values of the maximum working pressure refer to the material condition R220. A safety factor of 3.5 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.

PLASTIC COATED COPPER TUBES

TALOS®



TALOS® 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 (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

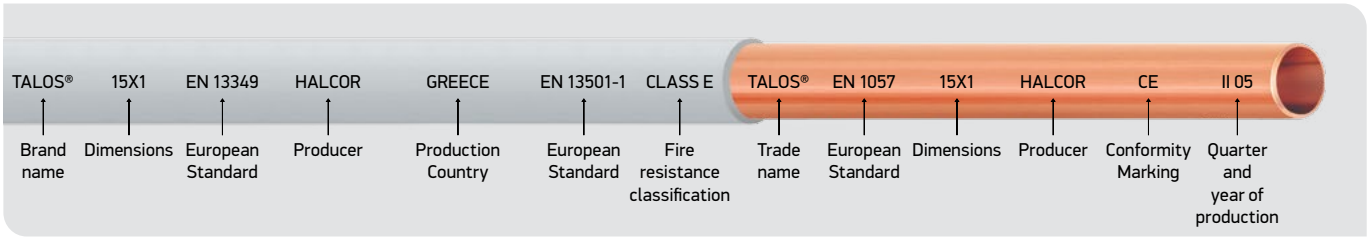
Copper tube: AFNOR, RAL / DVGW, BSI, AENOR, NSAI, DVGW, KIWA / GASTEC-QA, SITAC, STF VTT, GOST VIK.

Mechanical Properties

Temper	EN 1057 Classification	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



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	Working pressure (bar)
12 x 1,00	16	0,079	0,308	4.400	100	-	25 or 50	97
15 x 1,00	19	0,133	0,391	7.500	120	-		76
16 x 1,00	20	0,154	0,420	8.700	130	-		71
18 x 1,00	23	0,200	0,475	11.300	145	-	25	62
22 x 1,00	27	0,315	0,537	17.700	175	-		50
15 x 0,80	19	0,141	0,318	8.000	125	-	25 or 50	63
18 x 0,80	23	0,211	0,385	11.900	150	-	25	52

The values of the maximum working pressure refer to the material condition R220. A safety factor of 3.5 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.

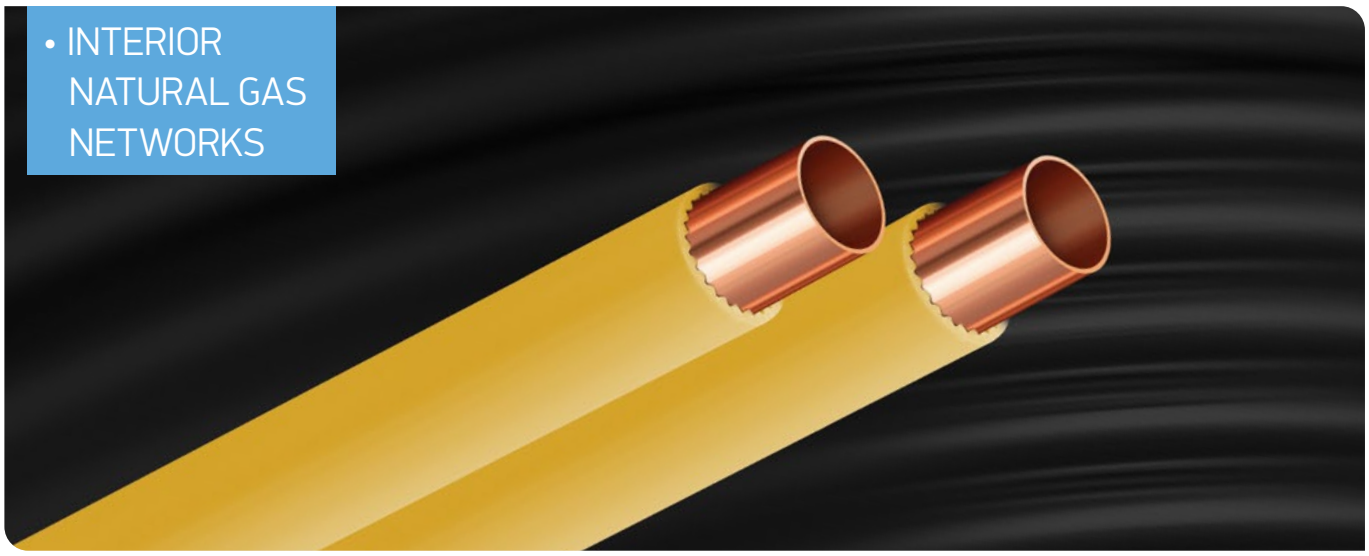
STRAIGHT HARD

15 x 1,00	19	0,133	0,391	7.600	-	55	Straight lengths of 4m	76
16 x 1,00	20	0,154	0,420	8.600	-	60		71
18 x 1,00	23	0,191	0,563	11.200	-	70		62
22 x 1,00	27	0,314	0,587	17.400	-	80		50

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

PLASTIC COATED COPPER TUBES

TALOS® GAS™



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

Specifications

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

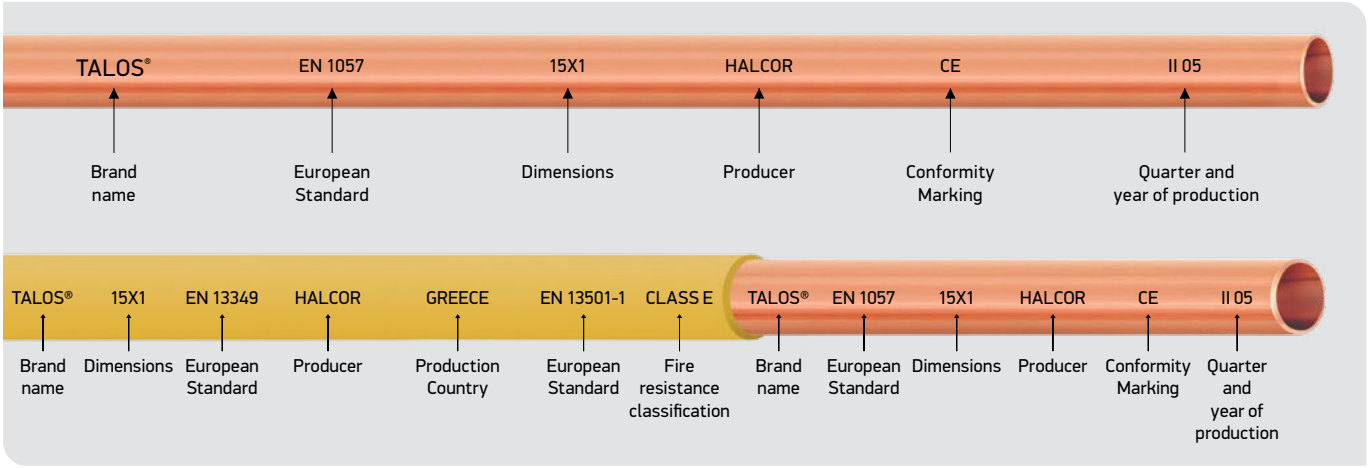
Quality Marks

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

Mechanical Properties

Temper	EN 1057 Classification	Min. Tensile Strength, R_m (MPa)	Min. Elongation, A (%)
Soft	R-220	220	40
Half hard	R-250	250	20
Hard	R-290	290	3

Minimum Marking



PLASTIC COATED COPPER TUBES
TALOS® GAS™

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		Working pressure (bar)
						Type	Pieces per bundle	
10x1,00	8,0	0,252	0,031	0,050	40	Straight lengths of 4m	250	118
12x1,00	10,0	0,308	0,038	0,079	45		400	97
15x1,00	13,0	0,391	0,047	0,133	55		600	76
15x1,20	12,6	0,463	0,047	0,125	-		125	93
18x1,00	16,0	0,475	0,057	0,201	70		450	62
18x1,20	15,6	0,564	0,057	0,191	-		100	75
22x1,00	20,0	0,587	0,069	0,314	-		300	50
22x1,5	19,0	0,860	0,069	0,284	-		80	76
28x1,50	25,0	1,111	0,088	0,491	-		60	59
35x1,50	32,0	1,405	0,110	0,804	-		50	47
35x2,00	31,0	1,845	0,110	0,755	-		50	64
42x1,50	39,0	1,699	0,132	1,195	-		40	39
42x2,00	38,00	2,236	0,132	1,134	-		40	53
54x2,00	50,0	2,908	0,170	1,963	-		30	41
64x2,00	60,0	3,467	0,201	2,827	-		25	34
76,1x2,00	72,1	4,144	0,239	4,083	-		20	29
88,9x2,00	84,9	4,859	0,279	5,661	-		15	24
108x2,50	103,0	7,375	0,339	8,332	-		10	25

The values of the maximum working pressure refer to the material condition R220. A safety factor of 3.5 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.

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	Working pressure (bar)
15 x 1,00	19	0,133	0,391	120	-	25 or 50	76
15 x 1,20	19	0,125	0,463	120	-	50	93
18 x 1,00	22	0,201	0,475	145	-	25 or 50	62
18 x 1,20	22	0,191	0,564	145	-	25	75
22 x 1,00	26	0,314	0,587	175	-	25	50

The values of the maximum working pressure refer to the material condition R220. A safety factor of 3.5 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.

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).

COPPER TUBES

TALOS® ECUTHERM™

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 polyethylene foam suitably expanded to form a foam with closed microcells, free of FCFC and fibrous substances, and is cross-linked (PE-X) to provided 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.

The TALOS® 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 resistance to fire. They exhibit low ∂ coefficient, determining its heat conductivity properties and very good μ coefficient which determines its resistance to penetration of moisture.

The TALOS® ECUTHERM™ 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.

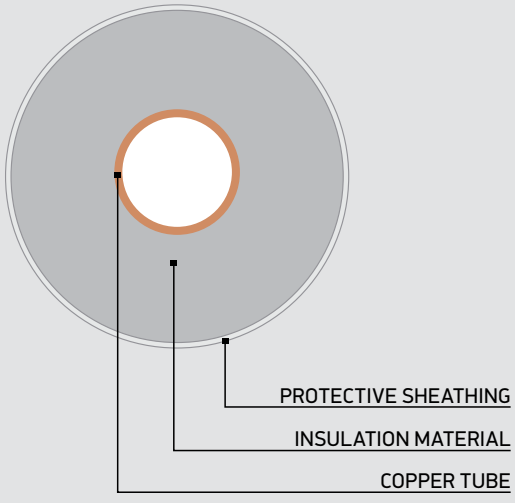
COPPER TUBES

TALOS® ACR ECUTHERM™

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 requirements imposed by new generations of refrigerants (HFCs, HFOs) which are 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

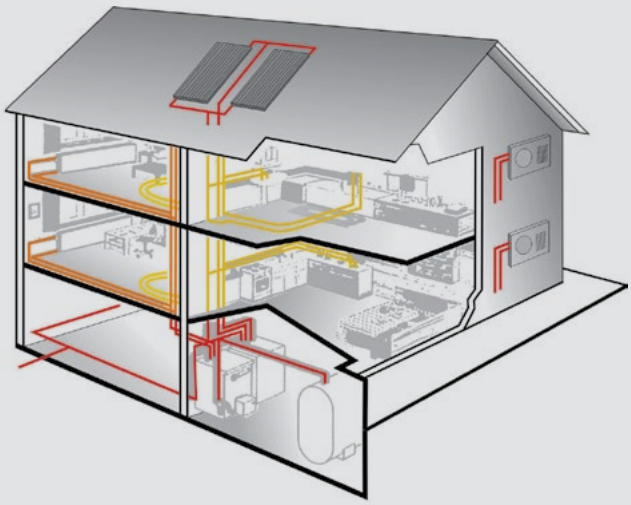
TALOS® ECUTHERM™: WATER PIPES: EN 1057
TALOS® ACR ECUTHERM™: REFRIGERATION PIPES EN 12735-1

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	Min. Tensile Strength, R_m (MPa)	Min. Elongation, A (%)
Soft	R-220	220	40



COPPER TUBES

TALOS® ECUTHERM™

Insulation Technical Properties

MATERIAL	PE-X or PE foam
DENSITY ACCORDING TO DIN 53420 ASTM D 1667	30-33 Kg/m^3
THERMAL CONDUCTIVITY COEFFICIENT (ƛ) ACCORDING TO ASTM C 335	0,039 W/m.K
VAPOUR-WATER DIFFUSSION RESISTANCE COEFFICIENT (μ) ACCORDING TO ISO 12572	> 9.000
WORKING TEMPERATURE	-80ºC to +110ºC (+90oC for PE foam)
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 100ºC	<5%

PE X Cross-linked Polyethylene

UV RESISTANCE

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
Working pressure	bar	167	122	96	97	76	71	62	50

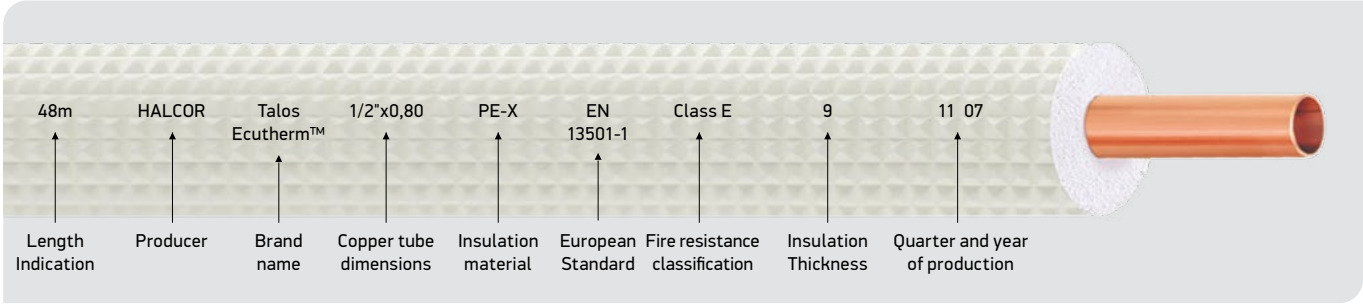
The values of the maximum working pressure refer to the material condition R220. A safety factor of 3.5 is used.
The minus tolerance of the wall thickness is considered. No further processing is taken into account.
For temperature up to 100°C.

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

Copper tube external diameter	Inch	3/16	1/4	5/6	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 external diameter with 9mm thick insulation	mm	22,76	24,35	25,94	27,52	30,70	33,87	37,05	40,23
Working pressure	bar	216	157	123	101	75	72	58	50

Maximum Working Pressure calculation according to EN 14276 Standard which complies with the European Directive PED 2014/68/EU (Pressure Equipment Directive)

Marking

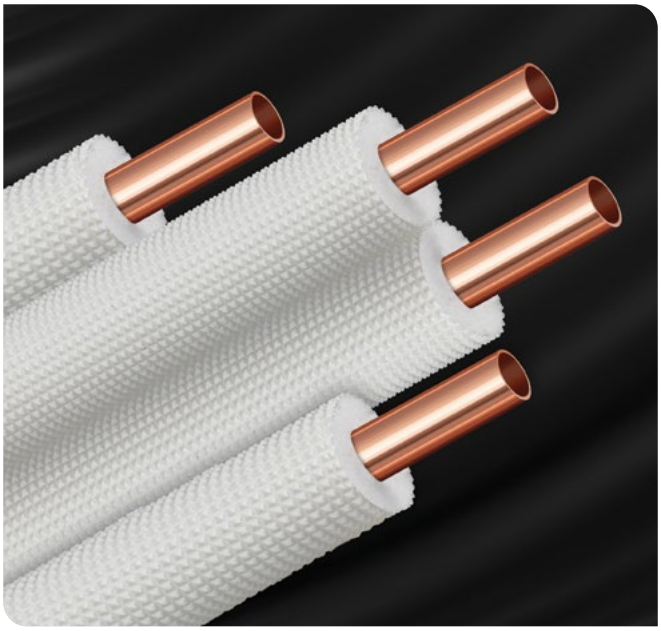


COPPER TUBES

TALOS® ACR ECUTHERM™

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 / 9	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	9 / 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 / 9	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

COPPER TUBES

TALOS® ACR ECUTHERM 2™

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

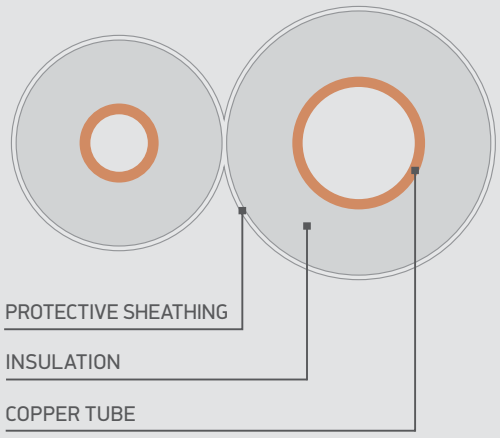
Pair Combinations for any Application

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"

COPPER TUBES
TALOS®
ACR ECUTHERM 2™

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 generation of refrigerants, including HFCs and HFOs, 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 1057 / EN 12735 Classification	Min. Tensile Strength, R_m (MPa)	Min. Elongation, A (%)
Soft	R-220	220	40

Insulation Technical Properties

PE X Cross-linked Polyethylene

UV RESISTANCE

MATERIAL	PE-X foam
DENSITY ACCORDING TO DIN 53420 ASTM D 1667	30-33 Kg/m^3
THERMAL CONDUCTIVITY COEFFICIENT (ϩ) ACCORDING TO ASTM C 335	0,039 W/m.K
VAPOUR-WATER DIFFUSSION RESISTANCE COEFFICIENT (μ) ACCORDING TO ISO 12572	> 9.000
WORKING TEMPERATURE	-80ºC to +110ºC
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 100ºC	<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)

Maximum working pressure calculation according to EN 14276 Standard which complies with the European Directive PED 2014/68/EU (Pressure Equipment Directive)

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	6,35-15,87	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 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
Working pressure	bar	157-101	157-72	157-72	157-58	101-75	101-72	101-58	75-58

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

cusmart®

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 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 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 ^{o}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 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 (α=0,0168 mm/(m • ^{0}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*

*Only products bearing the NSF Mark on the product, product packaging, and/or documentation shipped with the product are Certified.

Mechanical Properties

Temper	Min. Tensile Strength, R_m (MPa)	Min. 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 THICKNESS		2	2	2	2	3	3
INSIDE DIAMETER (id) (mm)		10	12	14	16	20	26
INSIDE DIAMETER CROSS-SECTION (cm2)		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
WORKING PRESSURE (bar)		33	32	27	24	25	25
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

The values of the maximum working pressure refer to the material condition R220. A safety factor of 3.5 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 100°C.

Different dimensions and lengths are available uppon 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 or PE foam
DENSITY ACCORDING TO DIN 53420 ASTM D 1667	30-33 Kg/m^3
THERMAL CONDUCTIVITY COEFFICIENT (ƛ) ACCORDING TO ASTM C 335	0,039 W/m.K
VAPOUR-WATER DIFFUSSION RESISTANCE COEFFICIENT (μ) ACCORDING TO ISO 12572	> 9.000
WORKING TEMPERATURE	-80°C to +110°C (+90oC for PE foam)
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.

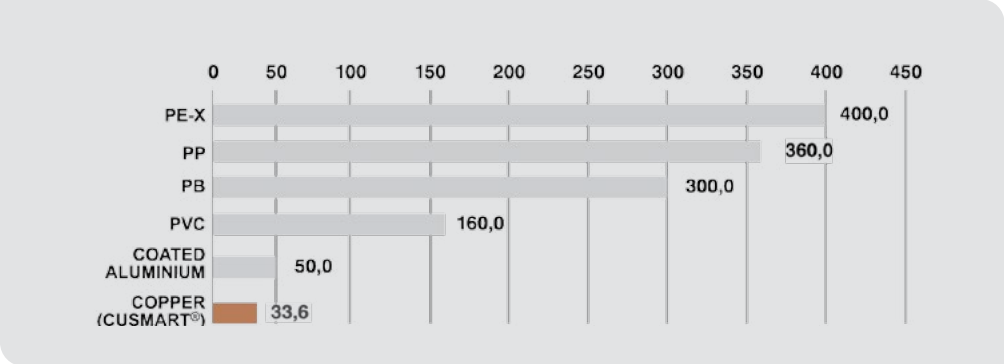
Significant and Uninterrupted Energy Saving.

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 polyethylene 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.

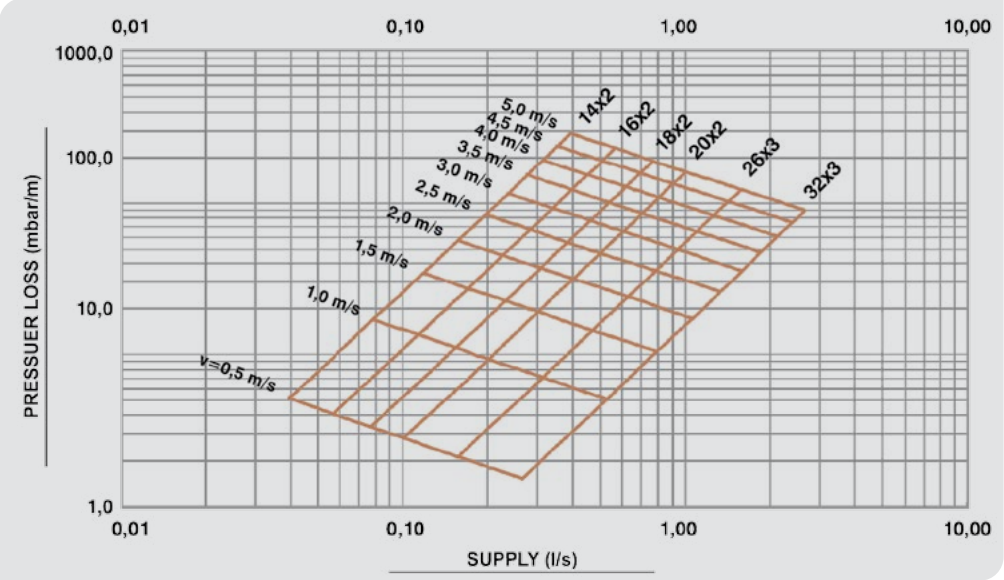
The CUSMART® all inclusive flexible copper tube system includes a full range of CUSMART FITTINGS (press and compression fittings), as well as tools, ensuring reliable results in every application.

cusmart®

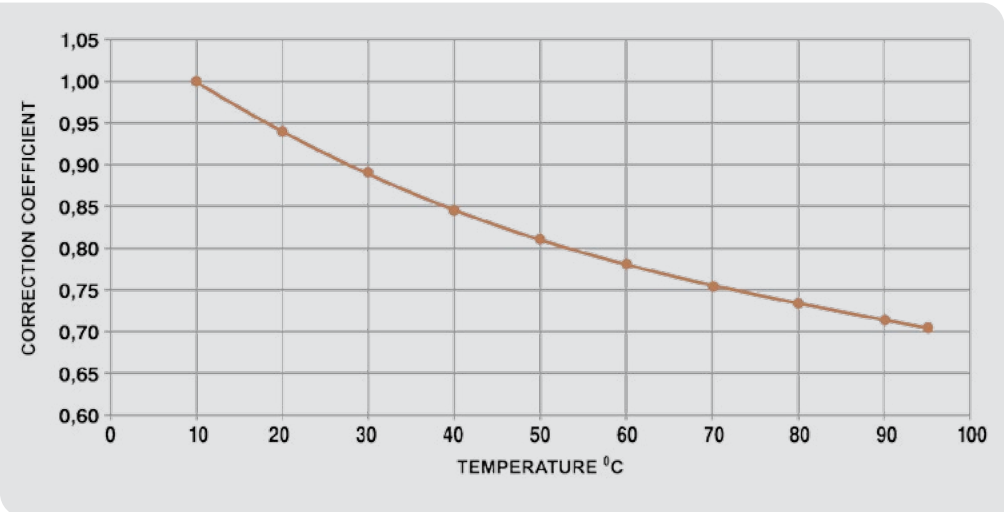
Comparative Diagram for Linear Expansion of the Tube (mm) ΔT = 40°C, L=50 M



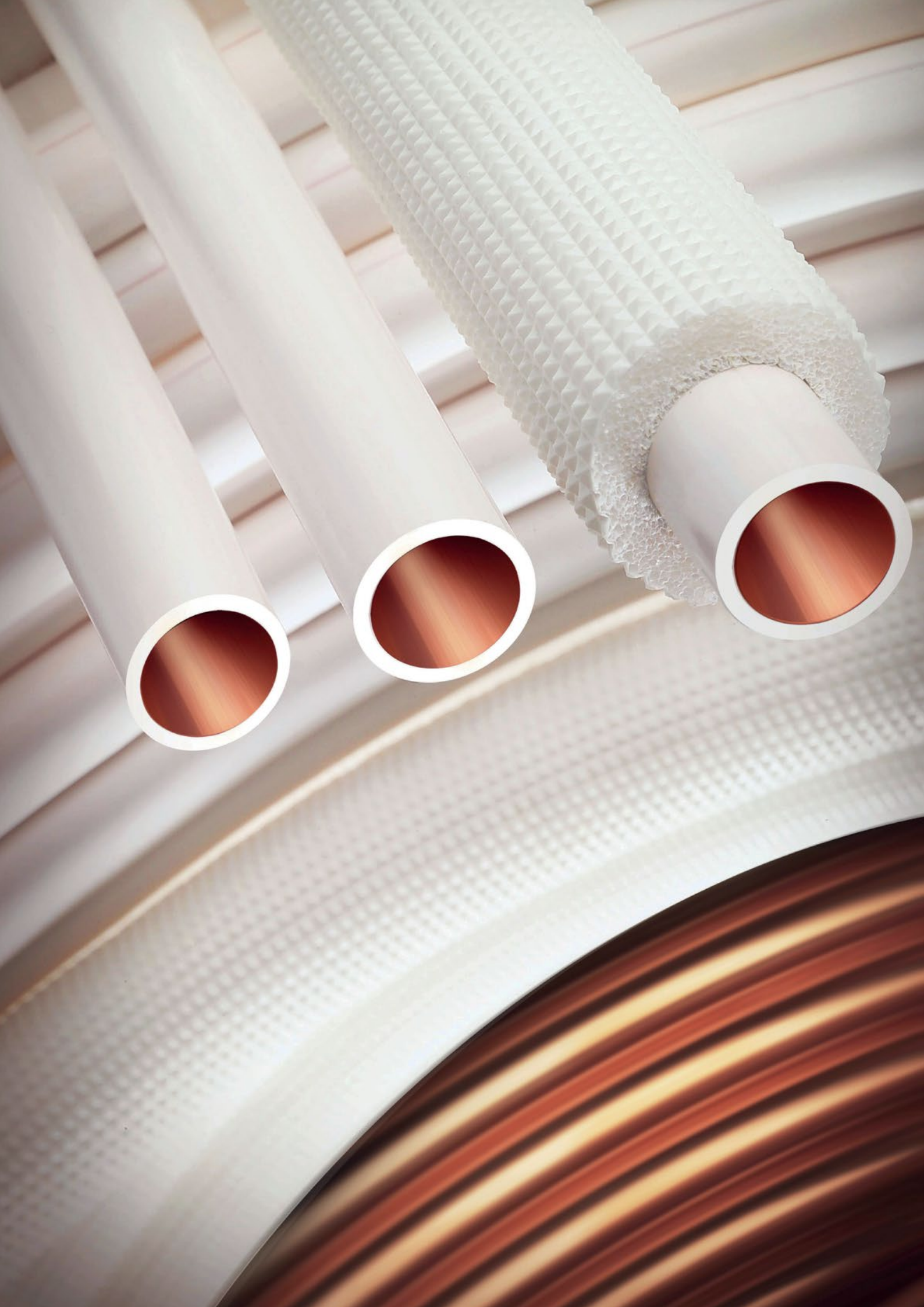
Pressure Loss Diagram at 10°C



Correction Coefficient for Pressure Loss according to Temperature



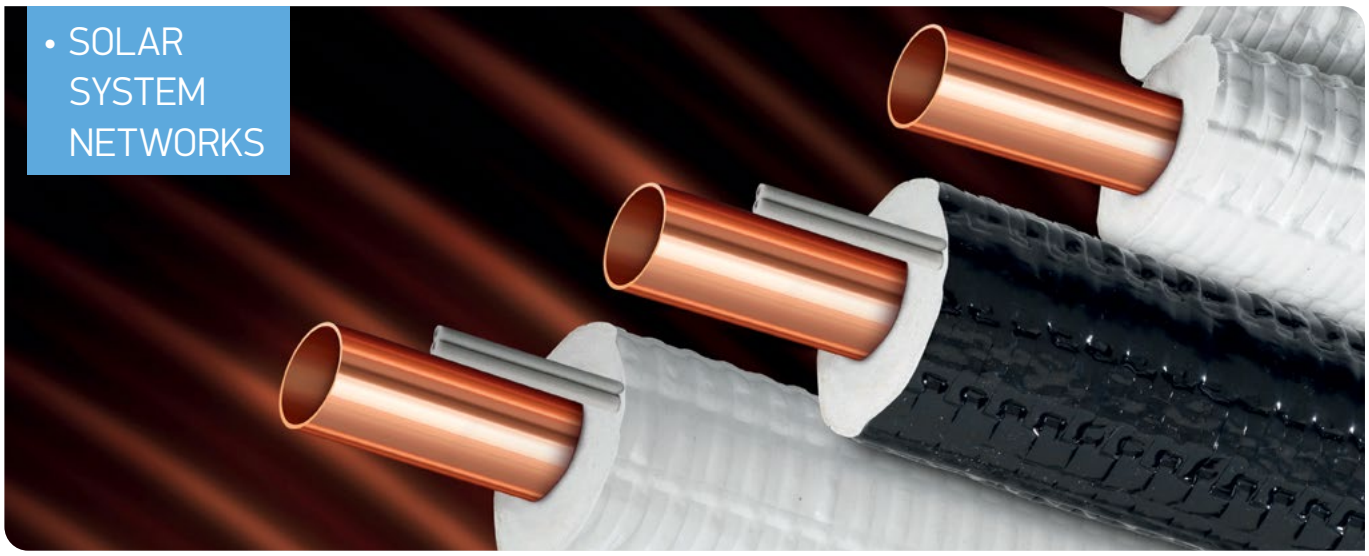
HALCOR reserves the right to amend any of the above-mentioned technical properties without prior notice.



COPPER TUBES

TALOS® ECUTHERM™ SOLAR

• SOLAR SYSTEM NETWORKS

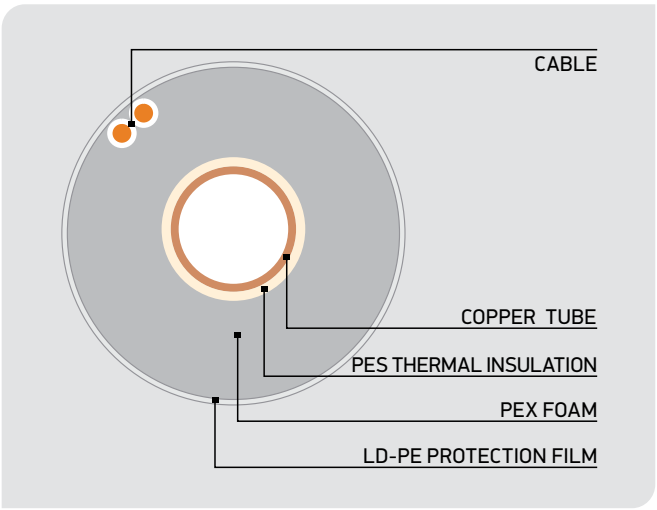


Due to its superior physical and chemical properties, engineers have always relied on copper for thermo hydraulic systems. The exploration of solar energy has also unveiled this red metal's advantages in solar systems, the most important being its high thermal conductivity. These systems are easy to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

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.

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.



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).

COPPER TUBES
TALOS®
ECUTHERM™ SOLAR

High Performance Technological Product

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

Copper Tube Technical Characteristics

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

Insulation Technical Properties

PE X Cross-linked Polyethylene

UV RESISTANCE

FOAM MATERIAL	PES/PE-X
DENSITY ACCORDING TO DIN 53420 ASTM D 1667	30-33 Kg/m^3
THERMAL CONDUCTIVITY COEFFICIENT (ñ) ACCORDING TO ASTM C 335 ISO 12572	0,039 W/m.K
VAPOUR-WATER DIFFUSSION RESISTANCE COEFFICIENT (μ) ACCORDING TO	> 9.000
WORKING TEMPERATURE	-80ºC to +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
Working pressure (at 150ºC)	bar	52	57	52	48	43	42
Bend radius		4xOD					

The values of the maximum working pressure refer to the material condition R220. A safety factor of 3.5 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account. For temperature up to 150°C.

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
Working pressure (at 150ºC)	bar	104	94	86	68	55	44
Bend radius		4xOD					

Standardized Dimensions TALOS® ECUTHERM™ SOLAR 2

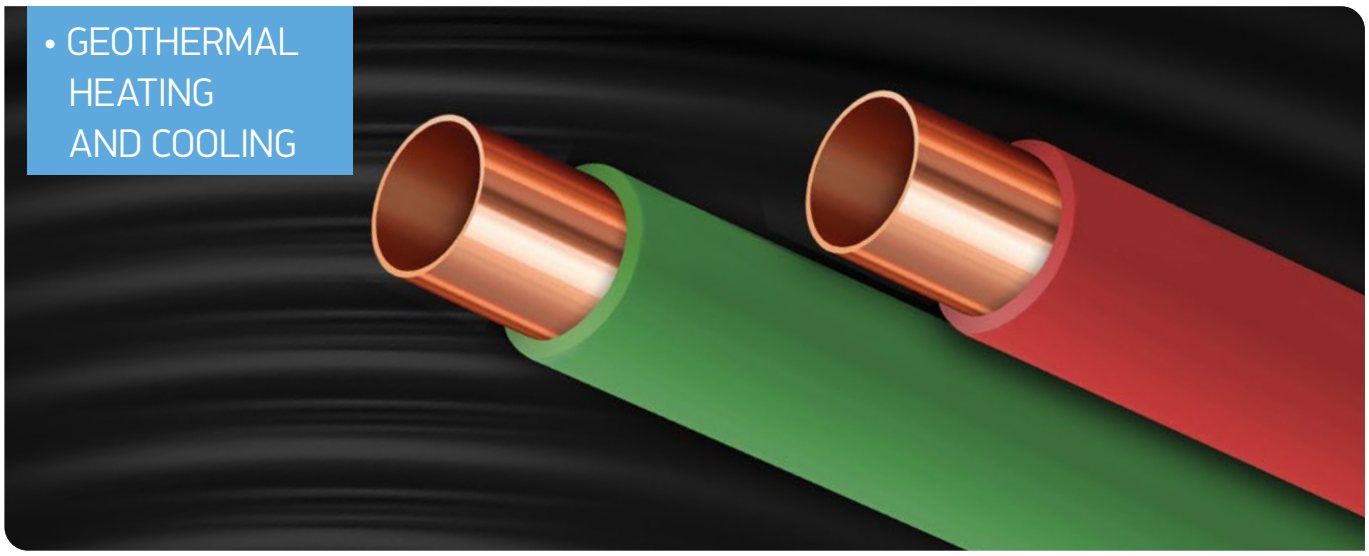
12/12, 15/15, 18/18, 22/22

Cable Technical Characteristics

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

PLASTIC COATED COPPER TUBES

TALOS® GEOTHERM™



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-

PLASTIC COATED COPPER TUBES
TALOS® GEOTHERM™

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 requirements of the Pressure Equipment Directive (PED) 2014/68/EU, 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

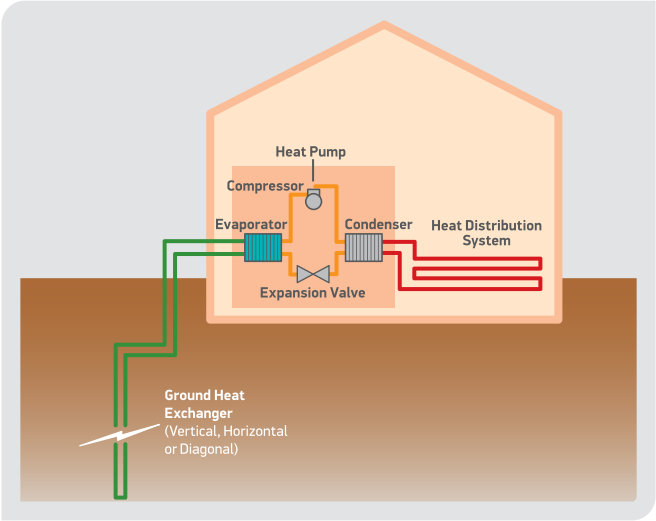
Maximum Working Pressure calculation according to EN 14276 Standard which complies with the European Directive PED 2014/68/EU (Pressure Equipment Directive)

Mechanical Properties

Temper	Min. Tensile Strength, R_m (MPa)	Yield Strength, $R_{p0.2}$ (MPa)	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 - 150m
LWC of 75 - 580kg
Packaged on pallets or in carton boxes



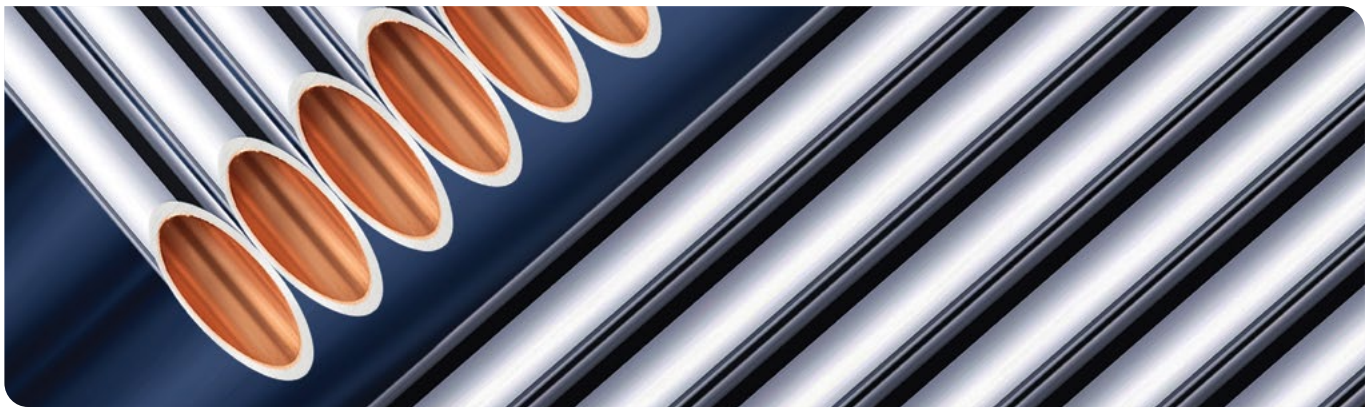
Standard Dimensions

Copper tube external diameter x wall thickness (mm)	Nominal copper weight (kg/m)	Working pressure (bar)
9,52 x 0,4	0,102	49
9,52 x 0,5	0,126	62
9,52 x 0,6	0,105	75
9,52 x 0,7	0,173	88
9,52 x 0,8	0,195	101
12,7 x 0,6	0,203	55
12,7 x 0,7	0,235	65
12,7 x 0,8	0,266	75
15,87 x 0,8	0,337	59
19,05 x 0,8	0,408	49
19,05 x 1,0	0,505	58

Other dimensions are available upon request.

COPPER TUBES

TALOS® PLATED™



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.

TALOS® PLATED™ Copper Tube Half Hard or Soft in Straight Lengths

Outside Diameter * (mm)	Wall Thickness (mm)	Length ** (m)	Working pressure (bar)
10	0,7 - 1,0	1 / 1,2 / 2 / 2,75 / 3	83 - 118
12	0,7 - 1,0	1 / 1,2 / 2 / 2,75 / 3	69 - 97
14	0,7 - 1,0	1 / 1,2 / 2 / 2,75 / 3	59 - 82
15	0,7 - 1,0	1 / 1,2 / 2 / 2,75 / 3	55 - 76
16	0,7 - 1,0	1 / 1,2 / 2 / 2,75 / 3	51 - 71
18	0,7 - 1,0	1 / 1,2 / 2 / 2,75 / 3	45 - 62
22	0,7 - 1,0	1 / 1,2 / 2 / 2,75 / 3	37 - 50
32	0,7 - 1,0	1 / 1,2 / 2 / 2,75 / 3	25 - 34

* 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 working pressure refer to the material condition R220. A safety factor of 3.5 is used. The minus tolerance of the wall thickness is considered. No further processing is taken into account.
For temperature up to 100°C.

Product Features

- Long lasting plated surface for that modern chromium-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 (DHP-Cu) with min. copper content 99.9% and P=0.015% - 0.040%.

Specifications:

Mechanical properties: EN1057 / Internal cleanliness: EN1057
Company standard: TB010

01/2018

HALCOR

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