OSNALINE®
Tubes and Tube Bundles

KME
THE EVOLUTION OF COPPER

KME Germany GmbH & Co. KG
OSNALINE® Tubes and Tube Bundles
[GB]

Content

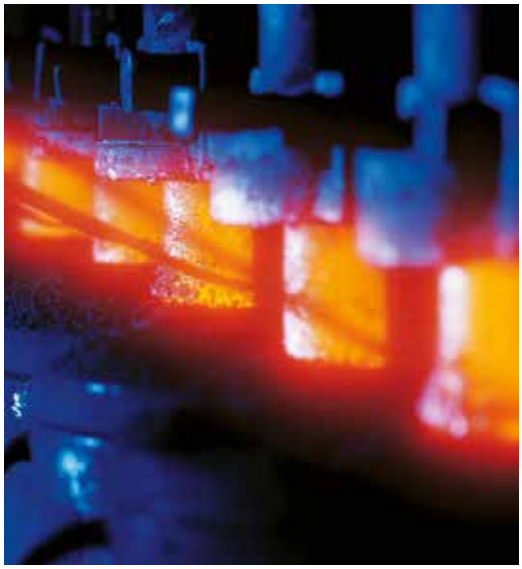
The Company

KME as one of the largest manufacturers of copper and copper alloy products offers best possible product and engineering solutions in the various fields of industrial applications. As a leading supplier in the most diverse industries, KME serves the worlds market with a broad spectrum of technologically leading copper and copper-alloy tubes, strips and sheets of outstanding production quality.

Marine Applications

For more than a century now, production of copper and its alloys has strengthened KME's reputation as one of the world's leading metal manufacturers. KME offers not only high quality products for corrosive environments, but also a wide range of project packages tailored to individual performance requirements. Production of seamless and welded pipes, as well as fittings and flanges, made from copper-nickel and other copper alloys are part of the company's solid investment for the future.

Additionally KME's business unit Marine Applications manufactures seam-welded, coiled stainless steel tubes and OSNALINE® tubes and tube bundles made of special corrosion resistant materials which are used in a range of industries including shipbuilding and offshore oil/gas. KME has been producing tube bundles to individual specifications into such industries for almost 50 years. This long tradition is unique and their experience and know-how have set standards worldwide.



OSNALINE® - Tubes and Tube Bundles

OSNALINE® tubes and tube bundles are pre-fabricated tube-runs consisting of a small diameter tube or group of tubes stranded in an extruded outer jacket. Each bundle can contain up to 19 tubes in a selection of materials and dimensions, and can be supplied either as a standard product or custom made to meet the client's specific requirements.

OSNALINE® products are generally used as impulse and instrument lines to transport gases and fluids and for hydraulic and pneumatic applications in various industries, such as:

- Chemical and petrochemical
- Shipbuilding and offshore
- Building and
- Plant construction and mechanical engineering.

Product Advantages

- **Cost-effective alternative** compared to conventional piping and field insulation;
- **Reduced costs, installation time and space-saving**;
- **Easy installation** similar to an electrical cable;
- Available in **very long lengths**, thus **reducing waste material, tube connections and the risk of leakages**;
- Stranding technology ensures **improved roundness, flexibility** and **equal bending radii** in all directions;
- Extruded outer jacket provides reliable **protection** from mechanical **wear**, **abrasion** and **corrosion**;
- **No maintenance** needed;
- **Spare tubes** facilitate a necessary enlargement or modification of an existing arrangement at a later stage;
- OSNALINE® products are inspected according to OSNALINE® specifications and 100% pressure tested prior to shipment

Metallic

Metallic
Metallic tubes and tube bundles are designed specifically for high pressure applications in hydraulics.

Tubes and tube bundles are subject to extreme corrosive loads, especially in a maritime environment. To avoid ingress of moisture and salt that leads to corrosion, as well as mechanical damage and wear from vibration, the tubes are protected by an extruded outer jacket and the tube ends by heat-shrinkable accessories.

KME is one of a few manufacturers worldwide capable of supplying coiled tube bundles made of high-alloy 6% Mo stainless steel (UNS S31254) according to NORSOK M-650NEW. UNS S31254 tubes are only available with outer jacket as OSNALINE® tube bundles.

For available tube materials and dimensions see the tables in the technical data section.

- Stainless steels (304, 316L, 316Ti...)
- High-alloy 6% Mo stainless steelsNEW
- Ni-base alloys

- Copper-Nickel

- Copper

Metallic

Long Continuous Coils
for pressure purposes acc. to DIN EN 10217-7

KME, with our state-of-the-art welding technology, produce a wide range of high quality tubes providing excellent properties in terms of strength, corrosion behaviour and ease of bending. Wherever there's a need for high performance pressure tubing, KME products are the first choice materials.

For available tube materials and dimensions see the tables in the technical data section.

Protection Pipe
Conventional tube jackets are not suitable for installation in crude oil and product oil carrying tanks. The jackets swell and dissolve leading finally to corrosion of the bare exposed tubes.

KME have designed a new grade of crude oil resistant jacket with antistatic properties (<10GOhm acc. IEC/EN 60079-0, section 26.13) which is tightly bonded to the tube by means of a special adhesive layer.

Heat Tracing / Electric Tracing

Heat Tracing
OSNALINE® products are designed to supply corrosive, pure and high-purity liquids, gases and vapours in chemical, petrochemical and industrial processes.

Process and analyser sample lines carrying certain substances, which are susceptible to spontaneous polymerisation or decomposition are generally delivered in a stabilised form to provide freeze protection or temperature maintenance. For this application, OSNALINE® tubes and tube bundles are also available with steam or electrical tracing.

Pre-insulated Single PTFE-Tube with Electric Tracer

Pre-insulated Tube Bundle with Electric Tracer - 2 Core

Electric Tracing
OSNALINE® products are additionally equipped with an electrical heating cable to provide freeze protection or temperature maintenance. The tubes and heating cable have a circumferential metal sheathing, consisting of two overlapping aluminium tapes for temperature distribution along the tubes.

A tin-plated copper strand in physical contact with the metal sheathing along the entire length of, serves as an equipotential bonding conductor. Together they are wrapped with a thermal insulation made of several layers of polyester fleece or glass fibre and protected by one of a variety of jacket materials according to the client's requirements.

Electrical tracing OSNALINE® products are used where steam is not available or steam supply could be interrupted, such as during shutdowns.

Electrical tracing versions are available with different heating cables such as:

- Self regulating
- Power limiting
- Constant power

By this means it is possible to maintain temperatures for frost protection from an ambient temperature of -25°C to over 200°C.

Steam Tracing / Pre-insulated

Steam Tracing
In addition to the medium tube made of stainless steel, OSNALINE® steam tracing products are alternatively available with a steam tracer tube made of copper or stainless steel. The tubes are wrapped with a thermal insulation made of several layers of polyester fleece and covered with a choice of additional jacket materials according to the client's requirement.

Two different types of steam tracing products are available:

- Heavy steam tracing: Steam tracer tube and medium tube are in direct contact
- Light steam tracing: Steam tracer tube and medium tube are separated from each other

Heavy steam tracing
Steam tracer tube and medium tube are in direct contact

Light steam tracing
Steam tracer tube and medium tube are separated from each other

Pre-insulated
Pre-insulated tubes and tube bundles are designed specifically for transport of liquid and gas in condensate return and steam supply lines, where a low temperature drop is expected due to low heat losses. To avoid heat loss, the tubes are wrapped with a thermal insulation made of several layers from polyester fleece or glass fibre and protected by one of a range of jacket materials in accordance with client requirements.

Pre-insulated Single Tube

Pre-insulated Tube Bundle - 4 Core

Heat Tracing
Special Coated Coils

Special Coated CoilsNEW
for process and emissions analysers

When corrosion and surface activity are of concern, solutions must be engineered using special alloys or surface treatments. To enhance further the physical characteristics of our stainless steel coils we have partnered *SilcoTek*® to offer special coated tubing with a ceramic-like inner surface to prevent adsorption and improve corrosion resistance. As a result, there is an improved response time by the analyser in detecting changes of trace amounts of active compounds (H_2S, mercury, ammonia and many others).

SilcoNert® *2000* is a chemical vapor-deposited (CVD) silicon coating, specifically designed to improve the inertness of stainless steel and other materials to sulphur and other types of chemicals. The CVD process produces a flexible, amorphous silicon layer capable of operating at high temperatures that diffuses into the metal lattice and serves as a chemically protective barrier with a coating thickness of 100-250 nm. The coating will conform to the most intricate surfaces while maintaining high dimensional tolerances. The surface is further passivated with covalently bonded hydrocarbon molecules. This allows the tubing surfaces to maintain their protection during bending and will also not interfere with threaded or compression joints; making *SilcoNert*® *2000* the ideal coating for process sampling, refinery gas sampling, and down hole sampling applications.

SilcoNert® *2000* treated tubing reduces uptake by orders of magnitude, relative to untreated or electropolished stainless steel tubing and also eliminates memory effects in sulphur analysis. Figure 1 shows that the adsorption of ammonia is almost completely prevented by the coating.

Dursan® is a high durability, wear resistant, corrosion resistant, and inert coating that is ideal for field sampling, process, and oil & gas applications. It offers superior wear resistance and durability and extends the life of stainless steel in harsh, corrosive environments. Figure 2 shows the improved corrosion resistance of stainless steel whereas in Figure 3, *Dursan*® is shown to double the surface hardness and wear resistance. Dursan's high temperature, heat and oxidation resistant coating virtually eliminates oxidation of stainless steel; maintaining a lustrous appearance even after exposure to 450°C.

Surface treated stainless steel coils prevent corrosion or adsorption of active compounds in process systems, and should be considered in applications where corrosive or active streams are to be sampled, transferred, or analysed; otherwise, poor surface inertness can result in performance issues ranging from poor sensitivity and resolution, to adsorption/desorption and catalytic effects. The resulting overall impact to the end user includes regulatory compliance issues, lost product, poor process yields; all of which can be avoided by using KME/Silco Tek products.

For further information, please visit http://www.silcotek.com

Heat Tracing
Special Coated Coils

Figure 1
Adsorption of ammonia on metal and polymer surfaces

SilcoNert® 2000

electropolished

316L stainless steel

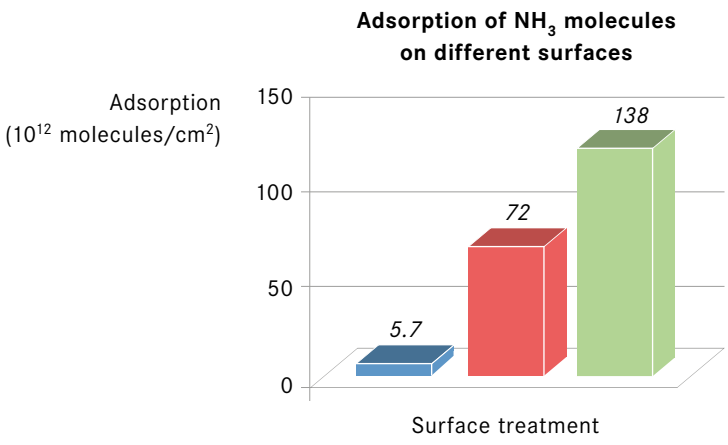


Figure 2
Improved corrosion resistance with Dursan®

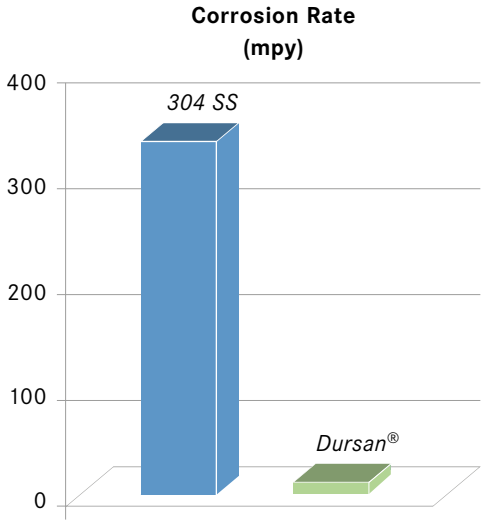
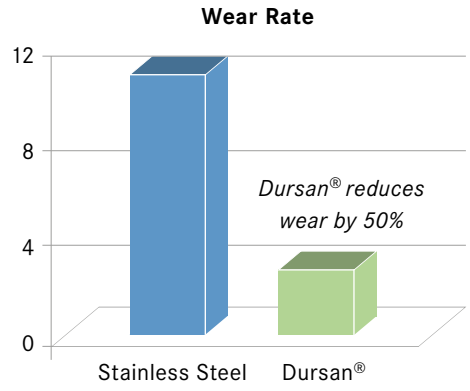


Figure 3
Improved wear resistance with Dursan®



Heat Tracing
Specific Designs

1.

1. Pre-insulated Individual tube
Suitable for medium temperatures (steam purging temperatures) above the maximum permissible heating cable temperature. Heating cable is separated from the process tube, so that the temperature existing at the heating cable is within the permissible limits.

2.

2. Tube in Tube System
Tube in tube configuration is used for the transport of toxic and corrosive media.
The combination of an outer safety tube and an inner process tube offers reliable protection for people and environment. The space between the tubes can be flushed by gas.

3.

3. Armoured System
Armouring is designed for particularly long vertical installations in harsh environments.
Steel strip or steel wire can be used for the armouring.

4.

4. Aluminium Tape System
This variation is suitable for adjacent heat-tracing installations when a sufficient safety distance is necessary but cannot be achieved due to space limitations.
An additional aluminium tape forms a barrier layer directly under the outer jacket and distributes the thermal load at the contact zone, thus avoiding partial overheating and melting of the outer jacket.

5.

5. Pre-assembled Heating Cable End Fitting
The maximum heating cable length is limited by the switch-on temperature and the inrush current. Larger tube bundle lengths are possible due to a factory-made, pre-assembled heating cable end termination inside the tube bundle. The power supply to the heating cables takes place at the beginning and end of the tube bundle.

6.

6. High-temperature Resistant End Sealing
Insulated tube bundle end sealing for tube temperatures up to 500°C.

Plastic

Plastic tubes and tube bundles are designed specifically for low pressure applications in pneumatics.

- PE-LD
- PE-HD
- PTFE
- PFA
- PA

Welding Bead Protection
Suitable for use in areas where welding may be applied.

Weld spatter can normally penetrate the outer jacket and underlying plastic tubes. To avoid damage, a bitumen paper absorbs the thermal load when it comes in contact with welding beads. This gives an additional protection to the plastic tubes.

Testing

Every OSNALINE® product leaving our production is thoroughly tested for operational security. Final product testing includes, but is not limited, to the following:

- 100% pressure testing according to specification
- Internal tube diameter consistency testing
- Material conformity testing
- External tube diameter and thickness conformity testing
- Labelling check

Documentation
A manufacturer's certificate or an inspection test certificate 3.1 acc. to EN 10204 is issued upon request. The documents contain the results of the performed tests. Third party inspection by classification societies can be carried out on request.

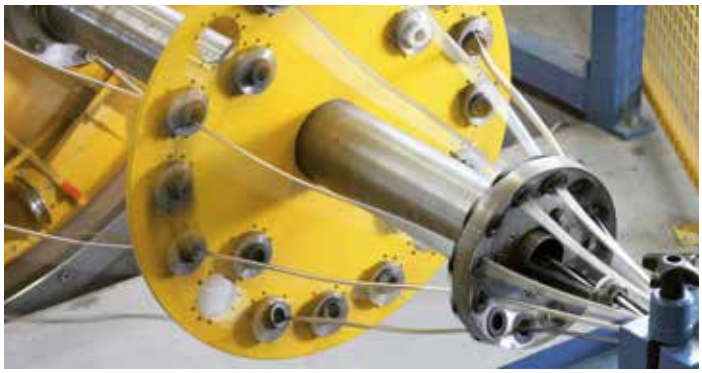
Safe Shipping
OSNALINE® single tubes are supplied on wooden pallets, in wooden boxes or alternatively on wooden drums. OSNALINE® tube bundles are usually supplied on wooden drums. All wooden lagging are heat treated according to international standards like IPPC ISPM 15 and the ends of tubes and tube bundles are protected against ingress of moisture and dust.

Tube Materials

Letter symbol	Material number	Standard	Properties and delivery conditions	Dimensions and product tolerances
Cu-DHP	CW024A	DIN EN 12449 ASTM B68, B75	Seamless coils Condition R220 Cleanness of the inner surface acc. to DIN EN 12735-2	DIN EN 12449 table 20
CuNi10Fe1Mn	CW352H	DIN EN 12449 ASTM B466	Seamless coils Condition R290	DIN EN 12449 table 20
X6CrNiMoTi17-12-2 X5CrNi18-10 X2CrNiMo17-13-2 X2CrNiMo18-14-3	1.4571, AISI 316Ti 1.4301, AISI 304 1.4404, AISI 316L 1.4435, AISI 316L min. 2.5% Mo	DIN EN 10217-7 (metric) ASTM A269 (imperial)	Longitudinal and orbital welded - calibrated (WCR) Tube hardness max. HRB 90 (180HV5)	DIN EN ISO 1127 Tolerance class D4, T5
X6CrNiMoTi17-12-2 X5CrNi18-10 X2CrNiMo17-13-2 X2CrNiMo18-14-3	1.4571, AISI 316Ti 1.4301, AISI 304 1.4404, AISI 316L 1.4435, AISI 316L	DIN EN 10216-5 (metric) ASTM A269 (imperial)	Seamless coils Cold finished, bright annealed (CFA) Tube hardness max. HRB 90 (180HV5)	DIN EN ISO 1127 Tolerance class D4, T5
X1CrNiMoCuN20-18-7	1.4547 min. 6.0% Mo	ASTM A269* UNS S31254 NORSOK standard M-630	Seamless coils Tube hardness max. HRB 90 (180HV5)	ASTM A269

Other dimensions and materials on request.

** Annealing temperature acc. to NORSOK standard M-630.*



Tube Materials

Dimensions and working pressure - Metallic tubes
Standard value for max. design pressure (bar) of metal tubes acc. to **American Bureau of Shipping (ABS)** Rules
Safety factor = 1,8 against Rp 0,2% yield strength

Welded steel tubes for pressure purposes - Technical delivering conditions - Part 7:
Tubes made of stainless steels; German version DIN EN 10217-7:2005
Tubes in compliance with Pressure Equipment Directive AD 2000-Merkblatt HP 0
Tolerance in compliance with DIN EN ISO 1127
Tolerance class D4/T5
Tube hardness smaller than 90 HRB
Standard value for max. design pressure (bar) of metal tubes acc. to American Bureau of Shipping (ABS)
Safety factor = 1.8 against RP 0,2% yield strength

Tube material																
Dimensions (mm)	Cu-DHP		CuNi10Fe1Mn		Stainless steel											
					1.4571 AISI 316Ti			1.4301 AISI 304			1.4404/1.4435 AISI 316L (min. 2,5% Mo)			1.4547 UNS S31254 (min. 6,0% Mo)		
	Design pressure (bar) *Temperature (°C)*															
	50	*100*	*50*	*100*	*20*	*50*	*100*	*20*	*50*	*100*	*20*	*50*	*100*	*20*	*50*	*100*
6 x 0.5	-	-	-	-	189	182	167	-	-	-	-	-	-	-	-	-
6 x 1.0	145	141	-	-	412	396	363	-	-	-	-	-	-	-	-	-
8 x 0.5	-	-	-	-	139	134	123	129	117	104	-	-	-	-	-	-
8 x 1.0	104	101	172	170	296	285	261	275	249	221	268	256	234	-	-	-
10 x 0.8	64	62	-	-	181	174	159	168	153	135	164	157	143	-	-	-
10 x 1.0	81	79	135	133	231	222	203	214	195	173	209	200	182	330	293	253
10 x 1.2	-	-	165	162	283	272	249	-	-	-	-	-	-	-	-	-
10 x 1.5	-	-	212	209	364	350	321	338	307	272	329	316	288	520	463	399
12 x 1.0	66	65	110	109	189	182	167	176	159	141	171	164	150	270	241	207
12 x 1.5	104	101	172	170	296	285	261	275	249	221	268	256	234	423	376	324
12 x 2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	588	524	451
[in]	*50*	*100*	*50*	*100*	*20*	*50*	*100*	*20*	*50*	*100*	*20*	*50*	*100*	*20*	*50*	*100*
¼" x 0.035"	118	115	-	-	336	324	296	-	-	-	304	292	266	-	-	-
¼" x 0.040"	-	-	-	-	-	-	-	-	-	-	355	340	310	-	-	-
¼" x 0.049"	176	171	-	-	-	-	-	-	-	-	450	431	393	-	-	-
⅜" x 0.035"	-	-	-	-	214	206	189	-	-	-	194	182	169	-	-	-
⅜" x 0.040"	87	84	144	141	-	-	-	-	-	-	-	-	-	-	-	-
⅜" x 0.049"	-	-	181	178	311	298	274	-	-	-	280	269	245	444	395	341
⅜" x 0.062"	-	-	-	-	-	-	-	-	-	-	368	352	321	583	519	447
⅜" x 0.065"	-	-	-	-	-	-	-	-	-	-	390	374	341	616	548	472
½" x 0.035"	55	54	-	-	157	151	138	-	-	-	142	136	124	-	-	-
½" x 0.040"	64	62	106	104	-	-	-	-	-	-	-	-	-	259	230	198
½" x 0.049"	-	-	-	-	-	-	-	-	-	-	204	196	178	322	287	247
½" x 0.062"	-	-	-	-	292	281	257	-	-	-	265	254	232	419	373	321
½" x 0.065"	-	-	-	-	-	-	-	-	-	-	280	268	244	442	393	339

Other dimensions and materials on request.
The pressure test is carried out with air under water using the max. design pressure multiplied by factor 1.5 up to a max. test pressure of 300 bar.
Hydro-testing with water applied for higher test pressures is available on request.

Dimensions and working pressure - Plastic tubes

Dimensions (mm)	Tube material																
	PE-LD			PE-HD				PA					PTFE				
	Design pressure (bar) *Temperature (°C)*																
	20	*40*	*60*	*20*	*40*	*60*	*75*	*20*	*40*	*60*	*80*	*100*	*20*	*50*	*100*	*150*	*200*
6 x 1.0	13	7	3	27	13	7	4	27	19	15	13	10	15	13	10	8	6
8 x 1.0	9	5	2	13	9	5	3	19	13	11	9	7	11	9	7	6	4
10 x 1.0	7	3	1	15	7	3	2	15	11	8	7	5	9	7	6	5	3
12 x 1.0	6	3	1	12	6	3	1	12	9	7	5	5	7	6	5	4	3
[in]	*20*	*40*	*60*	*20*	*40*	*60*	*75*	*20*	*40*	*60*	*80*	*100*	*20*	*50*	*100*	*150*	*200*
¼" x 0.040"	13	7	3	27	13	7	4	27	19	15	13	10	-	-	-	-	-
⅜" x 0.040"	8	4	2	16	8	4	2	16	11	9	7	6	-	-	-	-	-
⅜" x 0.062"	13	7	3	27	13	7	4	27	19	15	13	10	-	-	-	-	-
½" x 0.062"	9	5	2	19	9	5	3	19	13	11	9	7	-	-	-	-	-

** Other sizes available by special request.*

NOTE: Maximum working pressures given are to be regarded as nominal values primarily for pneumatic systems (safety factor 3 against bursting pressure). Apart from undergoing dimensional inspection, every OSNALINE® plastic tube is routine tested throughout its length by the unobstructed passage of a steel ball and also tested pneumatically for its ability to withstand the specified system pressure.

Jacket materials

KME Type	Letter symbol	Material description	Standard	Flammability	Flammability tested by
OSNA 2000 Type 1	YM3	PVC Polyvinylchloride	DIN VDE 0207 Part 5	IEC 60 332-3-22 Category A/F	ABS HN 987717
PE-LD	2YM1 and 2YM2	PE-LD Low density polyethylene	DIN VDE 0207 Part 3 ASTM D 1248: Type II, Class C, Category 5		DIN EN 12449 table 20
OSNA PE HM2*	HM2*	TPE-O* Thermoplastic elastomer	DIN VDE 0282 Part 24, HM2	IEC 60 332-3-22 Category A/F	ABS HN 789265
OSNA TPU*	TPU*	TPU* Thermoplastic polyurethane	DIN VDE 0282 Part 10	IEC 60 332-3-22 Category A/F	ABS 03-ES 331499

** Tube bundle only with additional filler jacket.* *Other jacket materials on request.*

Temperature limits of jacket materials

KME Type	During assembly Min. / Max. (°C)	Before and after assembly (°C)
OSNA 2000 Type 1	-5 / +50	-40 / +80
PE-LD	-20 / +50	-60 / +70
OSNA PE HM2	-15 / +50	-25 / +80
OSNA TPU	-40 / +50	-60 / +120

Permissible bending radius

Permissible bending radius (nominal)		
Type	**Tube bundle**	**Tubes**
Copper	8 x OD	6 x OD
Stainless steel and copper-nickel	10 x OD	
PE-HD, PA	7 x OD	6 x OD
PE-LD		5 x OD
PTFE / PFA		7 x OD
Heat insulated and Heat traced	10 x OD	-

Accessories and Tools

Heat-Shrinkable Dividing Caps

including Hot Melt Glue inside

Heat-Shrinkable Dividing Caps

2-Core

Heat-Shrinkable Dividing Caps

3-Core

Heat-Shrinkable Dividing Caps

4-Core

Heat-Shrinkable Dividing Caps

6-Core

Heat-Shrinkable End Sealing Caps

Heat-Shrinkable Sleeves

Accessories and Tools

Heat-Shrinkable Winding Tape

Heat-Shrinkable High-Temperature Sleeves

Thermofleece Sleeves

Plastic Glands with Heat-Shrinkable Part

Repair Sleeves

OSNACOL®

Product Line Intended for Alternative Energies

Earth Collector Tubes for Geothermal Heat Pump Systems
To meet the needs of domestic geothermal energy installations, KME has specifically developed OSNACOL®, a single copper tube with a special covering. The most commonly used systems for the ecological use of geothermal energy are the horizontal and vertical loop and well methods.

Direct Heat Exchanger (DX)
In the “conventional horizontal loop system”, for best energy efficiency of the two loops, tubes are laid at a depth of 0.8 - 1.2 m underground. A refrigerant is then circulated through these tubes, which are connected straight to the heat pump. The main benefit of OSNACOL® is the double walled construction of the tube with the inner oxygen diffusion resistant copper tube and the outer covering for external protection. A geothermal energy system requires an outside area of 25 m² to serve a heat output of 1 kW to be effective.

Depth Probe
In the “vertical loop system", a pair of vertical U-tubes are filled with a mixture of water and glycol, which is circulated in a closed loop to trap energy at depths from 5 to 150 metres. This system needs three loops and is definitely more expensive compared to the direct heat exchanger, but it allows the use of the geothermal system even where less space is available.

Well System
Finally, the “well system” operates by heat exchange with the water in aquifers, often at depths of 10 - 20 metres, which remain at the same temperature all year round. This guarantees high thermal yields from heat pumps.

Tube dimension	Material	Standard	Coil length
10.6 x 0.3*	DHP Copper (SF-Cu)	DIN EN 12449 DIN EN 12735-2	Standard: 65, 70, 75 m Manufacturing lengths on drums up to max. 2000 m
10.0 x 0.7**			
12.0 x 0.8			
14.0 x 0.8			
14.0 x 0.9			
18.0 x 0.8			
18.0 x 0.9			

* *OSNACOL® DX-light: extremely thin-walled tubes with max. quality*
** *OSNACOL® DX*
Other dimensions, colour and printing available on request.

OSNACOL® in coils:

Standard coil

Bifilar coil

Research & Development

KME provides all of the key technologies for the production of high-performance products. Careful control of product chemical composition allows the requirements of all international standards to be met and ensures excellent ductility, weldability, corrosion performance and the highest reliability, which in turn provides economic efficiency.

KME is conducting R&D in various fields of technology:
- Engineering
- Materials
- Coatings
- Manufacturing

The R&D department for material development covers both the testing of new alloys and the further development of known ones. The goal for such research work is to constantly improve products for the benefit of our customers and has the facility to draw on the knowledge and experience from the whole KME group.

The laboratory's melting and casting facilities are capable of casting blocks up to 3,000 kg which can be further processed at the production facilities. This means that optimal production parameters can be determined in advance. A small rolling mill and a hot forging process, together with annealing and salt-bath furnaces, are used for thermo-mechanical treatments within the department.

The development of materials is supported by the full range of chemical analysis equipment (S-OES, XRS, ICP, F-AAS, GF-AAS etc.), including metallography, and by SEM electron microscope including EDX analysis systems. In the area of coatings, a galvanotechnical laboratory has been set up. Destructive tests provide additional data, making it possible to compile customer-specific information - e.g. with temperature tensile tests - on particular stresses such as thermal/chemical problems in specific areas.

The unique combination of know-how and long-standing experience in the field makes KME a highly qualified partner in all challenges that arise.

KME Quality-Management

KME is committed to the continuous improvement of all our business and production processes in terms of efficiency, effectiveness and reliability as regards their organisation, technological aspects and staff management.

The aim of our commitment is to increase the satisfaction of all stakeholders.

We are constantly engaged in:
- creating products of outstanding quality
- preventing errors and defects
- minimising the costs associated with errors and inefficiencies
- preventing the waste of resources
- establishing safe production conditions to protect both our employees and the environment

We aim for excellence by means of transparent management systems designed to satisfy the requirements of our clients together with the demands of the market and technology.

The quality management systems implemented throughout the KME Group are fully compliant with the provisions of ISO 9001 as well as, in the case of our automotive industry clients, ISO TS 16 949, and our staff is strongly committed to their implementation at all levels.

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