

INDUSTRIAL TUBES

Wieland

INDUSTRIAL TUBES FOR
HIGH PRESSURE APPLICATIONS



SIMPLE.
NATURAL.
COOL.

K65[®]-System

WWW.K65-SYSTEM.COM

K65[®]

WIELAND-K65 TUBES

Wieland-K65 is a high-strength copper alloy with a considerably higher thermal conductivity than that of stainless steel or aluminium and has very good processing properties. It is therefore particularly suitable for use as heat exchanger tube. Tubes made of Wieland-K65 have been developed in order to meet the trend towards natural refrigerants such as CO₂ (R744) and the resulting higher operating pressures.

Due to its various positive properties, the natural refrigerant CO₂ (R744) is becoming increasingly popular particularly in refrigeration, with the biggest challenge remaining with the high operating pressures used to operate transcritical CO₂ (R744) refrigeration systems.

YOUR BENEFITS

With the high-strength alloy K65, Wieland offers a tube material that enables cost-effective as well as safe manufacture and installation of the entire refrigeration system – from the heat exchanger tubes and its manifolds through to the connecting tubes of the compressor rack and the pipework for the installation of the entire refrigeration system.

In addition, heat exchangers with K65 tubes are more efficient than those made of materials with significantly lower thermal conductivity such as stainless steel. Compared to aluminium, K65 exhibits much higher resistance to creeping and fatigue, in particular at high temperatures, as well as superior corrosion resistance similar to that of pure copper.

These excellent properties of Wieland-K65 are rounded off by the possibility of joining tubes in an easy, safe and cost-effective way by means of brazing.

Your benefits at a glance

- | Cost-effective solution through reduced amount of material used
- | Safety through TÜV-certified and tested quality
- | Good workability on existing machines
- | Familiar, simple joining through brazing
- | Efficient and compact heat exchangers through high thermal conductivity and optional surface enhancements
- | High resistance to creeping and fatigue
- | High corrosion resistance



COST-EFFECTIVE AND SAFE

Due to the high strength of K65, much thinner tube wall thicknesses can be used than in the case of pure copper. This not only results in significant material- and cost saving but also makes the handling of the tubes easier.

K65 is a new material for applications in air conditioning and refrigeration. Wieland has already done the groundwork to facilitate the use of K65. An official certification by TÜV allows K65 tubes to be designed in accordance with the AD2000 rules and, therefore, in conformance with the European Pressure Equipment Directive 97/23/EC. UL 207 certification for the North American market is available on request.

In addition, factory standards have been issued to define the necessary quality and to simplify ordering.

The properties and behaviour of the material have been tested in a large number of material tests at Wieland's laboratories and the valuable experience gained from these tests has been outlined in different information brochures.

Moreover, a suitable joining technology using K65 brazing fittings has been developed with several partner companies. This technology has been subjected to extensive bursting-pressure tests as well as metallographic analyses and is certified for operating pressures of up to 120 bar.

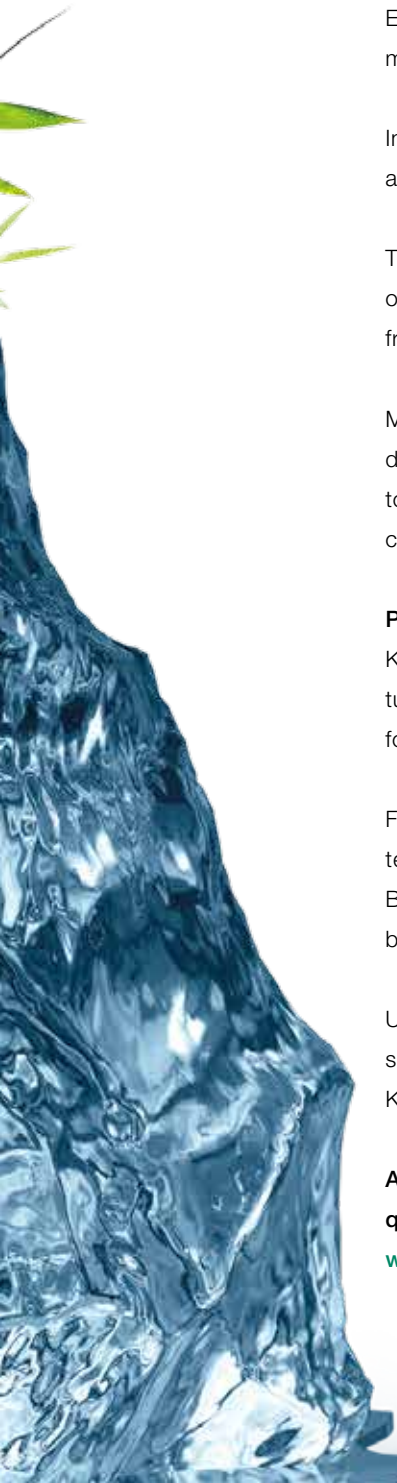
Proven processing- and joining technology

K65 has excellent processing properties which are similar to those of pure copper. This makes K65 tubes ideally suited as tubes for e.g. heat exchangers. Relatively few tool adjustments are necessary for the bending of hairpins and the expanding of tubes.

For the installation of refrigeration systems the manufacturer IBP Conex | Bänninger offers a wide range of 120 bar brazable fittings made of K65.

Umicore Brazetec has recommended suitable brazing alloys for the joining of K65 tubes.

Any information is available on request or on the internet at www.k65-system.com.



PROPERTIES AND FORMS OF DELIVERY

Product: Seamless drawn plain tube,
inner grooves possible on request

Identification: Marked with manufacturer, material,
dimension

Material: Wieland K65 / CuFe2P / CW107C /
UNS C19400

Certification: according to the VdTÜV material data
sheet 567 (temper soft R300)
UL 207 on request

Chemical composition in per cent by weight according to DIN EN 12449:	
Fe	2.10–2.60
Zn	0.05–0.20
P	0.015–0.15
Pb	0.03 max.
Cu	balance

Physical properties	
Thermal conductivity	> 260 W/(m.K)
Density	8.91 g/cm ³
Coefficient of thermal expansion (between 0 and 300 °C)	17.6 x 10 ⁻⁶ /K
Modulus of elasticity	123 GPa
Specific heat capacity	0.385 J/(g.K)
Reference values at room temperature	

Available Tempers					
Temper	Standard	Tensile strength R _m (MPa) min.	0.2% yield strength R _{p0.2} (MPa)	1% yield strength R _{p1.0} (MPa) min.	Elongation A5 (%) min.
R300 soft annealed	VdTÜV 567	300	140 to 250	160	longitudinal 30 transverse 20
R300 soft annealed	EN 12449	300	max. 250	–	25
R370 half-hard	EN 12449	370	min. 250	–	15
R420 hard	EN 12449	420	min. 320	–	5

Reference values at room temperature, R370 only in straight lengths

K65 tubes in straight lengths	
Overall standard	Wieland R-1085
Dimensional tolerances, inner cleanliness and form of delivery	EN 12735-1
Dimensions	Outside diameter 5–54 mm Wall thicknesses 0.3–4.1 mm Lengths up to 7,000 mm

Additional tempers and dimensions on request

K65 tubes in level-wound coils	
Overall standard	Wieland R-1084
Dimensional tolerances, inner cleanliness and form of delivery	EN 12735-2
Dimensions	Outside diameter 5–16 mm Wall thicknesses 0.3–2 mm
Coil weight	150 kg

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