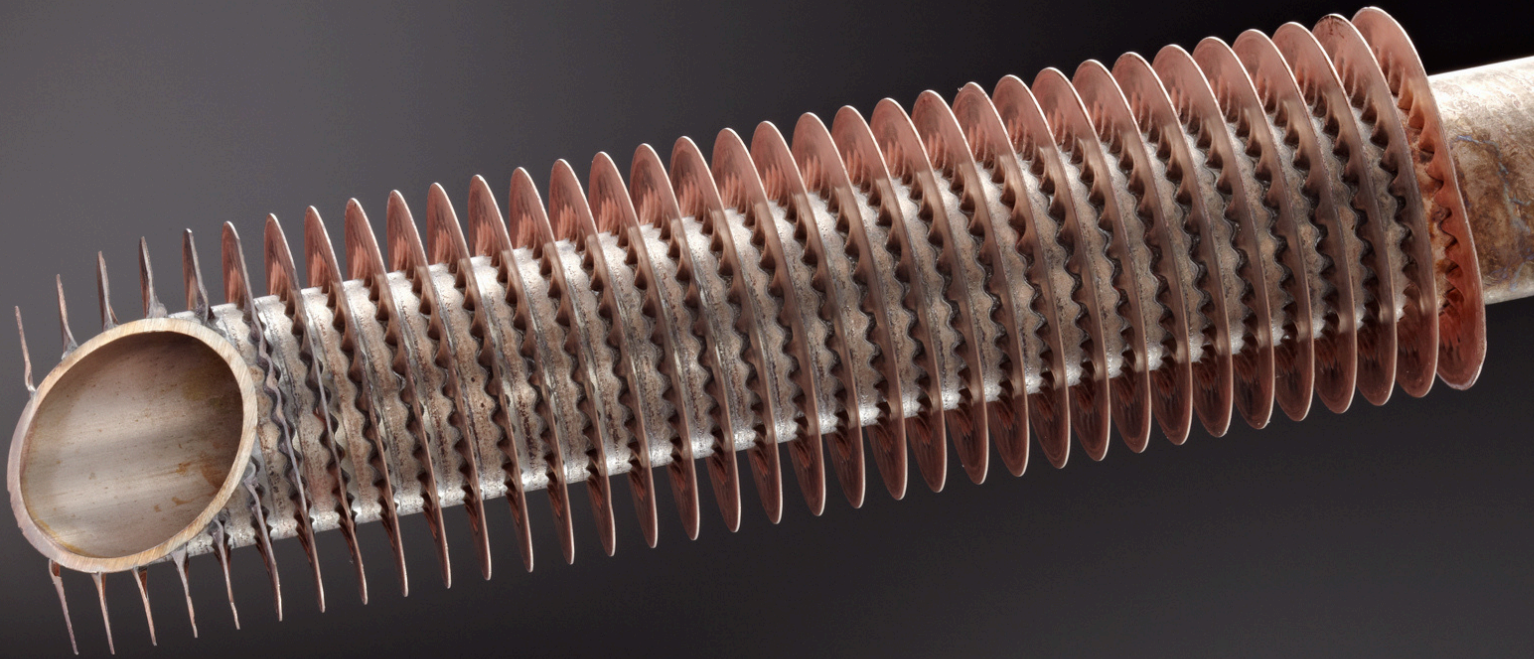


# SCHMOELE



## CORROFIN®-Finned Tubes

### In Copper and Copper Alloys

- Good thermal conductivity by soldering the fins onto the tube
- High heat transfer efficiency by optimum surface area ratio
- Versatile application using different materials and methods of surface treatment
- Optimum support in the tube bundle as well as possible air-side flow conduction without additional baffles by approved hexagonal supporting rings from silicon rubber

# Corrofin-Finned Tubes in Copper and Copper Alloys

## Application

Corrofin finned tubes are used to cool and heat gases. The following interesting application fields have evolved:

Compressed gas industry	Intercoolers Gas heaters Gas coolers
Klimatechnik	Air coolers Air heaters
General Engineering	Air condensers CO <sub>2</sub> -condensers Solvent coolers Lubricating oil coolers

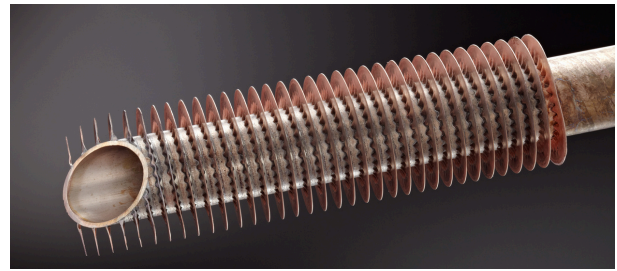
## Description

Corrofin<sup>®</sup> finned tubes are made from copper materials by helically winding the strip around the tube and soldering them with tin solder at the same time. This achieves a good heat-conducting connection between the tube and the strip. The slightly waved fin foot increases the bond strength between tube and fin and thus improves heat transfer.

Corrofin finned tubes can be used at operating temperatures of up to 150 °C. When using pure tin solder, the permissible operating temperature increases to 180 °C.

The ends of the finned area are additionally soldered to the core tube with a soft solder point. On request the strip ends can also be secured by a brazing point.

If an end cap, having an outside diameter slightly greater than the fin outside diameter, is brazed to one tube end, fitting into tube plates and exchange of Corrofin finned tubes can be facilitated.



## Surface protection

On request, Corrofin finned tubes up to 4.8 m in length can be electro.tinned on their outside surface for corrosion protection.

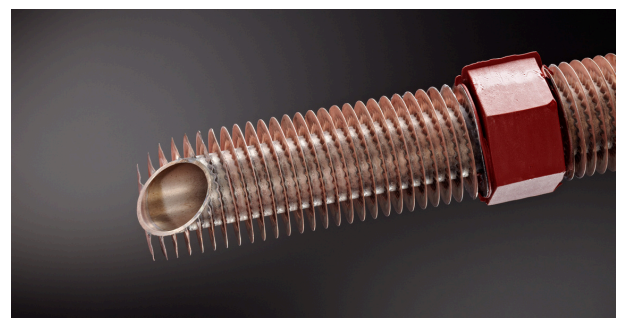
## Supporting rings

On request, Corrofin finned tubes can be supplied with hexagonal support rings, which are applied using an injection molding process. The support rings ensure perfect support in the heat exchanger, especially with longer finned tubes.

By the use of of silicone rubber, the elasticity of the support rings is retained even under extreme operating conditions.

When using hexagonal support rings, simultaneously a triangular tube pitch is determined.

Furthermore, the hexagonal form of the supporting rings can be used to build an air-side flowpath in the heat exchanger, thus avoiding the additional use of baffles.



## Materials

Schmöle Corrofin finned tubes are manufactured from the materials listed in the table below.

The mechanical properties given in this table apply to the unfinned tube ends at room temperature and shall serve the design engineer as a calculation basis. Due to the soldering procedure differing values can be found in the finned section.

In case of pressure vessel installations subject to acceptance, in addition for the tubes the requirements of the AD-Merkblatt W 6/2 have to be respected.

Other materials as well as materials according to international and national standards such as ISO, EN, ASTM, ASME, BS, AFNOR etc. available on request.

When selecting the finned tube and the materials, the operating conditions of the specific individual application have to be considered.

The silicone rubber back-up rings can be used within the permissible operating temperatures for Corrofin finned tubes, i. H. up to 180 °C.

Component	Material designation DIN		Material Standard	Material-No.
Tube	Cu-DHP	R 250	DIN EN 12451	2.0090
	CuZn28Sn1As	R360	DIN EN 12451	2.0470
	CuZn20Al2As	R340	DIN EN 12451	2.0460
	CuNi10Fe1Mn	R290	DIN EN 12451	2.0872
	CuNi30Mn1Fe	R370	DIN EN 12451	2.0882
Fin strip	Cu-DHP	R220	DIN 1652	2.0205
	CuNi10Fe1Mn*	R300	DIN 1652	2.0872
Solder	S-Sn60Pb40Sb		DIN 29453	2.3665
	AG104		DIN 1044	2.5158
Supporting ring	Silicon rubber		-	-
End cap	Material of the tube		-	-

\*economical lot sizes provided

Other tube material (r.g. stainless steel) on request

# Dimensions

Schmöle-Code-Nr.	unberipptes Rohrende		berippter Rohrteil						Ungefähres Gewicht		
	Außen-ø	Wand-dicke	Rippen-außen-ø	Rippen-dicke	Rippen-teilung	Innen-quer-schnitt	Außen-ober-fläche	Flächen-verhältnis	Rohr	Band	gesamt
	$d_1$ mm	$s_1$ mm	$d_5$ mm	$\delta_R$ mm	m mm	$q_i$ cm <sup>2</sup>	$A_3$ m <sup>2</sup> /m	$A_2/A_1$ -	$G_{Cu}$ kg/m	$G_{Cu}$ kg/m	$G_{Cu}$ kg/m
2 28 14	14,0	1,00	28,0	0,25	2,00	1,13	0,50	13,3	0,36	0,52	0,88
25 28 14	14,0	1,00	28,0	0,25	2,50	1,13	0,41	10,9	0,36	0,42	0,78
3 28 14	14,0	1,00	28,0	0,25	3,00	1,13	0,35	9,3	0,36	0,35	0,71
4 28 14	14,0	1,00	28,0	0,25	4,00	1,13	0,27	7,2	0,36	0,26	0,62
2 32 18	18,0	1,00	32,0	0,25	2,00	2,01	0,60	12,0	0,48	0,63	1,11
25 32 18	18,0	1,00	32,0	0,25	2,50	2,01	0,50	9,7	0,48	0,50	0,98
3 32 18	18,0	1,00	32,0	0,25	3,00	2,01	0,42	8,4	0,48	0,42	0,90
4 32 18	18,0	1,00	32,0	0,25	4,00	2,01	0,33	6,6	0,48	0,32	0,80
2 38 18	18,0	1,00	38,0	0,30	2,00	2,01	0,92	18,3	0,48	1,18	1,66
25 38 18	18,0	1,00	38,0	0,30	2,50	2,01	0,76	14,9	0,48	0,95	1,43
275 38 18	18,0	1,00	38,0	0,30	2,75	2,01	0,69	13,7	0,48	0,86	1,34
3 38 18	18,0	1,00	38,0	0,30	3,00	2,01	0,63	12,5	0,48	0,79	1,27
4 38 18	18,0	1,00	38,0	0,30	4,00	2,01	0,49	9,8	0,48	0,59	1,07
2 50 24	24,0	1,25	50,0	0,35	2,00	3,63	1,57	23,3	0,80	2,50	3,30
275 50 24	24,0	1,25	50,0	0,35	2,75	3,63	1,17	17,3	0,80	1,86	2,66
3 50 24	24,0	1,25	50,0	0,35	3,00	3,63	1,07	15,8	0,80	1,72	2,52
4 50 24	24,0	1,25	50,0	0,35	4,00	3,63	0,82	12,1	0,80	1,31	2,11



Preferred dimensions

Other dimensions on request.

## Forms of supply

- in straight lengths up to 9500 mm
- in bent form on request
- with unfinned tube ends
- with hexagonal supporting rings
- up to 4500 mm lengths outside galvanicall tinned
- Sockets on request

## Tube codification

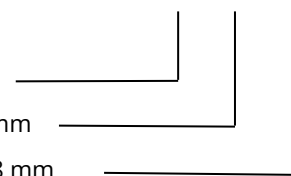
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275 38 18

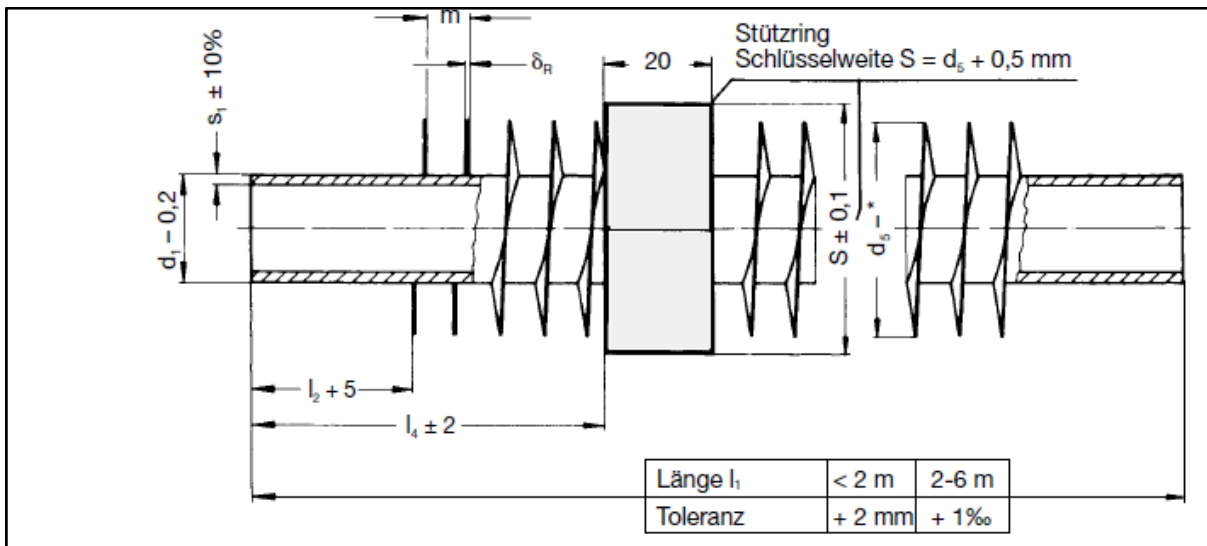
Fin pitch 2,75 mm

Fin outside diameter 38 mm

Tube outside diameter 18 mm



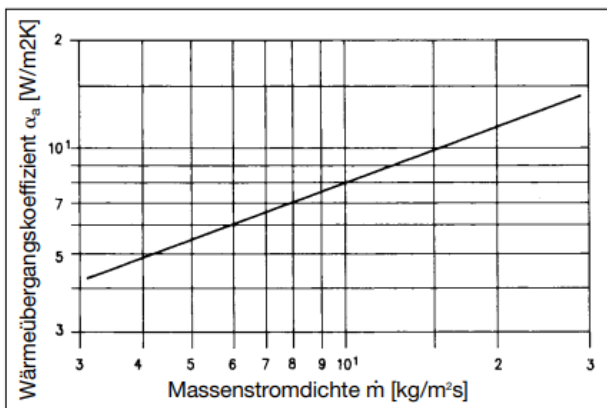
# Tolerances



\*Tolerances depends on fin height

## Thermal design

The following graph can be used for the design of heat exchangers to be equipped with Corrofin finned tubes. This graph shows the mean air-side heat transfer coefficient  $\alpha_a$  referred to the mass flow density  $m$  for forced air flow in the flow cross section of the air between tubes.



Heat transfer coefficient  $\alpha_a$  for Corrofin

## Testing and Approvals

The leak testing of Corrofin finned tubes is carried out by an eddy current test of the unfinned base tube.

In case of fin strip ends secured by a brazing point, the finished finned tubes are leak tested at 20 bar air under water.

Schmöle supply Corrofin finned tubes for pressure vessel application according to AD-Merkblatt W 6/2, having obtained the corresponding authority by TÜV for finned tubes with brazed fin strip ends.

This product description is based on our own research and the relevant literature which was applied with the necessary care.

Nevertheless, we strongly recommend testing the suitability of the product under your actual operating conditions. This refers particularly to the suitability of the material chosen for the intended application.

The relevant standards and specifications for the operation of the heat exchanger have to be respected.

Our sales and technical departments are available for any further advice you may need.

The product is subject to modifications without notice, particularly if they are made for reasons of quality improvement, increase in efficiency or simplification of production.



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