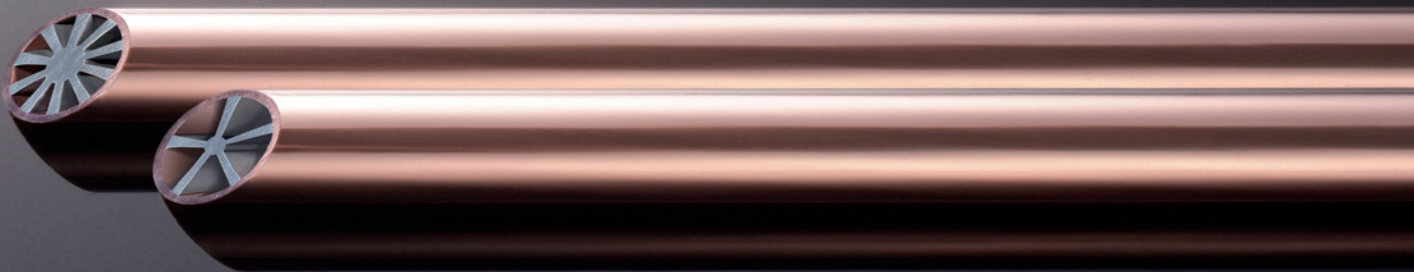


Wieland

Star tubes

Wieland Thermal Solutions[®]
PROVIDING EFFICIENCY



Wieland Star Tubes

Wieland star tubes are heat-exchanger tubes with the inside surface enhanced by a star-shaped extrusion. The tube is bonded onto the extrusion by a drawing operation causing good thermal contact. The star shape increases the inside surface and enhances the inside heat transfer. Star tubes are primarily used for shell-and-tube heat exchangers or coaxial heat exchangers (mainly refrigerant dry expansion evaporators).

The plain outer tube may also be replaced by a low finned tube (for example GEWA-K). The standard aluminium extrusion has 5 or 10 beams. The outer tube can be made of copper, copper alloys or carbon steel. The outside diameters range between 15 and 19 mm. Star tubes are available in straight lengths or, on request, as coiled heat exchanger.

Quality Assurance

To ensure consistent product quality, Wieland-Werke AG has a sophisticated quality control system according to DIN EN ISO 9001:2000 which has been verified and certified by the independent certification company, Bureau Veritas Quality International (BVQI). Since 30 December 2002, our test laboratories in the Central Laboratory and Development Services have been accredited to DIN EN ISO/IEC 17025 and DIN EN ISO 9001 as test and certification laboratories.

Technical Service

Our Technical Marketing experts are available at any time as contact partners to work together with your experts from the very early product planning stages in order to obtain optimum results for the manufacturing stage and for your application. The only way to find the best, most economical solution is by means of comprehensive technical consultation based on computerised thermal engineering rating.

Materials

	Wieland Symbol	EN	EN number	USA UNS	Composition as per
Tube	K21	Cu-DHP	EN CW024A	C12200	EN 12452
	L10	CuNi10Fe1Mn	EN CW352H	C70600	EN 12452
	L30	CuNi30Mn1Fe	EN CW354H	C71500	EN 12452
	Carbon steel	P235GH (St 35.8)	1.0345	ASTM A179	EN 10216-2
Extrusion	A22	AW-ALMgSi	EN AW6060	(A96101)*	EN 573-3

* Impurities not absolutely identical with DIN.

Sizes (Standard)

The following standard sizes are available:

5 beams l_1 up to 8 m												
Tube No.								Tube weight (kg/m)			Weight of extrusion (kg/m)	
	d_1 (mm)	s (mm)	A_i (m ² /m)	A_i/A_a (-)	F (mm ²)	d_h (mm)	D_m (mm)	Cu-DHP (K21)	CuNi10Fe1Mn (L10) CuNi30Mn1Fe (L30)	P235GH (Carbon steel)		AW-ALMgSi (A22)
5-15-08	15	0.8	0.097	2.06	101	4.19	130	0.32	0.32	0.28	0.12	
5-15-10	15	1.0	0.093	1.97	94	4.04	130	0.39	0.39	0.35	0.11	
5-16-08	16	0.8	0.104	2.07	120	4.59	130	0.34	0.34	0.30	0.13	
5-16-10	16	1.0	0.101	2.01	112	4.43	130	0.42	0.42	0.37	0.12	
5-19-08	19	0.8	0.129	2.16	186	5.74	150	0.41	0.41	0.36	0.15	
5-19-10	19	1.0	0.126	2.11	176	5.59	150	0.50	0.50	0.44	0.14	

Also available in other sizes and materials

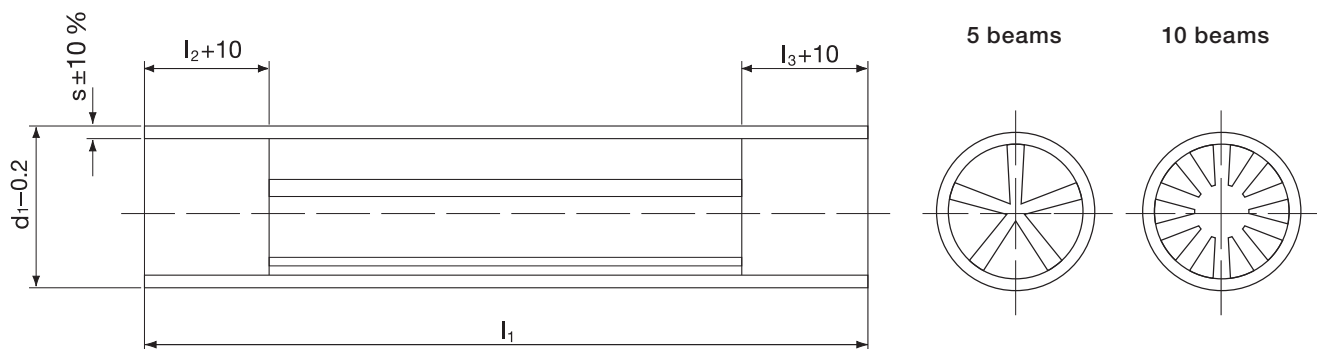
10 beams l_1 up to 8 m											
Tube No.								Tube weight (kg/m)			Weight of extrusion (kg/m)
	d_1 (mm)	s (mm)	A_i (m ² /m)	A_i/A_a (-)	F (mm ²)	d_h (mm)	D_m (mm)	Cu-DHP (K21)	CuNi10Fe1Mn (L10) CuNi30Mn1Fe (L30)	P235GH (C-Steel)	AW-AlMgSi (A22)
10-16-08	16	0.8	0.135	2.69	84	2.50	80	0.34	0.34	0.30	0.22
10-16-10	16	1.0	0.125	2.49	78	2.50	80	0.42	0.42	0.37	0.21
10-19-08	19	0.8	0.174	2.92	141	3.22	90	0.41	0.41	0.36	0.27
10-19-10	19	1.0	0.164	2.75	132	3.22	90	0.50	0.50	0.44	0.26

Also available in other sizes and materials

Sizes, surfaces, areas, weights

Symbols

d_1	tube OD	A_i/A_a	surface area within finned section
s	tube wall	F	flow area ratio (inside/outside within finned section)
l_1	tube length	d_h	hydraulic diameter within finned section
l_2, l_3	length of tube protruding over extrusion	D_m	smallest possible mean bending diameter, nominal, for hairpin tubes
A_i	inside surface area within finned section		



Tolerance on tube length

Tube length l_1		Tolerance	Tube length l_1		Tolerances l_3 (mm)	
above (mm)	up to (mm)		(mm)		K20, L10, L30	P235GH (Carbon steel)
-	2000	+2 mm	up to 2000		+10	+40
2000	8000	+1 %, max. 5 mm	2000-5000		+20	+40
			about 5000		+30	+60

Tube tolerances according to EN 12451



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