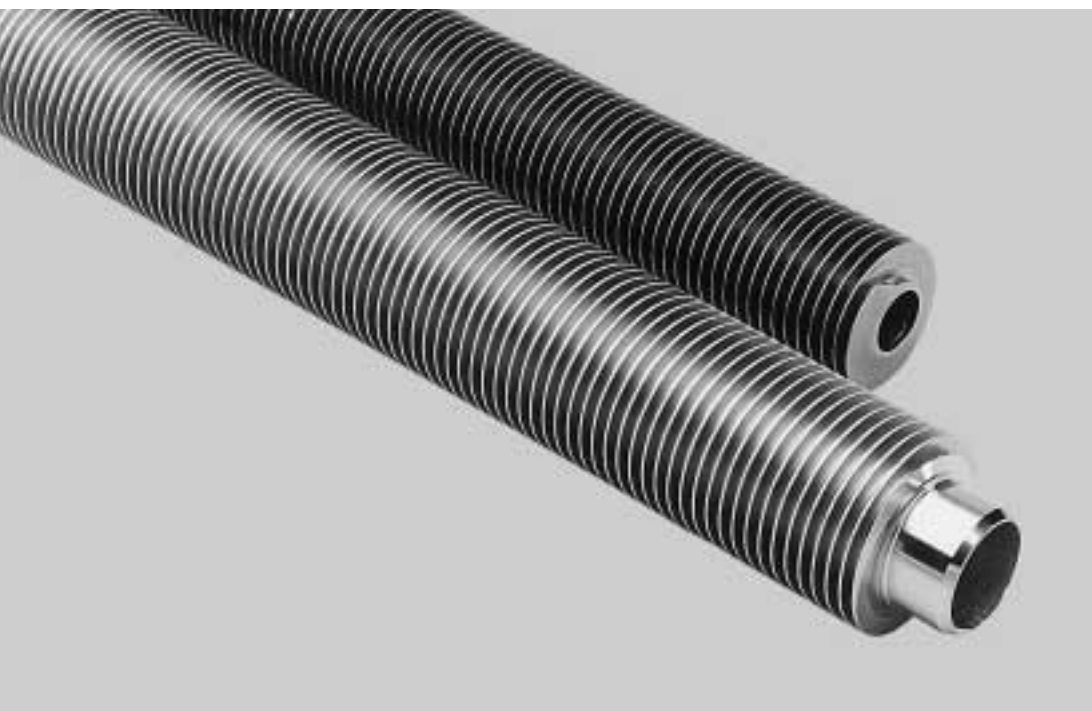


Wieland



***High Finned Tubes
GEWA-H***



High finned tubes type GEWA-H are mainly used in heating (gas-fired boilers, condensing boilers, flue gas condensers), in mechanical and automotive engineering (oil coolers, mine coolers, air coolers for Diesel engines) in chemical engineering (gas coolers and heaters, process coolers), in power plants (air coolers, cooling towers), and nuclear engineering (uranium enrichment plants).

Production and Processing

The fins are obtained by roll forming the outer surface of a plain tube. This process results in an increase in strength of the finned sections, whereas the plain ends and lands remain soft. However, soft annealing of the finned tubes is necessary if they must be suitable for bending and coiling.

High finned tubes require easy forming materials. Aluminium and its alloys allow up to 15 mm in fin height, copper up to 10 mm. These finned tubes stand up against very high mechanical and thermal stresses.

The following certifications have been obtained for manufacturing the tubes for use in plants which require monitoring:
VdTÜV-Werkstoffblatt 420/3 (SF-Cu)
VdTÜV-Werkstoffblatt 420/4 (aluminium alloys)

Many applications require a corrosion-resistant plain core tube in a different material. In that case, the outer tube is rolled onto the core tube so as to provide for a firm bond and good thermal contact between the two tubes. The permissible thermal stress has to be checked in each case because of the difference in thermal expansion between the core tube and the finned tube.

GEWA-H high finned tubes are expanded, welded or soldered into tube plates or can be sealed with O-rings.

For special applications, an extended inside surface may be useful. It can be obtained through integral fins (see fig.) or subsequent inserts for a better heat transfer.



Quality Assurance

Wieland's quality assurance system, which has been functioning successfully for many years, completely covers all production stages from material reception through to despatch.

Technical Service

Expert application engineers are available at any time as contact partners to work together with the customer's own experts from the very early product planning stages in order to obtain optimum results for the manufacturing stage and for the actual intended application. The only way to find the best, most economical problem solution is by means of comprehensive technical consultations based on computerized thermal engineering rating.

Symbols

d_1	OD of plain end
d_3	ID of finned section or OD of core tube
d_4	root diameter
d_5	diameter over fins
d_6	OD of stripped end
s_1	wall thickness of plain end
s_2	root wall thickness
l_1	overall tube length
l_2	length of plain end
l_3	length of stripped end
l_4	length of the protruding core tube
A_1	surface area within finned section taking into account the mean negative tolerance on fin height
A_1/A_2	surface area ration – outside to inside surface area within finned section – (without core tube)

Tube Number Code System

Explanation based on the example of tube No. H-0710.18100-00

H	07	10	18	100	00
Type GEWA-H	number of fins per inch	nominal fin height in mm	nominal root diameter in mm	root wall thickness in 1/100 mm	Code number for the inner structure (00 = plain inside surface)

Length tolerances

l_1 (mm)	Length tolerances
< 2000	+ 2 mm
2000 – 8000	+ 1 ‰ (max. 5 mm)
> 8000	+ 0.7 ‰

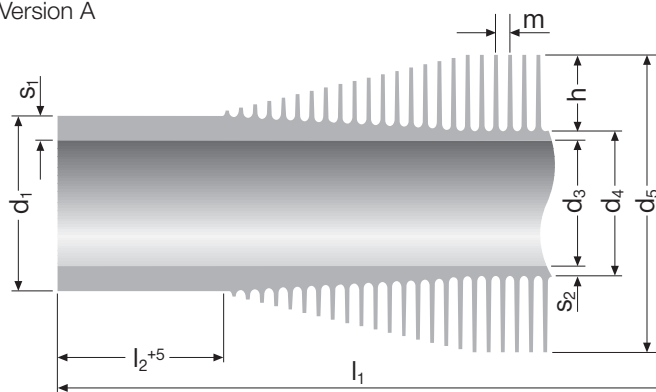
Weight conversion $G = G_{A22} \cdot f$

Materials	f
A61	1.01
K21	3.31

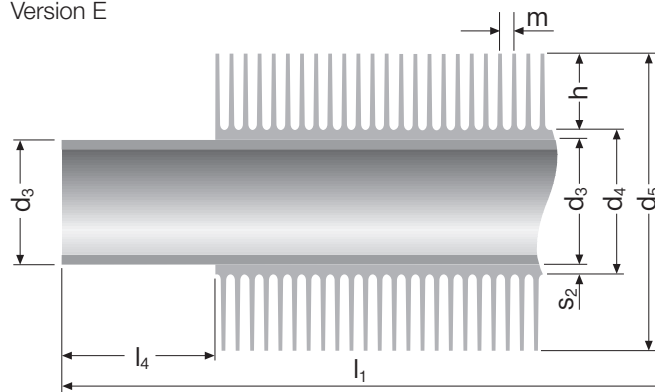
Materials and Properties

Wieland		K21	A22	A61
DIN symbol Material No. Composition as per		SF-Cu 2.0090 DIN 1787	AlMgSi0.5 3.3206 DIN 1725	AlMn1 3.0515 DIN 1725
Comparable foreign standards	USA	UNS	C12200	–
	France	NF	Cu-b1	A-GS
	U. K.	BS	C106	–
	Italy	UNI	Cu-DHP	9006
	Spain	UNE	C-1130	L-3441
	Sweden	SIS	5015	4103
	EAA Registration Record	–	6060	3103
Mechanical properties of the plain tube sections (indicative values)	Material condition	F22	F13	F10
	Elongation limit $R_{p0.2}$ (N/mm ²)	45–120	min. 65	min. 40
	Tensile strength R_m (N/mm ²)	min. 220	min. 130	min. 95
	Elongation A_5 (%)	min. 40	min. 15	min. 17
Physical properties (indicative values)	Density (kg/dm ³)	8.94	2.70	2.73
	Melting range (°C)	1083	585–650	645–655
	Mean thermal expansion coefficient at temperatures (10 ⁻⁶ /K) (°C)	17.6	23.4	23.5
		20–300 (to DIN 17679)	20–100	20–100
	Thermal conductivity at 20 °C (W/mK)	310	200–220	160–200
Chemical composition to DIN (%)	Cu ≥ 99.9 P 0.015–0.040 oxygen-free	Si 0.3–0.6 Fe 0.10–0.30 Cu 0.10 Mn 0.10 Mg 0.35–0.6 Cr 0.05 Zn 0.15 Ti 0.10 Other: individual 0.05 total 0.15	Si 0.50 Fe 0.7 Cu 0.10 Mn 0.9–1.5 Mg 0.30 Cr 0.10 Zn 0.20 Ti 0.10 Other: individual 0.05 total 0.15	
(For A22 and A61 maximum impurities)				

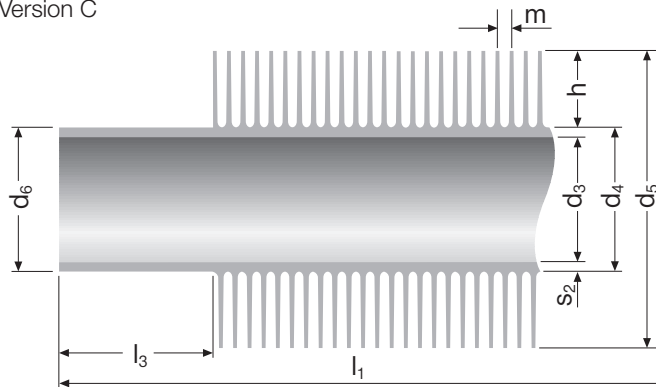
Version A



Version E



Version C



Available Versions

- A Tube with plain ends
- B Tube finned throughout
- C Tube with stripped ends
- D Bimetallic tube, finned throughout
- E Bimetallic tube, with stripped ends
- F Bimetallic tube, with stripped ends and supports (on request)

GEWA-H		5.3 fpi		fin pitch $m = 4.8 \text{ mm}$ fin height $h = 7.5 \text{ mm}$				mean fin thickness $\delta_R \approx 1.3 \text{ mm}$ production length max. 10 m	
Tube No.	Material		Finned section						approx. weight
	A22	A61	d_3 (mm)	d_4 (mm)	d_5 (mm)	s_2 (mm)	A_1 (m^2/m)	A_1/A_2 (-)	G_{A22} (kg/m)
H-0507.18125-00	○	○	16.0	18.5	33.5 ± 0.5	1.25	0.29	5.7	0.46
H-0507.20125-00	○	○	18.0	20.5	35.5 ± 0.6	1.25	0.31	5.4	0.50
H-0507.25150-00	○	○	22.0	25.0	40.0 ± 0.6	1.50	0.36	5.2	0.65
H-0507.27150-00	○	○	24.5	27.5	42.5 ± 0.7	1.50	0.38	5.0	0.71

Other sizes and materials: please enquire

GEWA-H

6.7 fpi

fin pitch $m = 3.8 \text{ mm}$
fin height $h = 10 \text{ mm}$

mean fin thickness $\delta_R \approx 0.55 \text{ mm}$
production length max. 10 m

Tube No.	Material		Finned section						approx. weight
	A22	A61	d_3 (mm)	d_4 (mm)	d_5 (mm)	s_2 (mm)	A_1 (m ² /m)	A_1/A_2 (-)	G_{A22} (kg/m)
H-0610.18100-00	○	○	16.5	18.5	38.5±0.5	1.00	0.49	9.4	0.51
H-0610.20125-00	○	○	18.0	20.5	40.5±0.6	1.25	0.52	9.2	0.60
H-0610.25125-00	○	○	22.5	25.0	45.0±0.6	1.25	0.60	8.5	0.71
H-0610.27125-00	●	●	25.0	27.5	47.5±0.7	1.25	0.64	8.1	0.77
H-0610.35150-00	○	○	32.0	35.0	55.0±0.8	1.50	0.76	7.6	1.02

Other sizes and materials: please enquire

● Preferential dimensions

GEWA-H

7 fpi

fin pitch $m = 3.6 \text{ mm}$
fin height $h = 10 \text{ mm}$

mean fin thickness $\delta_R \approx 0.5 \text{ mm}$
production length max. 10 m

Tube No.	Material			Finned section						approx. weight
	K21	A22	A61	d_3 (mm)	d_4 (mm)	d_5 (mm)	s_2 (mm)	A_1 (m ² /m)	A_1/A_2 (-)	G_{A22} (kg/m)
H-0710.18100-00		○	○	16.5	18.5	38.5±0.5	1.00	0.52	10.0	0.52
H-0710.18125-00	○	○	○	16.0	18.5	38.5±0.5	1.25	0.52	10.3	0.56
H-0710.20125-00	●	●	●	18.0	20.5	40.5±0.6	1.25	0.55	9.8	0.61
H-0710.25125-00		○	○	22.5	25.0	45.0±0.6	1.25	0.64	9.0	0.72
H-0710.25150-00	●	●	●	22.0	25.0	45.0±0.6	1.50	0.64	9.2	0.76
H-0710.27125-00		●	●	25.0	27.5	47.5±0.7	1.25	0.68	8.6	0.78
H-0710.27150-00	○	○	○	24.5	27.5	47.5±0.7	1.50	0.68	8.8	0.83
H-0710.35150-00		○	○	32.0	35.0	55.0±0.8	1.50	0.81	8.1	1.03
H-0710.35175-00	○	○	○	31.5	35.0	55.0±0.8	1.75	0.81	8.2	1.10

Other sizes and materials: please enquire

● Preferential dimensions

GEWA-H

8 fpi

fin pitch $m = 3.2$ mm
fin height $h = 10$ mm

mean fin thickness $\delta_R \approx 0.45$ mm
production length max. 10 m

Tube No.	Material			Finned section						approx. weight G_{A22} (kg/m)
	K21	A22	A61	d_3 (mm)	d_4 (mm)	d_5 (mm)	s_2 (mm)	A_1 (m ² /m)	A_1/A_2 (-)	
H-0810.18100-00		○	○	16.5	18.5	38.5±0.5	1.00	0.59	11.5	0.53
H-0810.18125-00	○	○	○	16.0	18.5	38.5±0.5	1.25	0.59	11.8	0.56
H-0810.20125-00	○	○	○	18.0	20.5	40.5±0.6	1.25	0.63	11.2	0.61
H-0810.25125-00		○	○	22.5	25.0	45.0±0.6	1.25	0.73	10.3	0.72
H-0810.25150-00	●	●	●	22.0	25.0	45.0±0.6	1.50	0.73	10.6	0.77
H-0810.27125-00		○	○	25.0	27.5	47.5±0.7	1.25	0.78	9.9	0.78
H-0810.27150-00	●	●	●	24.5	27.5	47.5±0.7	1.50	0.78	10.1	0.84
H-0810.35150-00		○	○	32.0	35.0	55.0±0.8	1.50	0.93	9.3	1.04

Other sizes and materials: please enquire

● Preferential dimensions

GEWA-H

8 fpi

fin pitch $m = 3.2$ mm
fin height $h = 13$ mm

mean fin thickness $\delta_R \approx 0.55$ mm
production length max. 10 m

Tube No.	Material		Finned section						approx. weight G_{A22} (kg/m)
	A22	A61	d_3 (mm)	d_4 (mm)	d_5 (mm)	s_2 (mm)	A_1 (m ² /m)	A_1/A_2 (-)	
H-0813.18100-00	○	○	16.5	18.5	44.5±0.6	1.00	0.83	16.1	0.61
H-0813.20125-00	○	○	18.0	20.5	46.5±0.6	1.25	0.89	15.7	0.69
H-0813.25125-00	○	○	22.5	25.0	51.0±0.7	1.25	1.01	14.2	0.81
H-0813.27150-00	○	○	24.5	27.5	53.5±0.7	1.50	1.07	13.9	0.93

Other sizes and materials: please enquire

GEWA-H

9 fpi

fin pitch $m = 2.8$ mm
fin height $h = 8$ mm

mean fin thickness $\delta_R \approx 0.45$ mm
production length max. 10 m

Tube No.	Material		Finned section					approx. weight	
	A22	A61	d_3 (mm)	d_4 (mm)	d_5 (mm)	s_2 (mm)	A_a (m ² /m)	A_a/A_i (-)	G_{K21} (kg/m)
H-0908.20125-00	●	○	18.0	20.5	36.5 ± 0.5	1.25	0.54	9.5	2.04
H-0908.25150-00	●	○	22.0	25.0	41.0 ± 0.6	1.50	0.63	9.0	2.59

Other sizes and materials: please enquire

● Preferential dimensions

GEWA-H

9 fpi

fin pitch $m = 2.8$ mm
fin height $h = 10$ mm

mean fin thickness $\delta_R \approx 0.45$ mm
production length max. 10 m

Tube No.	Material		Finned section					approx. weight	
	A22	A61	d_3 (mm)	d_4 (mm)	d_5 (mm)	s_2 (mm)	A_1 (m ² /m)	A_1/A_2 (-)	G_{A22} (kg/m)
H-0910.16100-00	○	○	14.0	16.0	36.0 ± 0.5	1.00	0.60	13.6	0.49
H-0910.18100-00	○	○	16.5	18.5	38.5 ± 0.5	1.00	0.66	12.7	0.54
H-0910.18125-00	○	○	16.0	18.5	38.5 ± 0.5	1.25	0.66	13.1	0.58
H-0910.20125-00	●	●	18.0	20.5	40.5 ± 0.5	1.25	0.71	12.5	0.63
H-0910.25125-00	○	○	22.5	25.0	45.0 ± 0.6	1.25	0.81	11.4	0.74
H-0910.25150-00	○	○	22.0	25.0	45.0 ± 0.6	1.50	0.81	11.7	0.79
H-0910.27125-00	●	●	25.0	27.5	47.5 ± 0.7	1.25	0.86	11.0	0.80
H-0910.35150-00	○	○	32.0	35.0	55.0 ± 0.8	1.50	1.03	10.2	1.06

Other sizes and materials: please enquire

● Preferential dimensions

GEWA-H

9 fpi

fin pitch $m = 2.8$ mm
fin height $h = 13$ mm

mean fin thickness $\delta_R \approx 0.60$ mm
production length max. 10 m

Tube No.	Material		Finned section					approx. weight	
	A22	A61	d_3 (mm)	d_4 (mm)	d_5 (mm)	s_2 (mm)	A_1 (m ² /m)	A_1/A_2 (-)	G_{A22} (kg/m)
H-0913.20125-00	○	○	18.0	20.5	46.5 ± 0.7	1.25	0.99	17.4	0.79
H-0913.25125-00	○	○	22.5	25.0	51.0 ± 0.8	1.25	1.12	15.8	0.92
H-0913.27150-00	●	●	24.5	27.5	53.5 ± 0.9	1.50	1.19	15.4	1.04
H-0913.35175-00	○	○	31.5	35.0	61.0 ± 1.0	1.75	1.40	14.2	1.34

Other sizes and materials: please enquire

● Preferential dimensions

Wieland

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