

## Finned Tube Capabilities

### Tube materials

All common tube materials can be welded including: carbon steel, low and high alloy steel and stainless steel. Base tubes can be seamless or welded according to any recognized standard (i.e. ASTM or ASME, DIN/EN, NF, etc.) and they can be supplied by Rosink or free issued by customers. The most commonly used materials are:

Steel type	Material no.	Designation acc. to DIN / EN standard	ASTM Standard	Grade
Carbon steel	1.0305	St.35.8 I bzw. P235GH TC1 St.35.8 III bzw. P235GH TC2	A 106 A 192	A
	1.0405	St.45.8 I bzw. P265GH TC1 St.45.8 III bzw. P265GH TC2	A 106 A 210	B A-1
Low and medium alloy steels	1.5415	15Mo3 bzw. 16Mo3	-	-
	1.5423	16Mo5	A 209 A 335	T 1 P 1
	1.7335	13CrMo44 bzw. 13CrMo4-5	A 213 A 335	T 12 P 12
	-	-	A 213 A 335	T 11 P 11
	1.7380	10CrMo 9-10	A 213 A 335 / A 369	T 22 P 22
	1.8201	7CrWVMoNb9-6	A 213 A 335	T 23 P 23
	1.7378	7CrMoVTiNB10-10	A 213 A 335	T 24 P 24
	1.7362	12CrMo 19-5	A 213 A 335	T 5 P 5
	1.7386	X12CrMo 9-1	A 213 A 335	T 9 P 9
High alloy steels	1.4903	X10CrMoVNb 9-1	A 213 A 335	T 91 P 91
	1.4901	X10CrWMoVNb 9-2	A 213 A 335	T 92 P 92
	1.4301	X 5 CrNi 18 10	A 312 / A 213	TP 304
	1.4306	X 2 CrNi 19 11	A 312 / A 213	TP 304 L
	1.4948	X 6 CrNi 18 11	A 312 / A 213	TP 304 H
	1.4401	X 5 CrNiMo 17 12 2	A 312 / A 213	TP 316
	1.4404	X 2 CrNiMo 17 13 2	A 312 / A 213	TP 316 LN
	1.4435	X 2 CrNiMo 18 14 3	A 312 / A 213	TP 316 L
	1.4571	X 6 CrNiMoTi 17 12 2	A 312 / A 213	TP 316 Ti
	1.4919	X 6 CrNiMo 17 13	A 312 / A 213	TP 316 H
	1.4541	X 6 CrNiTi 18 10	A 312 / A 213	TP 321
	1.4941	X 8 CrNiTi 18 10	A 312 / A 213	TP 321 H
	1.4878	X 12 CrNiTi 18 9	-	TP 321 H
	1.4550	X 6 CrNiNb 18 10	A 312 / A 213	TP 347 TP 347 H
	1.4876	X 10 CrNiAlTi 32 20	-	Alloy 800 (H)
1.4877	X 5 NiCrCeNb 32 27	-	-	



### Fin materials

Almost every combination of tube and fin material can be welded. The most common materials are however:

material grade	max. fintip temperature
DC01-04 (EN 10130) / ASTM A 1008	490 °C
1.4512 (EN 10088-2) / TP 409 (ASTM A 240)	650 °C
1.4301 (EN 10088-2) / TP 304 (ASTM A 240)	850 °C

Stainless steels like 1.4571 (TP 316Ti) or 1.4541 (TP 321) are also common fin materials. Should you have a requirement where other materials are needed, please do not hesitate to contact us. If desired, we can also produce stainless steel / carbon steel combinations. By the use of the appropriate filler materials the increase of the hardness values is reduced resp. hardness peaks are avoided.

### Solid fins

These are welded to the tube applying the patented NOH-FIN or HF welding procedure. The pressure applied while winding the finstrip onto the tube may lead to a slight thinning at the fintip. The finfoot has a width of up to 120% of the nominal fin thickness.

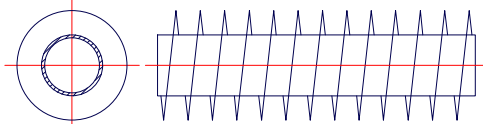
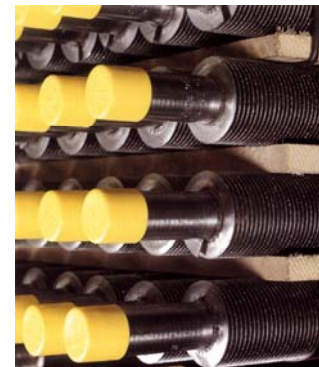


Fig 1 : tube with solid fins



### Serrated fins

Serrated fins are produced by slitting the finstrip equally spaced during the production process. A base 5 mm (0.19") high remains unslitted to form the continuous finfoot. When the finstrip is helically wound onto the tube the serrated part of the finstrip divides at the outer end thus forming rectangular segments.

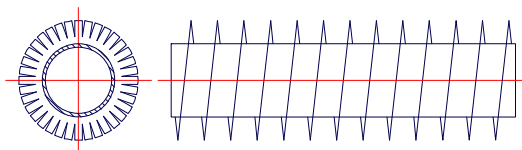
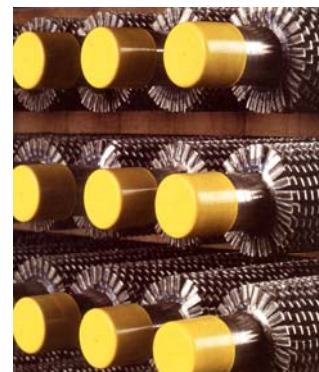


Fig 2 : tube with serrated fins





### Dimensions

ASA Nominal pipe	OD Base tube	Fin height min./max. I-fin solid	Fin height min./max. I-fin serrated
1/2"	21,3 mm	6,5 – 10 mm	6,5 – 32 mm
	25,0 mm	6,5 – 13 mm	
	25,4 mm	6,5 – 13 mm	
3/4"	26,9 mm	6,5 – 14 mm	
	31,8 mm	6,5 – 19 mm	
1"	33,7 mm	6,5 – 19 mm	
	38,0 mm	6,5 – 25 mm	
1 1/4"	42,4 mm	6,5 – 27 mm	
	44,5 mm	6,5 – 29 mm	
1 1/2"	48,3 mm	6,5 – 31 mm	
	51,0 mm	6,5 – 32 mm	
2"	57,0 mm	6,5 – 32 mm	
	60,3 mm	6,5 – 32 mm	
2 1/2"	76,1 mm	6,5 – 32 mm	
	88,9 mm	6,5 – 32 mm	
3"	101,6 mm	6,5 – 38 mm	
	114,3 mm	6,5 – 38 mm	
4"	139,7 mm	6,5 – 38 mm	
	141,3 mm	6,5 – 38 mm	
6"	168,3 mm	6,5 – 38 mm	
	219,1 mm	6,5 – 38 mm	

Tube wall thickness: min. 2 mm for  $\varnothing \leq 26,9$  mm resp. 2,3 mm for  $\varnothing > 26,9$  mm.

The fin height can be determined in steps of 0,1 mm.

### Finned dimensions („serrated“)

max. fin density for fin thickness:	I-fins (NOH-FIN)	I-fins (HF)	U-fins (NOH-FIN)
1,25 mm	303 fpm	260 fpm	
1,0 mm	310 fpm	280 fpm	
0,9 mm	320 fpm	280 fpm	370 fpm
0,8 mm	330 fpm	280 fpm	385 fpm
0,7 mm			400 fpm
0,6 mm			417 fpm
0,5 mm			435 fpm

The fin thickness can be determined in steps of 0,05 mm, the max. fin thickness is 2,5 mm for solid fins. For serrated fins the maximum fin thickness is 1,5 mm for carbon steel and 1,3 mm for 1.4512 (TP 409).

For other dimensions please contact us.

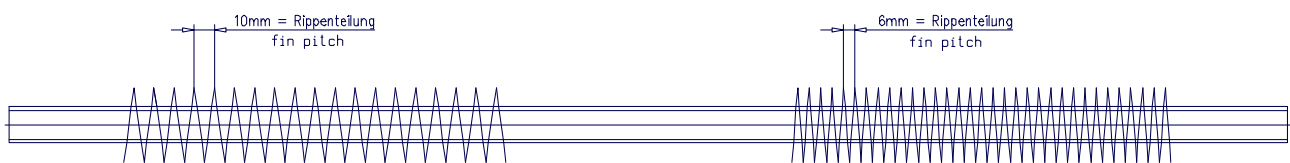


## Finned tolerances

Rosink fintubes are produced following the International Standard for Dimensions, Tolerances and Tests of welded fins (issue June 1990).

## Different fin pitch

It is also possible to have different fin pitches on one tube:



If e. g. the fin pitch chosen is too big to use thin tube sheets, it can also be decreased locally in certain areas in order to avoid the necessity of alternative and expensive support structures.

## Tube bending

In addition to the finning services Rosink also offers cold bending of the tube ends. Our bending equipment can manipulate both ends of tubes in a single operation, thus ensuring exact alignment of the ends.

