



# The tubular heat exchanger series from Alfa Laval

## ViscoLine™ Annular Unit

### Applications

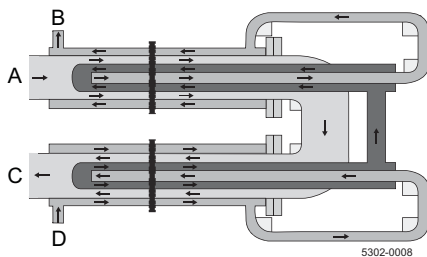
The ViscoLine™ Annular heat exchanger (VLA) is ideal for the heating, cooling and pasteurization of non-Newtonian products with high viscosity, and products that contain particulates. These units are most commonly used in conjunction with low acid products with average/high viscosity, such as tomato concentrate, banana paste, sourdough, chocolate sauce, mayonnaise, malt extract and tomato-based sauces in general.

### Standard design

The VLA unit consists of four concentric tubes. The product medium flows in between two service channels, and is heated or cooled from the inside and outside at the same time. The unit features easy, full inspection of the product side by removing the tube insert. The outer shell is corrugated and the other three concentric tubes are not corrugated, smooth. If required, the product tube can be corrugated. To achieve a more even temperature on the product, static mixers can be welded on outside the third concentric tube. ViscoLine Annular heat exchangers are connected in series on product side and in parallel on water/service side and grouped on support frame or full frame.

### Working principles

The product medium runs in between the second and the third concentric tube and is counter-current relation to the service medium. The only spare parts needed are the O-rings in the header. There is a maximum gap on the product side of 49.2 mm and a minimum gap of 5.8 mm.



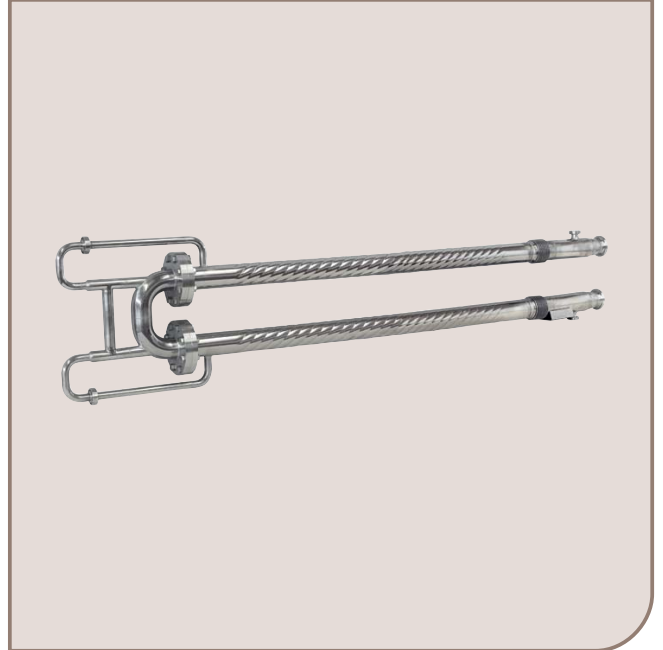
A = Product in  
B = Media out

C = Product out  
D = Media in

### Standard materials

Product side (tubes) . . . Stainless steel AISI 316L  
Service side (shell) . . . Stainless steel AISI 304 or AISI 316L (optional)  
Frame . . . . . Stainless steel AISI 304 (units can be angled for self-draining on request)

Other material available on request is 254 SMO on product side.  
Product bends in AISI 316L



### Technical data

**Mechanical design pressure** The ViscoLine Annular unit was designed for a pressure of 15 barg on the product side (tubes) and 10 barg on the service side (shell), depending on the connection and size. The unit can, however, accommodate higher pressure ratings up to 100 bar, depending on component thickness and connection type.

The ViscoLine Annular Unit complies with the European Pressure Equipment Directive (PED), and is entitled to bear the CE mark, though depending on the design of the connections. Where the CE mark is not required, ViscoLine Annular will be manufactured according to good engineering practice.

It is designed for a temperature of 160°C. All units are provided with an expansion joint to absorb any thermal expansion stresses that arise

### Connections

Product side (tubes)	. . . SMS
	DIN 11851
	Tri-Clamp
	Flange
Service side (shell)	. . . SMS
	DIN 11851
	Tri-Clamp
	Flange

### Options

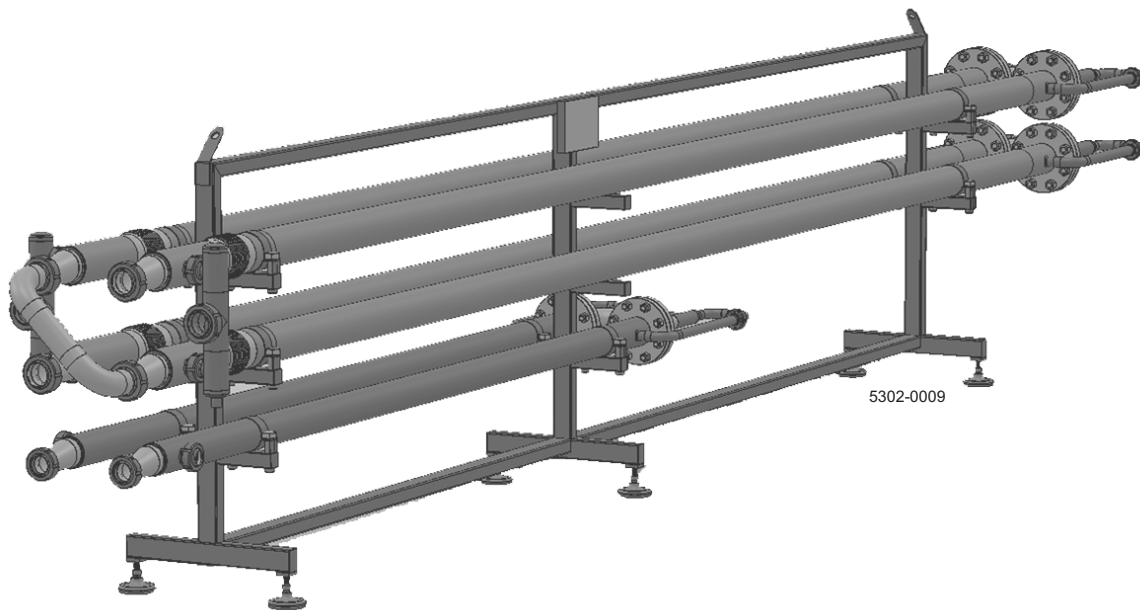
- Protection sheets
- Insulation
- Shell in steel grade AISI 316L
- Other pressure and temperature ratings on request

### Designation

VLA 52/70/114/129-6.0-316L/304

VLA: ViscoLine Annular  
52: 1 st tube diameter  
70: 2 nd tube diameter  
114,3: 3 rd tube diameter  
129: 4 th and outer diameter of service shell  
6.0: module length (meter)  
316L: material product side (tube)  
304: material service side (shell)

All types are also available in 3 meter length.



Type	Gap [mm]	Volume in product gap [litres]	Heat transfer area [m <sup>2</sup> ]
VLA 16/25/40/52-6	5.8	3.6	1.10
VLA 25/34/52/63-6	7.5	6.2	1.48
VLA 18/28/52/63-6	10.5	8.1	1.37
VLA 28/40/63/76-6	9.8	9.7	1.78
VLA 25/38/63/76-6	10.7	10.4	1.75
VLA 25/34/63/76-6	12.8	11.9	1.68
VLA 20/28/63/76-6	15.8	13.7	1.57
VLA 40/60/76/85-6	5.9	7.8	2.37
VLA 34/52/76/85-6	10.1	12.4	2.24
VLA 34/51/76/85-6	10.7	13.1	2.22
VLA 34/48/76/85-6	11.9	14.3	2.15
VLA 28/40/76/85-6	16.1	17.9	2.02
VLA 25/38/76/85-6	17.0	18.7	1.99
VLA 25/34/76/85-6	19.1	20.2	1.91
VLA 20/28/76/85-6	22.1	22.0	1.81
VLA 40/63/85/102-6	8.8	12.6	2.59
VLA 40/60/85/102-6	10.4	14.6	2.53
VLA 34/52/85/102-6	14.5	19.2	2.40
VLA 34/51/85/102-6	15.1	19.9	2.38
VLA 28/48/85/102-6	16.4	21.1	2.34
VLA 28/40/85/102-6	20.5	24.7	2.19
VLA 25/38/85/102-6	21.5	25.5	2.16
VLA 25/34/85/102-6	23.5	27.0	2.08
VLA 20/28/85/102-6	26.5	28.8	1.97
VLA 40/70/89/102-6	7.5	11.5	2.78
VLA 40/63/89/102-6	10.7	15.8	2.67
VLA 40/60/89/102-6	12.3	17.8	2.61
VLA 34/52/89/102-6	16.5	22.5	2.48
VLA 34/51/89/102-6	17.1	23.1	2.46
VLA 28/48/89/102-6	18.3	24.3	2.41
VLA 28/40/89/102-6	22.5	28.0	2.26
VLA 25/38/89/102-6	23.4	28.7	2.23
VLA 25/34/89/102-6	25.5	30.2	2.16
VLA 20/28/89/102-6	28.5	32.0	2.05
VLA 34/60/89/102-6	11.3	16.1	2.53
VLA 34/60/89/102-6	10.3	14.5	2.46
VLA 28/48/89/102-6	16.3	21.0	2.28
VLA 28/48/89/102-6	14.8	18.6	2.19
VLA 52/85/102/114-6	6.3	11.5	3.25
VLA 52/76/102/114-6	10.7	18.5	3.13
VLA 52/70/102/114-6	13.8	23.1	3.02
VLA 40/63/102/114-6	17.1	27.4	2.91
VLA 40/60/102/114-6	18.7	29.4	2.85
VLA 34/52/102/114-6	22.8	34.0	2.72
VLA 34/51/102/114-6	23.4	34.6	2.70
VLA 28/48/102/114-6	24.7	35.9	2.65
VLA 28/40/102/114-6	28.8	39.5	2.50
VLA 52/89/114/129-6	10.7	21.3	3.56
VLA 52/85/114/129-6	12.7	24.6	3.49
VLA 52/76/114/129-6	17.1	31.7	3.37
VLA 52/70/114/129-6	20.2	36.2	3.26
VLA 40/63/114/129-6	23.4	40.6	3.14
VLA 40/60/114/129-6	25.0	42.5	3.09
VLA 34/52/114/129-6	29.2	47.2	2.94
VLA 28/48/114/129-6	31.0	49.0	2.87
VLA 28/40/114/129-6	35.2	52.7	2.72
VLA 52/89/114/129-6	8.7	16.9	3.45
VLA 52/89/114/129-6	7.2	13.8	3.34
VLA 52/76/114/129-6	15.1	27.5	3.22
VLA 52/70/114/129-6	18.2	31.9	3.15
VLA 52/60/114/129-6	23.0	38.2	2.98
VLA 70/114/140/154-6	10.7	26.7	4.50
VLA 70/102/140/154-6	17.1	40.4	4.27
VLA 70/89/140/154-6	23.4	52.4	4.04
VLA 70/85/140/154-6	25.4	55.8	3.97
VLA 52/76/140/154-6	29.8	63.0	3.85
VLA 52/70/140/154-6	32.9	32.9	3.74
VLA 70/89/140/154-6	19.6	42.3	3.86
VLA 70/89/140/154-6	19.6	42.3	3.81

Type	Gap [mm]	Volume in product gap [litres]	Heat transfer area [m <sup>2</sup> ]
VLA 85/129/154/168-6	10.5	29.2	5.03
VLA 70/114/154/168-6	17.9	47.1	4.77
VLA 70/102/154/168-6	24.2	60.7	4.54
VLA 70/89/154/168-6	30.6	72.8	4.31
VLA 129/168/206/219-6	15.9	58.2	6.68
VLA 102/140/206/219-6	30.2	102.2	6.16
VLA 102/129/206/219-6	35.5	116.5	5.97
VLA 89/114/206/219-6	42.9	134.3	5.71
VLA 85/102/206/219-6	49.2	148.0	5.48
VLA 70/168/206/219-6	30.2	102.2	6.68
VLA 70/140/206/219-6	15.9	58.2	6.16

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