

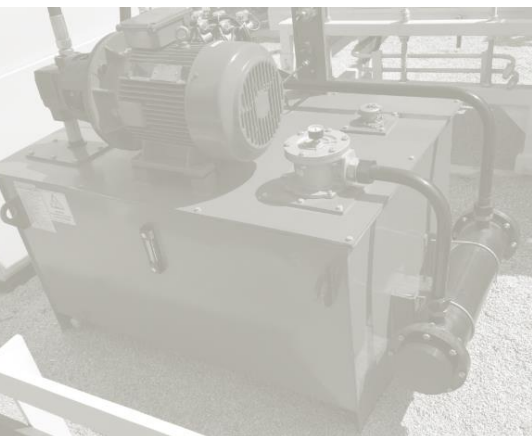


Thermal Systems

Tube & Fin Heat Exchanger

Oil/Water Coolers

ST Series



**be different.
make a difference.**

Oil/Water Coolers, ST Series

Shell tubes heat exchanger

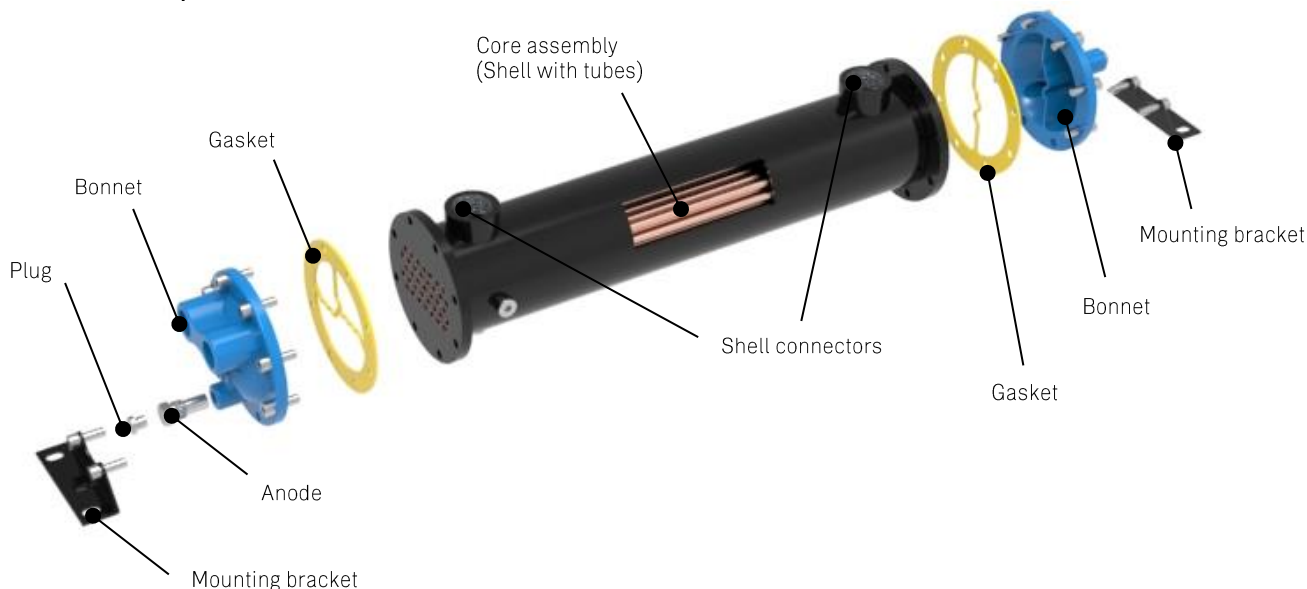


Function

Our ST series is a modular range of shell and tube design heat exchangers. The main benefits of this design are the versatility of applications more independent of the used fluid quality and good maintenance ability compared to other heat exchanger types. Our modular setup allows the best suitable connection and flow principle for lowest pressure drop at highest cooling performance. We supply single or more pass configurations as well as different material combinations. For raising efficiency we offer all these configurations with hybrid finned tube technology.

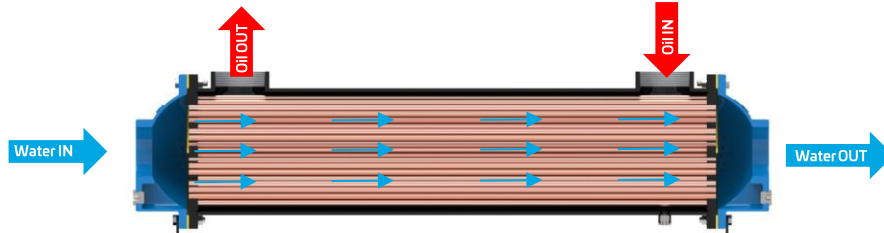
Design

A bundle of tubes are rotary expanded on both end flanges to create two fluid circuits, for heat exchanging purpose. The end flanges are sealed with a gasket and the connection to the hydraulic system is implemented in the bonnet. One fluid flows through the tubes (the tube side) and the other through the outer tube (shell side), separated from each other. The heat transfers from one fluid to another through the tube walls, either from tube side to shell or the other way round.

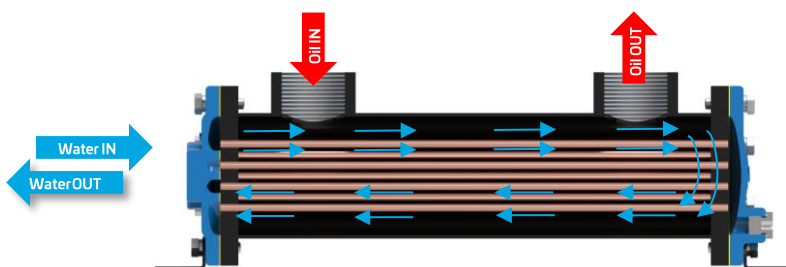


Apart from different sizes we offer one-pass, two pass and four pass configuration:

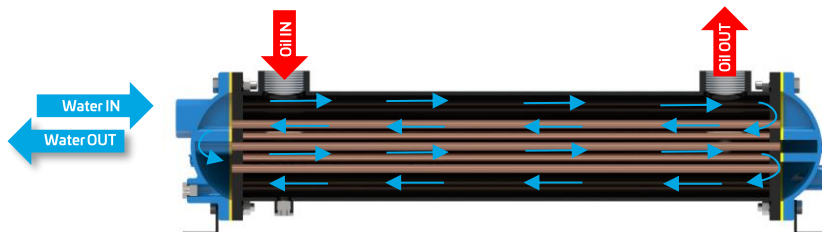
one-pass



two-pass



four-pass



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Oil/Water Coolers, ST Series

Shell tubes heat exchanger



Material and Limits

Depending on the projected application we offer different material configurations to all of our ST series modules.

Materials

	A	B
shell	carbon steel	carbon steel
tube sheet	carbon steel	copper/nickel 90/10
tube	copper	copper/nickel 90/10
bonnet	cast iron	admiralty brass + zinc anode
extended fins	aluminium	aluminium
mounting brackets	carbon steel	carbon steel
coat of paint	shell / black bonnet / blue	shell / black bonnet / blue

Working pressure

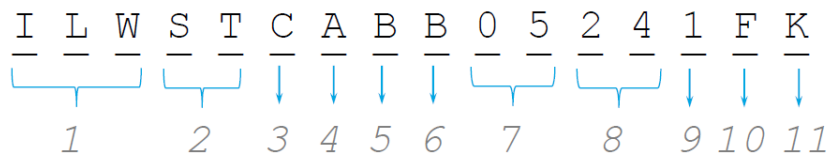
shell side (oil side)	max. 20 bar *
tube side	max. 10 bar

Max. working temperature

oil	120°C
water	100°C

*Valid only for liquids (oil) from group 2, of PED 2014/68/EU

Order Code



1 Product Series

I	Industrial Application
L	Heat exchanger
W	Oil/Water cooling

2 Product Series

ST	shell tube cooler series
----	--------------------------

3 Tube diameter

<i>hybrid with fin</i>	
C	5,0 mm tube Ø – with fin / only shell 02, 03 & 05
D	9,5 mm tube Ø – with fin / only shell 05, 06 & 08
<i>Plain w/o fin</i>	
A	6,35 mm tube Ø – on request
B	9,5 mm tube Ø – on request

4 Material configuration

A	Oil/Water configuration A
B	Oil/Water configuration B
...	any other configuration and material on request

5 Shell connection / compatible bonnet connection

B	BSP thread / only with BSP bonnet
N	NPT cone thread / only with NPT bonnet
U	SAE o-ring (UNF) / only with NPT bonnet
S	4-bolt SAE flange / only with NPT bonnet
F	Pipe flange (on request) / only with pipe flange bonnet

6 Bonnet connection

B	BSP thread
N	NPT cone thread
F	Pipe flange (on request)

7 Shell inner diameter / compatible tube lengths)

02	60 mm / only with 8 & 10
03	80 mm / only with 14 & 24
05	125 mm / only with 24 & 36
06	150 mm / only with 24, 36 & 48
08	200 mm / only with 36, 48, & 60

8 Tube length

08	203 mm
10	254 mm
12	304 mm
14	355 mm
18	457 mm
24	609 mm
36	914 mm
48	1219 mm
60	1524 mm

9 Flow passes

1	One pass
2	Two pass
4	Four pass

10 Gasket material

F	Compressed fiber (standard)
P	PTFE (on request)
N	NBR (on request)
V	Viton / FPM (on request)

11 Index /customized

K	Standard EU sales kit
BXX	To be advised by asa

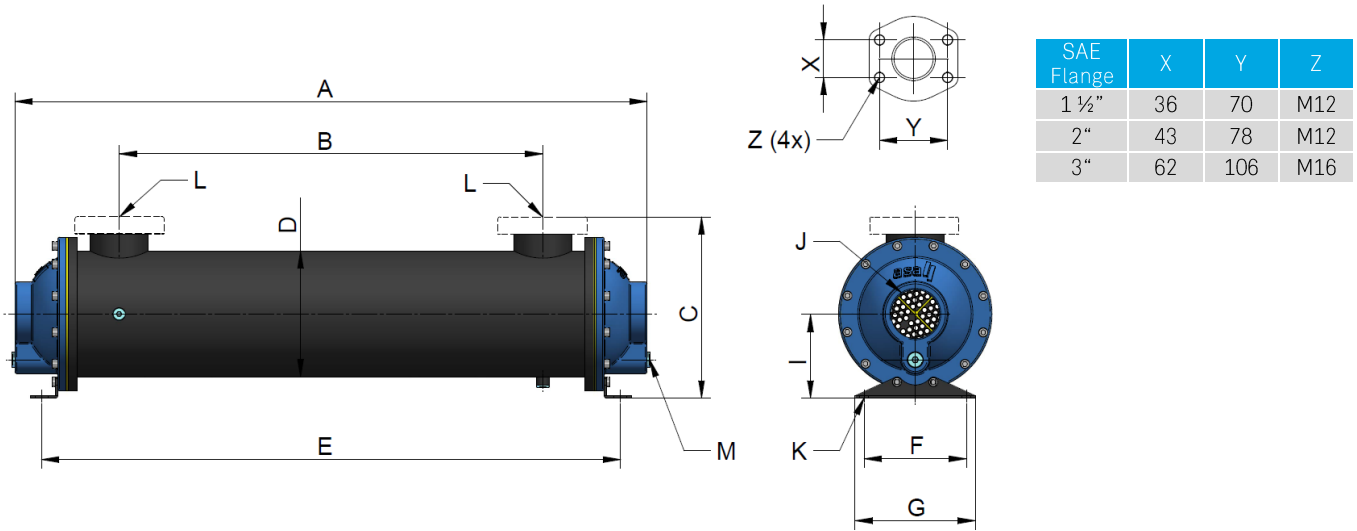
Oil/Water Coolers, ST Series

Shell tubes heat exchanger



ONE PASS

Dimension



Technical Data

order number	A	B	C		D	E	F	G	I	J	K	L		M	weight
	[mm]	[mm]	BSPP [mm]	SAE [mm]	∅ [mm]	[mm]	[mm]	[mm]	[mm]	BSPP/ NPT	slot [mm]	BSPP/ NPT	SAE	BSPP	[kg]
ILWSTCA...02081F	264	98	99	n/a	65	265	64	89	41	3/4"	9x16	3/4"	n/a	n/a	3
ILWSTCA...02101F	315	149	99	n/a	65	316	64	89	41	3/4"	9x16	3/4"	n/a	n/a	3
ILWSTCA...03141F	435	228	139	145	89	424	76	127	66	1 1/4"	11x19	1 1/2"	1 1/2"	1/4"	9
ILWSTCA...03241F	689	482	139	145	89	679	76	127	66	1 1/4"	11x19	1 1/2"	1 1/2"	1/4"	12
ILWSTCA...05181F	542	310	190	211	127	545	102	165	102	1 1/2"	11x25	1 1/2"	2"	1/4"	19
ILWSTCA...05241F	694	462	190	211	127	697	102	165	102	1 1/2"	11x25	1 1/2"	2"	1/4"	23
ILWSTCA...05361F	999	767	190	211	127	1002	102	165	102	1 1/2"	11x25	1 1/2"	2"	1/4"	30
ILWSTDA...05241F	762	511	190	203	133	697	102	133	102	2"	13x19	1 1/2"	2"	3/8"	20
ILWSTDA...05361F	1067	816	190	203	133	1002	102	133	102	2"	13x19	1 1/2"	2"	3/8"	30
ILWSTDA...06241F	765	483	222	238	159	714	127	159	114	3"	13x19	2"	2"	3/8"	45
ILWSTDA...06361F	1070	787	222	238	159	1019	127	159	114	3"	13x19	2"	2"	3/8"	57
ILWSTDA...06481F	1375	1092	222	238	159	1324	127	159	114	3"	13x19	2"	2"	3/8"	68
ILWSTDA...08361F	1149	781	295	318	219	1064	178	210	146	4"	16x22	3"	3"	3/8"	91
ILWSTDA...08481F	1454	1086	295	318	219	1369	178	210	146	4"	16x22	3"	3"	3/8"	114
ILWSTDA...08601F	1759	1391	295	318	219	1674	178	210	146	4"	16x22	3"	3"	3/8"	137



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Oil/Water Coolers, ST Series

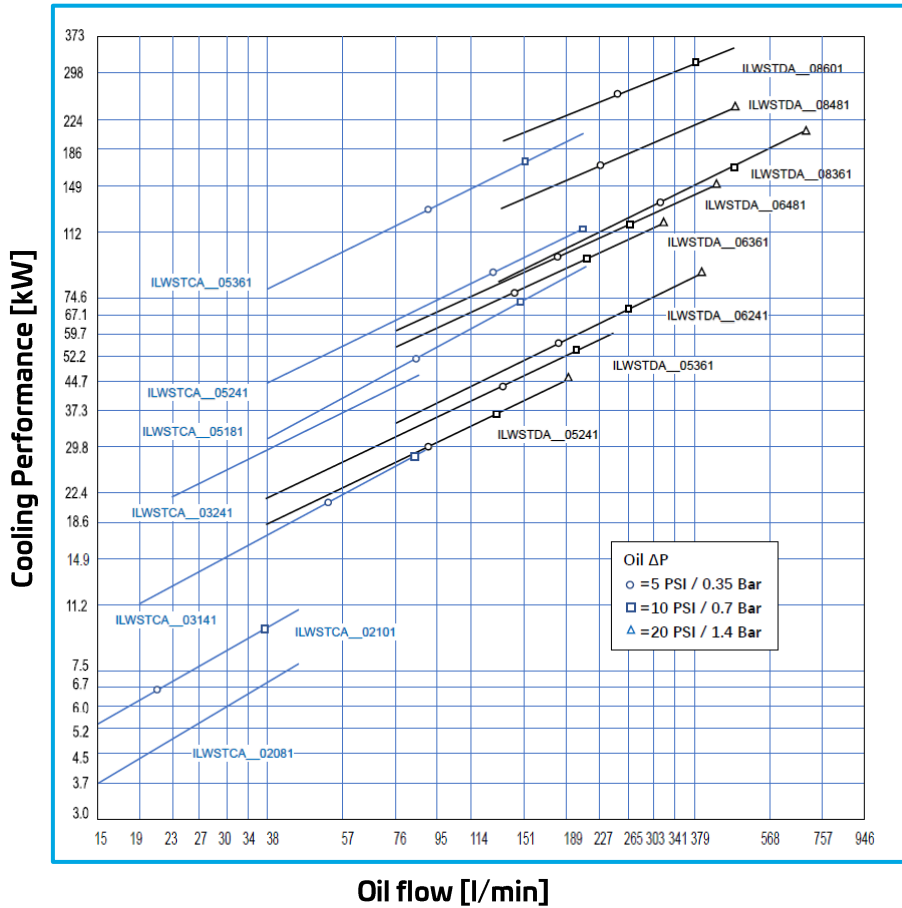
Shell tubes heat exchanger



ONE PASS

Performance at 21cSt

1:1 Oil to Water Ratio-High Water Usage



Maximum Water Flow Rates 1 Pass	
size	l/min
2"	49
3"	91
5" (5mm)	212
5" (9,5 mm)	246
6"	454
8"	833

Oil Pressure Drop

- Most systems can tolerate a pressure drop through the heat exchanger of 1 to 2 Bar.
- Excessive pressure drop should be avoided.

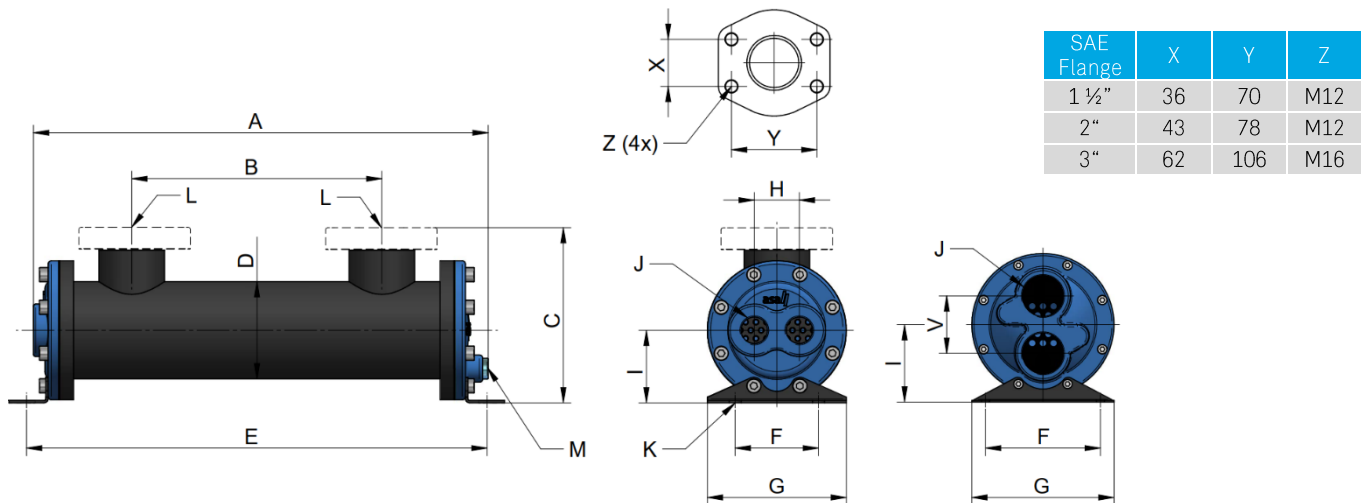
Oil/Water Coolers, ST Series

Shell tubes heat exchanger



TWO PASS

Dimension



Technical Data

order number	A	B	C	D	E	F	G	H	I	J	K	L	M	V	weight		
	[mm]	[mm]	BSPP [mm]	SAE [mm]	Ø [mm]	[mm]	[mm]	[mm]	[mm]	BSPP/NPT	slot [mm]	BSPP/NPT	SAE	BSPP	[mm]	[kg]	
ILWSTCA...02082F	264	98	99	n/a	65	265	64	89	29	41	9/16"	9x16	3/4"	n/a	n/a	-	3
ILWSTCA...02102F	315	149	99	n/a	65	316	64	89	29	41	9/16"	9x16	3/4"	n/a	n/a	-	3
ILWSTCA...03142F	411	228	139	145	89	416	76	127	41	66	3/4"	11x19	1 1/2"	1 1/2"	1/4"	-	9
ILWSTCA...03242F	665	482	139	145	89	679	76	127	41	66	3/4"	11x19	1 1/2"	1 1/2"	1/4"	-	12
ILWSTCA...05182F	522	310	190	211	127	545	102	165	61	102	1"	11x25	1 1/2"	2"	1/4"	-	19
ILWSTCA...05242F	674	462	190	211	127	697	102	165	61	102	1"	11x25	1 1/2"	2"	1/4"	-	23
ILWSTCA...05362F	979	767	190	211	127	1002	102	165	61	102	1"	11x25	1 1/2"	2"	1/4"	-	30
ILWSTDA...05242F	762	511	190	203	133	697	102	133	-	102	1 1/2"	13x19	1 1/2"	2"	1/4"	76	20
ILWSTDA...05362F	1067	816	190	203	133	1002	102	133	-	102	1 1/2"	13x19	1 1/2"	2"	1/4"	76	30
ILWSTDA...06242F	765	483	222	238	159	714	159	197	-	114	2"	13x19	2"	2"	3/8"	80	45
ILWSTDA...06362F	1070	787	222	238	159	1019	159	197	-	114	2"	13x19	2"	2"	3/8"	80	57
ILWSTDA...06482F	1375	1092	222	238	159	1324	159	197	-	114	2"	13x19	2"	2"	3/8"	80	68
ILWSTDA...08362F	1149	781	292	318	219	1064	210	267	-	146	2 1/2"	16x22	3"	3"	3/8"	114	91
ILWSTDA...08482F	1454	1086	292	318	219	1369	210	267	-	146	2 1/2"	16x22	3"	3"	3/8"	114	114
ILWSTDA...08602F	1759	1391	292	318	219	1674	210	267	-	146	2 1/2"	16x22	3"	3"	3/8"	114	137



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Oil/Water Coolers, ST Series

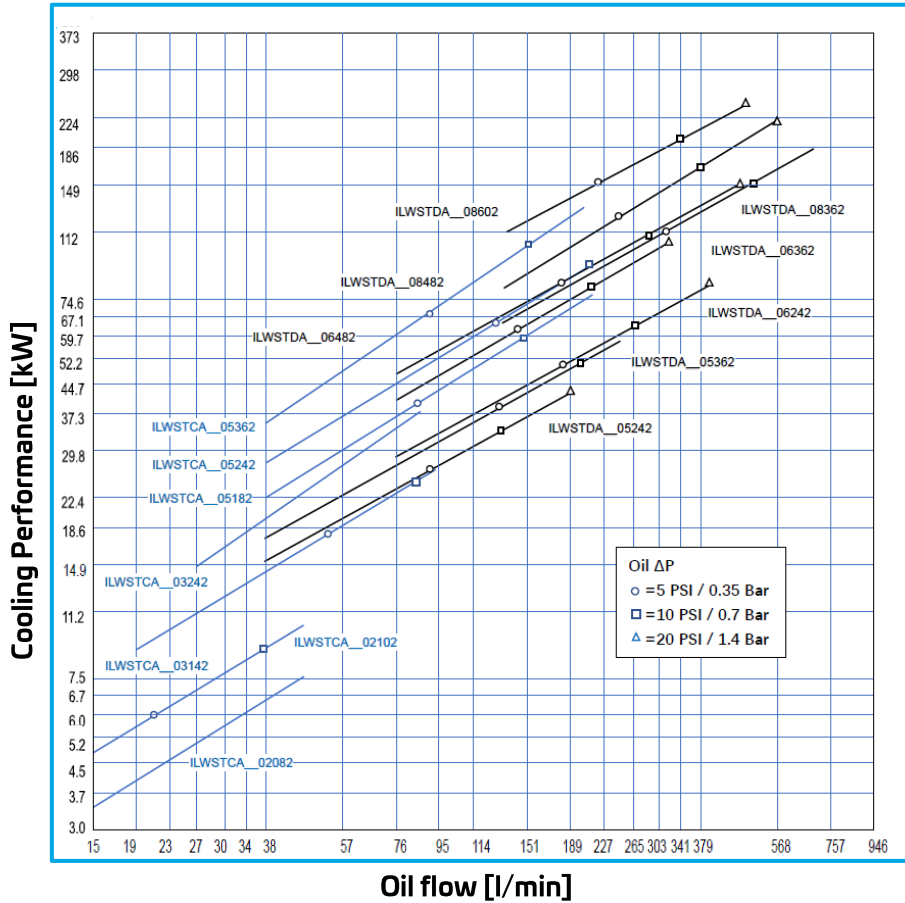
Shell tubes heat exchanger



TWO PASS

Performance at 21cSt

2:1 Oil to Water Ratio-Medium Water Usage



Maximum Water Flow Rates 2 Pass	
size	[l/min]
2"	23
3"	45
5" (5mm)	106
5" (9,5 mm)	121
6"	227
8"	416

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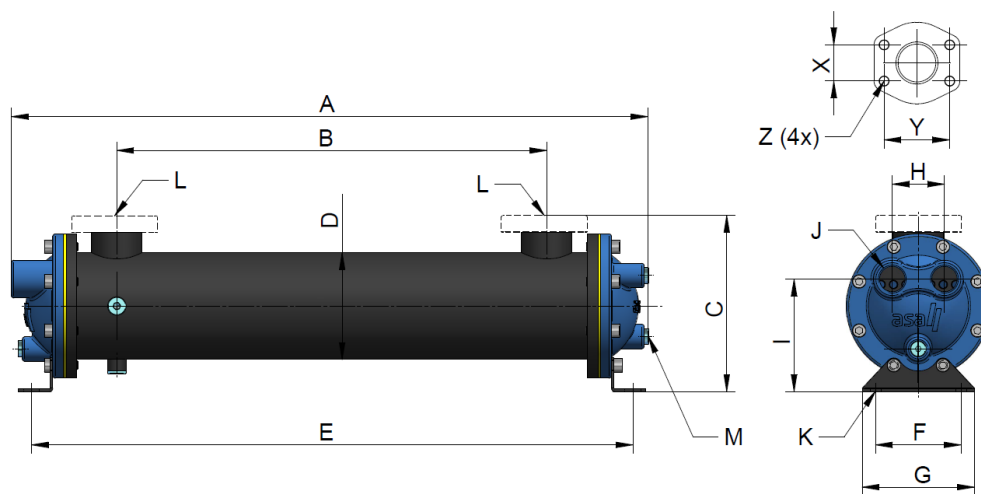
Shell tubes heat exchanger



FOUR PASS

Dimension

SAE Flange	X	Y	Z
1 1/2"	36	70	M12
2"	43	78	M12
3"	62	106	M16



Technical Data

order number	A	B	C		D	E	F	G	H	I	J	K	L		M	weight
	[mm]	[mm]	BSPP	SAE	∅	[mm]	[mm]	[mm]	[mm]	[mm]	[BSPP]	slot	BSPP	SAE	BSPP	[kg]
			[mm]	[mm]	[mm]							[mm]				
ILWSTCA...03144F	411	228	139	145	89	424	76	127	45	84	1/2"	11x19	1 1/2"	1 1/2"	1/4"	9
ILWSTCA...03244F	665	482	139	145	89	679	76	127	45	84	1/2"	11x19	1 1/2"	1 1/2"	1/4"	12
ILWSTCA...05184F	522	310	190	211	127	545	102	165	64	125	3/4"	11x25	1 1/2"	2"	1/4"	19
ILWSTCA...05244F	674	462	190	211	127	697	102	165	64	125	3/4"	11x25	1 1/2"	2"	1/4"	23
ILWSTCA...05364F	979	767	190	211	127	1002	102	165	64	125	3/4"	11x25	1 1/2"	2"	1/4"	30
ILWSTDA...05244F	762	511	190	203	133	697	102	133	62	134	1"	13x19	1 1/2"	2"	1/4"	20
ILWSTDA...05364F	1067	816	190	203	133	1002	102	133	62	134	1"	13x19	1 1/2"	2"	1/4"	30
ILWSTDA...06244F	765	483	222	238	159	714	159	197	73	150	1 1/2"	13x19	2"	2"	3/8"	45
ILWSTDA...06364F	1070	787	222	238	159	1091	159	197	73	150	1 1/2"	13x19	2"	2"	3/8"	57
ILWSTDA...06484F	1375	1092	222	238	159	1324	159	197	73	150	1 1/2"	13x19	2"	2"	3/8"	68
ILWSTDA...08364F	1149	781	292	318	219	1064	210	267	108	190	2"	16x22	3"	3"	3/8"	91
ILWSTDA...08484F	1454	1086	292	318	219	1369	210	267	108	190	2"	16x22	3"	3"	3/8"	114
ILWSTDA...08604F	1759	1391	292	318	219	1674	210	267	108	190	2"	16x22	3"	3"	3/8"	137



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Oil/Water Coolers, ST Series

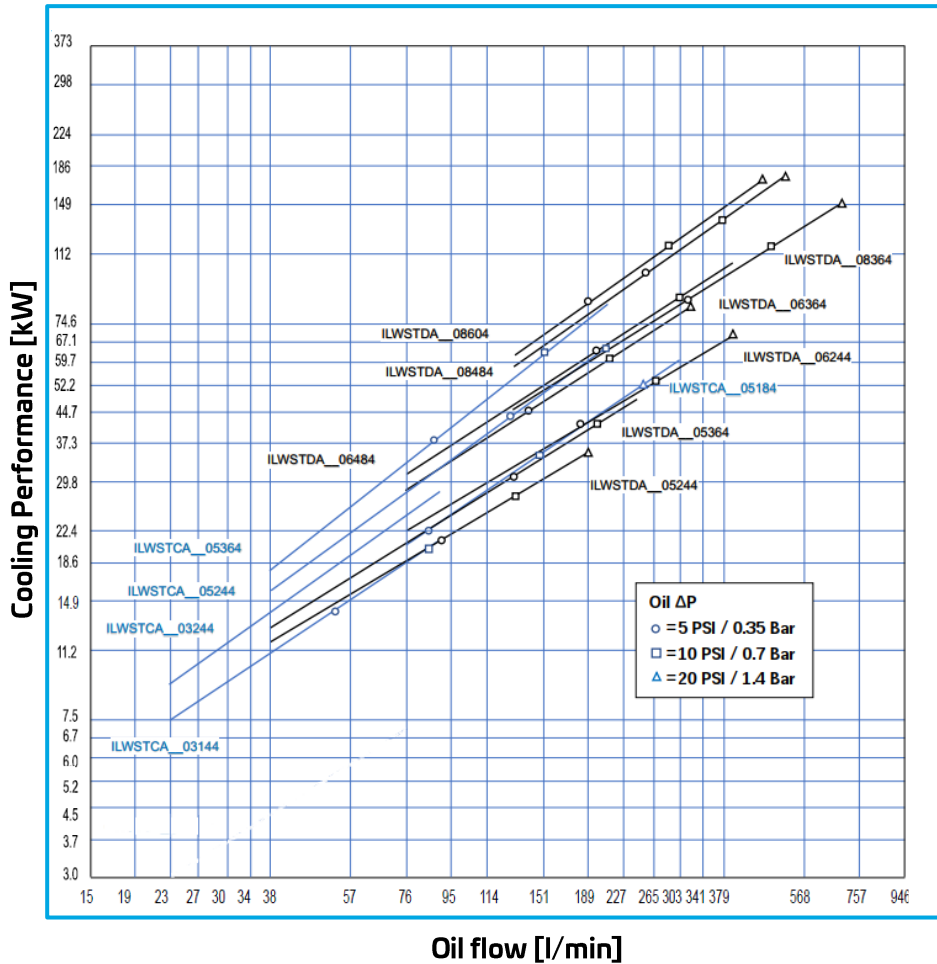
Shell tubes heat exchanger



FOUR PASS

Performance at 21cSt

4:1 Oil to Water Ratio-Low Water Usage



Maximum Water Flow Rates 4 Pass	
size	[l/min]
2"	n/a
3"	23
5" (5mm)	53
5" (9,5 mm)	61
6"	114
8"	246

This data sheet and the corresponding scale drawings are to be used as a general guideline and technical overview of our products. Please contact us if more exact information is needed. As we are constantly improving our products, their characteristics, dimensions and weights may also change, although we do our best to incorporate these changes continually. asa assumes no liability for any information therein, any errors, omissions, misprints, nor any direct or indirect damages, losses or costs resulting therefrom. Any cooling performances and general technical values indicated in this catalogue are measured at a test bench according to asa testing procedures or calculated, based on such tests. They represent a basis for your product selection. Due to different conditions in testing and application environments the performance may also vary by +/- 15%. All sound values are determined in accordance with ISO 9614-2, DIN EN ISO 11203 accuracy class 3 or Machinery Directive 2006/42/EG and are A-rated. At some of the performance data, possible differences to competition data are possible. The reason to that are no existing standardized testing procedures on individual subjects, e.g. for cooling performance measurements. Therefore, we recommend all products to be checked under the system operating conditions. This is also true of vibrations and mechanical stress as well as for pressure peaks and thermal stress and any other relevant factors. General tolerances according to DIN ISO 2768-vL. General tolerances for casted parts according EN ISO 8062-3 (DCTG 10). Tolerances for rubber parts are according to ISO 3302-1 (class M4-F+C). The tolerances of welding seams are defined by quality group D according to EN ISO 10042, if it is not specified on the actual scale drawing or data sheet. Any form of liability is excluded for the information included in this datasheet. All details and calculation values are checked to the best of our ability, but these do not ensure any intrinsic product properties; due to the wide-ranging possible applications, it is advised that all technical data herewith included be confirmed through testing carried out by the end-user. asa technology Produktions- und Vertriebs GmbH reserves the right to modify the product without any separate notification. This refers to both technical data and the product itself. Furthermore, it is herewith specified that the datasheet does not substitute the corresponding scale drawings, assembly and installation guidelines, nor the operating instructions.

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Oil/Water Coolers, ST Series

Shell tubes heat exchanger



Selection Procedure

Step 1 Thermal Duty Determination.

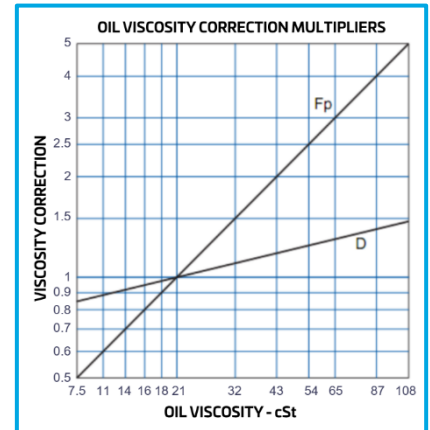
This will vary with different systems, but typically coolers are sized to remove 20% to 35% of the input nameplate kW.

Step 2 Determine Approach Temperature.

Desired oil leaving cooler °C – Water Inlet temp. °C = Actual Approach

Step 3 Determine kW Curve Heat Load

$$\text{kW heat load} \times \frac{22}{\text{Actual approach}} \times \text{Viscosity Correction D} = \text{Curve kW Power}$$



Step 4 Enter Curves

Enter the value of the kW Curve Heat Load on the vertical line oil flow on the cooling performance diagram (Pages 5, 7, 9), any curve above the intersecting point will work.

Step 5 Determine oil pressure drop

The values indicated in the diagram are valid for hydraulic oil with a viscosity of 21cSt (appr. ISO VG 32). Multiply the pressure drop by the Correction factor Fp according to the used hydraulic oil viscosity.

- =0,35bar
- = 0,7 bar
- △=1,4bar

Oil/Water Coolers, ST Series

Shell tubes heat exchanger

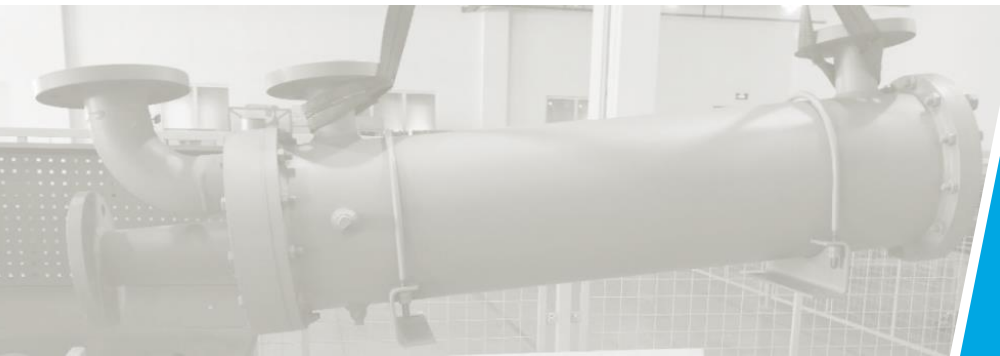
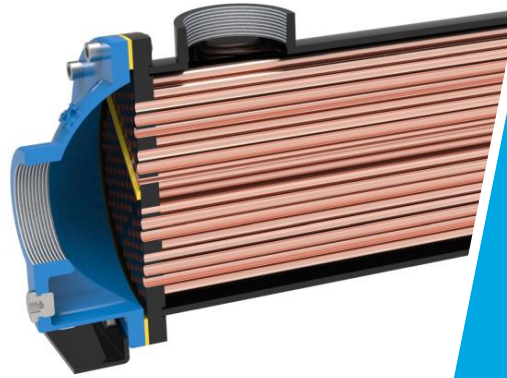
Customized to your applications

Apart from the actual application parameters of the fan drive, ambient conditions and scope of delivery, we offer customized heat exchanger solutions for many types of fluids. Please contact us with your specific requirements and use our benefits regarding consultation and most realistic verification.

Selection	Application
Type of fluids	Ambient / fluid conditions for material configuration
Flow rates	Connection size and flange types
In/outlet temperatures or heat load data	Space restrictions and mounting situation
Allowable pressure drops	Possible specified water fouling factors
Operating and design pressure	

your advantages:

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- ✓ calculation and simulation
- ✓ verification on test bench
- ✓ procurement option system
- ✓ approved quality





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AUSTRIA

asa technology Produktions-
und Vertriebs GmbH
Prager Strasse 280
A-1210, Vienna
Tel.: +43 1 292 40 20
support@asahydraulik.com

AUSTRALIA

asa Products Pty Ltd
Quinlan Road 23
3076 Epping, Victoria
Tel.: +61 3 9397 6129
melbourne@asahydraulik.com

BRASIL

asa hydraulik do Brasil Ltda.
Rua Maria Fett 96 Bloco B
Vila Mercedes, 03263000, Sao Paulo, SP
Tel.: +55 11 9 8862-0022
sales_brazil@asahydraulik.com

CHINA

asa Hydraulik Technology (Suzhou) Co.Ltd
江苏省苏州市工业园区方洲路 128 号 6 区 B 幢
Area 6, Building B,
Fangzhou Road No 128,
Suzhou industrial park,
Suzhou City, Jiangsu Province
Tel.: +86 512 62381988
suzhou@asahydraulik.com

INDIA

asa heatexchanger Pvt Ltd
Plot no.1226, Phase-3, GIDC, Vatva
Ahmedabad - 382445
Tel.: +91 70 43907273
salesindia@asahydraulik.com

USA

asa hydraulik of America
160 Meister Avenue 20 A
Branchburg, New Jersey 08876
Tel.: +1 800 473 94 00
Tel.: +1 908 541 15 00
sales_us@asahydraulik.com