

Solutions for Fluid Technology



DOC® 钎焊板式换热器

DOC® BRAZED PLATE HEAT EXCHANGER

DOC® 坚固板式换热器适用于液压油

DOC® STURDY PLATE HEAT EXCHANGER FOR OIL HYDRAULICS



技术特点

- 可高压下工作
- 可高温下工作
- 连接牢固, 钎焊式换热板
- 冷却功率 5kW到360kW
- DOC® 系列的冷却器适用于大多数液压领域
- 由于换热板之间采用钎焊方式连接, 冷却器结构非常坚固
- 也使得换热器可以承受很高的工作压力
- DOC® 系列14, 30和60 可以承受32 bar, DOC® 系列20和77 可以承受16 bar
- 采用钎焊设计使得换热器可承受温度高达225°C
- 换热器的连接部分坚固, 允许采用高紧固扭矩进行装配

RESISTANT

- High pressure operation
- High temperature operation
- Sturdy connection blocks, brazed on the plate-heat-exchanger
- Cooling capacity from 5 to 360 kW
- Coolers of the DOC® Series are suitable for most industrial hydraulic applications
- Due to the brazed contact points between the plates the cooler has a very sturdy design
- This allows best possible resistance against high operating pressures
- 32 bar for series DOC® 14, 30 and 60, 16 bar for series DOC® 20 and 77
- The brazed design allows temperatures up to 225°C
- The sturdy connection blocks allow high fastening torques for assembling

安装简便



EASY INSTALLATION

换热器的连接部分很坚固

- 允许使用扳手进行装配紧固
- 允许将换热器直接接入管路

STURDY CONNECTION BLOCKS

- With spanner grip for assembly
- Possible to fit directly on the pipes



格板式安装支架

- 可以和换热器一起提供
- 组装快捷

SHELF-TYPE MOUNTING-BRACKET

- Supplied with cooler
- Quick assembly

强大的冷却能力

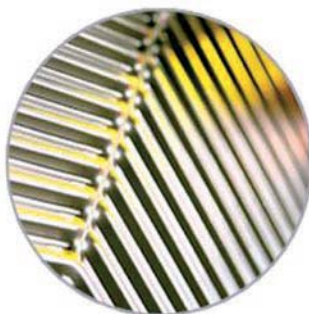


- 通过连接部分的压力损失小
- 换热板经过优化设计
- 所以具有强大的冷却能力和低压力损失
- 通过实现 湍流来获得高效的热传导 (K 值/热传动系数; $P=k*A*\Delta T$)
- 因此, 换热器的结构紧凑而耗水量低
- 并获得强大的冷却能力, 小水流和低温升

HIGHEST COOLING CAPACITY

- Low pressure drop over the connectors
- Optimized plate design
- Thereby high cooling capacity and low pressure drop
- Highly efficient heat transfer caused by turbulent flow (high k-value / heat transfer coefficient; $P=k*a*\Delta T$)
- This leads to a compact design and a low water consumption
- High cooling capacity, very low water flow and low Delta T

持久保持良好冷却效率



保持持续冷却能力, 无淤塞流动

- 大流量湍流
- 换热板平滑而均匀
- 冷却器内流量平衡而均匀
- 经过设计的湍流流动甚至可以实现冷却器内的自我清洁

BEST COOLING EFFICIENCY PERMANENTLY AVAILABLE

- Maximum cooling capacity without fouling through:
- High turbulent flow
 - Smooth and uniform plates
 - Equally distributed flow in the cooler
 - The turbulent flow given by the design allows a self cleaning effect inside the cooler

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DOC® 钎焊板式换热器应用于液压领域



工作原理

由有波纹的薄金属板所构成的换热表面一层一层堆叠起来。在换热板之间构成介质流动的通道，而角落端口经过设计以便两个介质的流动通过一个一个交替排列的通道，通常，形成全对向流动。

流体介质被封闭在边缘钎焊起来的换热板所构成的空间内。换热板的接触部位也要进行钎焊来承受通过的流体介质所带来的压力。

标准设计

换热组件由包封板封闭起来。连接端口位于前包封板，换热板表面设计有波纹来增强换热效率并提高机械强度。

标准材质

包封板: 不锈钢 304
 连接部件: 不锈钢 304
 换热板: 不锈钢 316
 钎焊材料: 铜

索取报价所需提供的信息

以下信息可以确保我们的方案和报价适合客户的应用需求:

- 所需流量
- 温度曲线
- 流体的物理特性
- 需要的工作压力
- 允许的最大压力损失

DOC® BRAZED PLATE HEAT EXCHANGER FOR HYDRAULICS

WORKING PRINCIPLES

The heating surface consists of thin corrugated metal plates stacked on top of each other. Channels are formed between the plates and corner ports are arranged so that the two media flow through alternate channels, normally in full counter-current flow.

The media are kept in the unit by a brazed seal around the edge of the plates. The contact points of the plates are also brazed to withstand the pressure of the media handled.

STANDARD DESIGN

The plate pack is covered by the cover plates. The connections are located in the front cover plate. The channel plates are corrugated to improve heat transfer efficiency and to increase the mechanical strength.

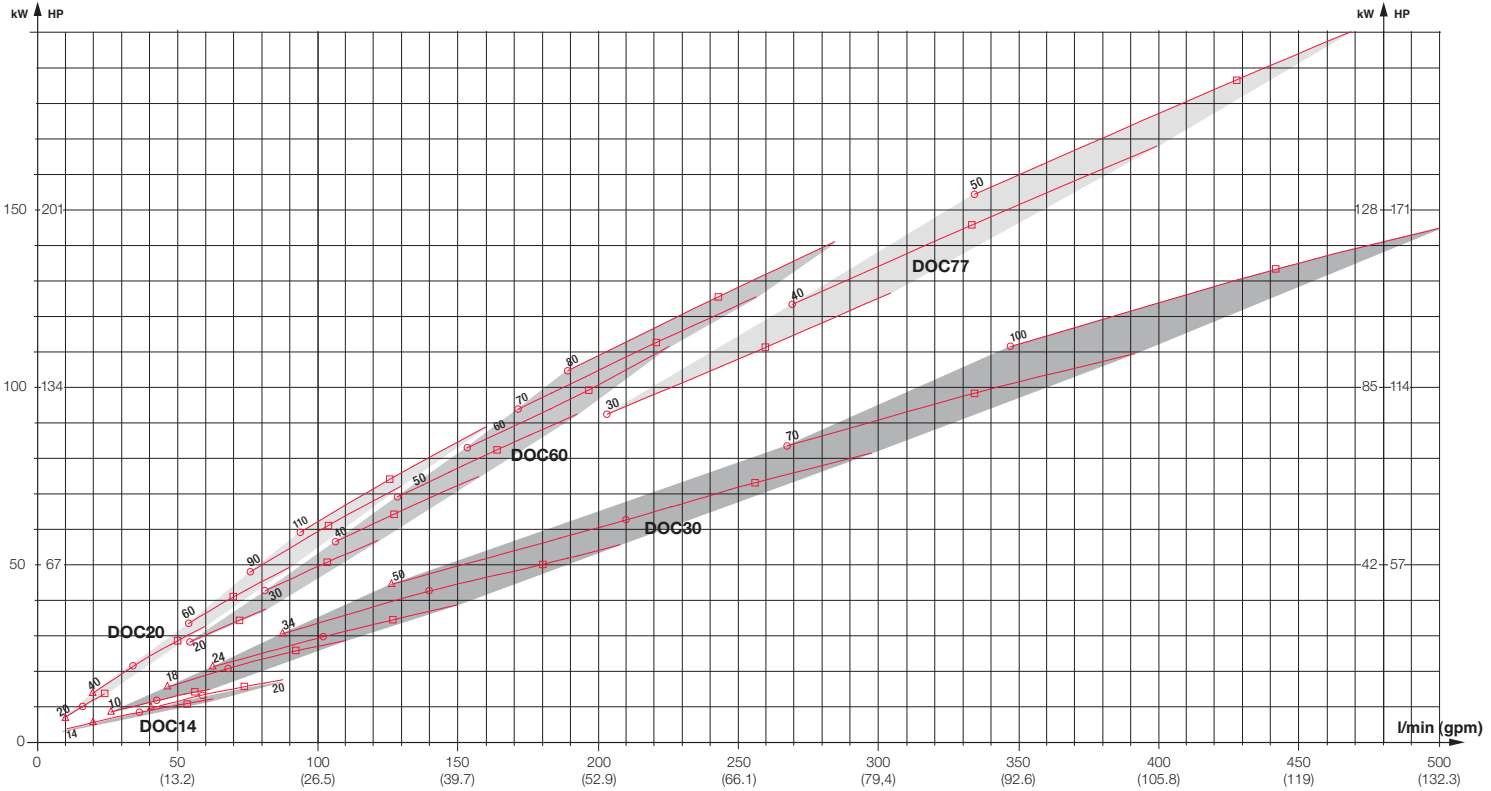
STANDARD MATERIALS

Cover plates: Stainless steel 304
 Connections: Stainless steel 304
 Plates: Stainless steel 316
 Brazing material: Copper

PARTICULARS REQUIRED FOR QUOTATION

In order to provide you with a specific quotation, all enquiries should be accompanied by the following particulars:

- Flow rates required
- Temperature programme
- Physical properties of liquids in question
- Desired working pressure
- Maximum permitted pressure drops



换热器选型图是

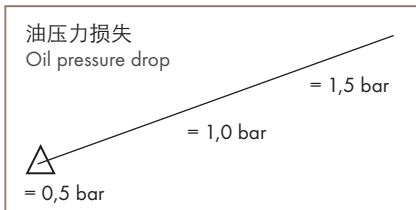
- 基于油温60°C和水温20°C。对于油温50°C，需要乘负载修正系数0.7。对于不同的水温，请参考右侧修正系数。
- 基于两个不同的油/水流量比，2:1 和 4:1。这意味着，按照曲线图，伴随着每一升的油通过冷却器，最少0.5升 (2:1) 或 0.25升 (4:1) 的水必须通过冷却器。
- 基于液压油 ISO VG 32。对于其他的油，需要考虑使用修正系数，将所需要的冷却负载乘冷却负载修正系数；油冷却器选择后，将压力损失乘压力损失修正系数。

THE DIAGRAM IS

- based on an oil temperature of 60°C and a water temperature of 20°C. For oil temperature of 50°C, multiply with the correction factor of 0,7 on the load. For other water temperatures see the correction factor on the right side.
- calculated for two different oil/water flow ratios, 2:1 and 4:1. This means that for every litre of oil circulated through the oil cooler, a minimum of 0.5 litre (2:1) or 0.25 litre (4:1) of water must be circulated to agree with the curve data.
- based on ISO VG 32 oil. For other oils, correction factors must be used. Multiply the required cooling load by the cooling load correction factor. After selecting the oil cooler, multiply the pressure drop by the pressure drop correction factor.

修正系数

CORRECTION FACTORS



水温 °C WATER TEMPERATURE °C	修正系数 CORRECTION FACTORS	粘度等级 VISCOSITY CLASS	冷却负载 COOLING LOAD	油压力损失 OIL PRESSURE DROP
15	0,91	ISO VG 22	0,95	0,9
20	1,00	ISO VG 32	1,00	1,0
25	1,12	ISO VG 46	1,05	1,2
30	1,20	ISO VG 68	1,20	1,5
35	1,50	ISO VG 100	1,35	2,1

如需要精确的计算, 精确的冷却能力或者应用条件超出本选型图, 请联系HBE的代表。

For accurate calculations and cooling capacities or other conditions outside of this diagram, please contact your HBE representative

标准技术数据

STANDARD DATA

	DOC®14	DOC®20	DOC®30	DOC®60	DOC®77	DOC®77HF
最高工作温度 Max. working temperature	225°C	225°C	225°C	225°C	225°C	225°C
最低工作温度 Min. working temperature	-196°C	-196°C	-196°C	-196°C	-196°C	-196°C
最大工作压力 Max. working pressure S1-S2/S3-S4, bar	33/33	16/16	33/33	40/40	16/30	16/30
最小工作压力 Min. working pressure	真空 Vacuum	真空 Vacuum	真空 Vacuum	真空 Vacuum	真空 Vacuum	真空 Vacuum
每通道的体积, 升 Volume per channel, litres	0,02	0,028	0,05	0,103	0,25	0,25
冷却功率, kW Cooling capacity, kW	< 16	6-75	10-100	20-140	40-170	120-360
标准的换热板数量 Standard number of plates	14, 20	20, 40, 60, 90, 110	10, 18, 24, 34, 50, 70, 100	20, 30, 40, 50, 60, 70, 80	20, 30, 40, 50	60, 70, 80, 90, 100

外形尺寸

DIMENSIONS

型号 TYPE	a	b	c	d	e	A	干重 DRY WEIGHT KG
DOC14	172	42	208	78	22	8 + (n x 2,25)	0,8 + (n x 0,06)
DOC20	270	46	324	94	26	8 + (n x 1,50)	1,5 + (n x 0,08)
DOC30	250	50	313	113	26	9 + (n x 2,35)	2,4 + (n x 0,10)
DOC60	466	50	527	113	26	13 + (n x 2,35)	2,1 + (n x 0,18)
DOC77	519	92	618	191	26	10 + (n x 2,85)	11,0 + (n x 0,44)
DOC77HF	519	92	633	191	26	10 + (n x 2,85)	13,0 + (n x 0,44)

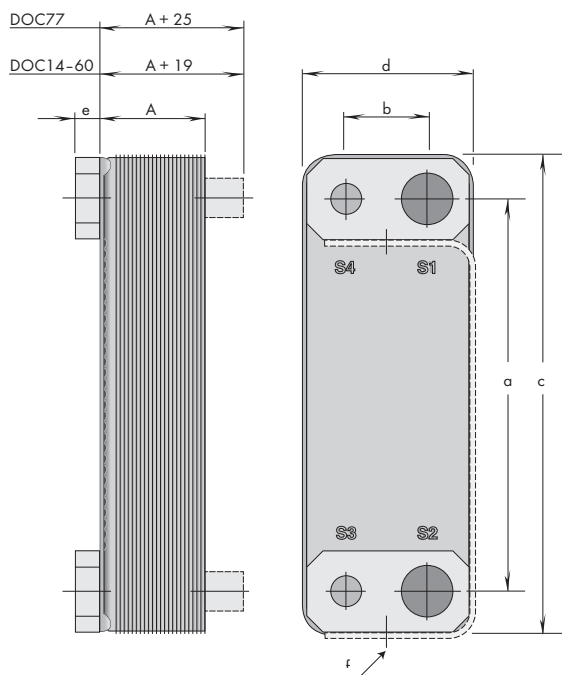
n = 换热板数量

n = number of plates

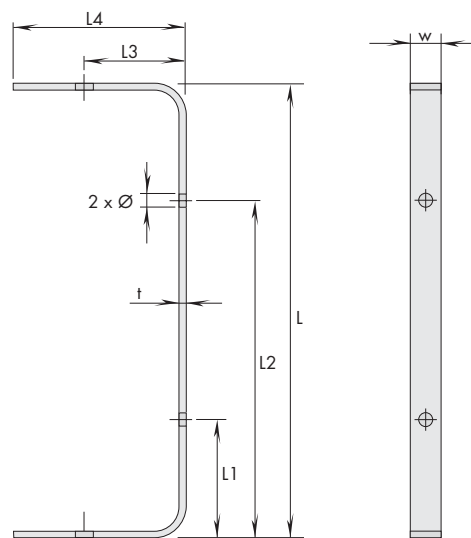
连接端口

CONNECTIONS

型号 TYPE	S1-S2, 油 S1-S2, OIL	S3-S4, 水 S3-S4, WATER	扳手 SPANNER GRIP	F
DOC14	ISO-G ¾"	ISO-G ¾"	32	M8
DOC20	ISO-G 1"	ISO-G ¾"	41	M8
DOC30	ISO-G 1¼"	ISO-G ¾"	50	M8
DOC60	ISO-G 1¼"	ISO-G ¾"	50	M8
DOC77	ISO-G 1½"	ISO-G 1"	50	M8
DOC77HF	SAE 2½"	ISO-G 1¼"	114	M10



DOC® 外形尺寸
DOC® Dimensioning



支撑架
Support bracket

支撑架尺寸

SUPPORT BRACKET DIMENSIONS

型号 TYPE	L	L1	L2	L3	L4	w	t	Ø
DOC14	177	57	119	44	78	20	5	9
DOC20	275	85	189	51	94	25	6	9
DOC30	255	75	179	58	100	25	6	9
DOC60	471	75	395	58	100	25	6	9
DOC77	524	149	372	106	180	25	8	11
DOC77HF	524	149	372	106	180	25	8	11

内螺纹连接 (可选)





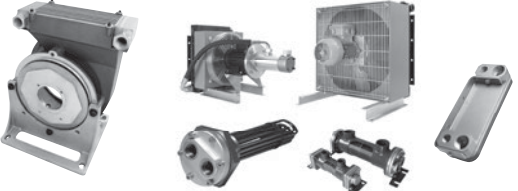


NIPPLE CONNECTIONS (OPTIONAL)

型号 TYPE	内螺纹 INT. THREAD
DOC14, 20, 30, 60	ISO-G 1/2" 内螺纹 ISO-G 1/2" int. thread
DOC77, 77HF	ISO-G 1" 内螺纹 ISO-G 1" int. thread

订货示例

ORDERING CODE - EXAMPLE

型号 TYPE	规格 SIZE	换热板数量 NUMBER OF PLATES
DOC	30	70

<p>铝制油箱 Oil tanks made of aluminium</p>	
<p>清洗端盖和附件 液位计和温度计 Cleaning covers and further tank accessories Level- and temperature indicators</p>	
<p>油箱加热器 Tank heaters</p>	
<p>钟罩和附件 Bellhousings and accessories</p>	
<p>带冷却器的钟罩 各类换热器 DOC® 钎焊板式换热器 Bellhousing with oil-cooler Heat exchangers DOC® Brazed plate heat exchanger</p>	
<p>SOFTEX® 弹性和无背隙联轴器 SOFTEX® elastic and no backlash shaft couplings</p>	
<p>STAREX® 齿面联轴器 STAREX® flexible couplings</p>	
<p>内燃机联轴器 Diesel engine couplings</p>	