HotMicroCoil 加热器具有广泛的应用领域。由于其良好的可塑性，是加热热流道喷嘴和贴合加热三维表面的理想选择。许多客户选择拉伸版的 HotMicroCoil 加热器，根据需要自行加工，还有一些客户则完全交给我们进行设计和安装。针对塑料喷嘴的加热，专门提供许多模块化的系统解决方案 (2.4)，集成了夹紧机构、封锁外壳、反射管或导热套管。

用于微型注塑技术和腔距较小多腔模具时，推荐使用最小厚度仅 1 mm 的 MicroCoil (2.1)；在空间较大的热流道中或热量需求更大时，建议选择功能更加强劲的 HotCoil (2.2)。由于后者横截面较大，默认在一侧进行连接，也可以根据需要再集成 J 型或 K 型热电偶。

“FREEK”品牌的 HotMicroCoil 只使用最优质的原材料和精度最高的组件。积极专业的员工根据产品特点，为生产系统量身定制的加热器，其电气和尺寸标准远远高出标准或市面要求。

*Our **HotMicroCoil heating elements** can be used in a wide variety of applications. Their high level of plasticity ideally suits them to the heating of hot runner nozzles and for accurately heating the contours of three-dimensional surfaces. Many of our customers order HotMicroCoil elements in their unformed state and perform the subsequent shaping work themselves, while others commission us to shape and fit the elements. A large number of ready-to-fit system solutions are available for plastic injection nozzles (2.4) with clamping mechanisms, housing bezel, reflection tube or heat conduction sleeve.*

In micro-injection moulding systems and high-performance tools with small cavity spacings, the preferred elements are MicroCoils (2.1), which are as thin as 1 mm, while where there is more space in the hot runner or the heat demand is higher, the more powerful HotCoils (2.2) are used. With its larger cross-section, the latter type has its connection point at one end as standard, and a Type J or K withcouple can also be integrated on request.

HotMicroCoils bearing the ‘freek’ brand use exclusively the highest-quality raw materials and high-precision components. Motivated and qualified employees process these parts within a refined production system that is closely adapted to the specific requirements of the product, resulting in heating elements that satisfy significantly higher electrical and dimensional standards than those demanded by norms or common on the market.

技术标准和公差： （无法针对此表格提出保修索赔要求）		
工作电压：	最大 250 V	
高压耐受（冷）：	800 V AC (1000 V AC, 1250 V AC)*	
绝缘电阻（冷）：	500 V (DC) 时 > 5 MΩ	
漏电电流（冷）：	253 V (AC) 时 < 0.5 mA	
表面温度：	最高 750° C	
总长度：	最长 3000 mm	
拉伸后的长度公差：	± 5% (± 2%, ± 1%)*	
直径公差：	± 0.15 mm (± 0.10 mm, ± 0.05 mm)*	
连接导线：	PTFE（聚四氟乙烯）绝缘导线，最高工作温度 260°C	
	HotCoil	**MicroCoil**
功率公差（冷）	± 10% (± 5%, ± 2%)*	
护套材料：	品质 1.4541	品质 2.4068 或 1.4541
功率密度（根据热量输出）：	最大 15 W/cm²	最大 15 W/cm²
每米加热长度电阻：	20 至 1400 Ω	15 至 4000 Ω
热电偶：	J / K 型	不可用
测试：	根据 EN 60335/2/11 & EN 60204-1	

*根据要求

Technical standards and tolerances: *(No warranty claims can be derived from this table)*		
Voltage:	*up to 250 V*	
High voltage flash test (cold):	*800 V (AC) (1000 V AC, 1250 V AC)**	
Insulation resistance (cold):	*≥ 5 MΩ for 500 V (DC)*	
Leakage current (cold):	*≤ 0,5 mA for 253 V (AC)*	
Surface temperature:	*max. 750°C*	
Length:	*max. 3000 mm*	
Length tolerance:	*± 5% (± 2%, ± 1%)**	
Diameter tolerance:	*± 0,15 mm (± 0,10 mm, ± 0,05 mm)**	
Leads:	*PTFE insulation, permanent temperature resistant up to 260°C*	
	HotCoil	***MicroCoil***
Power tolerance (cold)	*± 10% (± 5%, ± 2%)**	
Sheath material:	*quality 1.4541*	*Quality 2.4068 or 1.4541*
Power density (depending on heat transfer):	*max. 15 W/cm²*	*max. 15 W/cm²*
Resistance per meter heated length:	*20 to 1400 Ω*	*15 to 4000 Ω*
Thermocouple:	*type J / K*	*not possible*
Test:	*Following to EN 60335/2/11 & EN 60204-1*	

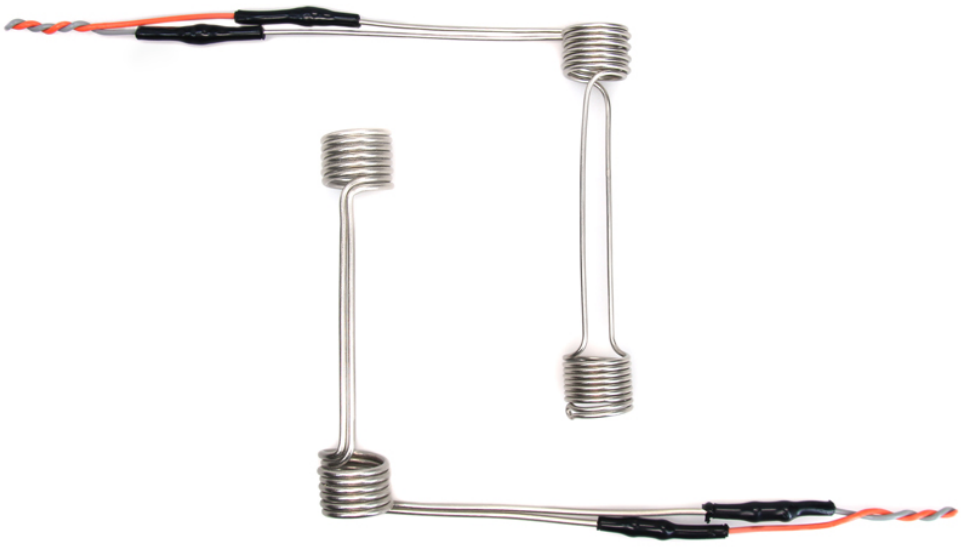
** on request*

2.1 MicroCoils
MicroCoils

Webcode 150

MicroCoil 横截面积较小，因此推荐两侧连接，不允许安装集成型热电偶。我们优选镍作为护套材料，因为镍结合了最佳热传导性、高耐腐蚀性和出色的塑形性能。采用双侧连接时，为实现标准规格 1000 mm PTFE 绝缘连接导线可以在一侧布线，多数情况下会将 MicroCoil 加工成发叉形状，平行（双线）盘绕。发叉型结构是拉伸型 MicroCoil 的默认交付状态。

*Owing to their small cross-sectional dimensions, **MicroCoils** are most often connected at both ends and do not permit the addition of a thermocouple. We prefer to use nickel as the sheath material here because it combines the best thermal conduction properties, high corrosion resistance and excellent deformation properties. To ensure that the standard 1000 mm PTFE-insulated connection cable can be positioned at one end, despite the standard two-ended connection of the element, in most cases the MicroCoil is formed into a hairpin shape and wound/laid in a bifilar (parallel) format. Our unformed MicroCoils are also supplied in the hairpin bend shape as standard.*



尺寸 / *Dimensions*

最小内部 *(min. inside)* - ∅	4 mm	6 mm	6 mm
■	1,0 x 1,6	1,3 x 2,3	1,4 x 2,4
●	1,3	1,8	2,0

标准尺寸 / *Standard sizes*

230V 时的功率 *P at 230 V*	**拉伸总长度（包含不加热的长度）** *Total length straight (incl. cold length)*	
	∅ 1,3 mm 1,0 x 1,6 mm*	**∅ 1,8 mm 1,3 x 2,3 mm***
	不加热长度 / *cold length:* 60 / 90 mm	
100 W	420 mm	
120 W	470 mm	
125 W		420 mm
140 W	520 mm	
150 W		470 mm
160 W	620 mm	
175 W		530 mm
200 W	720 mm	590 mm
240 W	820 mm	
250 W		700 mm
280 W	920 mm	
300 W		810 mm
320 W	1020 mm	
350 W		920 mm
400 W	1220 mm	
450 W		1140 mm
550 W		1350 mm

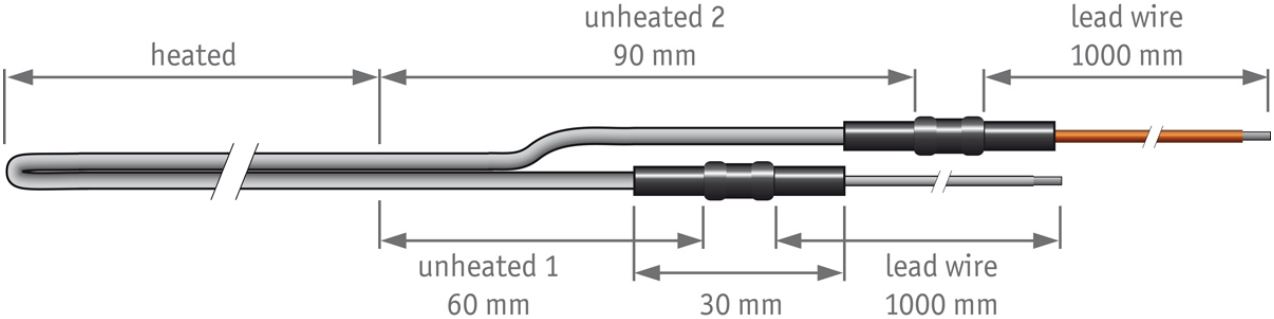
*仅盘绕型 / only coiled

根据要求可提供其他规格

Other types on request.

注意: 已经弯折过的加热器禁止二次加工。禁止弯折连接区域和不加热区域前端 5 mm 处

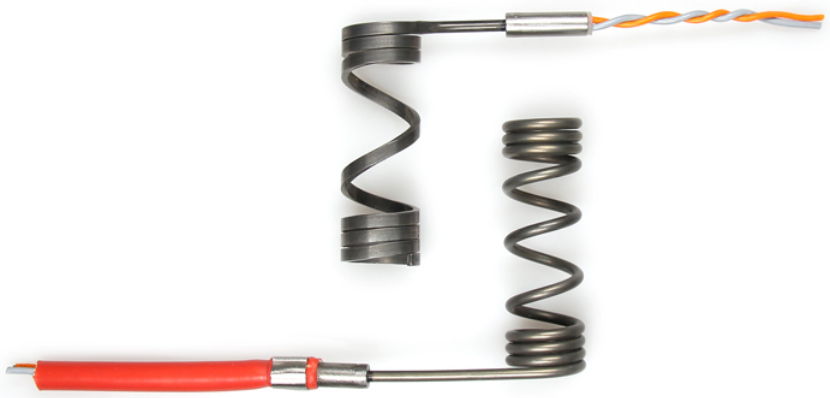
Attention: *Elements which have been bent once, must not be altered anymore. The connection area as well as the first 5 mm unheated area must not be deformed at all.*



2.1.1 MicroCoil 变体 / *MicroCoil Variants*

Webcode 173

单侧连接的紧凑型 MicroCoil / *Compact MicroCoils with single-ended connection*



直径 1.8 mm 或 1.3 x 2.3 mm 以上的 MicroCoil，即使功率密度更高，也可以设计为单侧连接（紧凑型变体）。这样可以使电功率更加集中。由于空间狭窄而选择超薄型加热导线时，只能通过延长加热长度（最长 600 mm）按比例增加功率。

MicroCoils from Ø 1.8 mm or 1.3 x 2.3 mm are also available with the supply at one end (Compact type) for higher power densities. This allows the electrical power to be concentrated still further. Because of the confined space available and thus the extremely thin heating element wires, however, the power can only be increased proportionately to length for heated lengths of up to 600 mm.

盘绕成复杂几何形状的 MicroCoil / *MicroCoils with complex winding geometries*

镍制 MicroCoil 极佳的可塑性可实现复杂的盘绕形状，不仅可以用于紧凑型加热装置，也可以用于对流空气加热应用。

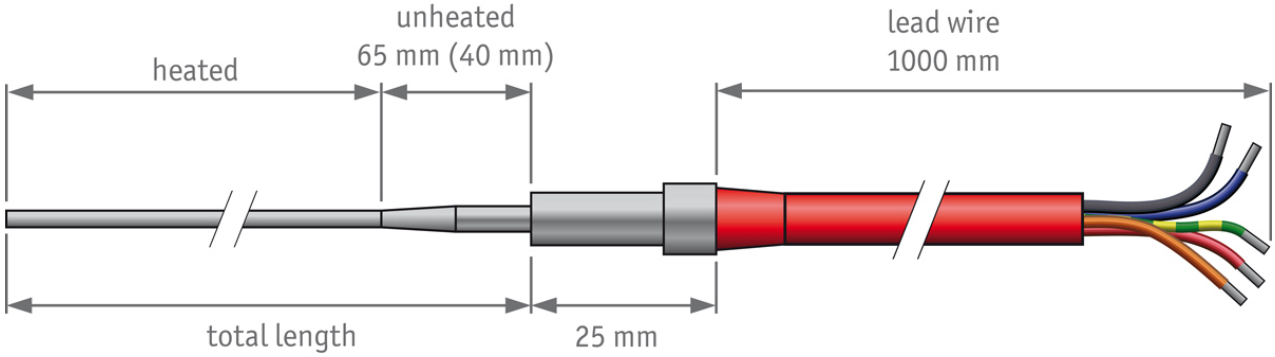
The outstanding plasticity of our nickel MicroCoils enables us to achieve highly complex winding geometries - and not only for contact heating but also for convection-based air heating applications.

2.2 HotCoils
HotCoils

Webcode 151

Hotcoil 的横截面更大，因此功率较 MicroCoil 更为强劲。所以应用于空间更大、需要高加热密度的热流道。由于型号多样化和成本原因，HotCoil 采用符合市场标准（即 Freek 标准）的不锈钢作为护套材料。HotCoil 体积足够大，可以集成热电偶。默认安装 J 型（铁铜镍；红/蓝）热电偶；根据 IEC 和 ANSI 标准，J 型和 K 型都可选用（参见 6.2）。由于集成型温度传感器的测量点位于加热器中，而那里实际上并不需要热量，因此允许应用更大加工（温度）范围或由于安装环境必须采用过热保护设计时，内置热电偶的 HotCoil 是不二之选。HotCoil 加热器的标准接线是 1000 mm 长的 PTFE 绝缘绞合线，带玻璃纤维软管和地线。

HotCoils have a larger cross-sectional area and are thus capable of greater power than MicroCoils. For this reason they are used in hot runners with adequate space and where high heat densities are required. Owing to the large number of variants and for cost reasons, the sheath material for HotCoils is stainless steel - the standard for the market and thus also for Freek. HotCoils are large enough that thermocouples can be integrated into them. Our standard here is Type J (Fe-CuNi; red/blue), while Types J and K are also available conforming to the IEC and ANSI standards (see 6.2). Since the measurement point of a built-in temperature sensor is situated in the heater and never where the heat is actually required, a HotCoil with a thermocouple makes particular sense where the application allows the use of larger processing (temperature) windows or where the installation location or the design requires protection against overheating. The standard connection for our HotCoil heating elements is a 1000 mm PTFE-insulated lead wire with fibreglass sleeve and protective earth conductor.



尺寸 / *Dimensions*

最小内部 *(min. inside)* - ∅	6 mm	8 mm	8 mm	12 mm	18 mm	24 mm
■		1,8 x 3,2	2,2 x 4,2	2,5 x 4,0	3,0 x 4,8	4,0 x 6,0
■			3,0 x 3,0	3,2 x 3,2		
●	3,0		3,3	4,0		

标准尺寸 / *Standard sizes*

230 V 时的功率 *P at 230 V*	拉伸总长度（包含不加热的长度） / *Total length straight (incl. cold length)*							
	1,8 x 3,2 mm	2,2x4,2 mm (仓库交货/from stock)	3,0 x 3,0 mm ∅ 3,3 mm	∅ 3,0 mm	2,5 x 4,0 mm (根据要求/on request)	3,2 x 3,2 mm ∅4,0 mm (根据要求/on request)	3,0 x 4,8 mm (根据要求/on request)	4,0 x 6,0 mm (根据要求/on request)
	不加热长度/ *cold length:* 40 mm	不加热长度/ *cold length:* 65 mm			不加热长度/ *cold length:* 40 mm			
150 W	200 mm	265 mm	265 mm					
175 W	250 mm			365 mm		250 mm		
200 W	300 mm	315 mm	315 mm		250 mm	300 mm		
225 W	350 mm	345 mm	345 mm		300 mm	350 mm		
250 W	400 mm	400 mm	400 mm	515 mm	350 mm	400 mm		
290 W	450 mm	450 mm	450 mm		400 mm	450 mm		
330 W	500 mm			615 mm	450 mm	500 mm		
350 W		525 mm	525 mm					
400 W	600 mm	585 mm	585 mm	765 mm	500 mm	600 mm		
470 W	700 mm	665 mm	665 mm		600 mm	700 mm		
550 W	800 mm				700 mm	800 mm	600 mm	
620 W	900 mm	825 mm	825 mm		800 mm	900 mm		
650 W							700 mm	
690 W		965 mm	965 mm					
700 W	1000 mm				900 mm	1000 mm		
750 W							800 mm	
800 W					1000 mm			800 mm
850 W		1165 mm	1165 mm			1200 mm	900 mm	
950 W		1265 mm	1265 mm		1200 mm	1400 mm	1000 mm	
1000 W								1000 mm
1100 W		1465 mm	1465 mm		1400 mm	1600 mm	1200 mm	
1200 W		1615 mm	1615 mm		1600 mm	1800 mm		1250 mm
1250 W							1400 mm	
1400 W		1815 mm	1815 mm				1600 mm	1500 mm
1550 W							1800 mm	
1600 W		2015 mm	2015 mm					1750 mm
1700 W							2000 mm	
1800 W								2000 mm
1850 W							2200 mm	
2000 W							2400 mm	2250 mm
2200 W								2500 mm

根据要求可提供其他规格

注意: 已经弯折过的加热器禁止二次加工。禁止弯折连接区域和不加热区域前端 5 mm 处

Other types on request.

Attention: *Elements which have been bent once, must not be altered anymore. The connection area as well as the first 5 mm unheated area must not be deformed at all.*

库存/标准型号选择表

盘绕型 HotCoil，**2.2 x 4.2 / 3.0 x 3.0 / ∅ 3.3 mm** [1]
标准型号：不加热长度 65 mm，230 V

Stock/ standard types selection table

*coiled HotCoils **2,2 x 4,2 / 3,0 x 3,0 / ∅ 3,3 mm*** [1]
Standard: unheated length 65 mm, 230 V

库存型号 / *stock types* 2,2 x 4,2 mm

功率 *Wattage*	W	200	225	250	290	350	400	470	620	690	850	950	1100	1200	1400	1600
总长度 *total length*	mm	315	345	400	450	525	585	665	825	965	1165	1265	1465	1615	1815	2015
加热长度 *heated length*	mm	250	280	335	385	460	520	600	760	900	1100	1200	1400	1550	1750	1950

内部 ∅ / *Inside-∅*	盘绕长度/ *coiled length*														
	20 mm	40 mm	60 mm	80 mm	100 mm	120 mm	140 mm	160 mm	180 mm	200 mm	220 mm	240 mm	260 mm	280 mm	300 mm
10 mm		200	250	350	350	400	470	470	620	620					
12 mm		225	290	400	400	470	470	620	620	620					
12,5 mm ½″		225	350	400	400	470	470	620	690	690					
14 mm		250	350	470	470	470	620	690	690	690					
15 mm		250	400	470	470	620	620	690	690	690					
16 mm 5/8″		250	400	470	470	620	690	690	850	850					
18 mm		290	470	620	620	620	690	850	850	850	850	950	950	950	950
19 mm ¾″		290	470	620	620	690	690	850	850	850	850	950	950	950	950
20 mm		290	470	620	620	690	850	850	950	950	950	950	950	950	1100
22 mm 7/8″	200	350	620	690	690	690	850	950	950	950	950	1100	1100	1100	1100
24 mm	200	350	620	690	690	850	950	1100	1100	1100	1100	1100	1100	1100	1200
25 mm 1″	225	400	620	690	690	850	950	1100	1100	1100	1100	1100	1100	1200	1200
28 mm	225	400	690	850	850	950	1100	1200	1200	1200	1200	1400	1400	1400	1400
30 mm	250	470	690	950	950	950	1100	1200	1400	1400	1400	1400	1400		
32 mm 1 ¼″	250	470	690	950	1100	1100	1200	1400	1400	1400	1400				
35 mm	290	620	850	1100	1100	1200	1400	1400	1600	1600					
38 mm 1 ½″	290	620	950	1100	1100	1200	1400								
40 mm	290	620	950	1200	1200	1400	1600								
42 mm	350	620	950	1200	1200	1400									
45 mm	350	690	1100	1400	1200	1600									
48 mm	400	690	1100	1400	1400										
50 mm 2″	400	690	1200	1600	1600										

功率 [W] / wattage [W]

[1]针对所有其他 HotMicroCoil 尺寸，我们分别确定了加热长度和功率（参见第 15 页的申请表）
[1] *For all other HotMicroCoil dimensions we determine length and wattage individually (see inquiry form page 16)*

2.2.1 HotCoil 变体 *HotCoil Variants*

Webcode 174

MultiPower-HotCoils

尽管横截面相对较大，HotCoil 仍成功的实现了微型化。从而为进出的加热螺旋管和集成的热电偶提供了充足的空间。我们还提供有两个独立加热区，即带有两个独立加热螺旋管的特殊型 HotCoil。可以独立控制（**MulitPower** 选项）或并行开关（紧急运行选项）.

*Despite their comparatively large cross-sectional areas, HotCoils can also be successfully used in miniaturisation. They offer ample space for a heating coil wound out and back plus an integrated thermocouple. As a special design, meanwhile, we also offer HotCoils with two separate heating zones, that is, two separate heating coils. These can be controlled independently of one another (**MultiPower** option) or connected in parallel (fail-safe option).*

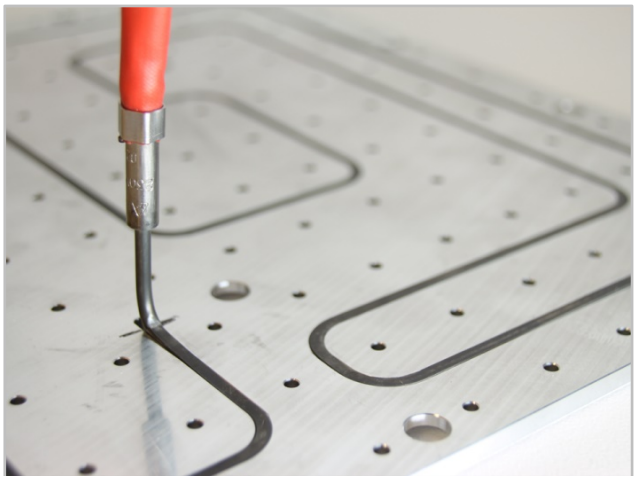
HotCoil 筒形加热器 / *HotCoil Cartridges*

针对许多高精度要求的应用，即使是市面上最小型号的筒形加热器，其尺寸仍然过大。尤其在需要同步执行温控过程而由于空间原因只能通过加热装置实现温控过程时，**基于 HotCoil 的低电压筒形加热器**是您的首选。Freek 成功处理过大量的特殊应用案例，积累了丰富的经验知识。

*For many precision applications, even the smallest conventional cartridge heater dimensions are still too big. Particularly where temperature-regulated process control must take place at the same time, yet due to lack of space can only be achieved via the heater, **low-voltage HotCoil-based heating cartridges** are a trusted alternative. Here Freek has built up an extensive body of practical knowledge through successfully resolving a large number of special applications.*

2.3 HotMicroCoil 平面加热器 *HotMicroCoil Surface Heating Elements*

Webcode 175



HotMicroCoil 可塑形极佳，可以自由变形。加热器除了圆筒形，还有许多特殊盘绕方法和几何形状，借此实现不同表面轮廓的加热。应用案例例如热流道分配器、加热板或热冲压。其中可以以两种方式使用加热器，安装在待加热表面上（根据材料焊接、根据力度张紧、按压或适配安装）或根据形状压入待加热表面的安装槽内。由于面积最大、热传导性能最佳，后者也日益广泛应用于塑料加工中（另请参见 2.3.8 Freek 导热系统）。由于并非所有客户都有相应的装备和相关经验，Freek 为客户提供服务，按照轮廓加工和压入 HotMicroCoil 加热器。

HotMicroCoils have an exceptional capacity for being shaped - even in three dimensions. Many special winding patterns and geometries apart from the purely cylindrical are thus possible, allowing heating close to the contours of all manner of surfaces. Applications include hot runner manifolds, heating plates and hot die stamps. The shaped heating elements thus obtained can be used in two principal ways: either placed over the surface to be heated (firmly bonded by soldering, force-fitted, pressed or otherwise appropriately joined) or pressed into a positive fit in grooves in the surface to be heated. The second of these alternatives is also becoming more widely accepted in plastics processing, as it offers the best heat transfer because the heating area is the greatest (see also 2.4.8 Freek Heat Transfer System). Since not all our customers have the necessary equipment and experience to press the HotMicroCoil elements into the contours of the surfaces, Freek also offers this as a service.

2.4 HotMicroCoil 喷嘴加热器 *HotMicroCoil Nozzle Heaters*

Webcode 152

2.4.1 HotMicroCoil，带反射管 *HotMicroCoil with Reflection Tube*

Webcode 155

带反射管的 HotMicroCoil 加热器的优点是安装简单，功率分配可变。通过直接接触和高匹配精度，加热装置确保到喷嘴良好的热传导。带反射管的 HotMicroCoil 加热器可以安装热电偶，推荐用于大直径和大功率应用。

*Characteristics of our **HotMicroCoils with reflection tube** are easy mounting and variable heat distribution. Because of its direct touch and toleranced fit, the heater allows a very good heat transmission to the nozzle. In all our HotMicroCoils with reflection tube the assembly of a thermocouple is possible and recommended for bigger diameters and power.*

规格:	
设计：	Freek
系统：	反射管
功能：	公差配合
加热器：	MicroCoils 1,0 x 1,6 / 1,3 x 2,3 / 1,4 x 2,4 / 1,8 x 3,2 mm HotCoils 2,2 x 4,2 / 3,0 x 3,0 mm
工业标准:	
尺寸：	∅ 最大 90 mm, 可自由选择
功率：	标准参见 2、3、4 页表格 也可选择其他功率

SPECIFICATIONS:	
Design:	*Freek*
System:	*Reflection tube*
Function:	*Toleranced fit*
Heater:	*MicroCoils 1,0 x 1,6 / 1,3 x 2,3 / 1,4 x 2,4 / 1,8 x 3,2 mm* *HotCoils 2,2 x 4,2 / 3,0 x 3,0 mm*
Industry standard:	
Dimension:	*∅ max. 90 mm, L freely selectable*
Power:	*Standards see tables page 2, 3, 4* *other wattage possible*

2.4.2 HotCoil，带夹紧箍 *HotCoil with Clamp Band*

Webcode 156

带夹紧箍的 HotCoil 是极其灵活的夹紧系统，十分受欢迎，特别适用于大功率加热较大的喷嘴和套筒。管夹尺寸可调节，可以抑制加热过程中加热器受热导致的“上升”趋势，从而有效地防止可能的严重过热。为实现更好的保护，所有 HotCoil 加热器都可以集成热电偶。除了带焊接夹紧元件的标准夹紧机构，还可以选择节约空间的吊耳夹紧机构。

*The **HotCoils with clamp band** are a highly demanded and very flexible clamping system, especially for heating larger nozzles and bushings with high power. The size-variable customizable clamp bands counteract the heating's thermal-related "lifting ambition" during heat-up and thus effectively prevent a possible critical overheating. For an even better protection all HotCoil heating elements can also be provided with an integrated thermocouple. As alternative to our standard clamping mechanism with welded clamping elements a space-saving lug clamping mechanism can be supplied.*

规格:	
设计：	Freek
系统：	夹紧箍
功能：	螺栓夹紧
加热器：	HotCoils 2,2 x 4,2 / 3,0 x 3,0 / 4,0 x 6,0 mm
工业标准:	
尺寸：	∅ x L 可自由选择 (≥ 内部 ∅ 25 mm)
功率：	标准参见 3、4 页表格 也可选择其他功率

SPECIFICATIONS:	
Design:	*Freek*
System:	*Clamp band*
Function:	*Screw clamping*
Heater:	*HotCoils 2,2 x 4,2 / 3,0 x 3,0 / 4,0 x 6,0 mm*
Industry standard:	
Dimension:	*∅ x L freely selectable* (≥ Inside ∅ 25 mm)
Power:	*Standards see tables page 3, 4 other wattage possible*

2.4.3 螺栓管夹 *Two Screw Clamp Band*

Webcode 157

Type FB

2.4.4 轴销管夹 *Axial Clamp Band*

Webcode 158

Type FE

Freek 除了生产自己的系统，还生产标准 Rosemount 系统，也用作“Husky 备用加热系统”（参见 11 页的参考表格）。例如**螺栓管夹** (FB) 和**轴销管夹** (FE)。两种系统可以选择“Rosemount 型” MicroCoil (∅ 1.4 mm) 和“Freek 型”MicroCoil (1.3 x 2.3 mm)。

*Besides its own systems Freek also manufactures original Rosemount-systems that can also be used as “Husky-replacement heater” (see reference table page 18-19). For example the **two screw clamp band** (FB) and the **axial clamp band** (FE). Both systems can be supplied with MicroCoils in “Rosemount style” (∅ 1,4 mm) as well as MicroCoils in “Freek style” (1,3 x 2,3 mm).*

规格: *SPECIFICATIONS:*	
设计 / *Design:*	Rosemount
系统: ***System:***	FB 管夹 *Clamp band FB*
功能: ***Function:***	螺栓夹紧 *Two-Screw clamping*
加热器: ***Heater:***	MicroCoils 1,3 x 2,3 mm ∅ 1,4 mm (Rosemount 型 / *style*)
工业标准: ***Industry standard:***	
尺寸: ***Dimension:***	∅ 19,05 x 25,40 mm (∅ 3/4“ x 1“) ∅ 19,05 x 30,50 mm (∅ 3/4“ x 1,20“) ∅ 22,23 x 30,50 mm (∅ 0,875“ x 1,20“) ∅ 22,40 x 30,50 mm ∅ 22,55 x 30,50 mm
功率功率: ***Power:***	230 V 时 250 W, 328 W (可以选择其他功率) *250 W, 328 W at 230 V (other possible)*
功率公差: ***Power tolerance:***	±2% (可能) *±2% (possible)*

规格: *SPECIFICATIONS:*	
设计 / *Design:*	Rosemount
系统: ***System:***	FE 管夹 *Clamp band FE*
功能: ***Function:***	轴销夹紧 *Axial clamping*
加热器: ***Heater:***	MicroCoils 1,3 x 2,3 mm ∅ 1,4 mm (Rosemount 型 / *style*)
工业标准: ***Industry standard:***	
尺寸: ***Dimension:***	∅ 19,05 x 25,40 mm (∅ 3/4'' x 1'') ∅ 19,05 x 30,50 mm (∅ 3/4'' x 1,20'')
功率功率: ***Power:***	240 V 时 149 W, 268 W (可以选择其他功率) *149 W, 268 W at 240 V (other possible)*
功率公差: ***Power tolerance:***	±2% (可能) *±2% (possible)*

2.4.5 锁杆系统 *Locking System*

Webcode 172

锁杆系统用于快速、简单和可靠的将加热器紧固到待加热的喷嘴上。内层护套精确贴合并压入喷嘴表面，实现最佳的热传递效果。由于锁杆系统高度较低，可以安装到空间狭窄的紧凑型腔体中。使用简单的常用工具就可以操作锁杆，也不用花费很长时间。

*Our **Locking System** provides a quick, easy and reliable clamping of the heating element on the nozzle to be heated. It facilitates an effective heat transfer, as the inside sheath is pressed to the nozzle with a high level of precision creating an interference fit. Due to the method of construction of the lock, installation is possible in the restrictive space of small cavities. The lock can be operated quickly and efficiently with simple readily available tools.*

规格:	
设计: **系统:** **功能:**	Freek 夹紧箍 轴销夹紧
加热器:	MicroCoils 1,0 x 1,6 / 1,3 x 2,3 mm 其他加热器，HotCoil 也可以
工业标准:	
尺寸:	∅ 最小 15 mm, 可自由选择
标准:	参见 2、3、4 页表格 也可选择其他功率

SPECIFICATIONS:	
Design: ***System:*** ***Function:***	Freek *Clamp band* *Axial clamping*
Heater:	*MicroCoils 1,0 x 1,6 / 1,3 x 2,3 mm* *other heaters, also HotCoils possible*
Industry standard:	
Dimension:	∅ min. *15 mm, L freely selectable*
Standards:	*Standards see tables page 2, 3, 4* *other wattage possible*

2.4.6 "Brazed Together" 外壳 (BT) / *"Brazed Together" Housing (BT)*

Webcode 159

“**Brazed Together**”外壳同“轴销”管夹 (FE) 和“双螺栓”管夹 (FB) 一样，属于标准的 Rosemount 系统，由 Freek 独家生产。这种结构中使用的 Freek MicroCoil 1.3x 2.3 mm 采用导热性能良好的高精度管道盘绕制成，通过外部车削件进行封装和隔热。可以选择真空焊接加热器，实现更好的热传递。
“Brazed Together”结构结合了以下优点：高匹配精度、良好的导热性、功率密度大、机械稳定性好。

*Like the "Axial-" (FE) and the "Two-Screw-"(FB) clamp band systems the "**Brazed Together**" housing is also an original Rosemount system that is exclusively manufactured at Freek. The Freek MicroCoil 1,3 x 2,3 mm used in this type is tightly coiled on a heat-conducting precision tube and encapsulated and thermically insulated by an outer lathing part. For an even better heat transition the heating element can be vacuum brazed as an option. The “Brazed Together” design combines many advantages: high accuracy, good heat conduction, large power density and mechanical stability.*

规格:	
设计: **系统:** **功能:**	Rosemount BT 外壳 公差配合
加热器:	MicroCoil 1,3 x 2,3 mm
工业标准:	
尺寸:	∅ 19,05 x 25,40 mm (∅ 3/4“ x 1“) ∅ 19,05 x 30,50 mm (∅ 0,75“ x 1,20“) ∅ 22,40 x 30,50 mm ∅ 22,40 x 34,00 mm 也可以选择其他尺寸 (最小起订量 25 件)
功率:	根据要求 根据客户要求

SPECIFICATIONS:	
Design: ***System:*** ***Function:***	*Rosemount* *Housing BT* *Toleranced fit*
Heater:	MicroCoil *1,3 x 2,3 mm*
Industry standard:	
Dimension:	*∅ 19,05 x 25,40 mm (∅ 3/4“ x 1“)* *∅ 19,05 x 30,50 mm (∅ 0,75“ x 1,20“)* *∅ 22,40 x 30,50 mm* *∅ 22,40 x 34,00 mm* *other dimensions possible* *(min. quantities of 25 pcs.)*
Power:	*on request* *according to customer specifications*

2.4.7 Kappa 系列 / *Kappa Series*

Webcode 160

Kappa 系列是我们的 EUCOPET 合作伙伴 Thermetic Products Inc. USA 的原版系统，由 Freek 自行生产。同时也是有效的“Husky 备用加热系统”（参见 18-19 页的参考表格）。

系统由一个镀镍的内部车削铜件和不锈钢外部套管组成。加热器盘绕在内、外管道之间，将热量高效传输至喷嘴。低公差内径和使用的材料确保在运行状态下，加热器始终牢固的处于喷嘴上，并且可以免去额外的夹紧机构。可以安装外部护套热电偶。

*The **Kappa series** is an original nozzle heater system of our EUCOPET co-operation partner Thermetic Products Inc. USA, which we assemble as well at Freek. At the same time it is a well-proven "Husky-replacement" heater (see reference table page 18-19).*

Thermetic's Kappa series are constructed with a nickel plated copper inner sleeve and a stainless outer sleeve. The heater is sandwiched between these sleeves eliminating the heat transfer problems associated with other dual sleeved designs. The material used direct the heat inward toward the nozzle, resulting in a very efficient heater with even heat distribution. The tightly toleranced ID allows a slip fit with no clamping required. An external bendable thermocouple ∅ 1,0 mm can be assembled.

规格:	
设计: **系统:** **功能:**	Thermetic Kappa 公差配合
加热器:	MicroCoils ∅ 1,4 mm (Thermetic 型)
工业标准:	
尺寸:	∅ 19,05 mm (∅ 3/4“) 长度: 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 150, 170, 190, 210 mm
功率:	240 V 时 220/350/400/450 W 也可以选择其他功率
功率公差:	±2% (∅ 1,4 mm “Thermetic 型”)

SPECIFICATIONS:	
Design: ***System:*** ***Function:***	*Thermetic* *Kappa* *Toleranced fit*
Heater:	*MicroCoils ∅ 1,4 mm (Thermetic style)*
Industry standard:	
Dimension:	*∅ 19,05 mm (∅ 3/4“)* *lengths: 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 150, 170, 190, 210 mm*
Power:	*220, 350, 400, 450 W at 240 V* *other wattage possible*
Power tolerance:	*±2% (∅ 1,4 mm “Thermetic style”)*

2.4.8 Freek 导热系统 (專利)
Freek Heat Transfer System (patented)

Webcode 161

Freek 导热系统主要面向过去使用浇注式导热元件操作热流道喷嘴的制造商和用户，他们希望坚持现有的工程技术知识，不想为这种先进的加热结构花费过高的费用。受专利保护的 Freek 导热系统替代产品的标准材料是黄铜，可选择涂层，基本都开有槽口。槽口首先减轻了拆装难度，例如改装时并得以区别于竞争对手的解决方案，可以在上面进行盘绕，通过密集盘绕使加热器端能够集中尽可能大的功率。

*The **Freek heat transfer system** especially addresses manufacturers and users who operated their hotrunner nozzles with cast-in heaters in the past and would like to stick to their engineering know-how without paying the high price of this former heater design. The standard material of our patent pending Freek heat transfer alternative is brass, with or without coating, basically with a slit. The slit allows the assembly of an external bendable thermocouple and facilitates the disassembly, e.g. in case of a revision and can be coiled over. This is not possible at competitor's solutions. Freek's tight coiling at the heater's ends provides a maximum possible power concentration (patented).*

规格:	
设计: **系统:** **功能:**	Freek 导热系统 公差配合
加热器:	MicroCoils 1,0 x 1,6 / 1,3 x 2,3 mm 其他加热器，HotCoil 也可以
工业标准:	
尺寸:	∅ 最小 8 mm, 可自由选择
标准:	参见 2、3、4 页表格 也可选择其他功率

SPECIFICATIONS:	
Design: ***System:*** ***Function:***	Freek *Heat transfer* *Toleranced fit*
Heater:	*MicroCoils 1,0 x 1,6 / 1,3 x 2,3 mm* *other heaters, also HotCoils possible*
Industry standard:	
Dimension:	*∅ min. 8 mm, L freely selectable*
Standards:	*Standards see tables page 2, 3, 4* *other wattage possible*

2.4.9 备件参考编号 *Spare part cross-reference list*

Webcode 162

系统 System	OEM 商品编号 *part number*	功率 *wattage* [W]	ID [mm]	L [mm]	Freek 订货号 *part number*
Two Screw Clamp Band	**Husky**				
	-	285 W (230 V)	19	25,40 (1,0'')	64M8.001
	520156	149 W (240 V)	19,05 (3/4'')	30,50 (1,2'')	64M9.008
	521334	250 W (230 V)	19,05 (3/4")	30,50 (1,2'')	64M9.001
		300 W (220 V)	19,1	30,50 (1,2'')	64MA.001
		250 W (230 V)	22,22	30,50 (1,2'')	64M9.002
		250 W (230 V)	22,55	30,50 (1,2'')	64M9.005
		440 W (240 V)	39,88	44,45 (1,75'')	64M9.009
Axial Clamp Band	534192	268 W (240 V)	19,05 (3/4'')	30,50 (1,2'')	64M9.011
	534233	268 W (240 V)	19,05 (3/4'')	30,50 (1,2'')	64M9.003
	534234	149 W (240 V)	19,05 (3/4'')	30,50 (1,2'')	64M9.004
	534445	149 W (240 V)	19,05 (3/4'')	30,50 (1,2'')	64M9.010
	SIG				
Reflection Tube Heater with heat conductive sleeve		250W (230 V)	22,55	29	65S6.013
					

系统 System	OEM 商品编号 *part number*			功率 *wattage* [W]	ID [mm]	L [mm]	Freek 订货号 *part number*
Kappa 系列 *Kappa Series*	**Husky 1250 series**						
	**1250 Bi-Metal**	**1250 Bi-Metal** (带热电偶/ with TC)	**Ultra 1250 (UNH)**				
	535069	3083481	4187817	400 W (240 V)	31,75 (1 1/4")	45	64P8.005
	535070				31,75 (1 1/4")		
	535071				31,75 (1 1/4")		
	535072				31,75 (1 1/4")		
	535073	3083485		400 W (240 V)	31,75 (1 1/4")	124	
	535074	3083486		400 W (240 V)	31,75 (1 1/4")	144	64P9.001
	535075				31,75 (1 1/4")		
	535344				31,75 (1 1/4")		
	535345				31,75 (1 1/4")		
	535346				31,75 (1 1/4")		
	535347				31,75 (1 1/4")		
	535348				31,75 (1 1/4")		
	535230				螺帽/ cap		AXAU.187
					热电偶/TC		

系统 System	OEM 商品编号 *part number*			功率 *wattage* [W]	ID [mm]	L [mm]	Freek 订货号 *part number*
Kappa 系列 *Kappa Series* 	**Husky 750 series**						
	750 Bi-Metal	**750 Bi-Metal (HTR S/A)**	**Ultra 750 (UNH)**				
	534975		5177912 4458363 (166 W)	220 W (240 V)	19,05 (3/4'')	30	64P5.001
				250 W (240 V)	19,05 (3/4'')	30	64P5.005
		1501609		350 W (240 V)	19,05 (3/4'')	30	64P5.006
	534976		4458365 (213 W)	220 W (240 V)	19,05 (3/4'')	40	64P5.002
				250 W (240 V)	19,05 (3/4'')	40	64P5.008
		1502992		350 W (240 V)	19,05 (3/4'')	40	64P5.007
	534977		4458366 (223 W)	220 W (240 V)	19,05 (3/4'')	50	64P5.003
				250 W (240 V)	19,05 (3/4'')	50	64P5.009
		1502993		350 W (240 V)	19,05 (3/4'')	50	64P5.012
	534978		4458367 (233 W)	220 W (240 V)	19,05 (3/4'')	60	64P5.004
				250 W (240 V)	19,05 (3/4'')	60	64P5.010
		1501594		400 W (240 V)	19,05 (3/4'')	60	64P6.022
	534979		4458368 (243 W)	220 W (240 V)	19,05 (3/4'')	70	64P6.001
		1502994		400 W (240 V)	19,05 (3/4'')	70	64P6.006
	534980		4458369 (253 W)	220 W (240 V)	19,05 (3/4'')	80	64P6.002
		1501595		400 W (240 V)	19,05 (3/4'')	80	64P6.007
	534981		4458370 (263 W)	220 W (240 V)	19,05 (3/4'')	90	64P6.003
				350 W (240 V)	19,05 (3/4'')	90	64P6.019
		1502995		400 W (240 V)	19,05 (3/4'')	90	64P6.008
	534982		4458371 (273 W)	220 W (240 V)	19,05 (3/4'')	100	64P6.004
				350 W (240 V)	19,05 (3/4'')	100	64P6.020
		1501596		400 W (240 V)	19,05 (3/4'')	100	64P6.009
	534983		4458372 (283 W)	220 W (240 V)	19,05 (3/4'')	110	64P6.005
				350 W (240 V)	19,05 (3/4'')	110	64P6.021
		1502996		400 W (240 V)	19,05 (3/4'')	110	64P6.010
			4458373 (293 W)	220 W (240 V)	19,05 (3/4'')	120	
	535470			220 W (240 V)	19,05 (3/4'')	130	64P7.001
		1502997	4458374 (303 W)	400 W (240 V)	19,05 (3/4'')	130	64P7.003
	535471			220 W (240 V)	19,05 (3/4'')	150	64P7.002
		1502998	4458376 (323 W)	450 W (240 V)	19,05 (3/4'')	150	64P7.004
	535472			220 W (240 V)	19,05 (3/4'')	170	64P8.001
		1502999	4458380 (343 W)	450 W (240 V)	19,05 (3/4'')	170	64P8.003
	535473			220 W (240 V)	19,05 (3/4'')	190	64P8.002
		1503000	4458382 (363 W)	450 W (240 V)	19,05 (3/4'')	190	64P8.004
	535474			220 W (240 V)	19,05 (3/4'')	210	
		1503001	4458386 (383 W)	450 W (240 V)	19,05 (3/4'')	210	
	535181				螺帽/ cap		AXAU.095
					热电偶/TC		

Kappa 系列
Kappa Series

带反射管加热器
Reflection Tube Heater
für/for 500 HTM Brass

系统 System	OEM 商品编号 part number				功率 wattage [W]	ID [mm]	L [mm]	Freek 订货号 part number
	Husky 500 series							
	500 HTM	**Copper Ultra 500 (5...=epoxy/ 2...=ceramic)**	**500 HTM Brass**	**Ultra 500 (UNH)**				
				4778275 (153 W)	280 W (240 V)	12,75 (1/2")	40	
				4778276 (159 W)	280 W (240 V)	12,75 (1/2")	50	
		5442630/ 2343737		4778277 (164 W)	280 W (240 V)	12,75 (1/2")	60	64P7.013
		5442631		4778278 (170 W)	280 W (240 V)	12,75 (1/2")	70	
		5442632		4778279 (175 W)	280 W (240 V)	12,75 (1/2")	80	
		5442633/ 2343739		4778280 (180 W)	280 W (240 V)	12,75 (1/2")	90	64P7.010
		5442634/ 2343741		4778281 (186 W)	280 W (240 V)	12,75 (1/2")	100	64P7.016
	3191678	5442635/ 2343742		4778282 (191 W)	280 W (240 V)	12,75 (1/2")	110	64P7.012
			5421799 (210 W)		280 W (240 V)	12,75 (1/2")	110	
		5442636/ 2343743		4778283 (197 W)	280 W (240 V)	12,75 (1/2")	120	
	3191680	5442637/ 2343744		4778284 (202 W)	280 W (240 V)	12,75 (1/2")	130	64P7.015
			5421753 (220 W)		280 W (240 V)	12,75 (1/2")	130	
		2343745		4778285 (208 W)	280 W (240 V)	12,75 (1/2")	140	64P7.008
			5421754 (220 W)		280 W (240 V)	12,75 (1/2")	140	
				4778286 (213 W)	280 W (240 V)	12,75 (1/2")	150	
			5421755 (220 W)		280 W (240 V)	12,75 (1/2")	150	
				4778287 (218 W)	280 W (240 V)	12,75 (1/2")	160	
			5421756 (230 W)		280 W (240 V)	12,75 (1/2")	160	
				4778288 (224 W)	280 W (240 V)	12,75 (1/2")	170	
			5421757 (230 W)		280 W (240 V)	12,75 (1/2")	170	65S6.160
				4778289 (229 W)	280 W (240 V)	12,75 (1/2")	180	
			5421758 (230 W)		280 W (240 V)	12,75 (1/2")	180	
				4778290 (235 W)	280 W (240 V)	12,75 (1/2")	190	64P7.011
			5421759 (230 W)		280 W (240 V)	12,75 (1/2")	190	65S6.159
				4778291 (240 W)	280 W (240 V)	12,75 (1/2")	200	
			5421760 (240 W)		280 W (240 V)	12,75 (1/2")	200	65S6.149
				4778292 (246 W)	280 W (240 V)	12,75 (1/2")	210	64P7.009
			5421761 (240 W)		280 W (240 V)	12,75 (1/2")	210	
				4778293 (251 W)	280 W (240 V)	12,75 (1/2")	220	
				4778294 (257 W)	280 W (240 V)	12,75 (1/2")	230	64P7.017
				4778295 (262 W)	280 W (240 V)	12,75 (1/2")	240	
				4778296 (267 W)	280 W (240 V)	12,75 (1/2")	250	
				4778297 (273 W)	280 W (240 V)	12,75 (1/2")	260	
				4778298 (278 W)	280 W (240 V)	12,75 (1/2")	270	
				4778299 (284 W)	280 W (240 V)	12,75 (1/2")	280	
				4778300 (289 W)	280 W (240 V)	12,75 (1/2")	290	
				4778301 (295 W)	280 W (240 V)	12,75 (1/2")	300	
						螺帽/ cap		
						热电偶/TC		

2.5 选件 *Options*

Webcode 153

管道 / *tube:*

- 镍 / *nickel* — 标准: MicroCoils 1,0 x 1,6 / ∅ 1,3 / 1,3 x 2,3 / ∅ 1,8 mm
  选件: HotCoils 2,2 x 4,2 / 3,0 x 3,0 / ∅ 3,3 mm
- 不锈钢/ *stainless steel* — 标准: *all* HotCoils / MicroCoils 1,4 x 2,4 / 1,8 x 3,2 mm
  选件: MicroCoils 1,0 x 1,6 / ∅ 1,3 / 1,3 x 2,3 / ∅ 1,8 mm

导线 / *leads:*

- PTFE (标准型，最高工作温度 260°C / *permanent temperature resistance up to 260°C*)
- 玻璃纤维 / *fibreglass* (最高工作温度300°C / *permanent temperature resistance up to 300°C*)

地线 / *earth lead:*

- 所有 HotMicroCoil 可用/ *all HotMicroCoils possible*

MicroCoil		焊接型 *brazed*
HotCoil		夹压型 *crimped*

保护软管* / *protection sleeve*:

N		无保护软管 *without protection sleeve*
NG (标准 / *Standard*)		玻璃纤维软管 (GLS) *fibreglass sleeve*
NM		金属软管 (MGS) *metal sleeve*
ND		编织金属软管 (DHG) *braided metal sleeve*

*用于所有带 1 个连接头的 HotMicroCoils

锁紧环: ≈ ∅ 11 / 9,5 / 7,5 / 6,5 mm

用于头部: ∅ 8,0 / 6,5 / 5,5 / 4,5 mm

可根据要求提供其他软管

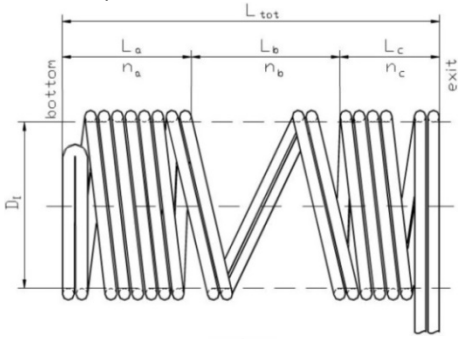
** for all HotMicroCoils with 1 terminal head*

fixing rings: ≈ ∅ *11 / 9,5 / 7,5 / 6,5 mm*

for head: ∅ *8,0 / 6,5 / 5,5 / 4,5 mm*

Other sleeves on request

盘绕型 / *Coiled execution:*



请详细说明/ *Please specify:*

D_I, $L_{tot;}$, 公差/ *tolerances*

功率分配还需要

In case of heat distribution additionally:

L_a, L_b, L_c + n_a, n_b, n_c

n =圈数或绝对/百分比功率

n:= number of coils or absolute power or proportional power

提示！功率分配 = 圈数分配

Note! Power distribution = coil distribution)

切线向: *Tangential:*

径向: *Radial:*

轴向: *Axial:*

接头 / *termination:*

标准接头 / *Standard terminations*		头部尺寸 / *head dimensions* ∅ x L / ∅環 / Ring
MicroCoil 2 个头 *MicroCoil 2 heads* ∅ 1,3 / ■ 1,0 x 1,6		最大 ∅ 5,5 x 30 mm
MicroCoil 2 个头 *MicroCoil 2 heads* ∅ 1,8 / ■ 1,3 x 2,3		最大 ∅ 5,5 x 30 mm
MicroCoil 1 个头 *MicroCoil 1 head* ∅ 1,3 / ■ 1,0 x 1,6 ∅ 1,8 / ■ 1,3 x 2,3		∅ 5,5 x 20 mm / $\varnothing_R$ 7,5 mm
MicroCoil compact ∅ 1,8 / ∅ 2,0 ■ 1,3 x 2,3 / 1,4 x 2,4		∅ 5,5 x 20 mm / $\varnothing_R$ 7,5 mm (根据要求/ *on request* ∅ 4,5 x 15 mm / $\varnothing_R$ 6,5 mm)
HotCoil ■ 1,8 x 3,2		∅ 5,5 x 20 mm / $\varnothing_R$ 7,5 mm
HotCoil ∅ 3,0 / 3,3 / 4,0 ■ 2,2 x 4,2 / 2,5 x 4,0 ■ 3,0 x 3,0 / 3,2 x 3,2		∅ 6,5 x 25 mm / $\varnothing_R$ 9,5 mm (根据要求/ *on request* ∅ 5,5 x 20 mm / $\varnothing_R$ 7,5 mm)
HotCoil ■ 3,0 x 4,8 *1 ■ 4,0 x 6,0 *2		*1 ∅ 7,5 x 28 mm / $\varnothing_R$ 9,5 mm *2 ∅ 8 x 30 mm / $\varnothing_R$ 11 mm

Xtreme 选件 / *Xtreme options:*

Xtreme small		用于小型加热应用的微型加热器 *Miniaturized heating elements for micro applications*
Xtreme 450		接头耐热最高450°C *Termination heat resistant up to 450°C*
Xtreme 450 S		Xtreme 450 带软管 *Xtreme 450 with sleeve*
Xtreme H_2O		防水 *watertight*
Xtreme Voltage		MicroCoil 高达 1250 V AC, HotCoil 高达 1500 V AC *MircoCoil up to 1250 V AC, HotCoil up to 1500 V AC*
Xtreme Safe		HotCoil, 带应急运行功能 *HotCoil with limp home function*
MultiPower		HotCoil, 带可独立控制的加热区 *HotCoil with independently controllable heating zones*

可根据要求提供其他接头 / *Other terminations on customer request*

2.6 服务 *Service*

Webcode 154

用户指南

- 使用的陶瓷绝缘材料具有吸湿的特性。因此，发货时通常会将 HotCoil/MicroCoil 加热器封装在塑料袋中。塑料袋已经打开，但是不立即使用加热器时，我们建议您重新密封包装加热器。调试前必须确定绝缘电阻，必要时计划干燥时间（控制启动或使用干燥箱）。
- 已经弯折过的加热器禁止二次加工。禁止弯折连接区域和不加热区域前端 5 mm 处。
- 管道护套最大 750°C 的温度负载并不适用于连接区域和焊接的加热器（例如 2.4.1 带反射管的 HotMicroCoil）。后者仅允许以 600°C 运行，温度更高时有焊点熔化的危险。连接区域产生的温度很大程度上决定了选择哪种接头。
- 不得超出额定电压，否则会产生过热危险。
- 一般来讲：产生的热量流失越多，即传导到待加热工件越多，便可以选择更高的管道护套表面负载。
- 不当的公差配合影响导热，形成热量积累，进而导致加热器严重过热。
- 每项实践应用中都有运行参数和环境参数，理论上无法极其精准，因此我们推荐批量投用 HotMicroCoil 前，先在实际运行环境中进行测试。

无法针对用户指南提出索赔。

User Manual

- *Because of the hygroscopic characteristic of the used ceramic insulation materials they absorb moisture. Therefore we send our Hot-/MicroCoils heating elements usually in air-tightly closed plastic bags. If the bags are opened and the heating elements are not used at once, we recommend repack the elements air-tightly. It is absolutely important to check the insulation resistance before use and – if necessary – to dry the elements (controlled start-up or drying oven).*
- *Elements which are bent once, must not be altered anymore. The connection area as well as the first 5 mm unheated area must not be deformed at all.*
- *The temperature stress of max. 750°C on the tube is not valid for the connection area nor brazed heating elements (e.g. 2.4.1 HotMicroCoil with Reflection Tube) The latter must not be operated at temperatures higher than 600°C as this could fuse the braze. The temperatures arising in the connection area determine decisively the suitability of the available terminations.*
- *The stated nominal voltage must not be exceeded, otherwise overheat is risked.*
- *Generally it can be said: the better heat is carried off, or flows into the work piece respectively, the higher the surface watt density on the sheath can be.*
- *A too slag fit obstructs the heat conduction and leads to heat accumulation that could overheat and eventually destroy the heater.*
- *In every practice application there are working and environmental parameters which cannot be calculated exactly in theory. That is why we recommend generally to test HotMicroCoil elements in the application under real working conditions before series use.*

No warranty claims can be derived from these user instructions.

申请表

Webcode 171

规格:

拉伸长度（加热 + 不加热）: mm 电压: V

加热长度 (a): mm 功率: W

不加热长度 1/(2*): mm 数量: 件

*仅 ∅ 1,3 / ∅ 1,8 / 1,0 x 1,6 / 1,3 x 2,3

HMC 标准型号:

MicroCoil (MC) 标准：镍管，1000 mm PTFE 绞合线，无软管（第 2 页）

☐ ∅ 1,3 ☐ ∅ 1,8 ☐ 1,0 x 1,6* ☐ 1,3 x 2,3*

*仅盘绕型

头部: ☐ 2 ☐ 1 (标准: 钢管)

☐ ∅ 1,8 compact ☐ ∅ 2,0 compact ☐ 1,3 x 2,3 compact ☐ 1,4 x 2,4 compact

HotCoil (HC) 标准：钢管，1000 mm PTFE 绞合线，带 GLS 软管（第 6 页）

☐ ∅ 3,0 ☐ ∅ 3,3 ☐ 1,8 x 3,2 ☐ 2,2 x 4,2 ☐ 3,0 x 3,0

☐ ∅ 4,0* ☐ 2,5 x 4,0* ☐ 3,2 x 3,2* ☐ 3,0 x 4,8* ☐ 4 x 6*

*仅用于标准规格

TE: ☐ 无 ☐ J (红 / 蓝) ☐ J (白 / 红) ☐ K(红 /绿)

HotMicroCoil 系统（第 11 页）

☐ 反射管 ☐ 夹紧箍 ☐ 双螺栓* (FB) ☐ 轴销* (FE)

☐ 锁杆系统 ☐ Brazed Together ☐ Kappa ☐ 导热系统

选件:（第 11 页）

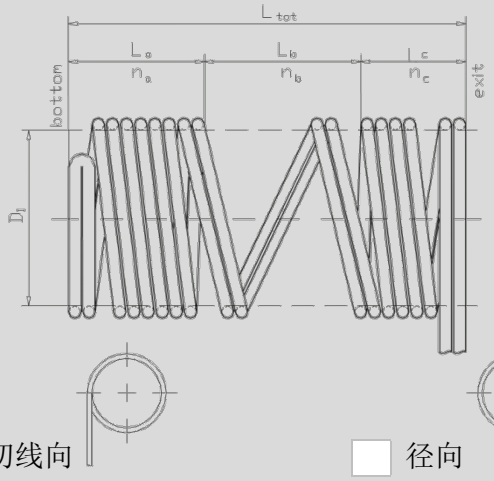
绞合线长度: (标准：1000 mm PTFE 绞合线) mm

地线: ☐ 是 ☐ 否

☐ 玻璃纤维软管 (GLS) ☐ 编织金属软管 (DHG) ☐ 金属软管 (MGS)

长度: mm

盘绕型: ☐ 是 ☐ 否



D_I: mm Tol.: mm

L_{tot}: mm Tol.: mm

功率分配:

L_a: W L_b: W L_c: W

n_a: n_b: n_c:

n =圈数或绝对/百分比功率

提示！功率分配 = 圈数分配

☐ 切线向 ☐ 径向 ☐ 轴向

寄件人信息:

公司: 姓名:

街道: 电话:

邮政编码/城市: / 电子邮件:

电话: (0 23 73) 95 90 - 0
传真: (0 23 73) 95 90 - 30

Inquiry form

Webcode 171

Specifications:

Straight length (heated + cold):		mm	*Voltage:*		V
Heated length (a):		mm	*Wattage:*		W
Cold length 1/(2):*		mm	*Quantity:*		pieces

*only ∅ 1,3 / ∅ 1,8 / 1,0 x 1,6 / 1,3 x 2,3

HMC Standard Type:

MicroCoil (MC) Standard: Nickel tube, 1000mm PTFE leads without sleeve (S. 3)

☐ ∅ 1,3 ☐ ∅ 1,8 ☐ 1,0 x 1,6* ☐ 1,3 x 2,3*

*only coiled

Terminals: ☐ 2 ☐ 1 (Standard for steel tube)

☐ ∅ 1,8 compact ☐ ∅ 2,0 compact ☐ 1,3 x 2,3 compact ☐ 1,4 x 2,4 compact

HotCoil (HC) Standard: Steel tube, 1000mm PTFE leads with fibreglass sleeve (S. 6)

☐ ∅ 3,0 ☐ ∅ 3,3 ☐ 1,8 x 3,2 ☐ 2,2 x 4,2 ☐ 3,0 x 3,0

☐ ∅ 4,0* ☐ 2,5 x 4,0* ☐ 3,2 x 3,2* ☐ 3,0 x 4,8* ☐ 4 x 6*

*only available as standard

TC: ☐ without ☐ J (red / blue) ☐ J (white / red) ☐ K (red/green)

HMC Systems (S. 11)

☐ Reflection Tube ☐ Clamp Band ☐ Two-screw* (FB) ☐ Axial* (FE)

☐ Locking System ☐ Brazed Together ☐ Kappa ☐ Heat Transfer

Options: (S. 20)

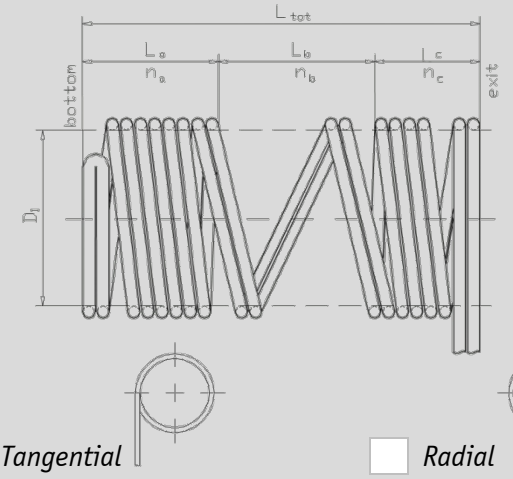
Lead length: (Standard: 1000mm PTFE leads) mm

Earth lead: ☐ Yes ☐ No

☐ Fibreglass sleeve ☐ Braided metal sleeve ☐ Flexible metal conduit

Length: mm

Coiled execution: ☐ Yes ☐ No



D_I: mm Tol.: mm

L_{tot}: mm Tol.: mm

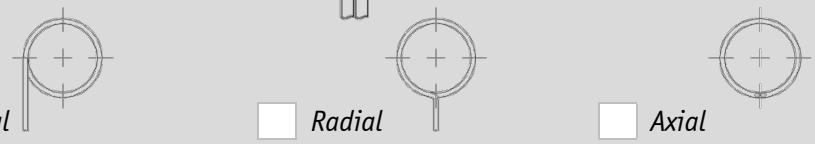
Power distribution:

L_a: W L_b: W L_c: W

n_a: n_b: n_c:

n = number of coils or absolute power of proportional power

Note! Power distribution = coil distribution



☐ Tangential ☐ Radial ☐ Axial

Sender address:

Company:		*Name:*	
Street:		*Telephone:*	
Zip / Town:	/	*E-Mail:*	

Telephone: +49 – (0)23 73 – 95 90-0
Telefax: +49 – (0)23 73 – 95 90-30