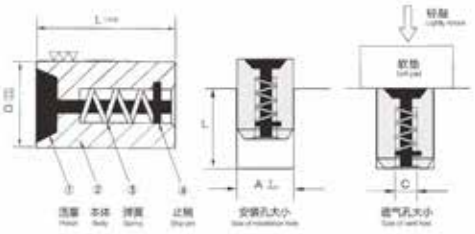
AIR EJECTOR & GAS VENT
SERIES
气顶、排气系列

气顶
AIR EJECTOR

AJV



材质	硬度
SUS420	HRC 48~52

Type	D 外径 External dia	L 长度 Length								A	C
		12	15	20	25	30	35	45	55		
AJV	5	●								5	4
	6	●								6	4.2
	8	○	●							8	4.5
	10	○	○	●						10	7
	12	○	○	○	●					12	7.7
	16					●				16	10.3
	18						●			18	12
	20					○	●			20	12.9
	25					○		●		25	14.9
	30					○		●		30	18

● 表示标准尺寸 Standard　○ 表示可选尺寸 Non-standard

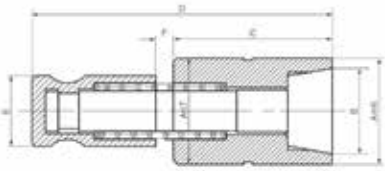
■ 说明 Details

- 空气前用在有深度、密闭之真空状态下，顶针顶出困难时用之，且产品面积大，不容易脱落时，亦可采用之。
- 本装置精度高，但装设很简单，且不占空间，面发挥的功能很大，为顶出装置改良之最佳利器。
- 其原理为利用空气阀控制，对封闭型之产品之剥脱，以空气扩散之原理，使产品在瞬间剥脱，达到自动化之效果。
- 本产品材质皆用不锈钢制成，绝不生锈，请安心使用。
- 消除模具在顶针设计上及制作过程之麻烦，以及化解在射出上多故障性，实为模具界一大新突破。

- It is used under the vacuumed condition in the deep and closed molds. Or it can be used for having problems with ejection of ejector pin and for the larger size of final products, which has difficulty leaving the molds.
- Easy installation, high precision and space saver.
- Using air valves to control the operation and the final products can leave the molds instantly.
- Air-jet valves are made from stainless steels and it will never rust.
- Sir-jet valves are one of the most innovated tools for the molding industries. It will improve the problems for molds design and injection troubles.

气顶
AIR EJECTOR

VAD

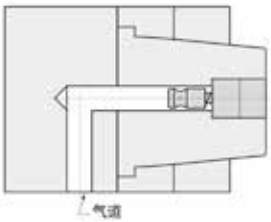


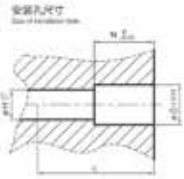
材质	硬度
SUS420	HRC 48~52

Type	A	B	C	D	E	F
VAD-8	8	6.6	11	24	6	1
VAD-10	10	8				
VAD-12	12	9.7	18	34	8	2
VAD-16	16	13	20	38		4
VAD-18	18	14.8	22	46	12	
VAD-20	20	16	26	50		6
VAD-25	25	20				

安装孔尺寸 Size of installation hole	G	N	φH	L
VAD-8	8	11	6.75	26
VAD-10	10			
VAD-12	12	18	9	36
VAD-16	16	20		40
VAD-18	18	22	14	48
VAD-20	20	26		52
VAD-25	25			

■ **安装方法** Installation diagram

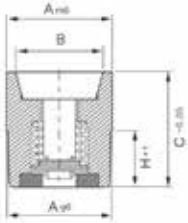




气顶
AIR EJECTOR

VA

材质	硬度
SUS420	HRC 48~52



Type	A	B	C	H
VA.050412	5	4	12	7
VA.065212	6	5	12	7
VA.086512	8	6.4	12	7
VA.100812	10	8	12	7
VA.121012	12	10	12	7
VA.161320	16	13.5	20	12
VA.201720	20	16	20	12

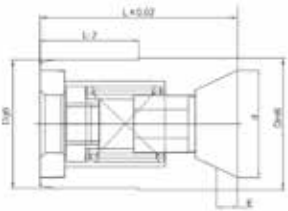
■ 产品特点 Precautions

- 欧洲标准气顶；
- 快速成型顶出优点；
- 采用高性能耐高温弹簧，最高可达250摄氏度；
- 有高气流通特点。

- Gas cap with European standard;
- Advantage of rapid molding ejection;
- Using high temperature spring, up to 250 degrees Celsius;
- Own the characteristic of high-pressure circulation.

VAN

材质	硬度
SUS420	HRC 48~52



Type	D	L	d	Work mpa	L/min(0.8Mpa)
VAN6	6	12	5	0.7~0.8	60
VAN8	8	12	6.5	0.7~0.8	65
VAN10	10	12	8	0.7~0.8	65
VAN12	12	12	10	0.7~0.8	70
VAN16	16	20	13	0.7~0.8	140
VAN20	20	20	17	0.7~0.8	200

六角芯子，不易转动
Hexagonal core, not easy to rotate

芯子与外壳配合要紧密，不易卡死
Core and body fit more closely, not easy to jam

■ 新VA精密气顶改进 New VA precision gas top improvement

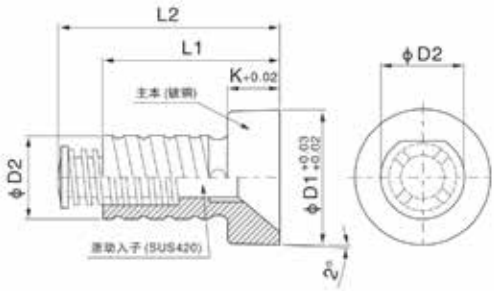
- 气顶与外壳60° 斜度配合，挤压分力减小，不易卡死。
- 芯子与外壳依靠六角止转，允许5度偏差的弧面使用。
- 锥面同时作为支撑面和配合面，密封更精密。
- 增加取出用垫片，可底部敲击取出不崩裂。
- 垫片带过滤功能，能够有效过滤气道内的杂质，避免气顶因杂质堵塞而无法顶出。

- When the air ejector is matched with the shell at 60 degree inclination, the extrusion separation decreases and no stuck.
- Core and shell are rotated by hexagonal, and arc surface with 5 degree deviation is allowed to be used.
- Conical surface acts as both supporting and matching surface, so the sealing is more precise.
- Adding a filler for removal, the bottom of the gasket can be knocked out without cracking.
- The gasket has a filtering function, which can effectively filter the impurities in the airway and prevent the Air poppet valve from being blocked due to impurities.

气顶
AIR EJECTOR

Z491/Z4911

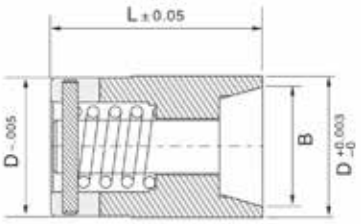
Type	材质	硬度
Z4911	SUS420	HRC 48~52
Z491	COPPER	HRC 35~40



Type	φD1	φD2	K	L1	L2
Z491/8	8	6	5	8	16
Z491/12	12	8		13	21
Z491/16	16	10	6	12	22

PPV

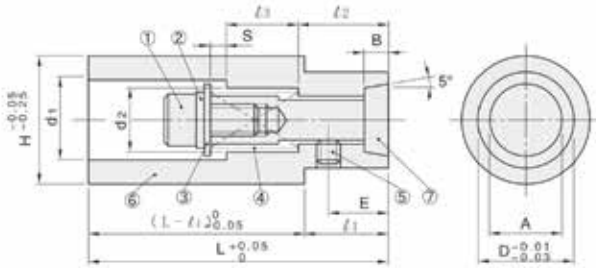
材质	硬度
SUS420	HRC 48~52



Type		D +0 -0.000	B ±0.005	L +0.002 -0
PPV-02	1/4"	0.2504	0.215	0.375
PPV-03	3/8"	0.3754	0.325	0.375
PPV-05	1/2"	0.5005	0.437	0.5
PPV-07	3/4"	0.7505	0.656	0.75
PPV-10	1"	1.0006	0.875	1
PPV-15	1-1/2"	1.5006	1.312	1.5

气顶
AIR EJECTOR

PQ



No.	Type	PQE		PQ	
		材质 Material	硬度 Hardness	材质 Material	硬度 Hardness
①	内六角螺栓	SCM435	HRC 38~43	SUS304	–
②	弹簧垫圈	SWRH62	HRC 42~50		
③	平垫圈	SK5	–		
④	弹簧	SUS304			
⑤	内六角螺塞	SCM435	HRC 34~43	SCM435	HRC 34~43
⑥	气缸筒	S45C	HRC 33~38	NAK101	HRC 35
⑦	活塞杆				

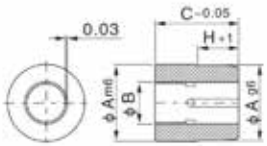
D	推力 N(kgf)	弹簧压缩力 N(kgf)	构成螺钉 ①	构成螺钉 ②
10	9.61 (0.98)	4.81 (0.49)	M3~L6	MSW3
13	16.67 (1.70)	8.34 (0.85)	M4~L8	MSW3
16	24.51 (2.50)	12.26 (1.25)	M5~L10	MSW4
20	38.25 (3.90)	19.61 (2.00)	M6~L12	
25	64.72 (6.60)	32.36 (3.30)	M8~L15	MSW5
32	124.54(12.70)	63.74 (6.50)	M10~L20	MSW5

Type		L PQE (选择Select)	L PQ (指定单位 Designated unit)1mm	S	E	ℓ1	ℓ2	ℓ3	d1	d2	H	B	A
PQE(钢型) PQ(不锈钢型)	10	20 25	19~35	1.5	7	12	10.5	8.5	8.5	6.5	15	3	7.5
	13	25 30 30	25~40		8	15	14	11	10.5	8.5	18	4	9
	16	30 40 35 35	28~50	2.5	10		16	12	12.5	10.5	21		11
	20	40 50 50 40	36~60	3.0	12	20	21	15	16	13	25	6	14
	25	50 60 60	44~70				26	18	19	16	32		18
	32	70 80 70	55~80	5.0	15	25	35	20	25	22	40	8	25

流动性比较高的树脂成形时，请选择AJV(不锈钢型)；流动性较低的树脂成形时，请选择AJVE(钢型)。

注：使用时空气压力应高于49N/cm²(500kpa)

VD 排气阀

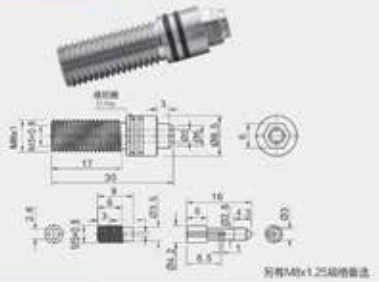


Type	φA	φB	C	φE	H
VD08	8	5	12	4	7
VD10	10	6		5	
VD12	12	8		7	–
VD16	16	10	20	9	12

氮气嘴
AIR SPIGOT

SAS01

SAS02



SAS03

SAS04

SAS05

SAS06

SAS07 非标

SAS08 非标

氮气嘴
AIR SPIGOT

SAS09

SAS10

SAS11

SAS12 非标

■ 安装方法 Installation method

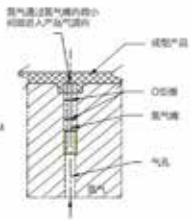
加工注意事项 Processing considerations

- 参考图示加工;
- 安装孔需保证表面粗糙度Ra0.8;
- 为保证螺纹孔与气针孔的同轴度，不允许用手动攻牙;
- 安装孔加工完毕后，须用气枪及火花油对孔进行彻底清洁，须保气孔内无油渍、铁屑及其他异物，以避免氮气充入时异物堵塞氮气嘴，造成氮气嘴损坏而影响成型。

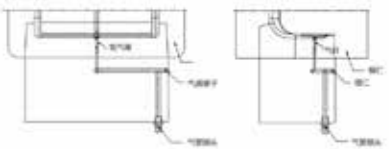
- Reference diagram processing;
- Installation hole should ensure surface roughness Ra0.8;
- In order to ensure the coaxiality of threaded hole and air pinhole, manual tapping is not allowed.
- After the installation hole has been machined, the hole shall be thoroughly cleaned with air gun and spark oil, and it shall be guaranteed that the hole shall be thoroughly cleaned with air gun and spark oil. There are no oil stains, iron chips and other foreign bodies in the stomata to prevent foreign bodies from clogging the nitrogen nozzle when nitrogen is filled in. The formation is affected by the damage of nitrogen nozzle.

因使用氮气成型时氮气压力为350bar，相当于大气压力350Kg/cm^2，气道塞子不允许用铜堵，必须攻牙使用气道塞子。

When the nitrogen pressure is 350 bar when using nitrogen gas, the airway plug is not allowed to block with copper when the atmospheric pressure is 350 kg/cm^2. The airway plug must be used for tapping.

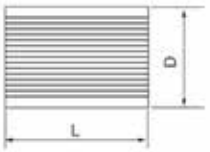


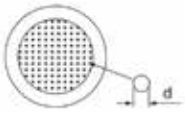
使用例子



排气栓
GAS VENT

GSV 直孔排气栓 Straight hole gas vent





材质 Material	硬度 Hardness
SUS304	HRC 130~190

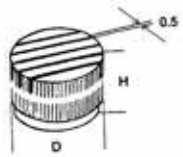
- d 0.3适用低压铸造模具
- d 0.5适用低压铸造模具与适用重力铸造模具

- Diameter of 0.3 is suitable for low-pressure casting mould;
- Diameter of 0.5 is suitable for low-pressure casting mould and suitable for gravity casting mould

Type	d	D±0.05	L±0.2	孔数 Hold count	空孔率(%) Punching rate	适用产品 Applicable product
GSV	0.3	5	10/15	89	30	低压铸造模具 Low-pressure casting mould
		6			29	
		8		200	28	
		10		340	31	
		12			28	
		14	15.0	550	27	
	0.5	4	10.0	39	55	重力铸造模具 低压铸造模具 low-pressure casting mould and gravity casting mould
		6	10/15	61	40	
		8		89	35	
		10		200	34	
		12	10.0		31	
		14	15.0	340	35	
		16			32	

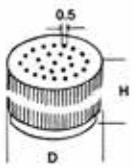
发泡模用排气栓 Foam mold gas vent

GBSV 条状孔式 Strip hole



Type	D
GBSV-4	4
GBSV-6	6
GBSV-8	8
GBSV-10	10
GBSV-12	12

GBHV 圆孔式 Round hole



Type	D
GBHV-4	4
GBHV-6	6
GBHV-8	8
GBHV-10	10
GBHV-12	12

排气栓
GAS VENT

GVC 中空模具专用 Hollow mold dedicated

Code	材质 Material	硬度 Hardness	孔径 Hole diameter
GVC	铜 Copper	RV 20	0.04

GVS 射出模具专用 Shooting mold dedicated

Code	材质 Material	硬度 Hardness	孔径 Hole diameter
GVS	不锈钢 Stainless steel	RV 50	0.04

极微细的排气孔，能将模具内的瓦斯或空气立即排出於模具外，简单而最有效果的产品为提升塑胶成型生产性能发挥威力。

有效解决下列之问题：

烧焦

树脂的填充较排气快时，空气受断热压缩，前端部变成高温，依情形而定，会引起变色，烧焦等问题。

溢料

在结合部前端的树脂温度上升，粘度下降，而易发生溢料，另外，空气造成填充障碍，则射出压力上升，结果模具微张，而全体发生溢料。

填充不足

虽然没有烧焦、溢料发生，但因空气造成的阻力，减缓了填充不足的现象。

气泡银线

空气与树脂凝缩造成气泡、银线、污点等外观不良问题。

循环时间延长

若提高树脂温度，模具温度，降低射出速度，虽然这些不良现象不会发生，但使循环时间延长。

节省能源、节省时间、节省成本

若从设计阶段开始考虑TX排气栓的话，模具的试模次数、时间、材料均可减少。装入排气栓的费用与时间约以往的1/3~1/10。

排气栓使用方法

1、排气栓在压入模具时，表面请勿直接打击。

2、排气栓在压入模具时，请使用JIS规格H7/S6之差。

In order to achieve its maximum molding productivities, simply using its ultra micro breathing cell to exhale gas and air from molds.

Common questions:

Burnt

When aberration and burnt issues occurred, it is because resin is filling faster than air exhaling which will result gasven to overheat.

Overflow

There are 2 possible conditions:

· When temperature of resin gets higher at the tip of seaming, it weakens its bonding strength.

· Air can filled up the path and blocks resin to flow functionallu which will cause ejection pressure to rise and materials to overflow.

Not enough fillings

Due to air pressure, it reduces the ratio of the filling speed, even there is no any sign of burnt or overflow.

Cell streak

If there are some cells ,streaks and mottles occurred, it is because the cells have not been vaporized completely between air and resin.

Extensive cycling time

The higher temperature of resin, molds and slower speed of injection cause extensive cycling time, however, it will not a ffect the quality of final products.

Enerty, time and cost savar

1.It will reduce the trial die,time and materials if users consider to use TX gasvent the beginning of the design.

2.It will save up to 1/3 to 1/10 of the total cost and time if installing gasvent

Installation

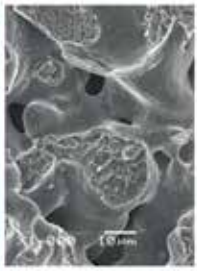
1.Do not touch the surface when gasvent is in use.

2.Use H7/s6 from JIS reference chart.

Type	外径D External dia	长度 L Length
GVC (铜)	3	10
	4	
	5	
	6	
	8	
	10	
	12	12
	15	10
	16	16

Type	外径D External dia	长度 L Length
GVS (不锈钢)	3	4.5
	4	4.5 / 10
	5	10
	6	
	8	
	10	
	12	12
	16	15
	20	

透气钢
POROUS STEEL



■ 主要性能 Main performance:

规格 Spec.		PMS-40-20μm
平均孔径 Mean pore radius		20μm
面孔隙率 Facial porosity		26~32%
密度 Density		6.0~6.2g/cm3
冲击韧性 Impact toughness		7~8J/cm2
抗拉强度 Tensile strength		450~480Mpa
弯曲强度 Bending strength		700~720Mpa
硬度 Hardness		400~450HV0.05
透气性能 Air permeability	EDM	1.5L/min · cm2 (3Bar)
	CNC	0.3L/min · cm2 (3Bar)
表面光洁度 Surface smoothness	EDM	Ra6.30
	CNC	Ra0.80
导热系数 Thermal conductivity		10~11 W/(m · K)
线膨胀系数 Coefficient of linear expansion		12~12.5x10-6(20~150℃)

■ 化学成分表 Chemical element:

C	Mn	Si	S	P	Cr	Ni	Cu
0.1	≤1	≤1	≤0.03	≤0.03	15~17	3~4	2~3

❶ 化学成分近似于SUS431
Chemical components are similar with SUS341.

■ 产品特点 Product characteristics:

透气钢是一种新型多孔金属材料，具有高强、高韧、耐腐蚀和可透气等优点。在模具上使用能迅速将模腔内空气和塑料挥发气体的排除，消除因排气不良造成的缺陷，诸如：烧焦、流痕、缺料、飞边等。

Porous steel is a new type metal material, with high strength, high toughness, corrosion resistance and good permeability. This material application in mold can exhaust gases in mold cavity and eliminate gases in plastics. Eliminate defects caused by poor exhaust, such as burning, flow marks, short shot, edge fin, etc.

透气钢还具有以下经济效应

- 降低注射压力，减少成型和保压时间，降低单位能耗和延长模具寿命；
- 降低内应力，防止产品的变形和翘翘，减少后续去应力工序。
- 快速成型，提高生产效率，降低废品率。

Porous steel also has following economic advantages:

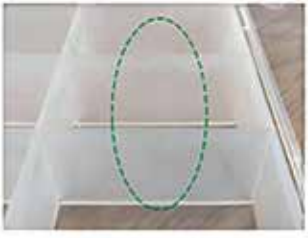
- Reduce injection pressure, molding and holding time, unit energy consumption and prolonged mold shelf life.
- Reduce internal forces to prevent deformation of product. Reduce following de-stressing procedure.
- Rapid prototyping, improving production efficiency and reducing scrap rate.

普通钢材制作，模具困气，
中心位置缺料。
Made of ordinary steel, the mold is air trapped, and the center position is short of material.

透气钢制作，模具排气良好，
网格清晰，成型完美。
Made of porous steel, the mold is well vented, the grid is clear, and the shape is perfect.

普通钢材制作，纳纹时模很难
根据需要形成降光皮纹效果
Made of porous steel, the mold is well vented, the grid is clear, and the shape is perfect.

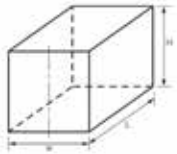
透气钢制作，排气优良，可以根据
自己需要来做出不同纹路效果
Made of porous steel, excellent exhaust, you can make different texture effects according to your needs.



上图未使用透气钢以前，塑料盒边缘弯曲，
下图使用透气钢以后，排气良好，塑料盒边缘平整。
Before the porous steel is used in the above picture, the edge of the plastic box is bent. After the porous steel is used in the picture below, the air exhaust is good and the edge of the plastic box is flat.

透气钢
POROUS STEEL

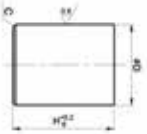
PSP 透气钢板材 Porous steel plate



Type	L	W	H
PSP50	50	50	50
PSP75	75	75	30
PSP100	100	100	50
PSP200	300	200	
PSP300			100
PSP600	600	450	125

其他规格尺寸可以定制
Other size available on request

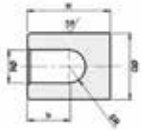
PSC 透气钢圆柱 Porous steel cylinder



Type	D	H	C
PSC4	4	10	0.3 x 45
PSC6	6		
PSC8	8		
PSC10	10	12	0.5 x 45
PSC12	12		
PSC16	16	14	1.0 x 45
PSC20	20	15	
PSC28	28		

整体式透气钢圆柱
Integral cylindrical porous steel

PSU U型透气钢圆柱 U Porous steel cylinder



Type	D	H	h	d	SR
PSU4	4	10	7	2	1
PSU5	5				
PSU6	6			3	1.5
PSU8	8			4	2
PSU10	10			6	3
PSU12	12	12	8		
PSU16	16	14	10	8	4
PSU18	18	16	11	10	5
PSU20	20				

U型透气钢圆柱
U shape cylindrical porous steel

透气钢
POROUS STEEL

透气钢设计、加工、维护指南
Guidelines for design, processing, maintenance of porous steel

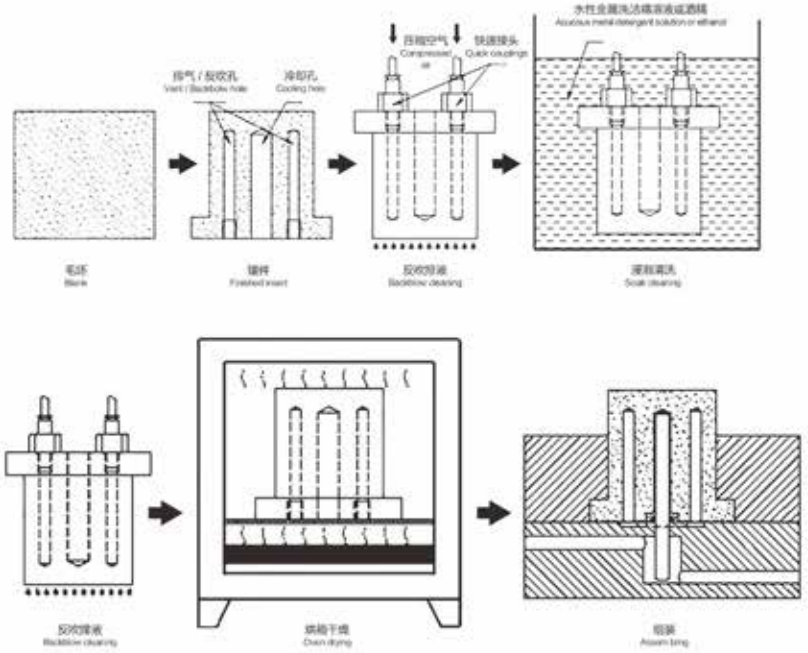
■ 透气钢特性 Attentions:

- 加工时液体会渗入孔洞中，因此必须进行规范的清洗和干燥。
- 设计冷却水道时应注意不能直接通入冷却水。
- 注塑产生的油污和颗粒物可能堵塞透气钢，需要反向通入压缩空气将表面的油污和颗粒物清理掉。配合使用”透气钢流量监测器”将大幅降低堵塞几率。

- The liquid will seep into the holes during processing, so the material should be cleaned and dried before processing.
- The cooling water can’t be connected directly when design cooling channels.
- Porous steel maybe blocked up by greasy dirt and particulates during injection, so compressed air of back blow needed to clean external greasy dirt and particulates. In addition, with the use of porous steel flow monitor can reduce block rate substantially.

■ 加工、清洗和安装 Processing, cleaning and assembling:

- 加工、清洗和安装流程应参考下图所示：
  Processing, cleaning and assembling flow chart refer to the picture as follows.



加工、清洗和安装流程示意图 processing, cleaning and assembling flow chart

透气钢
POROUS STEEL

■ 加工方法 Processing method：

透气钢可选用的加工方法与致密钢完全相同，但应注意不同加工方式可能对孔洞的造成不同程度堵塞，根据对透气的影响将加工方法分为：

接触性加工

接触性加工为传统机械加工，会发生堵塞降低透气性；

非接触加工

一般为放电加工和激光加工，不会降低透气性，EDM加工一般会扩大表面孔洞

Processing method of porous steel is the same with dense steel,but should attention that different processing method will result in block at different degrees. Processing method can be divided into two methods according to the effect on the permeability.

Contact processing

contact processing is a traditional machining, will result in block and reduce air permeability.

Non-contact processing

Usually means electro discharge machining and laser machining, and will not reduce air permeability. EDM process will enlarge surface holes.

CNC精加工

- 选用适用M系材质加工的圆弧铣刀或球头铣刀（有PVD涂层更佳）。
- Choose arc milling cutter or ball headed milling cutter made from M series material.(If the knife coated with PVC will be better.

线切割加工 / WEDM

- 中走丝加工后建议进行抛光处理，避免粘模。
- 慢走丝切割后可直接使用，但慢走丝会出现细微跳丝现象，属于正常现象。
- Polishing treatment needed After middle-speed WEDM process to avoid sticking.
- It can be used directly after WEDM-LS process. Slightly steel wire skipping can be accepted.

EDM加工 / EDM processing

- EDM加工时电流会扩大表面孔洞，EDM加工后应进行抛光处理。
- During EDM processing the current will enlarge surface holes. So polishing treatment needed after EDM processing.

激光刻蚀 / Laser engraving

- 功率：9W（Power:9W） / 频率：30KHz(Frequency:30KHz)
- 线宽：0.01mm(line width:0.01mm) / 速度：800mm/sec (Speed:800mm/sec)
- 激光功率越大表面氧化越严重，应先大功率刻蚀、后小功率去氧化层。
  Surface oxidation will be worse with higher laser power. So high-power etching first, low-power deoxidization followed.

抛光 / Polishing

- 不同方式的加工后均可进行抛光，除慢走丝和EDM加工后应从1000#纤维油石开始抛光外，其它应从800#纤维油石开始抛光。
- The mould can be polished after different machining。Except the method of wire cutting and EDM，it should be polished from 1000# fiber stone，the others can be started from 800# fiber stone.

维护和清洗
Maintanence and cleaning

■ 堵塞原因分析 Blockage reason analysis：

在注塑过程中，树脂产生的油污和颗粒物可能导致透气钢表面堵塞，堵塞物主要有：

- 树脂残留：塑料本身残留，增塑剂、抗静电剂、阻燃剂等
- 颗粒物：包括各种矿物质颜料、炭黑等填料、空气中粉尘等
- 油脂物：脱模剂、防锈剂、润滑剂等

The first problem of solving blockage: Back blow liquid grease and particulates in time to prevent high temperature consolidation on porous steel surface.

- Resin residues: Plastic residues, plasticizer, antistatic agent and flame retardant.
- Particulates: including different kind of mineral pigments, carbon black and dust in air.
- Grease: releasing agent,anti-rust agent and lubricant.

■ 维护和清洗 Maintanence and cleaning：

如轻度堵塞会触发监测器报警，报警后可参考图6所示，使用喷壶喷洒丙酮或酒精在透气钢表面，油污溶解后用棉布或脱脂棉擦拭干净，重复2-3次，再打开反吹气体用棉布或脱脂棉一边反吹一边擦拭即可。

If slightly blocked caused monitor alarming, reactions refer to picture 6. Using watering can spraying alcohol or acetone on the surface of porous steel. Clean the surface with cotton cloth or absorbent cotton after the grease dissolved and repeat 2-3 times. Then blow the surface with back blow gas and wipe with cotton cloth or absorbent cotton at the same time.

透气钢的设计、使用、维护都是比较专业的，如果你想对这个产品做更进一步的了解，请及时和我们联系，我们会给你提供更加详细和专业的指导。

The design, use and maintenance of porous steel are more professional, if you want to further understand this product, please contact us in time, we will provide you with more detailed and professional guidance.