

三流体/四流体喷嘴 Three- and Four-Substance Nozzles

● 多流体喷嘴技术在确保产品质量的前提下，完美兼顾了雾化功能和成本两方面。

SCHLICK multiple nozzle technology combines functional design and complete cost-effectiveness with familiar SCHLICK quality

● SCHLICK 能实现多种流体的同时混合，雾化液滴十分精细，而且一致性、重复性好

The SCHLICK design for very fine atomisation with simultaneous mixing of multiple media means that reproducible results are guaranteed

● 定制设计和个性化解决方案能满足客户各种应用

Individual solutions and designs guarantee very diverse operation options

● 多种控制选项，为流程优化提供可能

Several control options allow for more freedom to optimise processes

为雾化解决方案而生

SCHLICK 雾化技术



材质

- 耐酸不锈钢
- 耐热不锈钢
- 钽金属
- 钛金属
- 哈氏合金
- 铬镍铁合金
- 客户指定材料

Materials

- Acid resistant stainless steel
- Heat resistant stainless steel
- Tantalum
- Titanium
- Hastelloy
- Inconel
- Custom materials available on request

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具体解决方案 - SCHLICK 创造

SCHLICK 多流体喷嘴仅通过一个喷嘴和一路雾化介质(空气或者蒸汽等)就能实现几种液体的精细雾化。

当雾化介质和流体离开喷嘴口的同时,两者密集混合

为增大雾化介质和流体的接触和碰撞面积,也可额外增加一路雾化介质

流体在喷嘴内部没有机会发生接触、反应,因为几种流体是在喷嘴外混合,且雾化介质是液体混合后才接触流体的。

液滴的大小可以通过流体和雾化介质的流量来控制,最小和最大流量之比(调节范围),大致能达到1:10。

Specific solutions – made by SCHLICK

SCHLICK multi-substance nozzles allow very fine atomisation of several liquids with one nozzle and only one atomising medium (air, gas or steam).

At the same time, an extremely intensive mix of the liquids takes place when they leave the nozzle's orifice.

There is also the possibility of additionally feeding a channel with air, gas, or steam to ensure a larger area of exchange between atomising medium and liquid.

Reactions between the various liquids inside the nozzle are ruled out, as the media have no contact until they mix externally when leave the nozzle's orifice.

The droplet size can be individually set from the ratio of the drive media mass to the liquid mass. A liquid control range of 1:10 is achievable.



雾化形状: 圆锥形



雾化角度: 10° - 40°



处理量: 0,5 - 40 l/min



Spray pattern: circular full-cone



Spray angle: 10° - 40°



Capacity: 0.5 - 40 l/min

创新性的产品设计

- 两种或三种流体同时混合
- 如将多流体喷嘴用作两流式喷嘴，雾化将更精细，更均匀
- 应用范围极为广泛
- 终身售后服务保障
- 免费产品设计和技术支持

Innovative product design

- Simultaneous mixing of two or three liquids
- Even finer and more even atomisation when used as a two-substance nozzle
- Very wide range of applications
- Long-term after-sales warranty
- Engineering free of charge

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Two-Substance Nozzles

防飞溅/差速包壳技术
ABC/PCA Technique

三/四流体喷嘴
Three-/Four-Substance Nozzles

多喷头技术
Multispray

喷嘴杆
Insertion Pipes

喷嘴头
Nozzle Heads

空心锥喷嘴
Full-Cone Nozzles

空心锥喷嘴
Hollow-Cone Nozzles

硬质合金喷嘴
Carbide Nozzles

扁平喷嘴
Flat-Spray Nozzles

喷射喷嘴
Smooth-Jet Nozzles

混合喷嘴
Mixing Nozzles

拉瓦尔喷嘴
Laval Nozzles

清洗喷嘴
Cleaning Nozzles

喷嘴附件
Accessories

测试中心
Test Center

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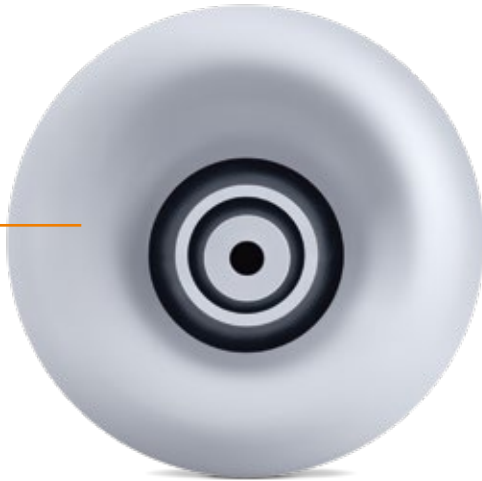
三流体喷嘴有两种雾化控制方式可供选择

雾化介质 - 流体 - 雾化介质

和两流体喷嘴相比，相同的液体流量和压缩空气消耗量下，三流体的喷嘴雾化更好更均匀，因为流体和压缩空气的接触面积更大

流体1 - 流体2 - 雾化介质

两种流体同时雾化



Two different options for controlling the SCHLICK three-substance nozzles lead to additional freedom

Atomisation medium – Liquid – Atomisation medium

By selecting the appropriate cross-section even finer and more even atomisation is possible compared to the same air (gas or air) and energy consumption with a two-substance nozzle. The reason is the large interfacial surface between the atomisation medium and the liquid.

Liquid 1 – Liquid 2 – Atomisation medium

Two liquids are atomized simultaneously.

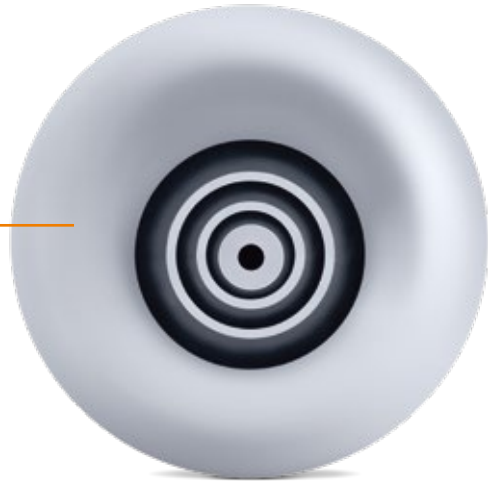
四流体喷嘴也有两种雾化控制方式可供选择

流体 - 雾化介质 - 流体 - 雾化介质

这种方式下，流体和雾化介质接触面积大

流体1 - 流体2 - 流体3 - 雾化介质

三种流体同时雾化



Even the SCHLICK four-substance nozzles offer two options for control:

Liquid – Steam/Air – Liquid – Steam/Air

Larger interfacial surface between the liquid and the atomisation medium.

Liquid 1 – Liquid 2 – Liquid 3 – Steam/Air

Simultaneous atomisation of three liquids.

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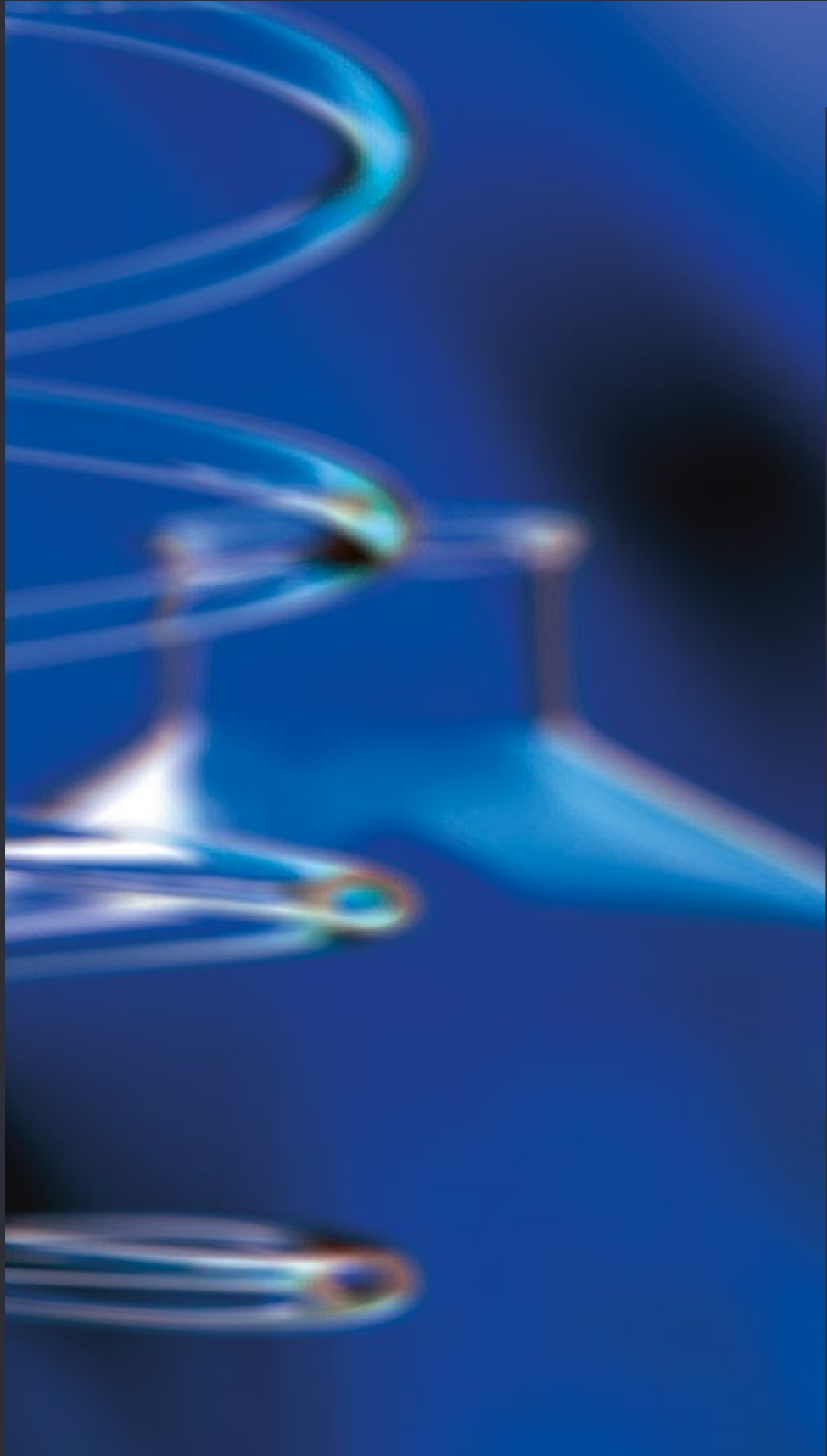
三-/四流体喷嘴/圆锥形/外混型
Three-/Four-Substance Nozzles / Full-Cone / External Mixing

应用

- 吸附
- 包衣
- 燃烧
- 精整
- 流化床技术
- 制粒
- 混合
- 工艺工程
- 修复
- 喷雾干燥
- 烟草工业

Applications

- Adsorption
- Coating
- Combustion
- Finishing
- Fluid bed technology
- Granulating
- Mixing
- Process engineering
- Recovery
- Spray drying
- Tobacco industry
(casing, flavouring)



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Three-/Four-
Substance Nozzles

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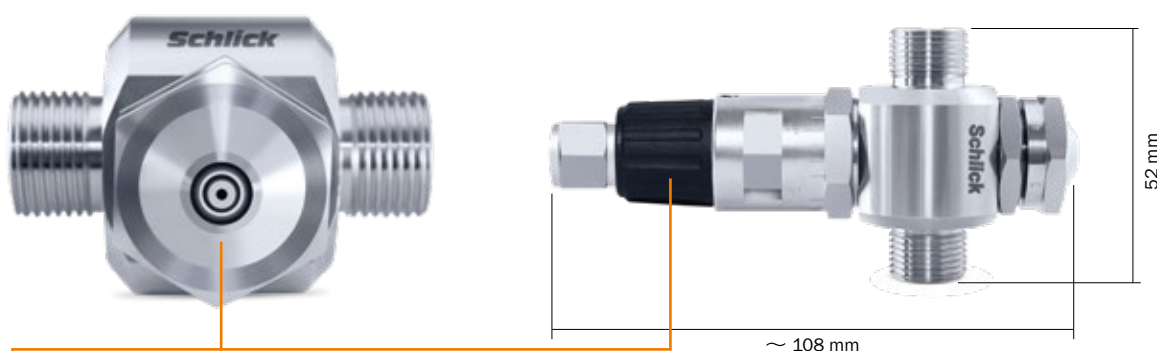
拉瓦尔喷嘴
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- 三流体喷嘴946 S1:
以中间流道(液体或气体)作为控制针阀
*Three-substance nozzle model 946 S1
With central air/liquid channel as
control needle.*



- 三流体喷嘴0/4 S41:
客户定制款,喷杆形状和长度依客户要求定制
*Three-substance assembly model 0/4 S41
Due to individual and customer-specific shaft
length please ask for dimensions.*

- 三流体喷嘴0/5 S30:
客户定制款,喷杆形状和长度依客户要求定制
*Three-substance assembly model 0/5 S30
Due to individual and customer-specific shaft
length please ask for dimensions.*

信任和质量是合作成功的基础，
 这不仅仅指我们的产品，
 也适用于我们的服务。
 如有需要，我们可向您提供喷嘴相关文件，
 如技术手册(包括图纸、流量图、安装和操作说明)
 、SCHLICK 的公司相关证书以及喷嘴的材质说明。

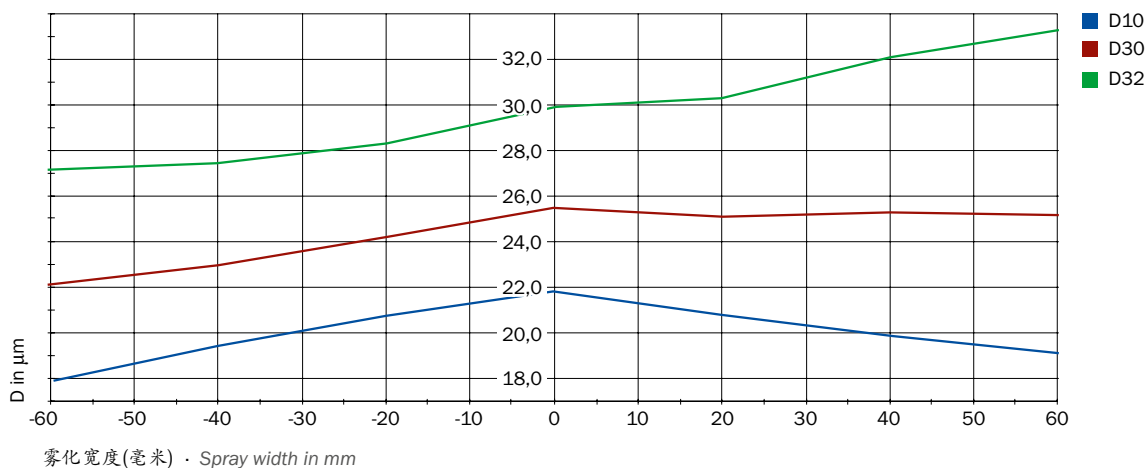
Reliability and quality are the basis for successful cooperation. This applies both to our products and to our service. If you wish, we will supply you with all necessary documentation such as technical handbooks for the nozzles (drawings, flow diagrams, installation and operating instructions) together with factory and material specifications.

三/四流体喷嘴参数

Exemplary performance data of SCHLICK three- and four-substance nozzles

型号 <i>Model</i>	三流体喷嘴 <i>Three-substance</i>	四流体喷嘴 <i>Four-substance</i>	雾化介质流量 (6 bar, 单位:立方/小时) <i>Atomising medium at 6 bar (g) in Normal m³/h of air</i>	最大流量 (水,单位:升/小时) <i>Maximum water flow rate in l/h</i>	液滴大小 (单位:微米) <i>Volumetric middle droplet size in µm</i>	雾化介质和水的重量比 <i>kg drive medium/kg water</i>
946 S1	•		32	100	50 - 70	0.30
0/4 S41	•		98	300	50	0.39
0/5 S30	•		220	650	50	0.40
0/56 S3	•		550	2100	70 - 80	0.30
0/56 S7	•		550	2100	70 - 80	0.30
0/56 S9	•		260	1030	70 - 80	0.30
0/56 S12	•		440	1740	70 - 80	0.30
0/56 S15	•		1970	7800	70 - 80	0.30
0/56 S16	•		920	3600	70 - 80	0.30
0/56 S11		•	350	1380	50 - 70	0.30
0/56 S17		•	79,3	310	50 - 70	0.30
0/56 S18		•	460	1820	70 - 80	0.30
0/56 S20		•	430	1705	70 - 80	0.30

946 S1 喷嘴雾化液滴大小 Droplet size model 946 S1



946 S1 喷嘴雾化液滴大小

中心孔径: 0.8毫米, 喷嘴加长(旋开1圈)
 孔口1环形间隙: 2.3毫米, 空气帽位置4
 雾化压力: 1.0 bar, 压缩空气消耗量: 7.5立方/小时
 孔口1雾化压力: 2.0 bar
 孔口1压缩空气消耗量: 2.6立方/小时
 雾化宽度: 120mm, 距离: 200mm
 液体流量: 100克/分钟, 流体压力: 0.1bar

Droplet size of Mod. 946 S1

Central orifice: 0.8 mm extended spindle (opened 1 rotation),
 orifice annular gap 1: 2.3 mm, air cap setting 4,
 atomising air pressure: 1.0 bar (g), atomising air consumption: 7.5 Nm³/h,
 atomising air pressure annular gap 1: 2.0 bar (g),
 atomising air consumption annular gap 1: 2.6 Nm³/h,
 spray width: 120 mm, distance: 200 mm,
 liquid throughput: 100 g/min, liquid pressure: 0.1 bar (Δp)

客户定制设计 *Customized Designs*

可按客户要求定制， 小批量生产

作为一家全球领先的喷嘴制造商，SCHLICK一直为客户提供高质量的标准化解决方案。

当然，凭借高精度的制造能力以及丰富的研发经验，SCHLICK也可根据客户要求设计开发、定制喷嘴。

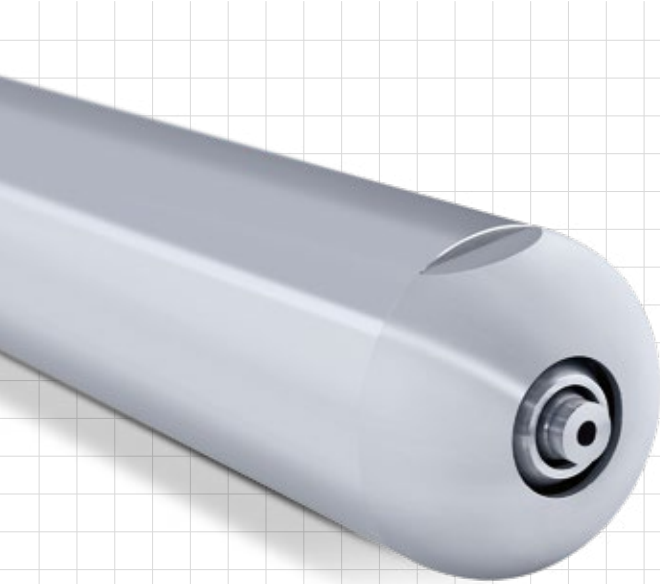
即使客户需求数量很少、交期又很急。

Custom and individual designs, small series

Als führender Düsenhersteller sind standardisierte Lösungen in hoher Qualität für SCHLICK business-as-usual.

Durch die extreme Fertigungstiefe und umfassendes Know-how werden aber selbstverständlich auch Sonder- und Einzelanfertigungen für individuelle Aufgabenstellungen realisiert.

Auch für Kleinserien. Innerhalb kürzester Zeit.



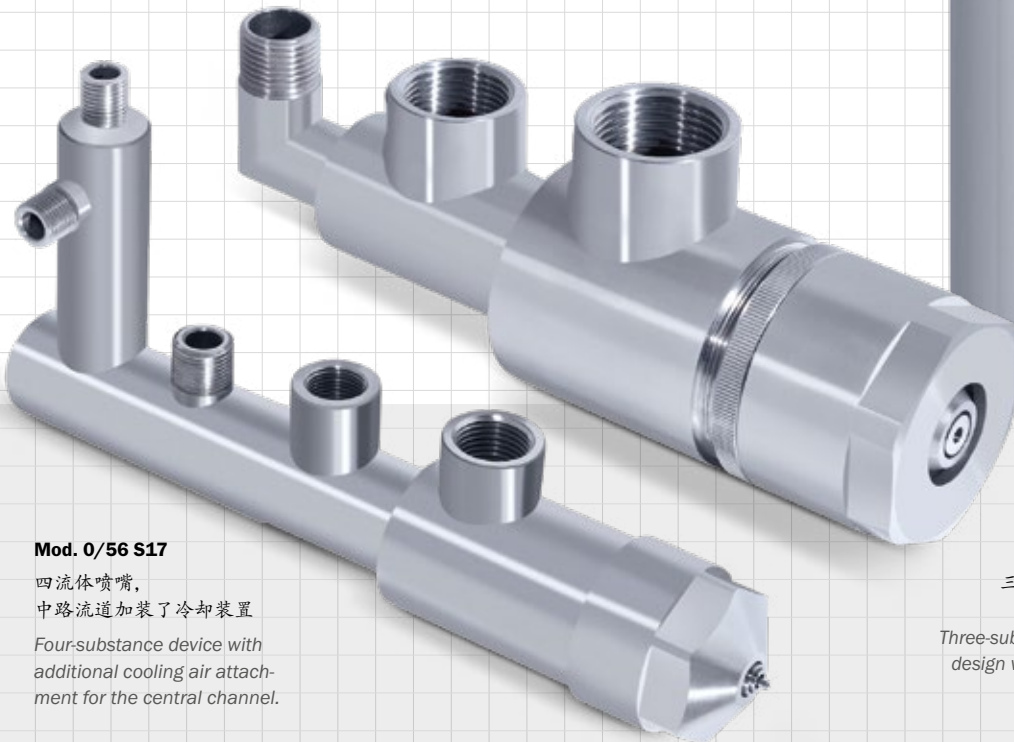
Mod. 0/56 S3

三流体喷嘴, 喷杆长度可按要求定制, 圆形风帽, 中间喷芯加长
Three-substance device with variable shaft length, rounded air cap and extended central liquid unit.



Mod. 0/56 S18

直角四流体喷嘴, 可单独配连接喷杆和夹紧装置
90° angled four-substance device with connected pipe design and central clamping.



Mod. 0/56 S17

四流体喷嘴, 中路流道加装了冷却装置
Four-substance device with additional cooling air attachment for the central channel.

Mod. 0/56 S3

三流体喷嘴, 焊接式设计, 所有接头都在同一侧
Three-substance device. Welded design with all attachments on one side.

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Test Center