在300jobs/天的大型车房，经常会有客户要定制油印图案，且数量小，品种多。这种情况下采用刻钢板移印的方法，显然无法胜任工作。于是脱胎于喷墨打印机的数码油标喷印机应运而生。

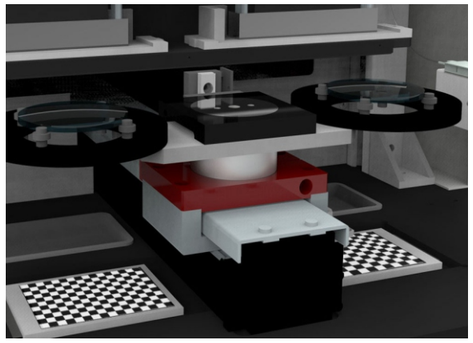
喷印机相比于移印机，可以同打印机一样随意喷印你需要的图案，结合自动探测隐形标，可以自动完成黄标的喷印。并且UV油墨不同于移印机的油性溶剂油墨,不会在镜片表面留下印记。

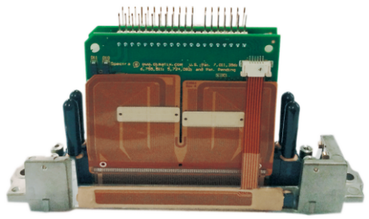
DIP300喷印机采用环保UV油墨和双工位冗余设计，自带每天的清洗程序、假日清洗程序,温控系统和保湿机构，最大程度地防止油墨堵塞喷嘴造成的Down机现象,简化维护保养,让你轻松、干净、环保喷印成为可能。

In mass production labs with 300 jobs/day, there are always clients asking for customization of their own pattern, with a small quantity but huge varieties. Pad printing by cliche is apparently unable to do the job. So digital inking printers, evolved from inkjet printers, came into market.

Compared to pad printing, digital ink printers can print any image you design and automatically finish any kind of image thanks to its combination with automatic identifying invisible mark. Unlike oil-based solvent, UV ink will not leave a mark on the lens surface after mark is erased by alcohol.

DIP300 uses environment friendly UV ink and is designed with duplex bit redundancy. Meanwhile, it comes with daily cleaning program, holiday cleaning program, moisturizing ink nozzle, ink temperature control unit to greatly prevent the nozzle from ink jam that will further leads to a Down machine. Its simplified maintenance makes it possible for you to experience an easy, clean and environmental friendly printing.



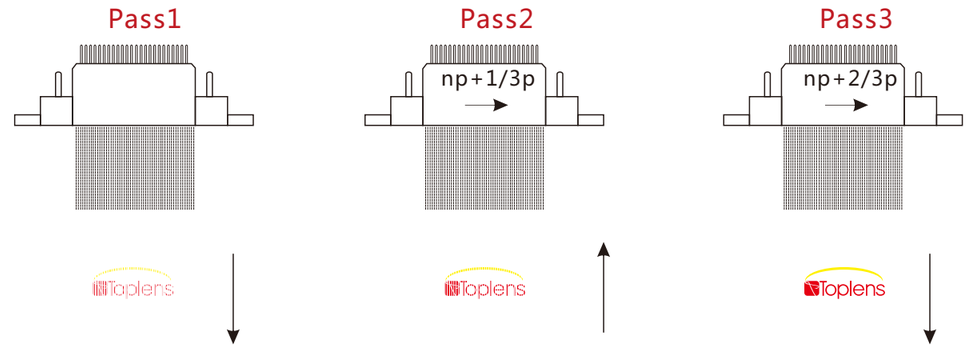


喷墨头
Inkjet Head

为了满足一部分用户对高分辨率的要求，使之有可与移印相比拟的效果，DIP300集成了细分插值系统分辨率从200DPI到1000DPI的可调，当有某个喷嘴堵塞时，这个细分插值系统尤其显示优势，可以用相邻的喷口来代替工作,解决坏点的问题。

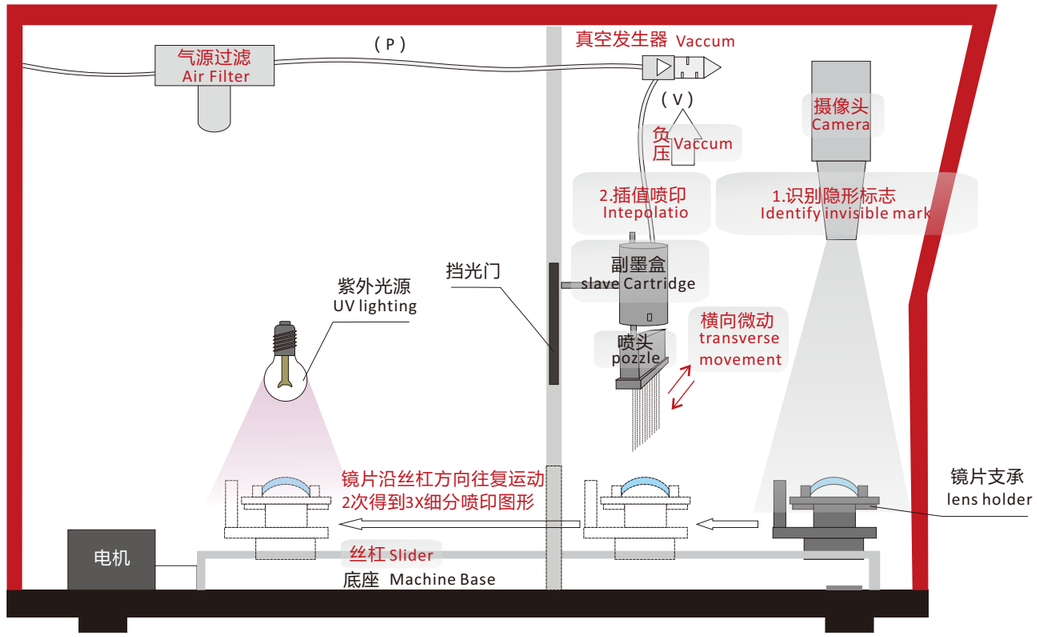
In order to meet clients' requirement of high-resolution inking so that it can have comparable results with pad printing, DIP300 introduces interpolation method in X-Y direction, resolution from 200DPI to 1000DPI adjustable. When there is a jammed nozzle, this in particular shows the advantages of interpolation system, solving the problem of dead pixels by replacing the nozzle with the adjacent ones.

3X细分插值原理(上如图)

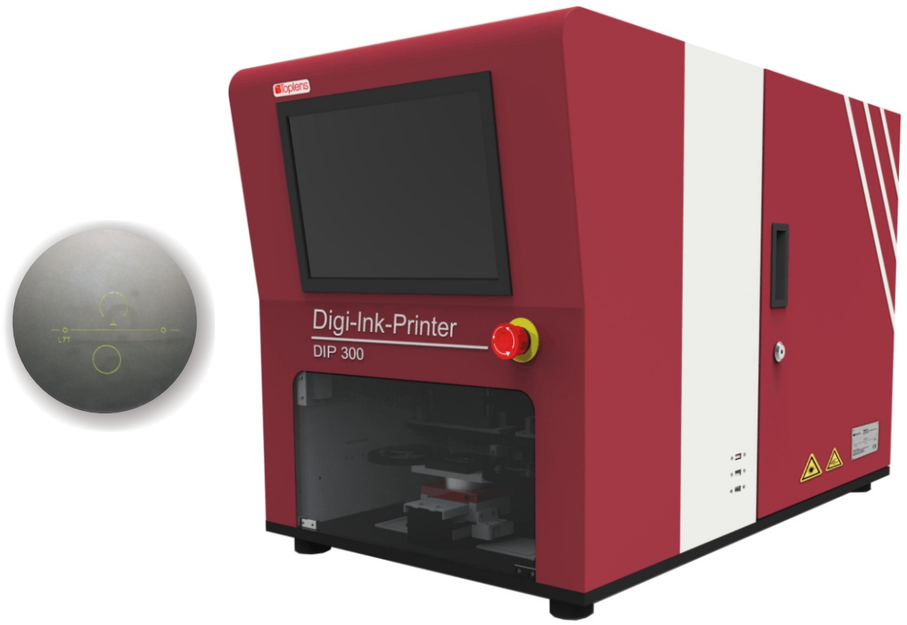


Schematic of Digital Ink Printer

数字喷印机的原理框图



DIP 300



技术特性

FEATURES

可喷印任何膜层的镜片，包括渐进	Able to mark any lens, including semi-finished,
镜片和半制片	Rx and Freeform lens
自动识别隐形标志，自动识别R/L镜片	Automatic R/L information and invisible mark reading
自动从服务器读取要喷印的图像	Automatic obtaining Jobfile/images
分辨率到800DPI到1200DPI	Resolution from 800DPI to 1200DPI
生产效率：600片/小时	Capacity up to 600 pcs/hr
双工位双喷头设计	Two-station design
采用环保UV油墨，颜色用户可选	Environment friendly UV ink
Y/Z精密移动平台，保证镜片的喷印质量	Y/Z precise movement platform
兼容 VCA and OMA 标准	Compatible with VCA and OMA standard
采用 1280×800, 12.1"的触摸显示屏	Display: 1280×800, 12.1" WXGA Touch LCD
采用Windows XPE系统	Windows XPE
专用每天清洗程序，维护方便	Easy daily maintenance
根据CE标准设计	Standard design in compliance with CE regulations

技术参数

TECHNICAL DATA

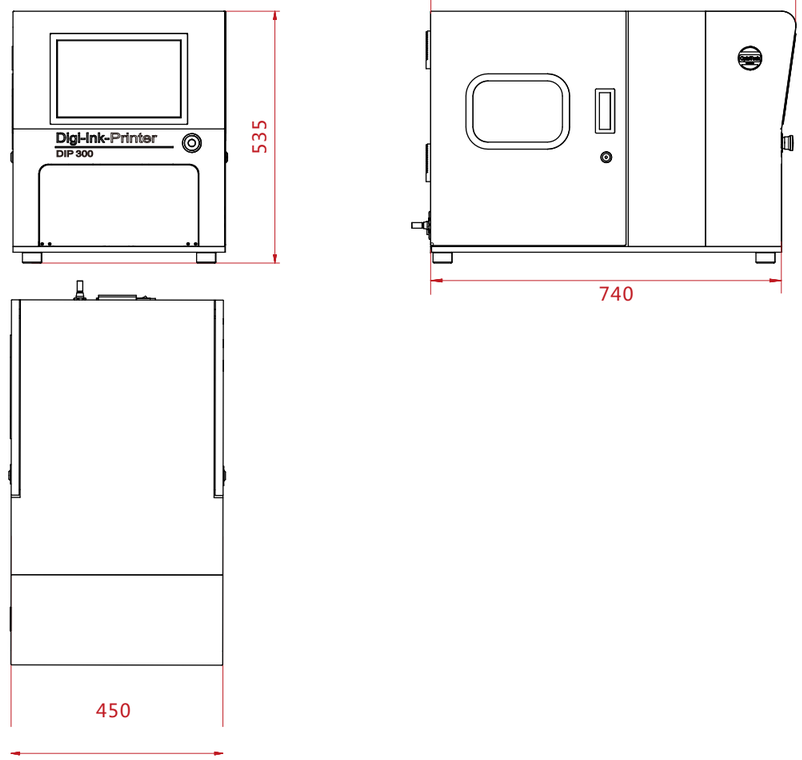
压缩空气	>4bar	Air Pressure
输入电源	100-230VAC 50/60Hz	Voltage
功率	800W	Power
外形尺寸	H×W×D: 525×450×750mm	Dimensions
重量	about 70 kg	Weight

附件

Accessories

品名 Items	规格 Description	部件号 P/N
喷头 Print Head	400dpi ,Steel	030-002-012
UV 油墨 UV Ink	Black	030-001-008
	yellow	030-001-007
清洗液 Flush	64*42	030-004-003

三视图

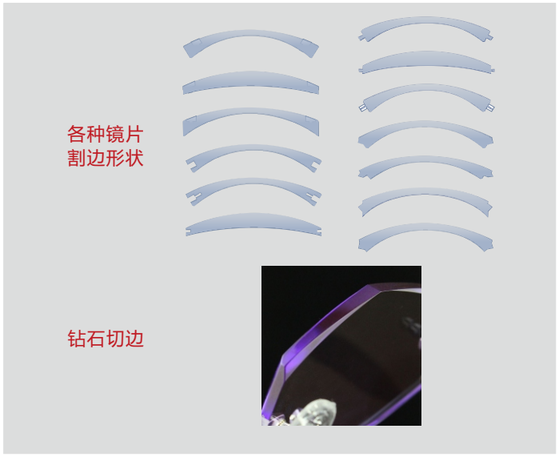


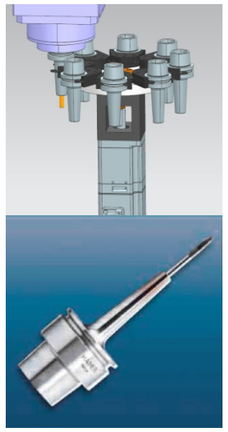
SmartEdger是目前市面上唯一的5轴5联动的割边装配中心，其All-in-One的设计就是要让人从繁杂的装配工作中解脱出来。工序包括割边、倒边、钻孔、开槽、抛光和钻石切边等。

基于EtherCAT工业总线运动控制模块的SmartEdger，可以对高基弯运动镜等高难镜片进行装配，特别是能够进行钻石切边，大大地解决了目前钻石切边人员市场短缺的难题。

SmartEdger is the only commercial 5-axis of lens crib center that is available currently, with its design of All-in-One freeing people from complicated fitting work. Its processing cycle includes crib, bevel, drilling, grooving, polishing and diamond trimming.

Based on EtherCAT industrial BUS motion control unit, SmartEdger can complete the fitting job with lens of high curves required by sports and other difficulties, especially diamond trimming, which greatly makes up the current shortage of diamond trimming professionals.





SmartEdger采用立式双工件轴和真空吸附装夹技术，可在线检测镜片的光学中心和散光轴位，快速切割一副镜片。标准配备的水切和干切双功能。内循环的水切可以确保你洁净的车间不像干切一样被污染，废渣收集系统可以让你轻松处理废渣，符合城市环保的要求。最高达40,000rpm的刀具，结合HSK-E25热缩刀柄，可以在1分钟内完成一副常规镜片的割边加工。

SmartEdger采用了自动换刀器设计，8个刀位可以让你有足够的加工工序。特别是聚氨酯抛光工具的引入，是钻石切边成为可能。

SmartEdger is designed in a vertical Twin workpiece spindle,vacuum clamping technology and in-situ power and cylinder axis detextion,which enable to cut one pairs of lens with both water-cut and dry-cut option. Unlike dry-cut that will bring pollution, water-cut in the cycle makes sure your workshop clean, through its contaminated waste collection system that lets you easily deal with waste and conforms to the city requirement of environment protection. With the tool of up to 40,000 rpm combined with HSK-E25 shrink tool holder, plus water-cut, crib processing of one conventional pair of lenses can be done within 1minute. In order to coordinate with these objectives, SmartEdger integrates an automatic tool shift with eight positions which allows you to have enough processing possibility. Thanks to shrink tool holder and PU polishing tool,it is possible to crib lenses faster and more accurately, even diamond trimming.

SmartEdger割边机采用5轴数控和运动系统和多种PCD成形切割刀具，可以对任何复杂的镜片和形状进行切割；包含的镜片边缘轮廓测量模块，可以非接触快速测量一副镜片的边缘轮廓；在位光学中心和散光轴位测量模块，可以省略离线的额外上盘工序；双工件轴和镜片真空吸附夹持系统是一次加工一副镜片成为可能。

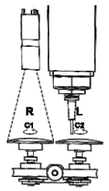
SmartDraw软件更是兼容OMA和VCA标准的3D镜片加工处理软件，可以实时显示3D的镜片形状，也可以让你操控工序参数。可以让你在切边前就可以看到切边后的效果，防止差错的发生。在3D环境中，你可以很方便地对要加工的工序进行编辑.为了提高加工效率，SmartDraw软件还提供脱机版本，你可以在普通的电脑中，比如在镜框扫描仪的工作电脑上，尽情地对你要加工的镜片进行精雕细琢，提高效率。同时你也可以设置要加工的工序和参数，这些参数会自动通过服务器上传到设备的加工序列中，在你喝咖啡的同时完成镜片的加工。

SmartEdger采用模块化设计，分数据处理模块、主轴模块、驱动模块、气源模块、冷切水模块、IO模块。得益于EtherCAT协议，SmartEdger开机后会自检各个模块，如果模块有问题，SmartEdger会直接告诉你出故障的单元或模块，让你轻松定位故障。

SmartEdger equipped with XYZBC1C2 CNC motion control system and PCD cutting tools, which enable to cut any complicated shape lens. Lens edge profile detection unit can inspect dual lens edge profile; In-Situ optical center and cylinder axis detection unit with vacuum clamp less system, save your investment on extra blocking sytem. Above all highlights make quick cutting one pair lens in one minute possible

SmartDraw is a 3D lens processing software, compatible with OMA and VCA standard. It can display real time 3D lens shape and allow you to control process parameters, which lets you check the results before and after trimming to avoid mistakes. In a 3D environment, you can easily edit processes in order to improve processing efficiency. SmartDraw also offers an offline version, so that you can install it on other computers. You can enjoy lens crafting during the process, improve efficiency and set process parameters automatically uploaded through the server to process the sequence of jobs, completing lens processing while having a coffee.

SmartEdger is designed based on modules, consisting of data processing module, the spindle module, driver module, compressed air module, cooling water modules, and IO modules. Thanks to EtherCAT protocol, SmartEdger will check each module automatically at startup. If there is a module in question, SmartEdger will tell you which unit or module it is to help you easily locate the fault.



5-Axis CNC system

Frame Forming

SmartEdger

可用于各类树脂和聚氨酯镜片的装配，包括单光、散光、渐进片和Sport镜片.可加工类型：全框、半框和无框等.工序：割边、开槽、倒边、钻孔、抛光和钻石切边。

for various plastics lens cribbing and fitting, including single vision, bi-focal,progressive and sports lens for full frame, semi-frame, rimless. Processing cycles includes cribbing, grooving, chambering, drilling, poli shing and diamond trimming

FEATURES

技术特性

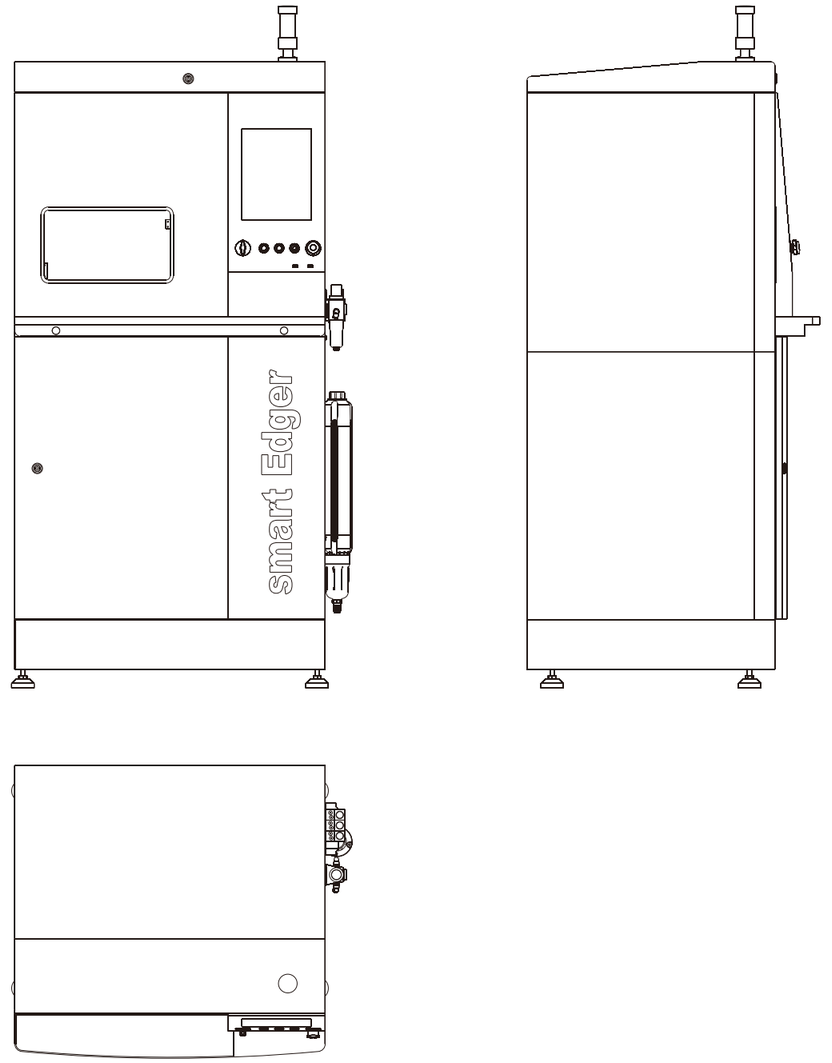
可干切或水切，自带25L冷切水箱	Enable both Wet & Dry cutting with 25L coolant tank
最大镜片：ϕf85mm	Max Diameter:ϕf85mm
数控轴系:X,Y,Z,B,C-5轴	CNCAxis:X,Y,Z,B,C-5Axis
数控协议：EtherCAT工业总线构架	CNC Protocol: Beckhoff EtherCAT
采用非上盘装夹技术	Clampingless Technology
双工件轴	DualWorkpiecespindlesdesign
镜片基弯：最大12D	Base: 12D
工具最大转速：40.000 RPM	Tool: 40.000RPM
刀柄：HSK-E25热缩刀柄	Tool Holder: HSK-E25 Shrink
边厚测量：2D 探针系统	Edge detection: 2DPin
自动换刀器：8个刀具	Auto Tool Changer: 8 positions
工位镜框数据标准：OMA或3D STE	Compatible with OMA standard or 3D STEP files
控制器:工业电脑	Controller: Industrial PC
显示器:12.1"	Display:12.1"
操作系统：Windows 7 嵌入式系统	OS: Windows7
根据CE标准设计	Standard design in compliance with CE regulations

TECHNICAL DATA

技术参数

输入电源	220V 50Hz	Voltage
功率	<2.5kW	Power
外形尺寸	1600X830X760mm	Dimensions
重量	about 750 kg	Weight

三视图



自由曲面设计（包括渐进多焦点）是车房中心的灵魂。自由曲面是指在曲面上光度成非对称的，能实现单一或多个光度优化的曲面，可以是A-Toric面，可以是渐进多焦点面，也可以是个性化单光曲面。

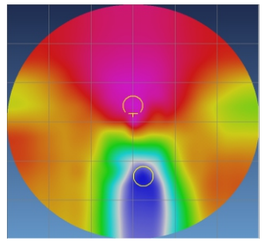
对于面光度有分布的自由曲面的生成，已经从求解高次非线性方式，有限元网格化平滑过渡到最新的有限元融合和几何光线追迹的技术。

我们讲自由曲面的设计，其实是包含两层含义:一是设计的框架，如通道长度，偏离量，面积分布等等。这方面往往不同公司有不同的定义。另外一个就是在相同框架下盲区的最大散度大小，通道宽度。一般来讲，盲区最大散光出现位置越远离镜片的有效光度区，越能让人眼舒服适应。

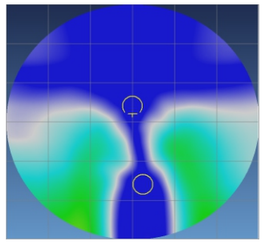
Free-form surface design (including progressive multifocal) is the soul of RX Labs. Freeform here is defined as lens surface with non-symmetrical optical power distribution that can be optimized to achieve a single or a plurality of the optical power, such as A-Toric surface, progressive multifocal surface or individual lens surface.

Solution to create such freeform with power distribution, has been evolved from high-order non-linear manner, finite element mesh of a smooth transition to the latest finite element integration and geometric optical ray tracing techniques.

Freeform surface design here actually contains two concepts: first, the design of the framework, such as the channel length, the shift amount, the area distribution and so on. This aspect is often defined differently among companies. The other concept is the maximum cylinder of astigmatism distortion area and the channel length within the same frame. In general, the further the maximum of cylinder spot in astigmatism distortion area is from effective optical power area, the more comfortable human eyes would feel.



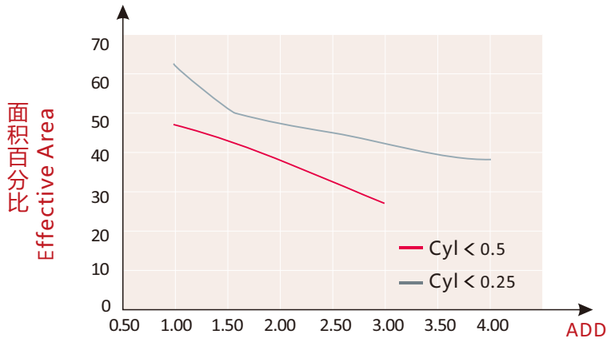
球光图



散光度

左图是一个典型的渐进多焦点的球光图和散光度

Typical Power and Cylinder Map



ADD from 1D to 4D area with Cyl<0.5

Some parameters to judge design

评定渐进设计好坏的几个参数

通道的宽度

ADD越大,通道就越窄。这是因为ADD越大,最大的散光就越大。通道两侧的散光就大。在ADD相同的情况下，通道的宽度直接相关于最大散光值和出现的位置。设计好坏的一个评价指标就是要让最大散光出现的位置远离中心有效区域(ϕ40mm)。

有效区域

(ϕ40mm)内的最大散光值,一般的设计这个值要大于ADD.好的设计则小于ADD。右图是我们ADD2.0典型设计的散光图。

CYL<0.25D 0.5D

ADD

,

Office

The width of the channel

The bigger ADD value is, the narrower channels become. This is because the maximum cylinder of astigmatism increases with ADD value, which narrows the channel. If ADD value keeps constant, the width of the channel is directly related to the maximum cylinder value and the position where the astigmatism occurs. An evaluation on the design is to check whether maximum astigmatism will appear away from the effective center area (ϕ40mm).

Effective Area

In effective area (ϕ40mm), this value is generally greater than ADD value while a good design can make it less than ADD value. The following graph is the typical cylinder map of ADD2.0 freeform we designed.

Maximum astigmatism cylinder

In general, the larger the ADD value, the smaller the effective area ratio, the ratio of the area with a CYL <0.25D and 0.5D to the entire area. Please refer to the following figure.

The essence of designs with various purposes is to adjust the distribution ratio between far view and near view areas. Then there is interior design, the standard design, outdoor design, Office design and fatigue design with different purposes.