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杭州科汀光学技术有限公司
KETING OPTICAL TECHNOLOGY INC., HANGZHOU

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 KOTI
KETING
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TECHNOLOGY INC.

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公司简介

COMPANY PROFILE



杭州科汀光学技术有限公司创建于1996年初，致力于光学薄膜器件和光机系统的生产与研发，是国家首批高新技术企业。公司以浙江大学光电学院为技术依托，建有浙江省研究院，高新技术研发中心、国家重点实验室中试基地等多个研发中心，拥有一支高层次、高水平的技术研发团队。公司批量生产应用于各类投影机，穿戴显示，数码相机，智能手机，车载摄像以及高端精密仪器用的各种光学薄膜元器件及组件，同时自主研发生产AR增强现实等光机模组。公司在光学薄膜元器件的研究开发以及制造方面一直处于国内领先水平，产品绝大多数出口国外，部分领域产品占据市场高份额，2016年荣获“隐形冠军”称号，在国内外享有盛誉，已成为关键光学薄膜器件及光学系统解决方案提供商。

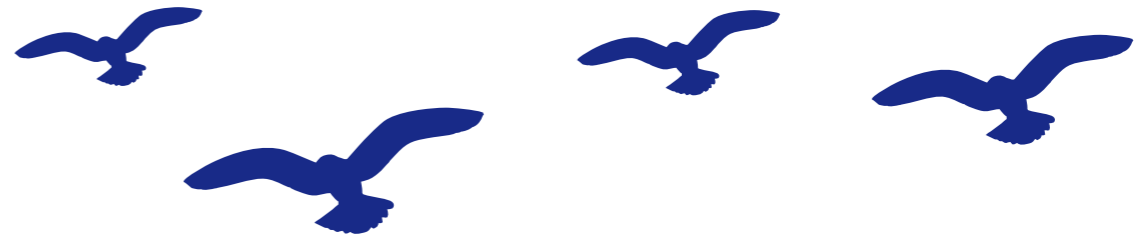
Hangzhou Keting Optical Technology Co., LTD., founded in early 1996, is committed to the development and production of optical components and optical systems, and one of the first national high-tech enterprises. Based on Zhejiang University, the company has built Zhejiang Research Institute, High-tech Research and Development center, State key Laboratory Pilot Base and many other research centers, with a high-level technology R&D team. KOTI produces various optical components used in projectors, wearable displays, digital cameras, smart phones, car cameras and high-end precision instruments, and independently develops and produces AR and other module system. KOTI has been in the domestic leading level in optical coating area, the vast majority of products are exported to advanced countries, part of the field of products with high market share, in 2016 won the title of "Hidden Champions". As a worldwide leading supplier, KOTI has become a key optical components and optical system solution provider.

1996 始于
20000m² 占地面积



发展历程

DEVELOPMENT COURSE



	<p>经过前期的稳步发展，公司规模不断扩大，2017年购入大批大口径真空镀膜设备。开始实现规模生产智能手机摄像头用红外截止滤光片。</p> <p>创新镀膜技术 发展光电产业 Innovating coating technology and developing photoelectric industry</p>		<p>公司战略升级，秉承多领域的发展方针，逐步在安防，车载，天文，医疗等领域打开局面，实现了规模化生产CCD/CMOS成像的红外截止滤光片。</p> <p>创新镀膜技术 发展光电产业 Innovating coating technology and developing photoelectric industry</p>		<p>经过浙大工业园区的孵化迁往余杭经济开发区（厂区占地2万平方米），开始批量生产投影显示用-梯度二向色镜，相机用-塑料基底中性密度滤光片。</p> <p>创新镀膜技术 发展光电产业 Innovating coating technology and developing photoelectric industry</p>	
2020	2017	2015	2013	2010	2006	1996
<p>自主研发的AR光波导显示光机批量出货，开发磁控溅射镀膜工艺，攻克低角漂窄带滤光片的生产与加工，应用在3D TOF结构光以及激光雷达等多领域。</p> <p>创新镀膜技术 发展光电产业 Innovating coating technology and developing photoelectric industry</p>	<p>进一步扩大投影机光学元器件的生产与加工，引领激光投影和LED微投光学元器件，开拓小型化光学系统，实现投影显示产品多元化。</p> <p>创新镀膜技术 发展光电产业 Innovating coating technology and developing photoelectric industry</p>	<p>攻克投影机领域更高难度的影院用Philip分色合色棱镜，成为全球三家能生产此产品的唯一一家中国光学镀膜厂商。同年，开发了相机用-蓝塑料基底低通滤波器。</p> <p>创新镀膜技术 发展光电产业 Innovating coating technology and developing photoelectric industry</p>	<p>公司于1996年在浙大实验室创立，开始进行光学薄膜以及光电子器件的研发与生产。公司以浙江大学光电学院为技术依托，拥有一支高层次，高水平的技术研发团队。</p> <p>创新镀膜技术 发展光电产业 Innovating coating technology and developing photoelectric industry</p>			

荣誉证书

CERTIFICATE OF HONOR



国家高新企业



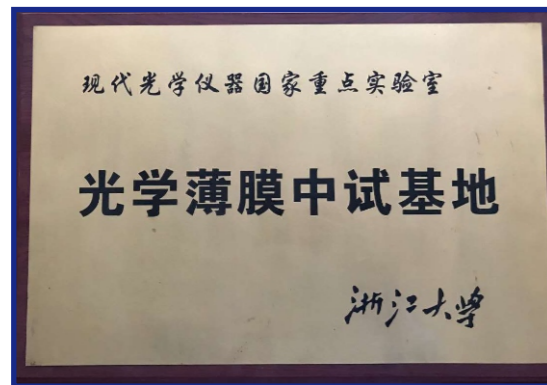
隐形冠军



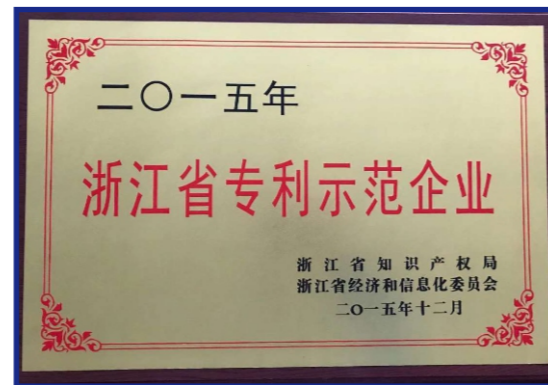
国家知识产权优势企业



IATF16949体系认证



国家重点实验室中试基地



专利示范企业



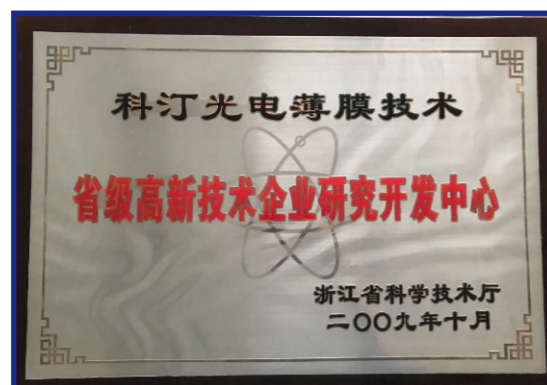
ISO9001体系认证



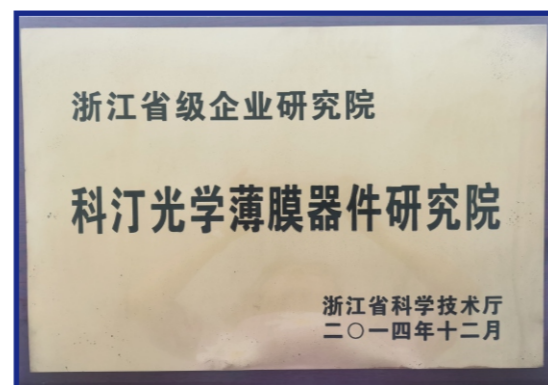
ISO14000体系认证



知识产权管理体系



省级研发中心



省级研究院



省科技进步奖

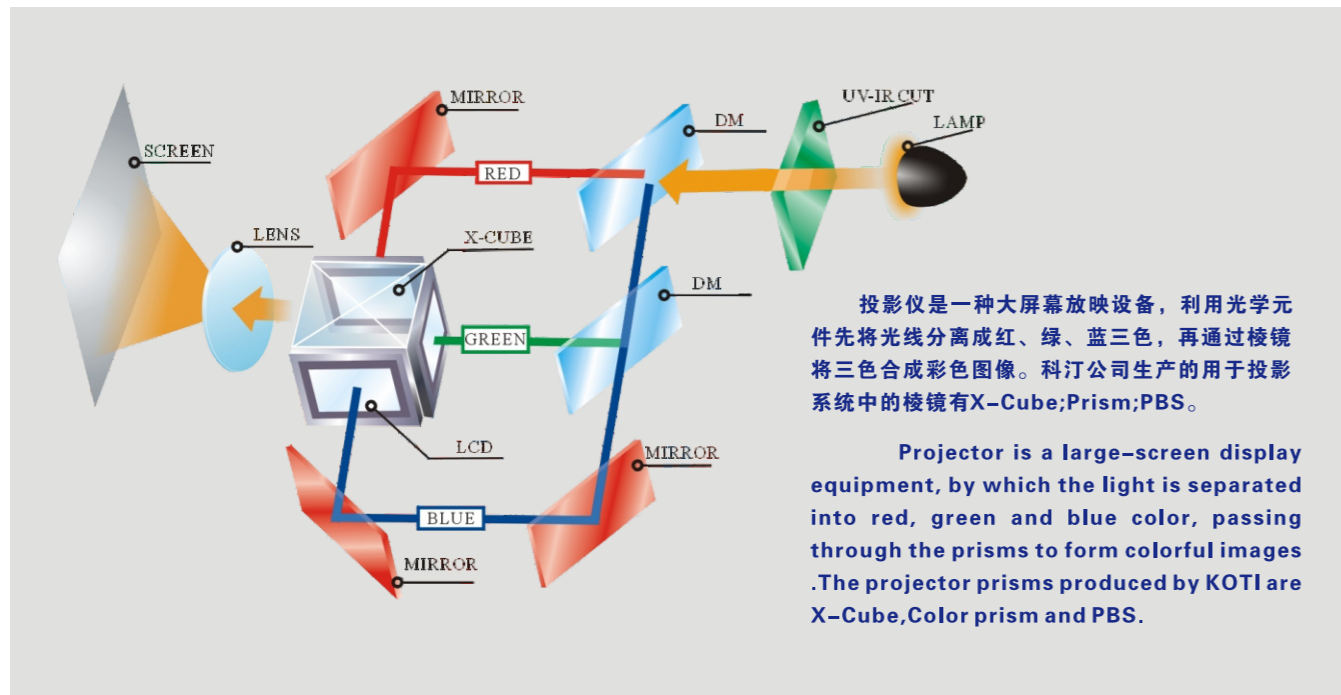


市科技进步奖



区科技进步奖

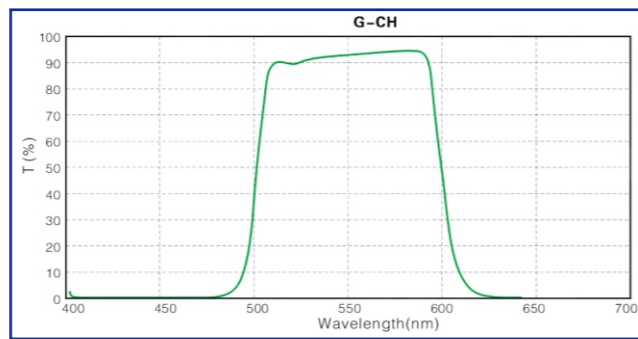
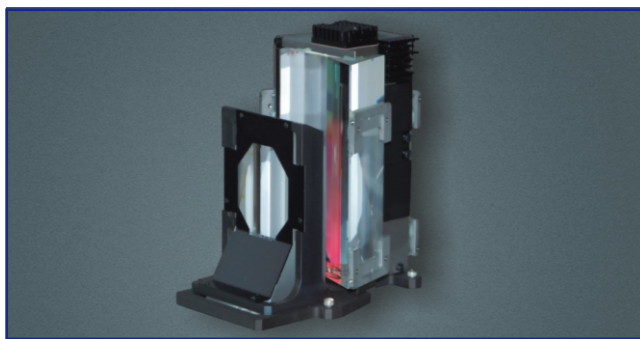
I. Optical Coating Components used in Projector Display: PRISM



1.分色合色棱镜 (Color Prism)

分色合色棱镜系统主要由philips棱镜及全内反射镜 (TIR) 组合而成，大量用于高亮度超大屏幕投影显示系统中，另小型philips也广泛应用于数码相机分色系统中。

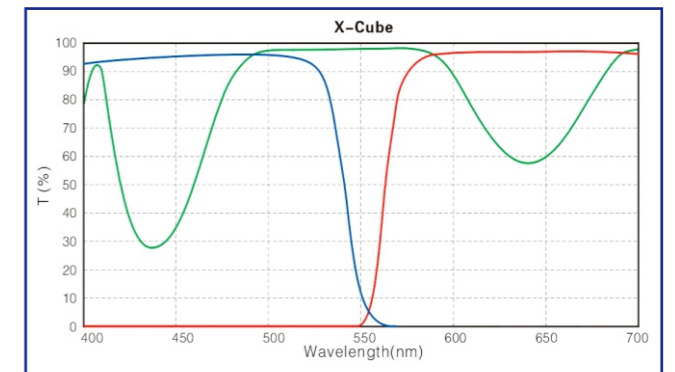
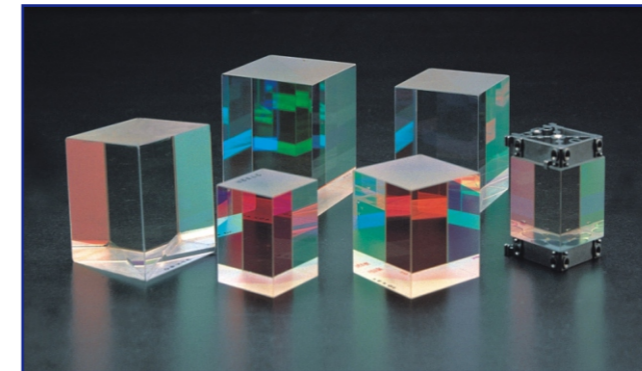
Combined with Philips prism and TIR (Total Internal Reflector) prism. Color Prism is mainly applied in high-brightness large screen display system. In addition, small Philips is widely used in color splitting system of digital cameras.



2.合色棱镜 (X-Cube)

X-Cube棱镜运用于投影机合光系统中，其主要作用是将红、蓝、绿三色合成彩色图像显示在屏幕上。科汀公司可根据客户需求提供各类X-Cube棱镜。

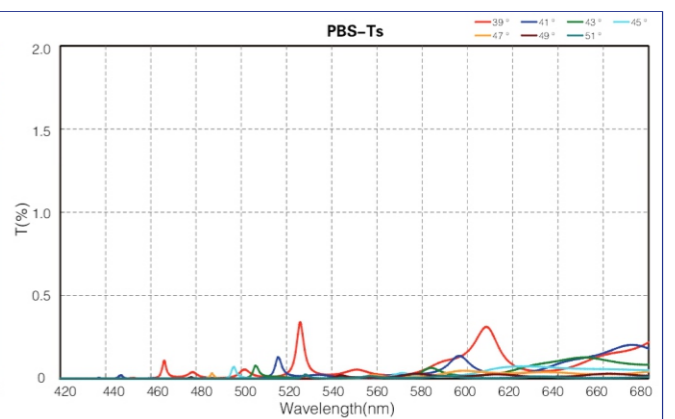
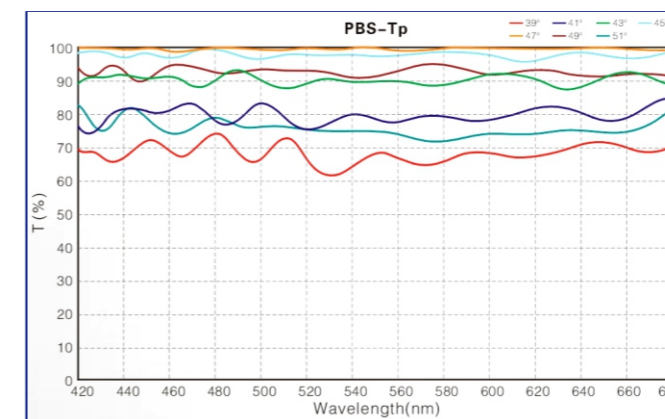
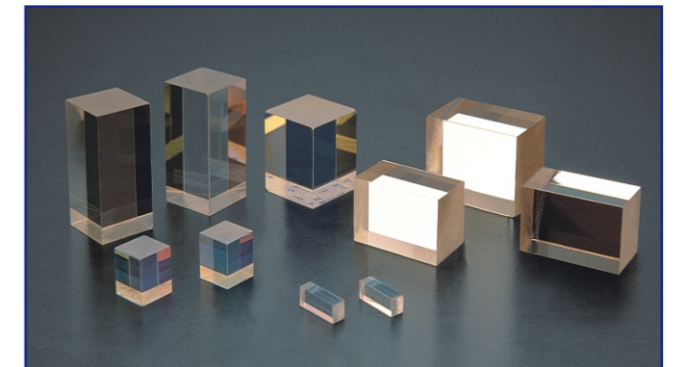
X-Cube is applied in the combination of light for projector, separated RGB image into colorful vision to be displayed in a screen. KOTI could produce various kinds of X-Cube.



3.偏振分束棱镜 (PBS)

自然光照射到偏振分束棱镜PBS上时，在特定的波段P偏振光高透过，而S偏振光高反射，从而达到P光和S光的分离。下图所示的是大角度范围 (39°-51°) 入射的偏振分束棱镜的实测透射率曲线。

When natural light goes through PBS (Polarizing Beam Splitter), P light and S light can be separated by the effect that P-Polarized light highly transmitted while S-Polarized light highly reflected in a transmittance of wide-angle (39°-51°) PBS.



II. Optical Coating Components Used in Projector Display: FILTER

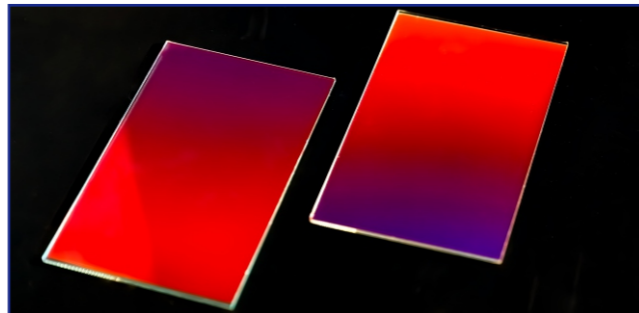
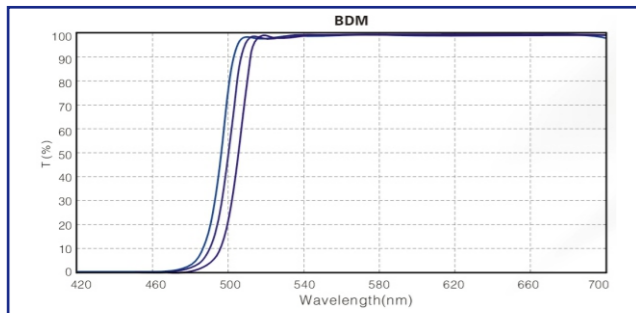
高端投影显示系统追求显示高清晰度，高亮度和色彩逼真的图像，以满足各种使用要求。科汀公司依赖领先的光学薄膜技术，可为客户提供优质的专业服务。

High-end projector display system pursues images of high definition, brightness and fidelity to fulfill to diversified applications. As an expert of optical coating, KOTI can offer professional services and effective solutions.

1. 分色镜 (Dichroic Mirror)

分色镜或称二向色镜 (DM) 主要用于分离红绿蓝三原色，可提高光的利用效率和色饱和度。科汀公司可根据客户需求提供不同梯度的分色镜。

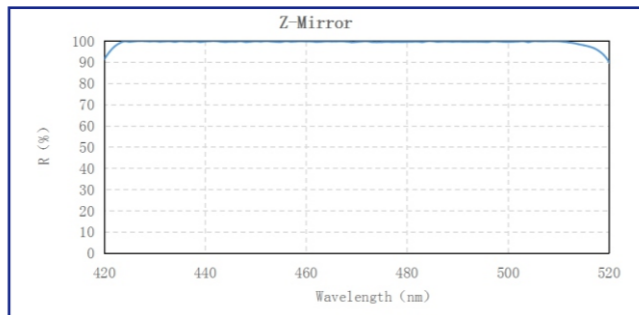
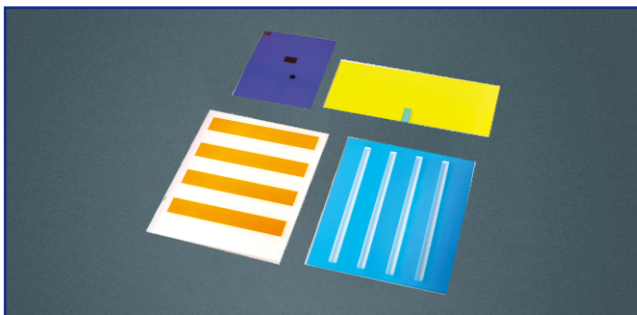
Dichroic Mirror is used to separate red, green, and blue color to increase light efficiency and color saturation. KOTI can provide different gradient dichroic mirror according to customer's requirements.



2. 区域反射镜 (Z-mirror)

镂空蓝光反射镜，现在多用于激光投影系统或激光电视中，主要用于将蓝激光聚焦到同一个方向。可以分区域镀膜或镂空基板两种方式。

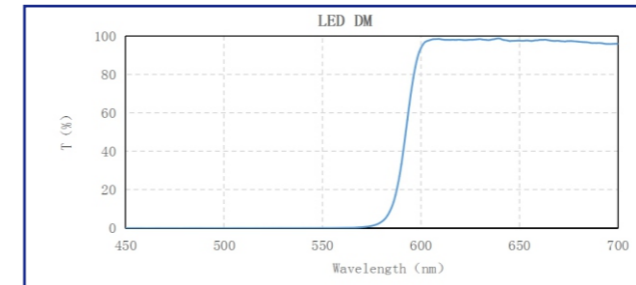
Z-mirror is used for making two blue laser beams focus on one direction. It has two patterns regional coating and hollowed-out substrate.



3. LED光二向色镜 (LED DM)

小尺寸的二向色镜，用于微型投影LED光源系统中，将三原色光合成同一光束。

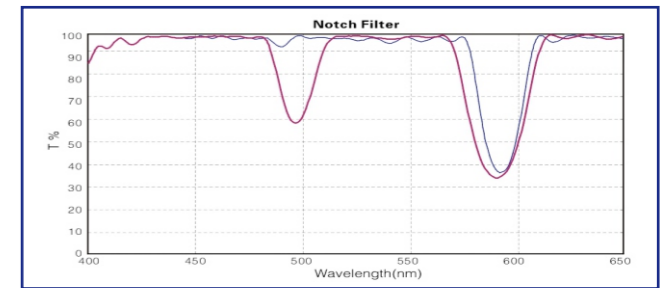
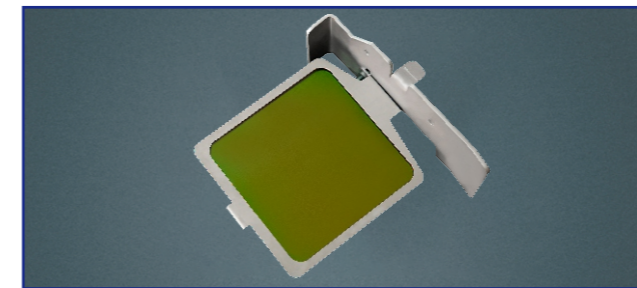
This small size dichroic mirror is used in mini-projector, combine the three primary colors of light into one beam.



4. 负滤光片 (Notch Filter)

负滤光片主要用来修饰RGB三种颜色，以使投影机颜色更加逼真。

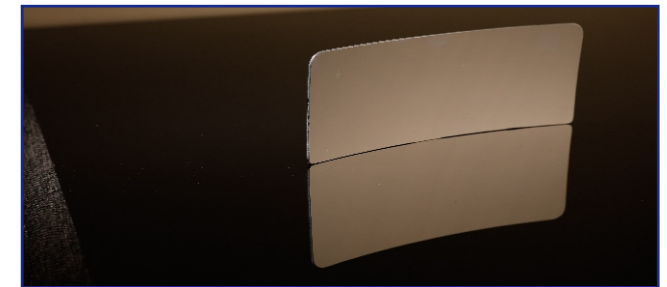
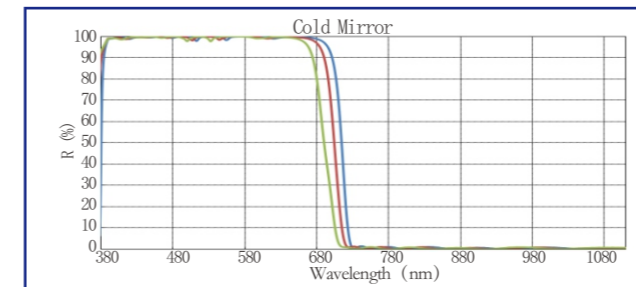
Notch filter is mainly used to modify the colors of R/G/B, thus to increase the fidelity of projector display.



5. 冷光镜 (Cold Mirror)

冷光镜在反射可见光的同时截止带有热量的近红外光，以减低光学系统或光学元件的辐射温度，广泛用于各种应用大功率光源的场合。

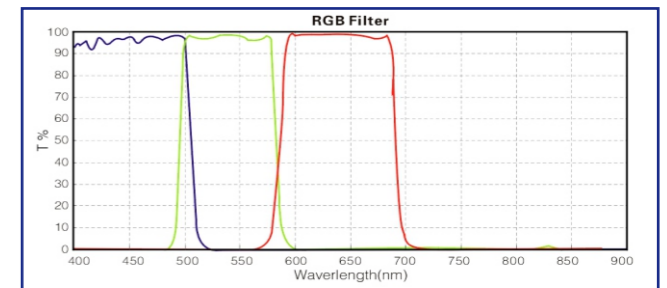
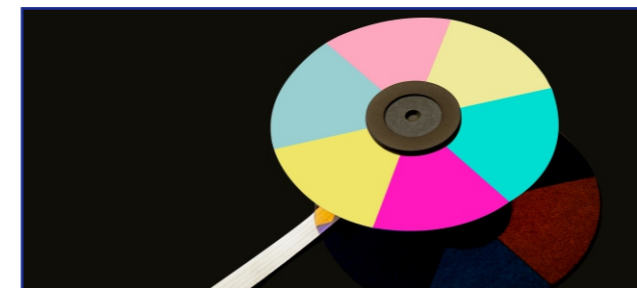
Cold Mirror can lower irradiation temperature of optical system and optical components by reflecting visible light while blocking near infrared light. It is widely used in high-power light source occasions.



6. 红、绿、蓝滤光片 (RGB Filter)

RGB三色滤光片分别只在红、绿、蓝三种颜色相对应的波段高通过，其他波段截止，有效分离三色，大量应用于彩扩，照明、显示处理等领域。

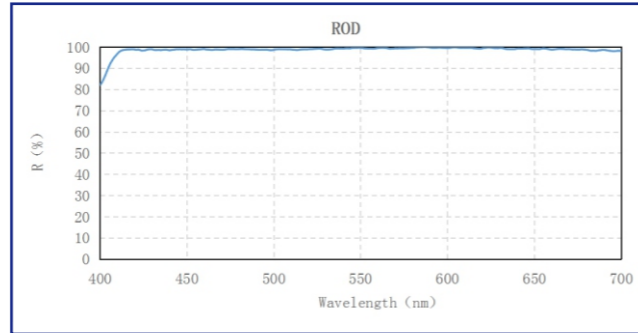
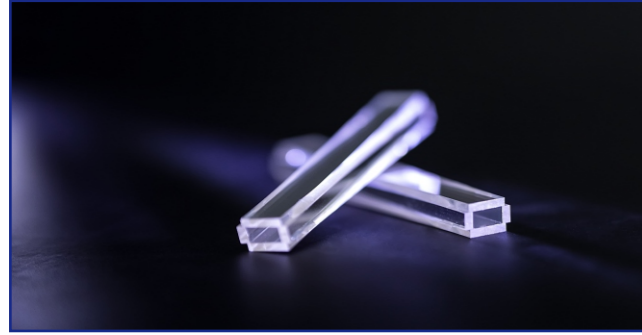
The R/G/B Filter can effectively separate R/G/B color by respectively transmitting relevant R/G/B wave while blocking other wave band. The R/G/B filter is mainly applied in digital mini-lab, illumination, display, etc.



7.光棒 (Rod Mirror)

用于投影系统的匀光器件，可以在高温高亮的环境中稳定工作，反射角度最高可达到80°。

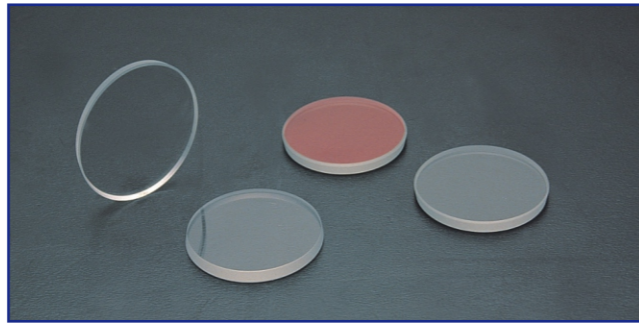
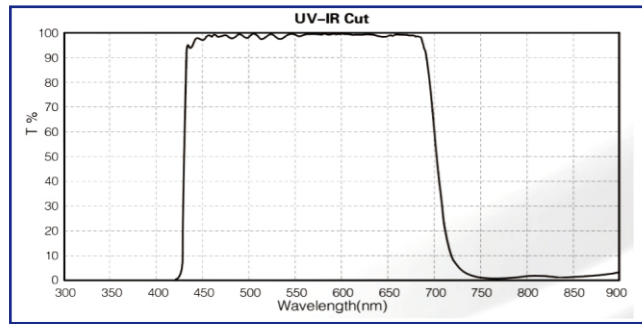
Rod Mirror has the function of homogenizing light.It can work stably in high temperature and bright environment, and KOTI can achieve the maximum reflection angle 80°.



8.紫外红外截止滤光片 (UV-IR Cut)

用于阻挡紫外和红外光，对可见光高透过，降低光源产生的高温，避免因紫外及红外对光学系统及元件，产生不良伤害。广泛用于舞台灯光、投影机、背投电视等光学系统中。

UV-IR Cut filter block UV and IR light , pass the visible light , so as to lower high temperature of the light source and avoid harming optical system.It is widely used in stage lighting,projector,rear projection TV,etc.



9.蓝宝石/扩散片/荧光陶瓷 (Sapphire、Diffuser, Fluorescent ceramic)

在激光投影显示系统中，用于匀光和散热。镀有蓝光透过红绿光反射膜的蓝宝石衬底，不仅提高荧光粉的发光效率，同时也起到荧光粉良好的散热效应。

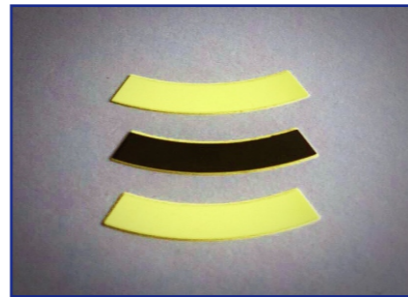
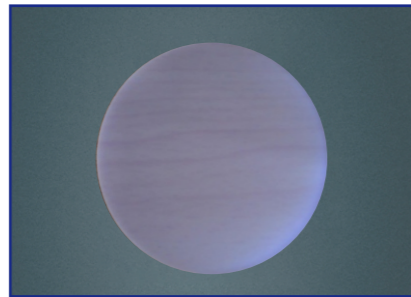
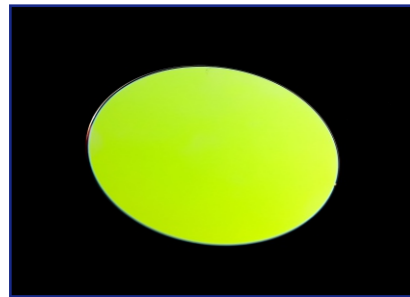
扩散片在激光投影显示系统中起到匀光，同时大幅降低激光散斑效应。

镀有高反膜的荧光陶瓷，不仅双倍提高荧光发光效率，同时也控制了荧光出光的发散角。

The sapphire substrate with blue light reflected through red and green light not only improves the luminous efficiency of fluorescent powder, but also plays a good radiating effect of fluorescent wheel.

The diffuser can homogenize the light in the laser projection display system and reduce the laser speckle effect greatly.

The fluorescent ceramic with high reflective film not only double increases the fluorescence efficiency, but also controls the divergence angle of the fluorescence light.



III . Optical Coating Components Used in Digital Products



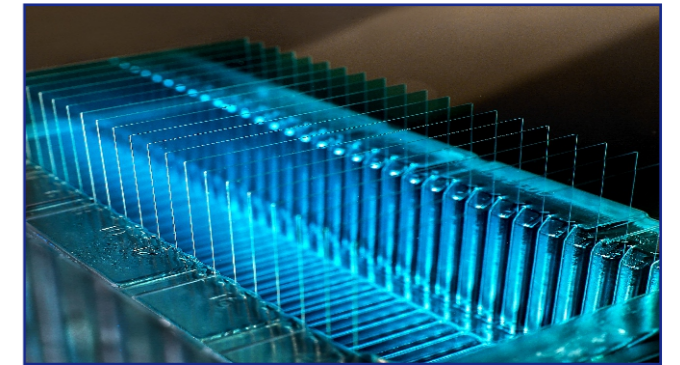
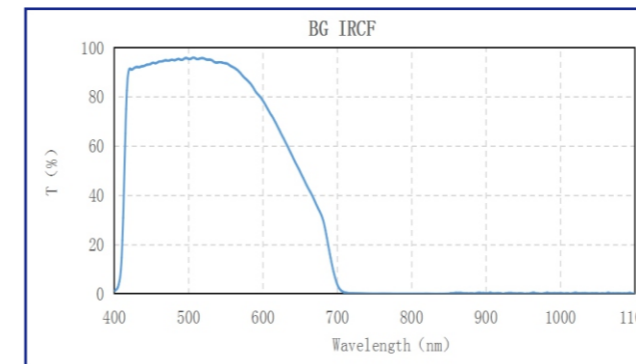
数码产品日新月异，相机 (DSC) ,摄像机 (DV) , 安防, 车载, 手机等摄像性能迅速提高，科汀公司携手数码厂家致力于研究高性能高表面光学成像产品。

The digital products are developing quickly. The camera performance of DSC, DV, security and protection monitoring, vehicles and mobile phone are innovated rapidly. KOTI can provide effective solutions for digital companies with high performance,superior optical surface coating components .

1.蓝玻璃镀膜滤光片 (Blue Glass)

蓝玻璃滤光片：科汀在蓝玻璃基底上进行镀膜，有效消除红外光的干扰同时大幅降低角度效应，大量用于广角拍摄。科汀可提供口径1mm以上的圆片和方片

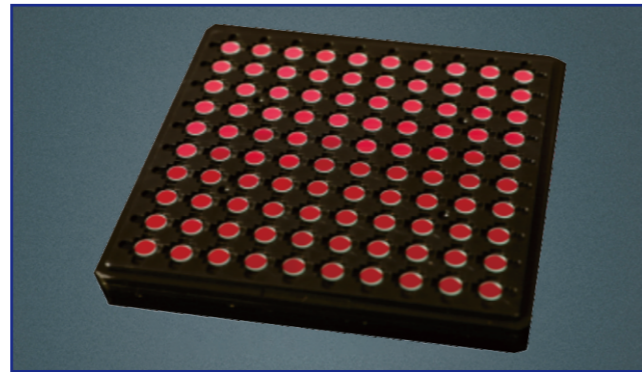
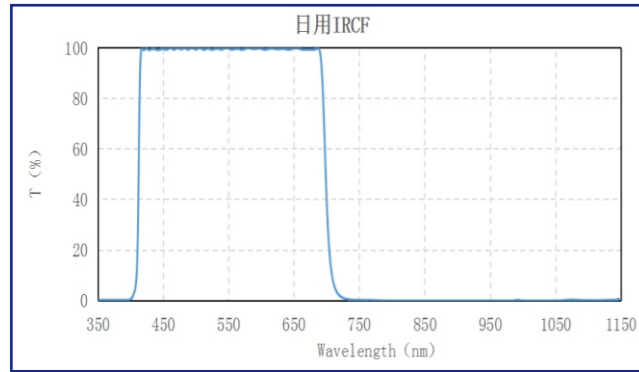
KOTI could coat on the blue glass,effectively eliminate the interference of infrared light and greatly reduce the angle effect It's widely used in wide-angle photography.KOTI can provide round and square plates with diameters above 1mm.



2. 红外截止滤光片 (IR-Cut)

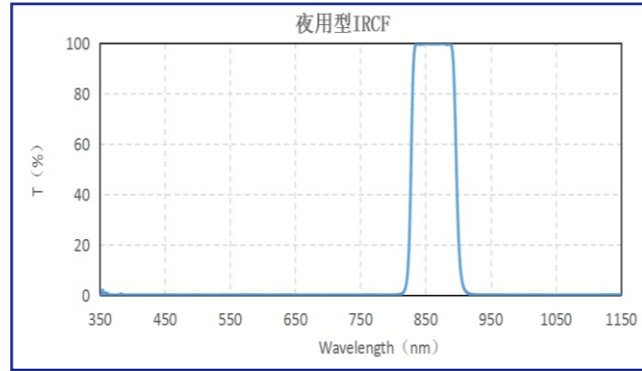
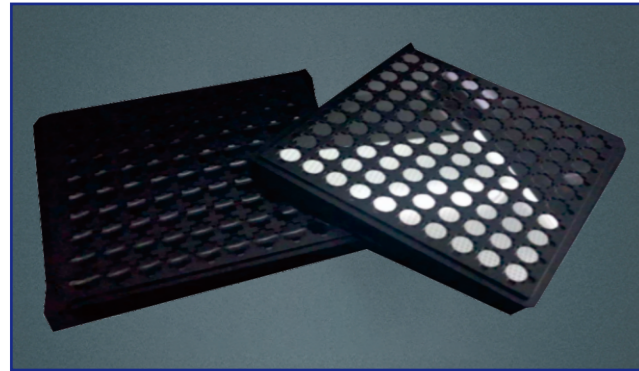
日用型IRCF：白玻璃上镀IRCUT，有效降低红外光对摄像的干扰，同时结合IAD辅助成膜极大提升产品环测可靠性，大量应用于CCD/CMOS成像。

KOTI could coat IRCF film on the white glass, it can effectively reduce the interference of infrared light to the camera, and at the same time combine with IAD technology to greatly improve the reliability measurement, which is widely used in CCD/CMOS imaging.



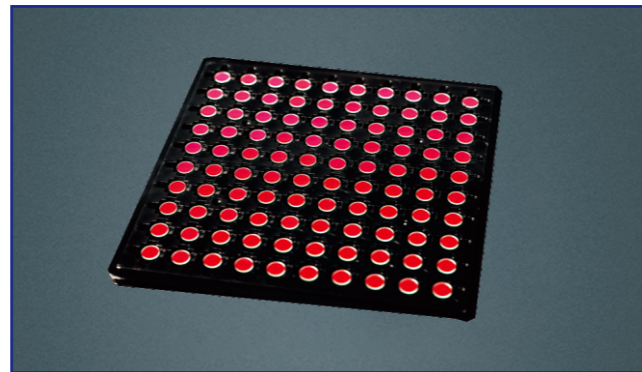
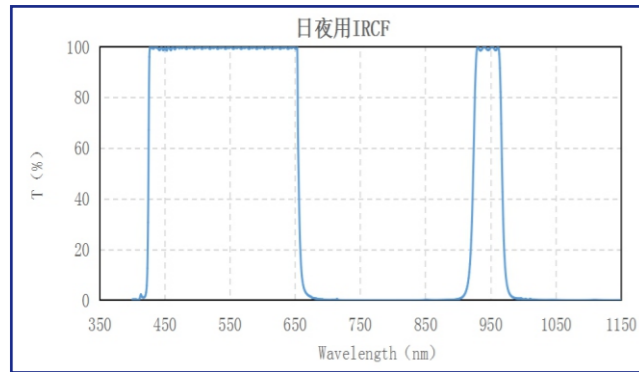
夜用型IRCF：科汀可提供不同波段的带通滤光片，主要分布在850nm, 940nm, 1064nm。最窄可以做到半带宽3.5nm。

KOTI provides bandpass filters of different wavebands, mainly distributed at 850nm, 940nm and 1064nm. The narrowest half bandwidth can be 3.5nm.



日夜两用型IRCF：代替红外截止滤光片，确保白天消除红外光干扰，晚上又可增强窄带通光的补偿。取代日夜切换器，精简整体产品结构。

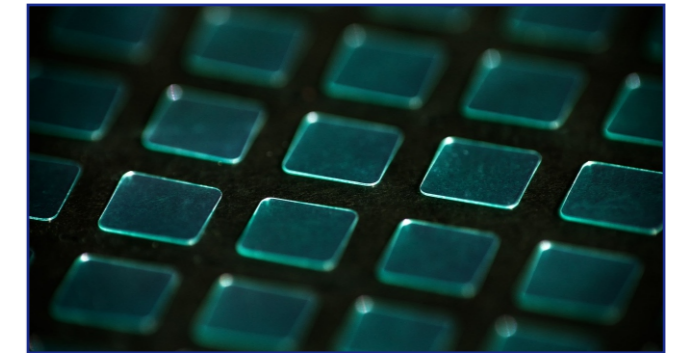
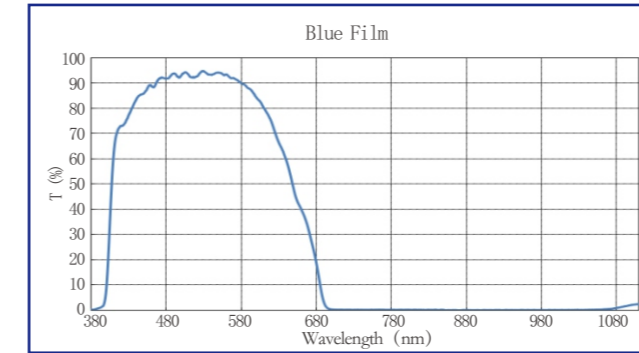
Day and night IRCF replace the infrared cut-off filter to ensure the elimination of infrared light interference during the day, and enhance the compensation of narrowband pass light at night. Replace day and night switcher, streamline the overall product structure.



3. 蓝塑料IRCF (Blue Film)

蓝塑料IRCF (Blue Film)：采用蓝塑料 (Blue Film) 为镀膜基底，在透过可见光的同时反射且吸收红外光，应用于CCD/CMOS 图像传感器上时可有效地提高图像的对比度和清晰度，减少红外光线干扰。并且对于大角度入射光线引起的色差有明显改善作用。

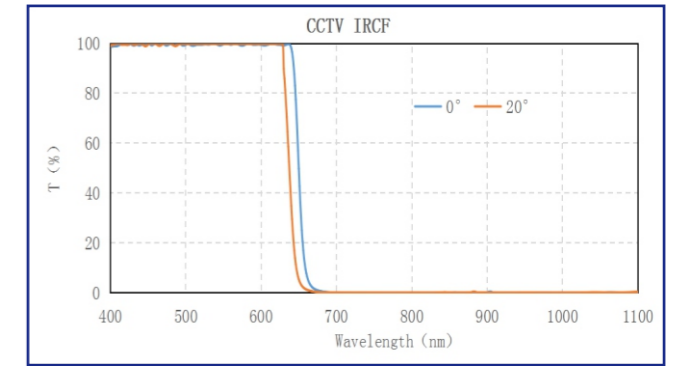
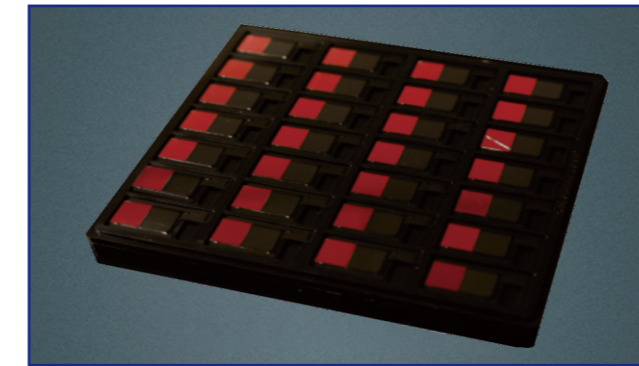
Blue Film as the coating substrate, through the visible light at the same time reflecting and absorbing infrared light, when applied to CCD/CMOS image sensor can effectively improve the contrast and clarity of the image, reduce infrared light interference. And it can obviously improve the color difference caused by large angle incident light.



4. 监控方片 (CCTV)

监控方片：应用在道路交通监控摄像头中的红外截止滤光片，与白片相配合，进行日夜监控模式切换。

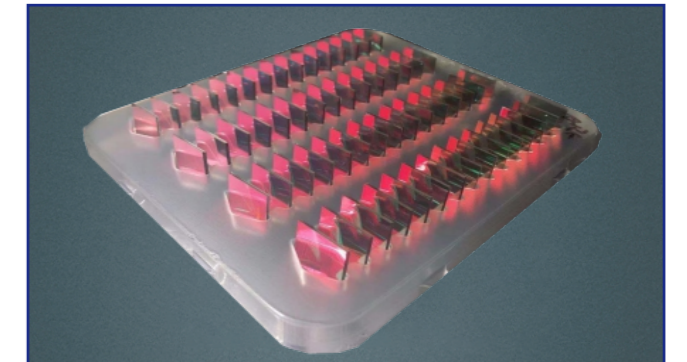
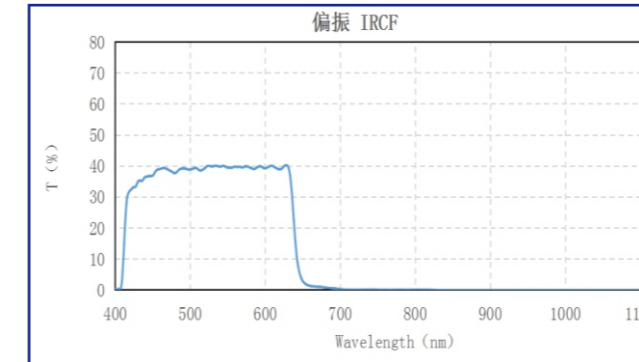
CCTV filters is used in road traffic surveillance cameras, matched with the uncoated glass to switch the day and night monitoring mode.



5. 偏振片 (Polarizer)

偏振片：应用于车载、安防监控领域，能够消除挡风玻璃等非金属材质的反光，从而拍摄到车辆内部清晰图像。

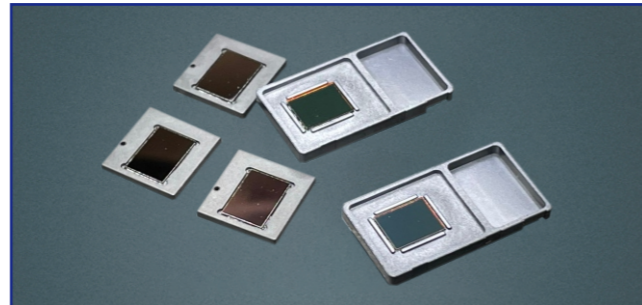
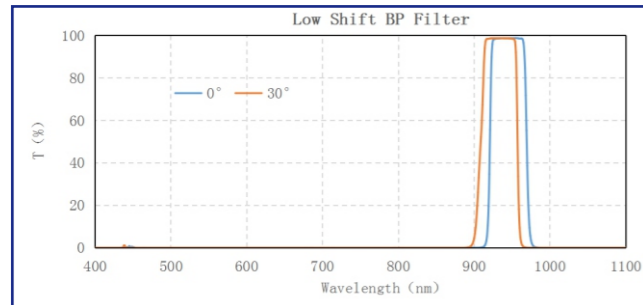
Polarizer is used in the field of vehicle and security monitoring. It can eliminate reflections from non-metallic materials such as windshields, thus capturing clear images of the vehicle's interior.



6.低角漂滤光片 (Low Angle Float Fliter)

低角漂滤光片：用于自动驾驶和TOF结构中的低角漂滤光片。在红外波段，0-15°角度漂移可以控制在5nm以内，0-30°在10nm以内。应用于面部3D识别、检测，机器视觉等众多领域；滤光片只允许对应波长（850/940/1550）的红外线通过，抑制其他光线，达到收集反射光线的作用。

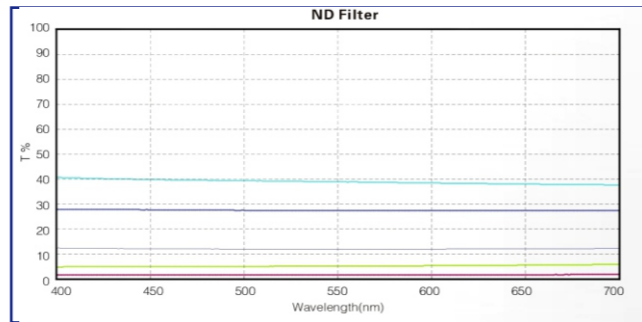
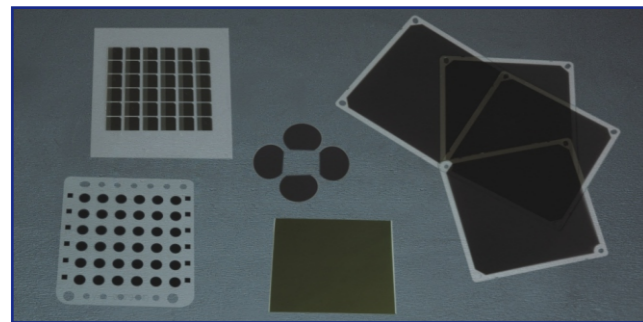
Low Angle float filter used in autopilot and TOF structures. In the infrared band, 0-15° Angle drift can be controlled within 5nm, 0-30° within 10nm. It also applied in the 3D face recognition, detection, machine vision and many other fields. The filter allows only infrared light of the corresponding wavelength (850/940/1550) to pass through, suppressing other light and collecting the reflected light.



7.中性密度滤光片 (ND Filter)

中性密度滤光片，主要应用于数码照相和手机。在不改变光源强度的情况之下，可以精确的调整曝光度，使得能够在一定的光圈与快门条件下，拍摄特殊效果的景物。科汀公司能提供在塑料和玻璃基板的ND Filter，在550nm外透过率为1.6%、6.3%、15%、25%等。

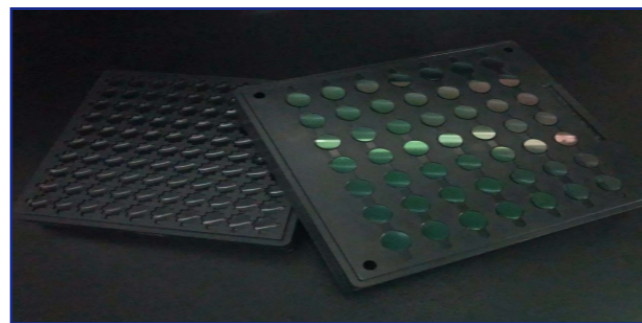
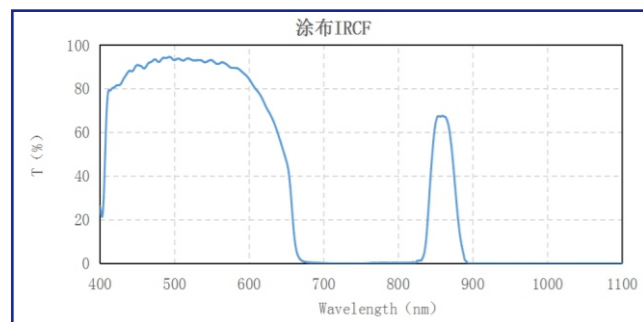
Under a certian aperture and shutter speed, digital camera and camera phones fixed with Neutral Density (ND) filter can take special photos by precisely light exposure without changing light incensity. KOTI could provide ND filters based on plastic or glass substrate, whose optical transmittance is 1.6%, 6.3%, 15% or 25% at 550nm.



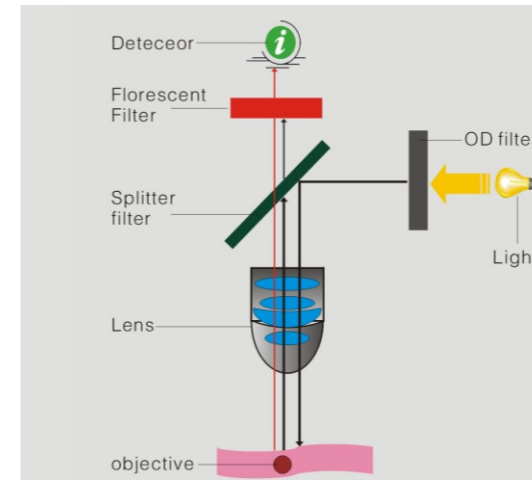
8.涂布IRCF (Spin Coating)

涂布IRCF：采用涂布工艺，达到类似蓝玻璃的效果，对红外光进行吸收，可有效地提高图像的对比度和清晰度。

By applying coating technology, to achieve the effect of blue glass, and absorb the infrared light, which can effectively improve the contrast and definition of the image.



N. Optical Coating Components Used in Advanced Optical Instruments

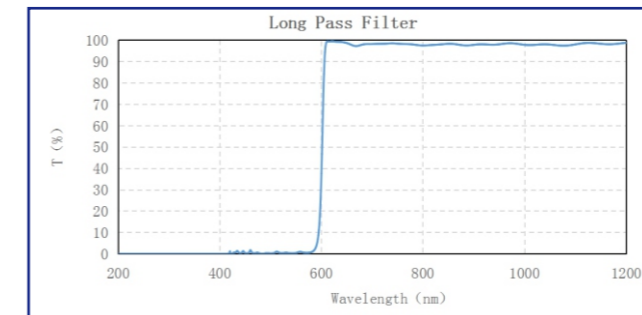


越来越多的光学系统被应用于各领域：医美，天文，激光雷达，红外测温，检测设备，光通信，新能源等各领域。使人类生活更舒适、更健康、更安全。科汀光学不断扩展镀膜技术力量，更新镀膜工艺，以应对日新月异的光学薄膜新需求。

More and more optical systems are applied to other industries such as medical beauty, astronomy, LIDAR, infrared thermometry, test instruments, photo-communications, and new energy, etc. They lead our life more comfortable, healthier and safe. KOTI keeps on updating thin film technique and enhancing technical force in order to meet new demand in optical coating.

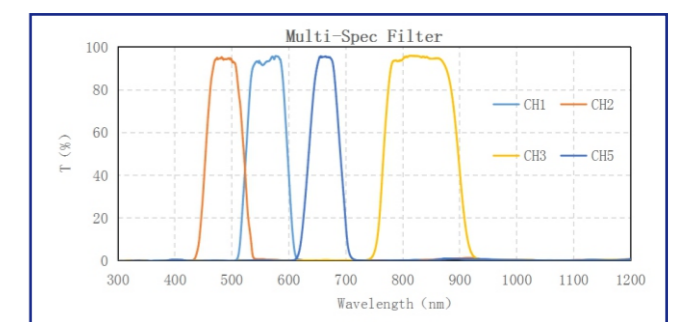
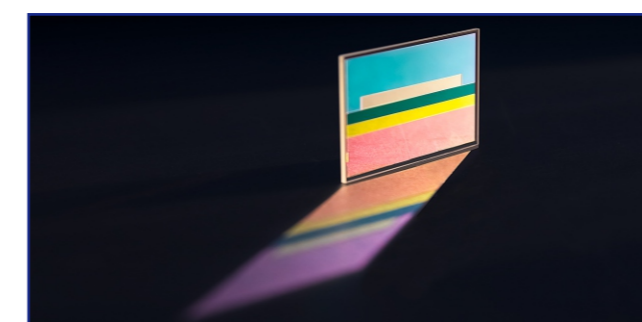
1.医美滤光片 (Medical Beauty Fliter)

医美滤光片：用于医美产品的紫外截止滤光片，在紫外波段可以做到OD6以上的截止，防止对皮肤产生伤害。KOTI can achieve the cutoff above OD6 in the UV band to prevent skin damage.



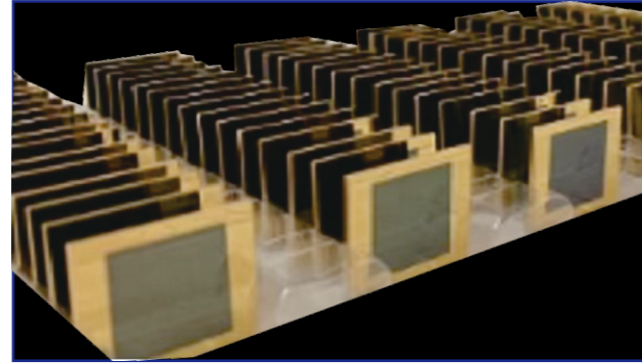
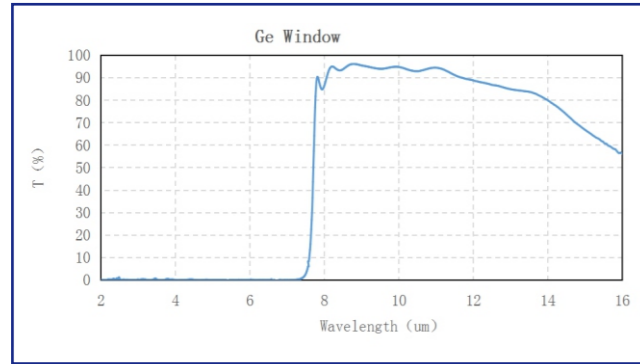
2.多光谱滤光片 (Multi-Spectral Fliter)

多光谱滤光片：其特征在于在光学基板上通过常规光刻形成光栏，各个光栏通光区分别镀有不同带通的窄带滤光片，用于空间遥感拍摄。It is characterized in that through conventional photolithography to form the light bar on the optical substrate, and each light bar is coated with different band pass, which are used for space remote sensing photography.



3. 红外测温滤光片 (Infrared Thermometry Filter)

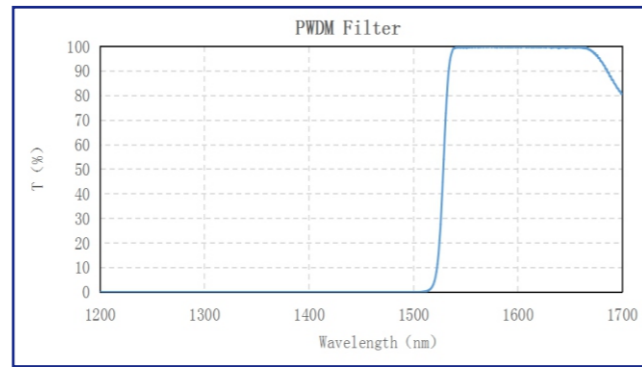
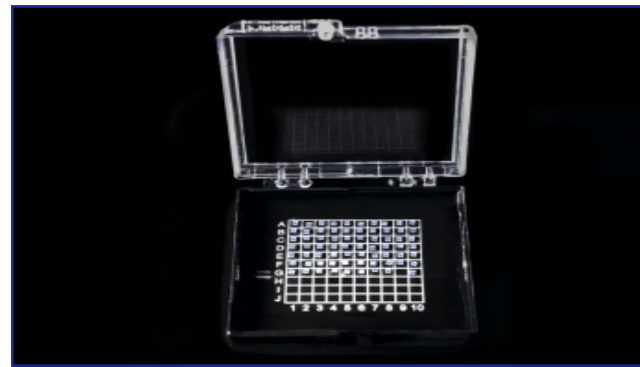
红外测温滤光片：7um前截止，8-14um透过 硅/锗窗口镀膜，边缘可以做金属化处理。
The light before 7um cut-off, 8-14um pass. Silicon/germanium window coating, edge can do metalization.



4. 光通信滤光片 (Optical Communication Filter)

光通信滤光片：应用于PWDM器件的光通信滤光片,具有非常低的插损、小波纹、高通带隔离度和高反射隔离度等优点。

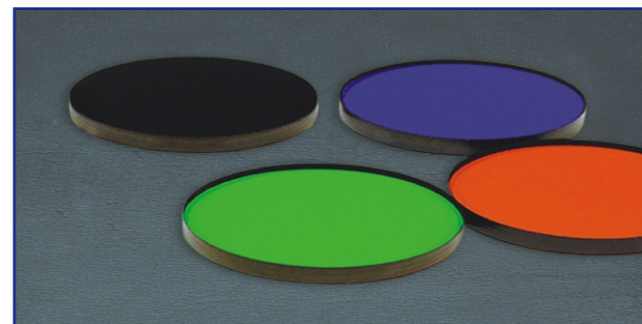
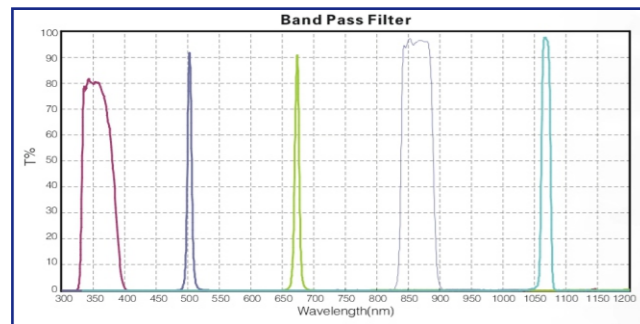
The optical communication filter used in PWDM devices has the advantages of very low insertion loss, small ripple, high pass band isolation and high reflection isolation.



5. 带通滤光片 (BP Filter) 、窄带滤光片 (NBP Filter)

带通滤光片：BP、NBP Filter的不同品种只在对应的波段保持高透过，其他波段保持截止。主要应用于高端测试仪器。科汀公司能提供多种带通滤光片，另外还可根据客户的需要进行定制。

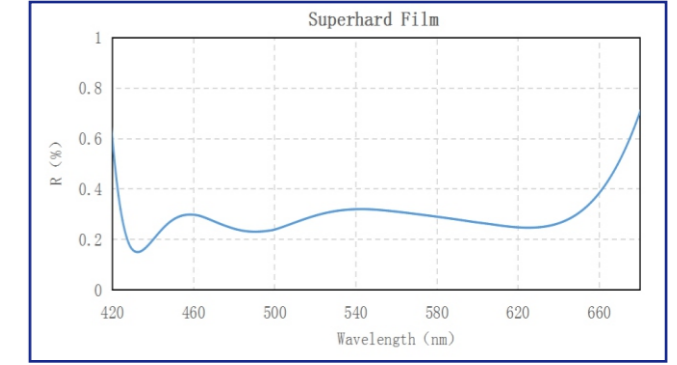
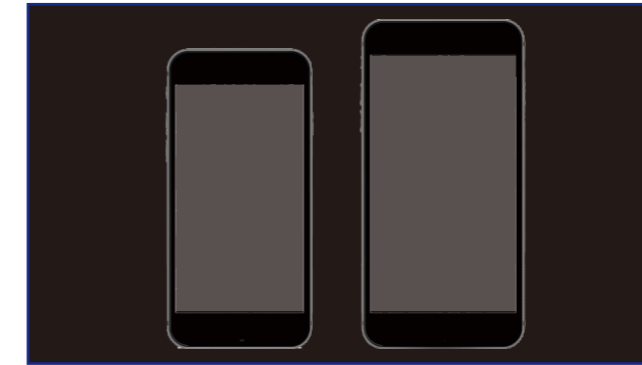
Band Pass Filter and Narrow Band Pass Filter are the special filters mainly used in high-end testers, which allow the selected wavelength only transmitted and others blocked. KOTI can provide BP and NBP filters according to the customer's requirements.



4. 超硬膜 (Superhard Film)

超硬膜：高透率的超硬膜，具有优异的抗摩擦磨损性能以及卓越的防水防油污性能，可广泛用于显示面板，提升防眩，防擦伤，增透等功能

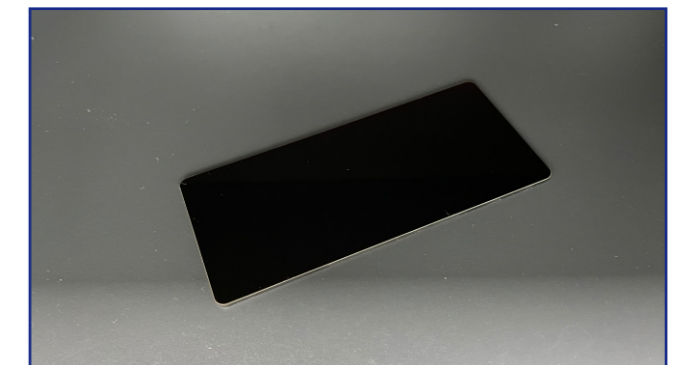
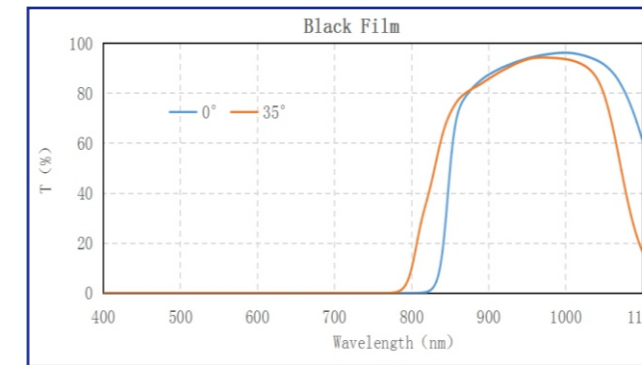
Superhard film with high transmittance has excellent friction and wear resistance and excellent waterproof and anti-oil performance. It can be widely used in display panel to improve anti-glare, anti-abrasion and anti-reflection.



5. 黑膜 (Black Film)

黑膜：利用镀膜材料本身可见光吸收，并且可再加ITO，AF等膜，有效防尘，防油污，用于TOF，激光雷达等领域。

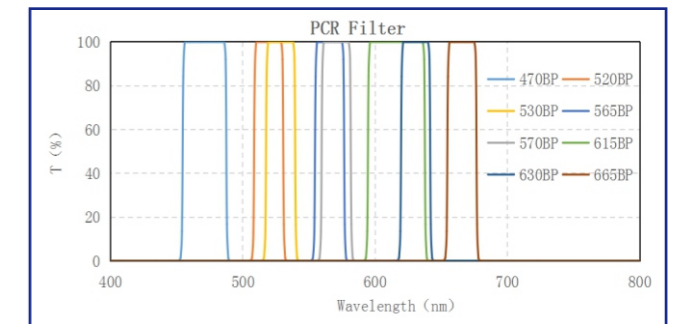
Black film uses visible light absorption from the coating material itself, and coat ITO, AF and other films to effectively anti-dust and anti-oil. It's widely used in TOF, LIDAR and other fields.



6. PCR滤光片 (PCR Filter)

PCR滤光片：应用于生物医学荧光检验分析系统中，分离和选择物质的激发光与发射荧光的特征波段光谱。

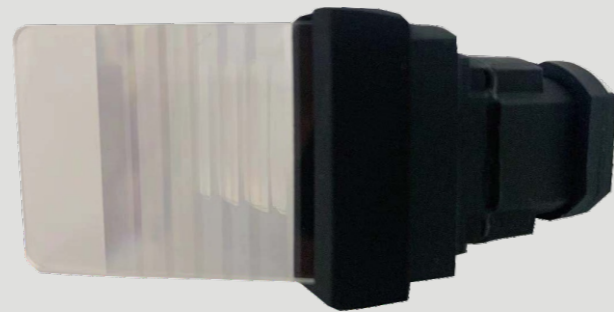
It is applied in biomedical fluorescence analysis system, separate and select of characteristic band spectra of excitation light and emission fluorescence of substances.



V. AR 穿戴显示用光学系统 (AR Wearable Display)

科汀为AR眼镜，头显等提供专业的光学显示解决方案，拥有阵列光波导设计和生产工艺等方面的核心技术，具备阵列光波导光机模组量产能力。

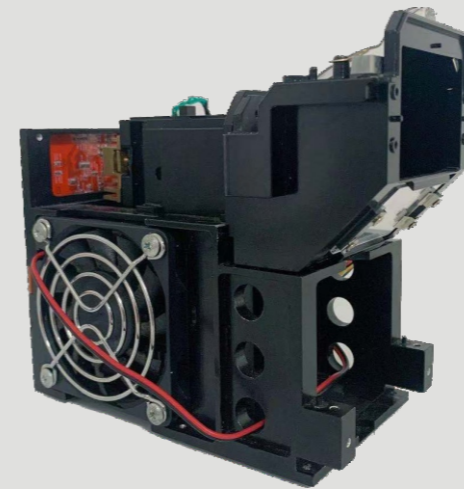
We provide professional optical display solutions for AR glasses, head display, etc. We have the core technology of array optical waveguide design and production process, and have the mass production capability of array optical waveguide optical module.



VI 超短焦投影系统 (Ultra-short Focal Projector)

应用场景：智能音箱、教育类桌面投影、智慧教室、车载广告等。

Application: Smart speaker, educational desktop projection, smart classroom, vehicle advertising, etc.



Product Spec

产品规格

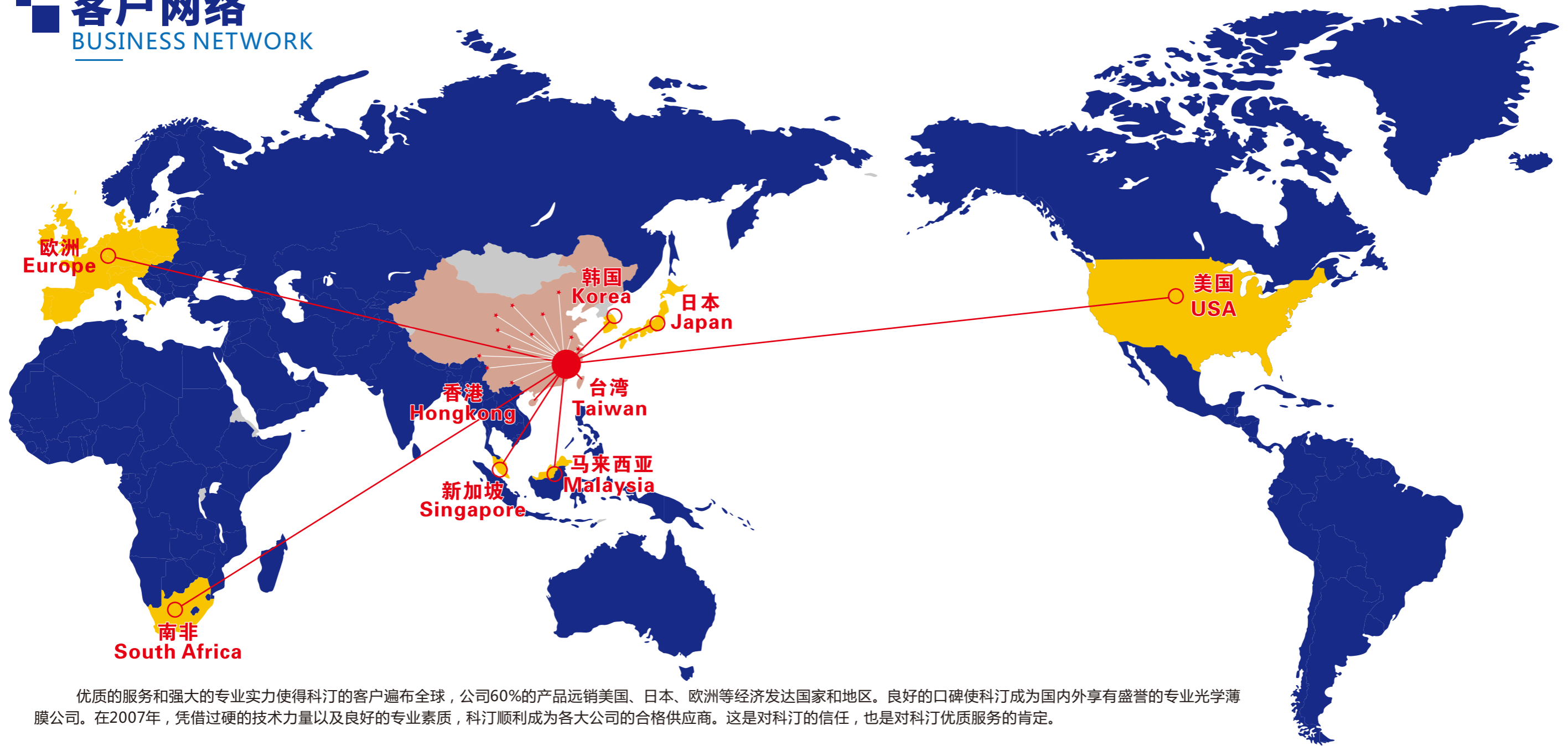
类型 Type	细节 Details	参数 Parameters
虚拟显示 Virtual Display	视场角 FOV 眼动范围 Eye-box 出瞳距离 Eye-relief 透光率 Light Transmittance	> 40° 10*10mm ² 18mm 85%
微显示屏 Micro Display	型号 Type 分辨率 Resolution 帧率 FPS	OLED , LCoS 960*720 , 1920*1080 60Hz
其它 Others	镜片厚度 Lens Thickness 模组重量 Module Weight	1.5mm~2mm < 13g

Product Spec

产品规格

类型 Type	细节 Details	参数 Parameters
显示芯片 Display chip	型号 Type 分辨率 Resolution	LCoS 1920*1080
光学 Optical	光源 Light source 光效率 Optical efficiency 照度均匀性 Illumination uniformity	RGB三色激光 > 40lm/W > 85%
镜头 The lens	投射比 TR 畸变 Distortion 画幅尺寸 Picture size 光机体积 Optical machine size	< 0.21 < 1% > 21"@0.12m < 300cc

客户网络 BUSINESS NETWORK



优质的服务和强大的专业实力使得科汀的客户遍布全球，公司60%的产品远销美国、日本、欧洲等经济发达国家和地区。良好的口碑使科汀成为国内外享有盛誉的专业光学薄膜公司。在2007年，凭借过硬的技术力量以及良好的专业素质，科汀顺利成为各大公司的合格供应商。这是对科汀的信任，也是对科汀优质服务的肯定。

The excellent service and strong technology enables KOTI to enjoy global customer network. The products are mainly exported to advanced countries and regions such as Japan, USA and Europe. KOTI has been regarded as the famous professional optical coating company in china and abroad. In 2007, KOTI became a qualified supplier for many influential companies by virtue of its strong technical force and excellent professional qualities. It's a trust for KOTI, and aslo the affirmation of its quality service.

生产流程

PRODUCTION FLOW

◎先进的制造设备
Advanced Production Machines

◎完善的检测手段
Perfect Inspection Facilities

◎规范的生产流程
Standard Production Process

◎优质的售后服务
Best After-Sales Service

装盘
Loading



清洗
Cleaning



切割
Cutting



镀膜
Coating



切割
Dicing Saw



质检
Inspection



仓库
Storage



自动转片
Automatic Rotor



半自动滚圆
Semi-automatic rounding



质检
Inspection



超声清洗
Ultrasonic cleaning



激光切割
Laser cutting



百级超净环境
100 Class ultra-clean environment



显微镜检验
Microscopic examination



自动排片
Automatic Film Arrangement



离心清洗
Centrifugal cleaning



自动点胶
Automatic dispensing



自动贴片
Self-mounting

