

INTER-CHINA CHEMICAL CO., LTD.
江苏泛华化学科技有限公司

江苏省镇江市新区丁卯经十五路99号国家大学科技园C19幢 (邮编212009) | C19 Bldg, ZUSP, Zhenjiang, Jiangsu, China
+86- 511- 88890008 (国内) | 84492112 (International)
+86- 511- 84435836 (国内) | 84407555 (International)
fhhx@chinatio2.com (国内) sales@chinatio2.com (International)
www.chinatio2.com



近红外反射二氧化钛
国家专利技术产品 节能降温新材料

- NATIONAL PATENTED TECHNOLOGY PRODUCTS
- NEW MATERIALS FOR ENERGY AND COOLING

The information and data provided in this brochure are based on our current knowledge and experience. They are only references. Considering different customers have different processes and applications, also in view of many factors that may affect them. We cannot guarantee the final products' performance. Please do adequate test before using this product. If there is any special requirement please contact our technology service department: tech@chinatio2.com
本样册所提供的信息和数据是建立在我们现有的知识和经验的基础之上。本资料仅作为用户使用前的指导性建议。由于不同的用户会有不同的生产工艺及应用方法，因此我们不能对其最终产品做出承诺。使用前请做好充分的试验工作，如有特殊要求，请联系我司技术服务部：tech@chinatio2.com

This invention is based on our exclusive technology and R&D with national patent(ZL201310754401.1).

We have signed an agreement with long term strategic partner, Shandong Doguide Group Co., Ltd., to authorize them to produce this product in their plant as a project which is handled by a mutual technical group.

Inter-China Chemical Co., Ltd is exclusively responsible for oversea marketing of this product.

此项发明由我司独立研发，获得国家专利，专利号：ZL201310754401.1。

我司与长期合作伙伴山东东佳集团合作生产。由泛华化学授权东佳集团独家生产制造 “IR- 1000” 产品。

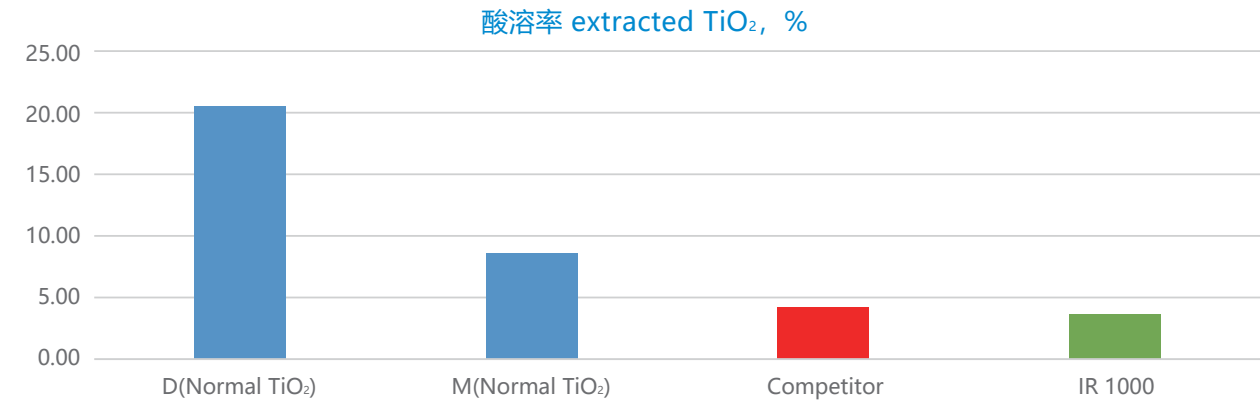
泛华化学负责此产品的海外销售独家代理和代理国内营销。

TiO ₂ content	二氧化钛含量	90%
Crystal form	晶型	Rutile 99%
Refractive index	折射率	2.7
Inorganic treatment	无机处理	2.3% dense amorphous SiO ₂ 3.0% Al ₂ O ₃
Organic treatment	有机处理	As required
Oil absorption	吸油量	19g/100g
Specific gravity	比重	4.0
Dispersion in oil	油中分散性	12.5μm

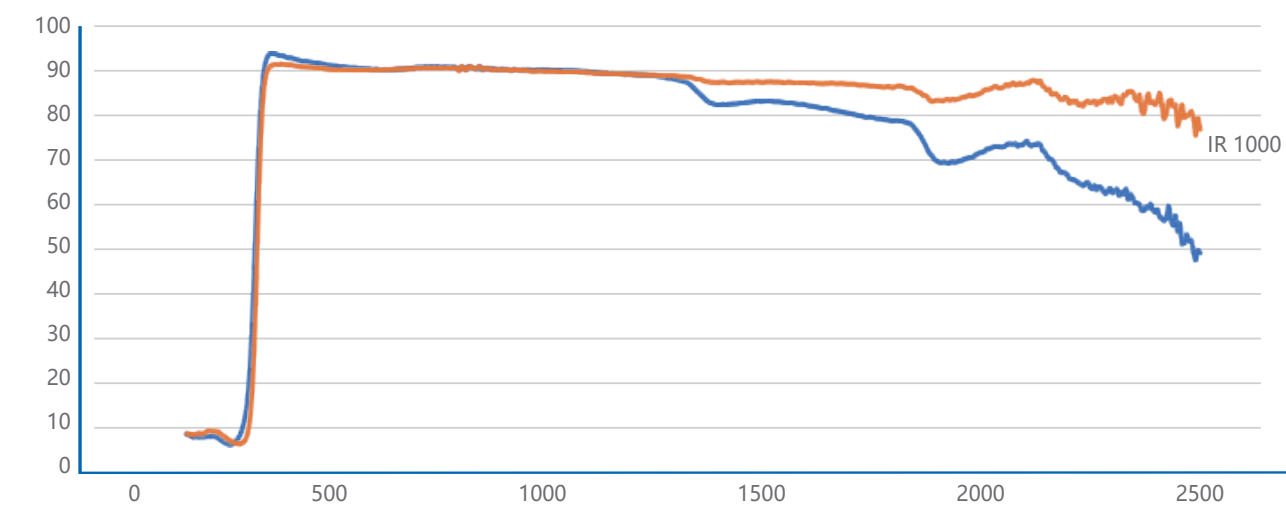
Note : All values are typical unless otherwise specified.
以上指标均为典型值，具体请参照产品质量分析单。

Durability comparison 优秀的耐候性

Titanium dioxide surface formation of a dense coating, has a very low acid solubility, super weather resistance !
二氧化钛表面形成的致密包覆层，有着极低的酸溶率、超强的耐候性！



Reflectance curve of TiO₂ 二氧化钛反射曲线



Composition of the solar radiation

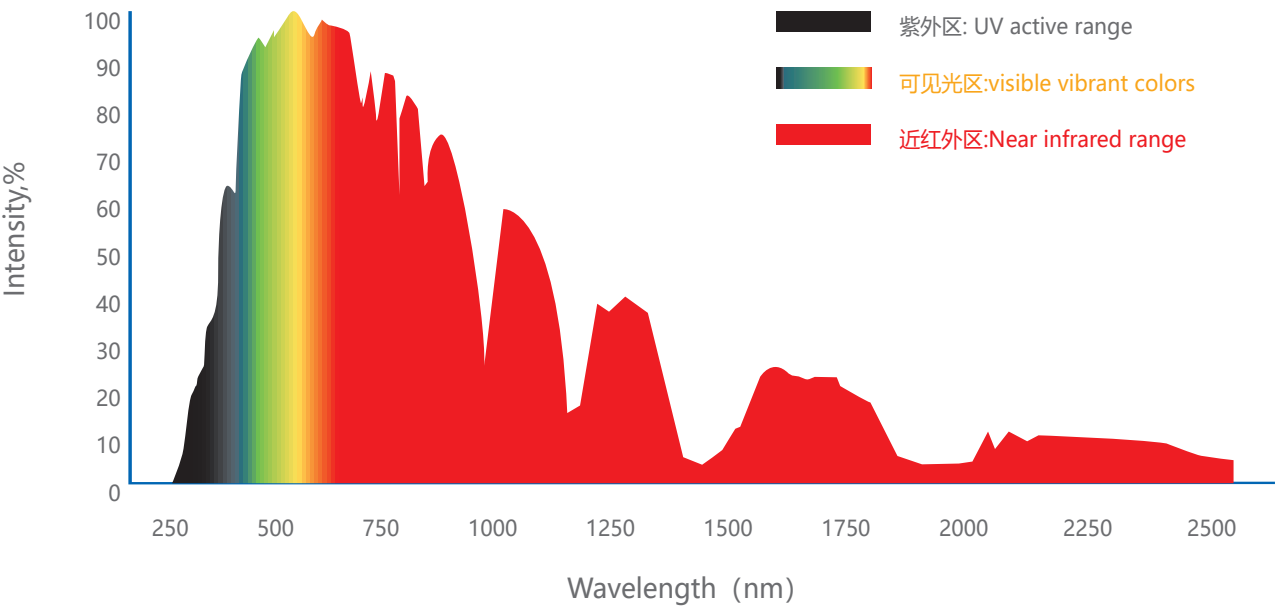
太阳辐射能量组成

The solar radiation is made up of UV, visible and infrared light.The heat is generated mainly by infrared radiation.

Our IR-1000 is a functional raw material which is designed to reflect infrared radiation.

阳光由紫外、可见光及红外部分组成。其中红外波长段是产生阳光能量和产生热量的主要部分，

我们的 IR- 1000 是为反射红外线特别设计的功能型材料。



Typical coating Applications

- Heat insulation architectural coatings
(Exterior coatings, roof coatings etc.)
- Coil coatings
- Container coatings
- Marine coatings
- Military coatings
- Clothes coatings

涂料的典型应用

- 建筑外表用热反射隔热涂料
(外墙涂料、屋顶涂料等)
- 卷钢涂料
- 集装箱涂料
- 船舶漆
- 军事伪装涂料
- 服装涂层

Product Advantages

- Ability to work in various color systems.
- Easy to adjust color shade in the system. Ability to produce infrared reflecting product with L* between 20-96.
- Production process is similar to common coatings and plastics.
- Super durability with infrared reflection.
- Good dispersion.
- Cost effective.

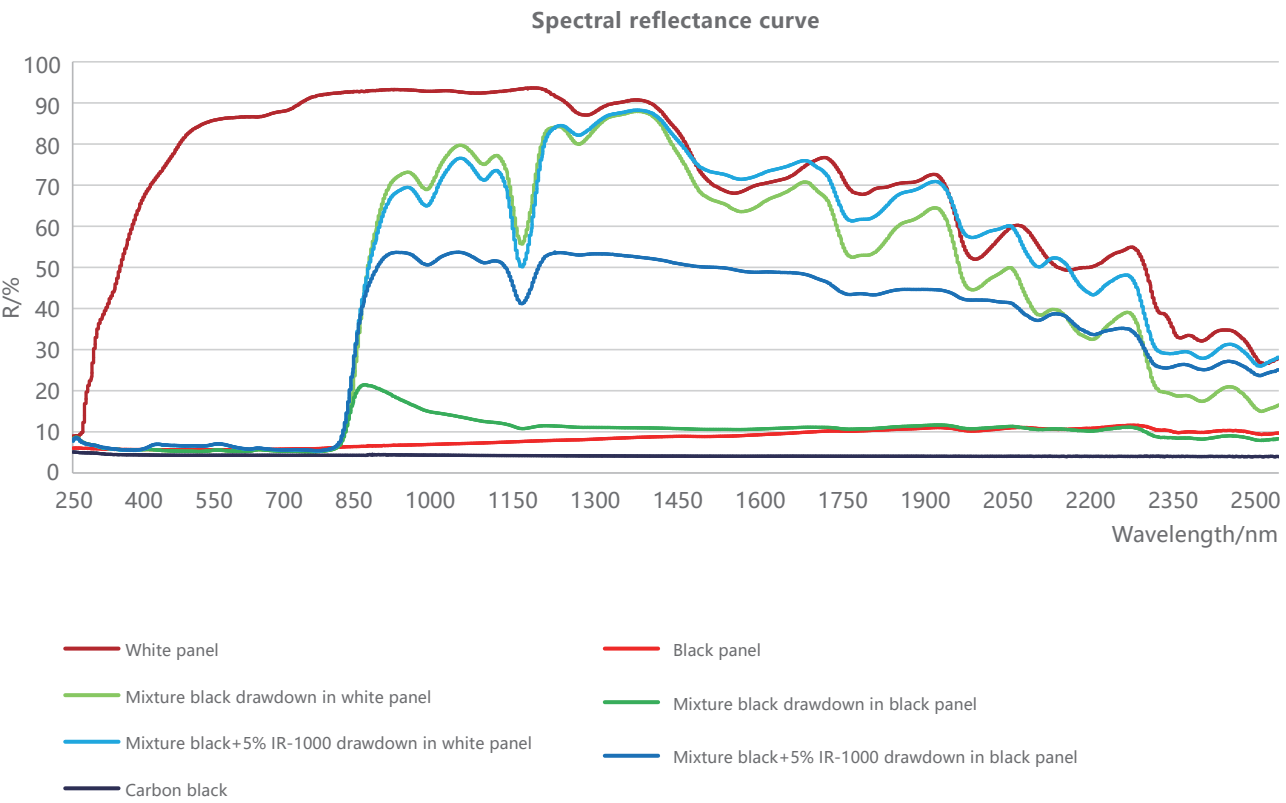
产品优点

- 冷颜料颜色较为单一，使用 IR 1000 可以配制出几乎所有的颜色。
- 颜色深浅调整简便，可以在 L* 值 20~96 的范围内均能方便的制出符合近红外散射性能优异的产品。
- 颜色控制简便，可直接制成红外反射功能型基础漆或色母，加入普通色浆或色母即可得到热反射隔热色漆。
- 涂料生产过程简单，按正常涂料工序即可，无需繁琐的工艺。
- 耐候性好，红外线反射性能持久。
- 成本优势。

The pure performance of IR-1000
IR-1000的近红外反射效果

RAL 9004 Signal black

组成	Component	IR-1000 formulation, g	Mixture black formulation, g	Carbon black formulation, g
炭黑	Carbon black	0	0	20
IR-1000	IR-1000	50	0	0
三原色混合黑	PY83+PR170+PB15:1	50	20	0
树脂/添加剂/溶剂	Resin/ additives/ Solvent	930	980	980

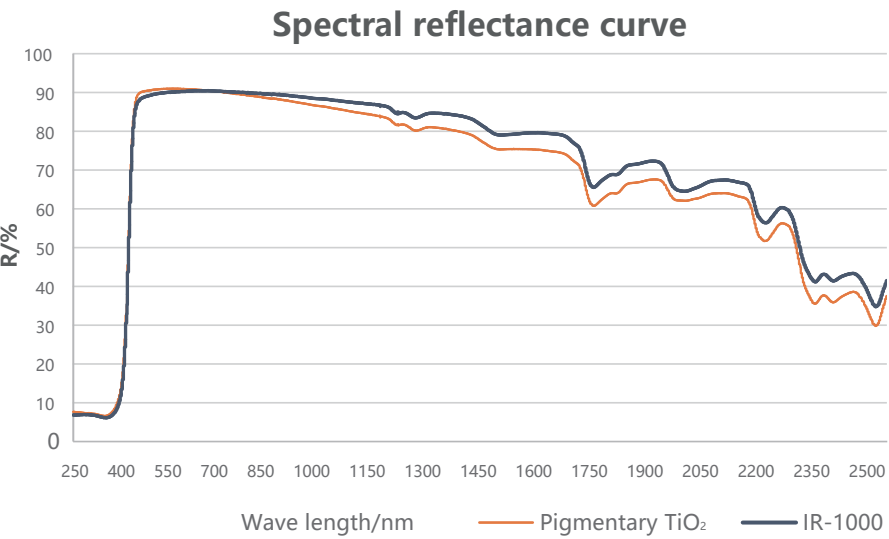


				反射比reflectance ratio	
				L*	TSR 300~2500nm NIR 780~2500nm
JG/T 235-2014	低明度类要求	Low L* requirement	≤40	≥0.25	≥0.4
在黑板制膜 Drawdown on black panel	混合黑配方	Mixture black formulation	27.86	0.09	0.14
	混合黑+5% IR-1000配方	Mixture black +5% IR-1000 formulation	30.13	0.25	0.48
加入IR-1000后的效果 The performance after adding IR-1000			18.1%	↑178%	↑243%
在白板制膜 Drawdown on white panel	混合黑配方	Mixture black formulation	27.79	0.32	0.66
	混合黑+5% IR-1000配方	Mixture black +5% IR-1000 formulation	30.27	0.33	0.67
炭黑配方	Carbon black formulation		25.68	0.04	0.04
白板	White panel		94.33	0.85	0.85
黑板	Black panel		28.61	0.07	0.08

Architectural reflective thermal insulation coating
反射隔热型建筑涂料

RAL 9016 Traffic white

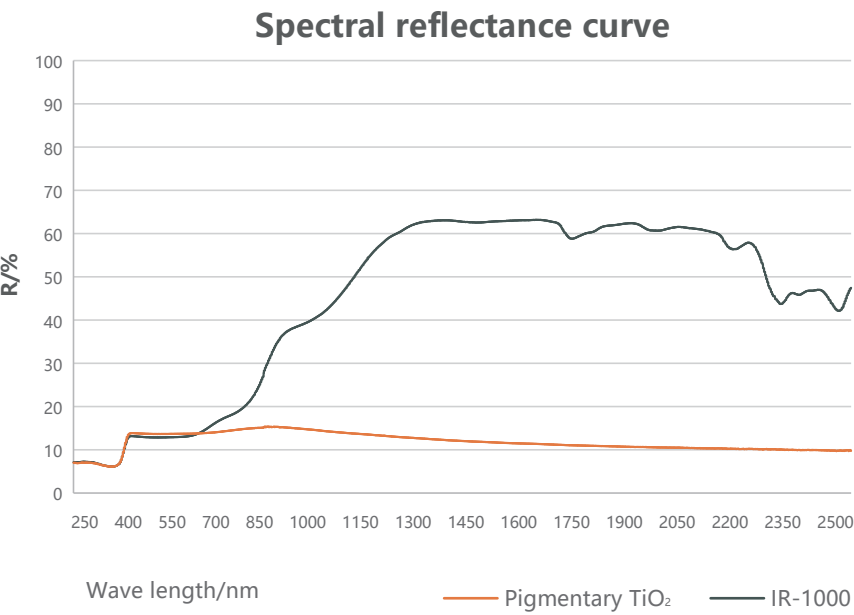
成分	Component	IR-1000 formulation, g	Normal formulation, g
IR-1000	IR-1000	20	0
钛白粉	Pigmentary TiO ₂	145	150
填料	Extenders	255	270
乳液和助剂	Acrylic resin emulsion & additives	320	320
水	Water	260	260
IR-1000 content = 2% PVC=50%			



反射比Reflectance ratio						
样品	Sample	L*	a*	b*	TSR 300~2500nm	NIR 780~2500nm
IR-1000配方	IR-1000 formulation	96.04	-0.52	2.35	0.86	0.83
常规配方	Pigmentary TiO ₂ formulation	96.31	-0.89	1.26	0.82	0.80

RAL 7010 Tarpaulin grey

成分	Component	IR-1000 formulation, g
IR-1000	IR-1000	100
颜料和填料	Pigment & extenders	320
乳液和助剂	acrylic resin emulsion & additives	320
水	Water	260
IR-1000 content = 10% PVC=50%		

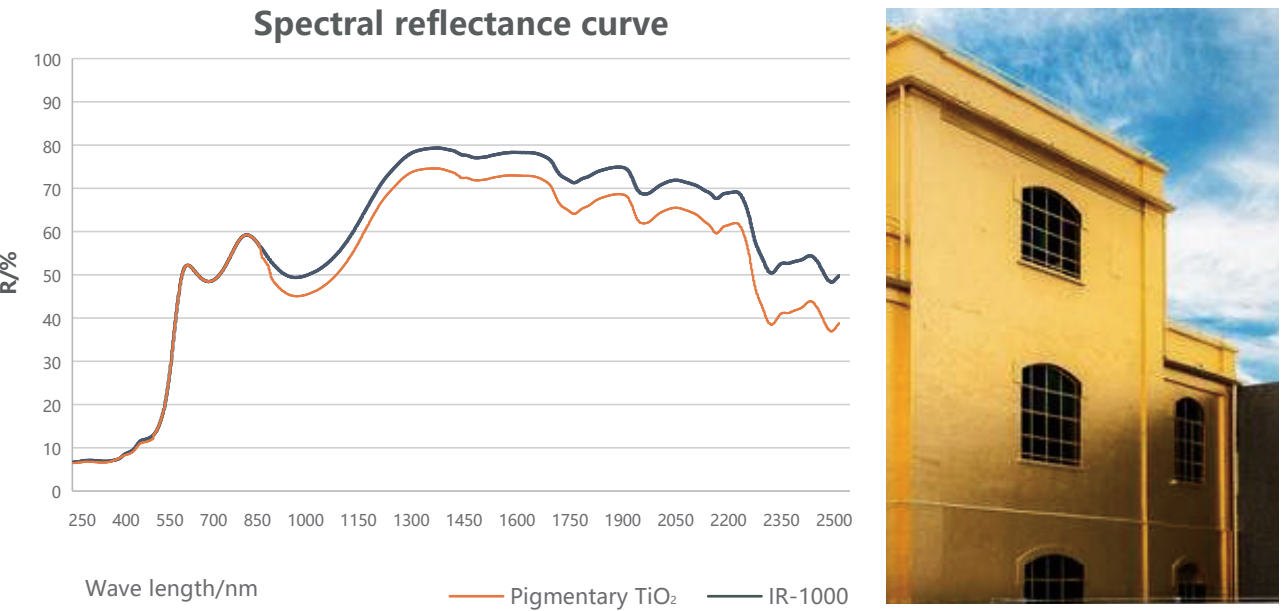


反射比Reflectance ratio						
样品	Sample	L*	a*	b*	TSR 300~2500nm	NIR 780~2500nm
IR-1000配方	IR-1000 formulation	43.00	-1.35	1.58	0.29	0.48
常规配方	Pigmentary TiO ₂ formulation	43.86	-1.26	1.38	0.13	0.13

Note:
Pigmentary TiO₂ formulation: 含有炭黑颜料
IR-1000 formulation: 不含炭黑颜料

RAL 1005 Honey yellow

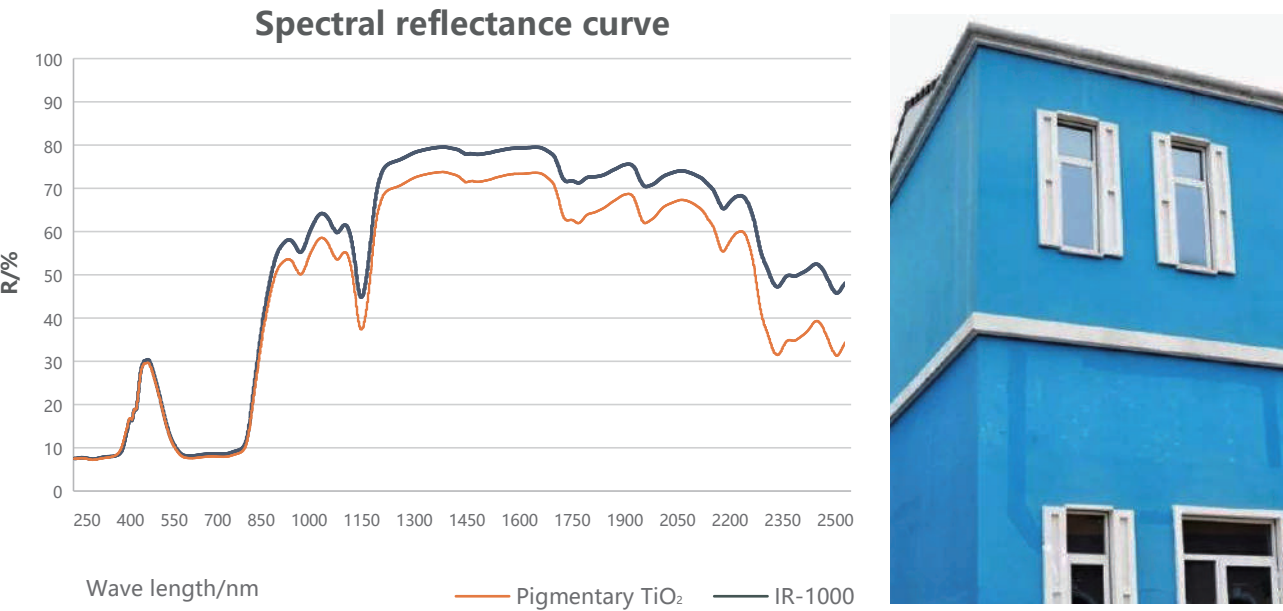
成分	Component	IR-1000 formulation, g
IR-1000	IR-1000	80
颜料和填料	Pigment & extenders	340
乳液和助剂	acrylic resin emulsion & additives	320
水	Water	260
IR-1000 content = 8% PVC=50%		



反射比Reflectance ratio						
样品	Sample	L*	a*	b*	TSR 300~2500nm	NIR 780~2500nm
IR-1000配方	IR-1000 formulation	65.95	16.99	50.42	0.52	0.67
常规配方	Pigmentary TiO ₂ formulation	65.78	17.21	49.89	0.43	0.59

RAL 5005 Signal blue

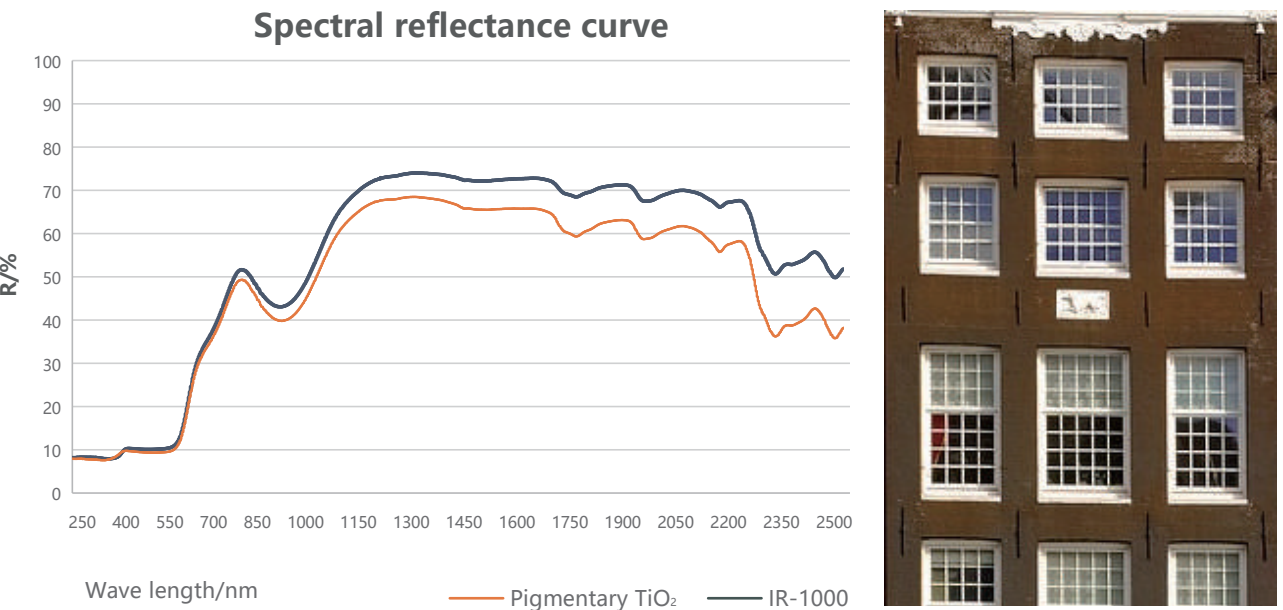
成分	Component	IR-1000 formulation, g
IR-1000	IR-1000	50
颜料和填料	Pigment & extenders	370
乳液和助剂	acrylic resin emulsion & additives	320
水	Water	260
IR-1000 content = 5% PVC=50%		



反射比Reflectance ratio						
样品	Sample	L*	a*	b*	TSR 300~2500nm	NIR 780~2500nm
IR-1000配方	IR-1000 formulation	36.30	-7.02	-31.52	0.36	0.65
常规配方	Pigmentary TiO ₂ formulation	36.28	-7.22	-32.32	0.29	0.54

RAL 8004 Copper brown

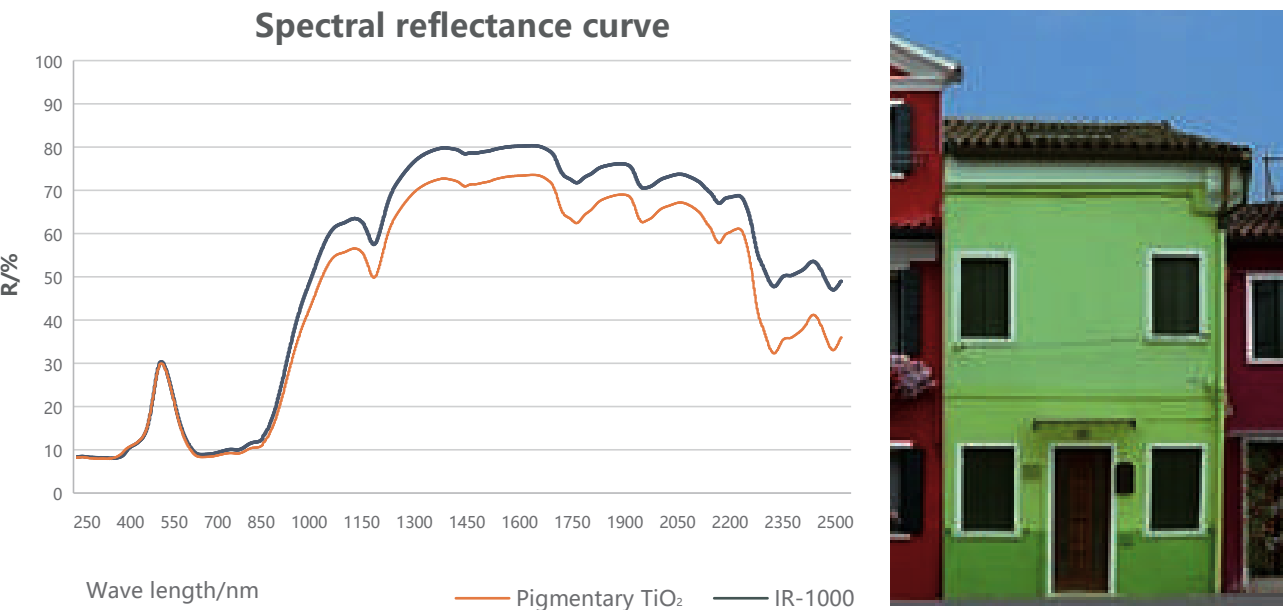
成分	Component	IR-1000 formulation, g
IR-1000	IR-1000	70
颜料和填料	Pigment & extenders	350
乳液和助剂	acrylic resin emulsion & additives	320
水	Water	260
IR-1000 content = 7% PVC=50%		



反射比Reflectance ratio						
样品	Sample	L*	a*	b*	TSR 300~2500nm	NIR 780~2500nm
IR-1000配方	IR-1000 formulation	41.52	28.41	18.03	0.37	0.59
常规配方	Pigmentary TiO ₂ formulation	41.37	29.10	18.26	0.32	0.51

RAL 6029 Mint green

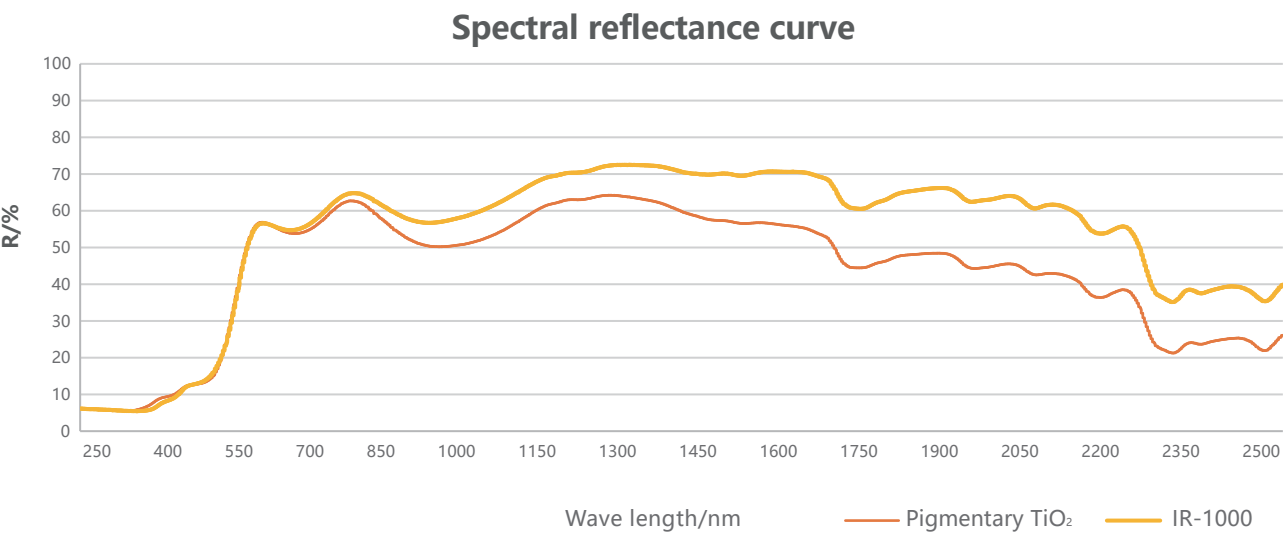
成分	Component	IR-1000 formulation, g
IR-1000	IR-1000	60
颜料和填料	Pigment & extenders	360
乳液和助剂	acrylic resin emulsion & additives	320
水	Water	260
IR-1000 content = 6% PVC=50%		



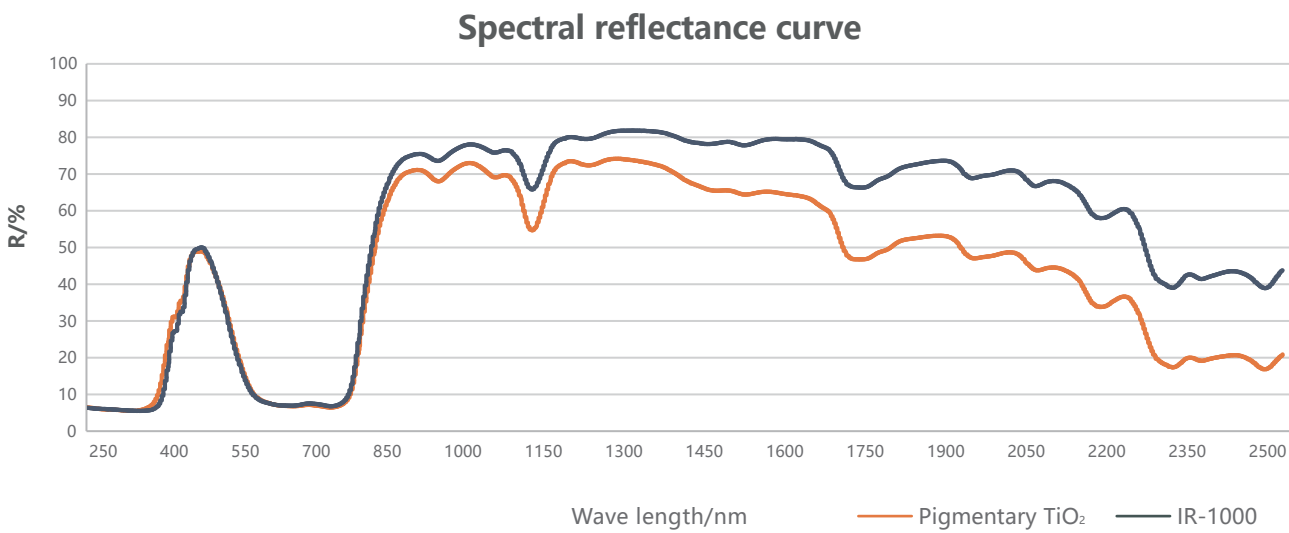
反射比Reflectance ratio						
样品	Sample	L*	a*	b*	TSR 300~2500nm	NIR 780~2500nm
IR-1000配方	IR-1000 formulation	44.00	-40.27	5.34	0.31	0.55
常规配方	Pigmentary TiO ₂ formulation	43.86	-41.04	4.82	0.25	0.46

Metal coating (Coil coating, automotive coating...)
金属涂料（卷钢涂料、汽车漆等）

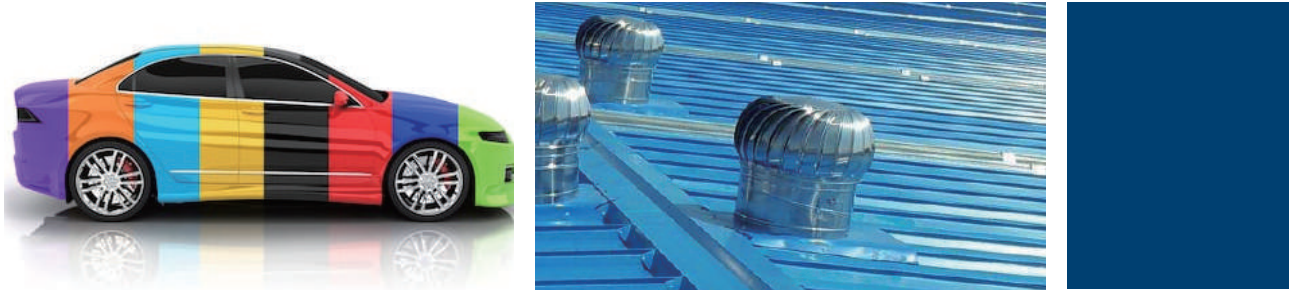
Coil coating

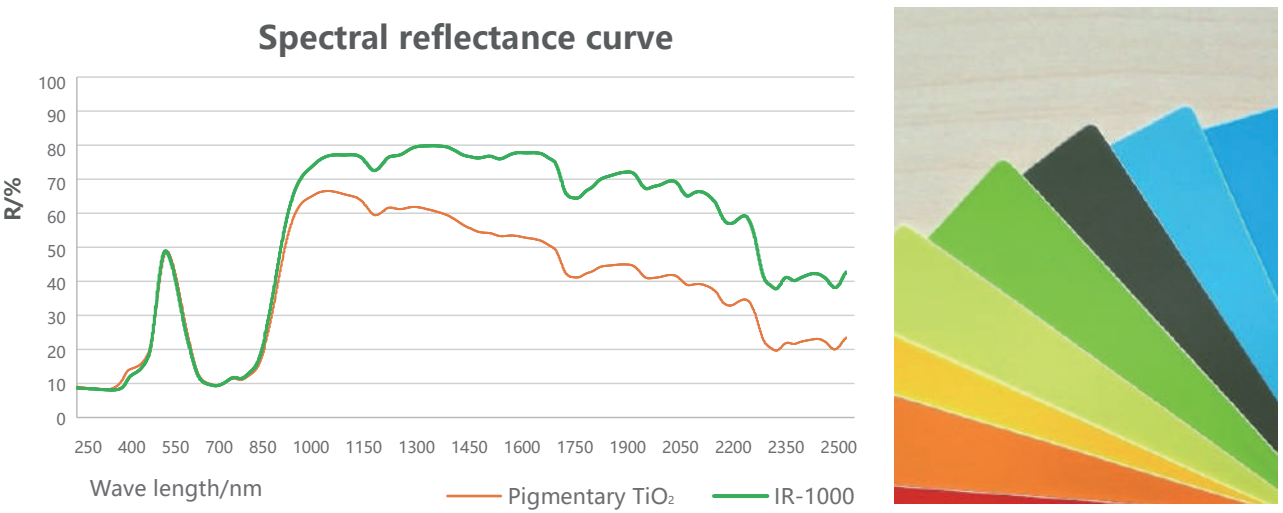


反射比Reflectance ratio						
样品	Sample	L*	a*	b*	TSR 300~2500nm	NIR 780~2500nm
IR-1000配方	IR-1000 formulation	68.63	15.61	47.67	0.48	0.63
常规配方	Pigmentary TiO ₂ formulation	68.78	15.50	47.28	0.44	0.54

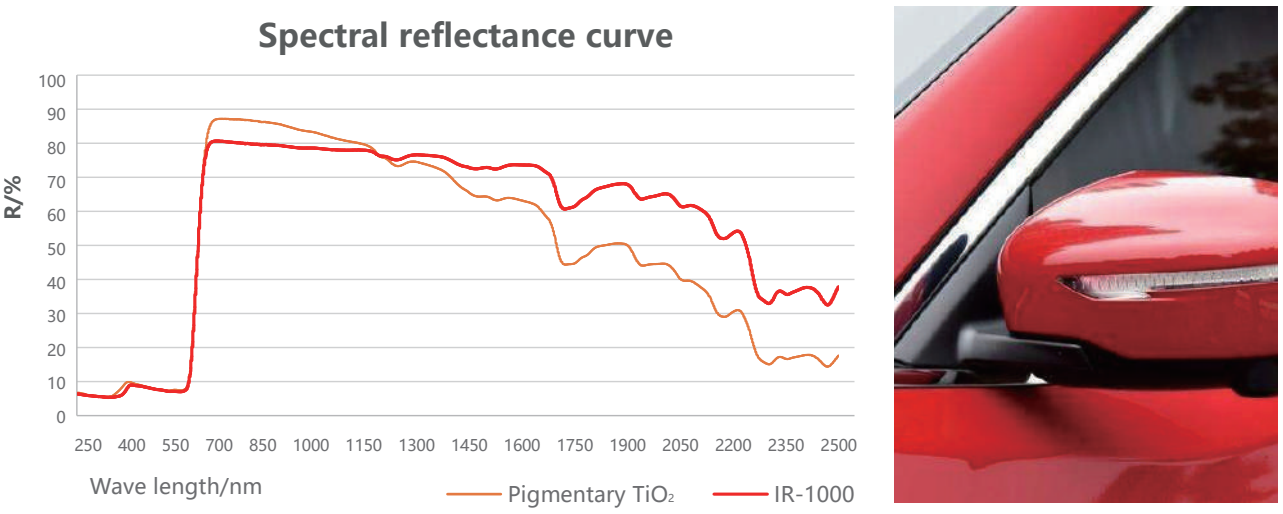


反射比Reflectance ratio						
样品	Sample	L*	a*	b*	TSR 300~2500nm	NIR 780~2500nm
IR-1000配方	IR-1000 formulation	50.38	-17.09	-36.20	0.43	0.72
常规配方	Pigmentary TiO ₂ formulation	50.91	-17.49	-36.10	0.38	0.63



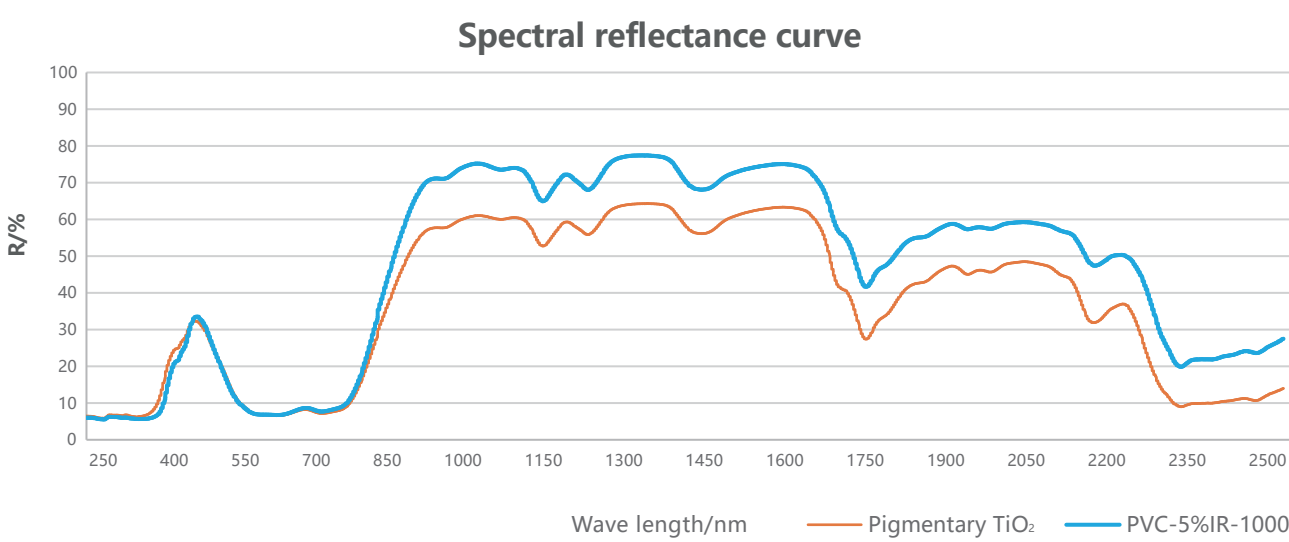


反射比Reflectance ratio						
样品	Sample	L*	a*	b*	TSR 300~2500nm	NIR 780~2500nm
IR-1000配方	IR-1000 formulation	60.61	-50.18	19.35	0.39	0.65
常规配方	Pigmentary TiO ₂ formulation	61.46	-48.86	19.60	0.33	0.51

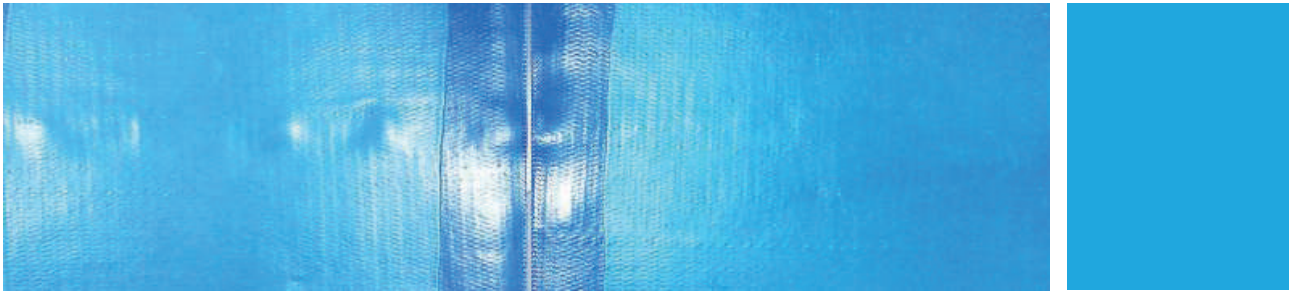


反射比Reflectance ratio						
样品	Sample	L*	a*	b*	TSR 300~2500nm	NIR 780~2500nm
IR-1000配方	IR-1000 formulation	48.49	52.20	23.67	0.53	0.76
常规配方	Pigmentary TiO ₂ formulation	49.25	52.79	24.16	0.50	0.71

Leather coating
皮革涂层



反射比Reflectance ratio						
样品	Sample	L*	a*	b*	TSR 300~2500nm	NIR 780~2500nm
IR-1000配方 (5%加量)	IR-1000 formulation	40.40	-2.51	-33.59	0.35	0.62
常规配方	Pigmentary TiO ₂ formulation	40.53	-2.25	-34.15	0.30	0.51



Typical plastics applications

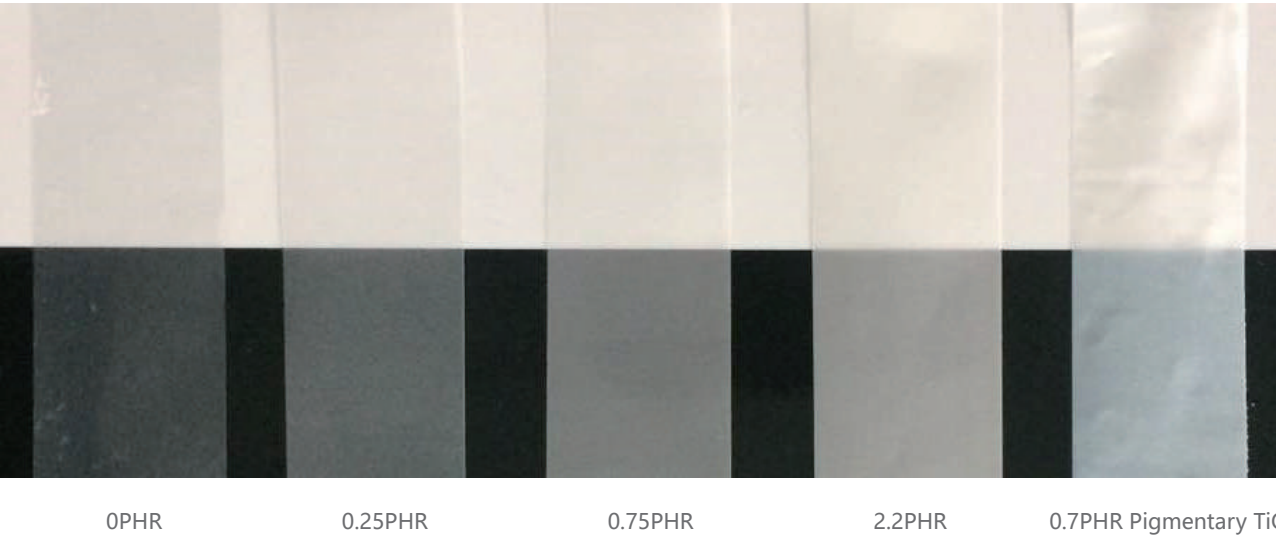
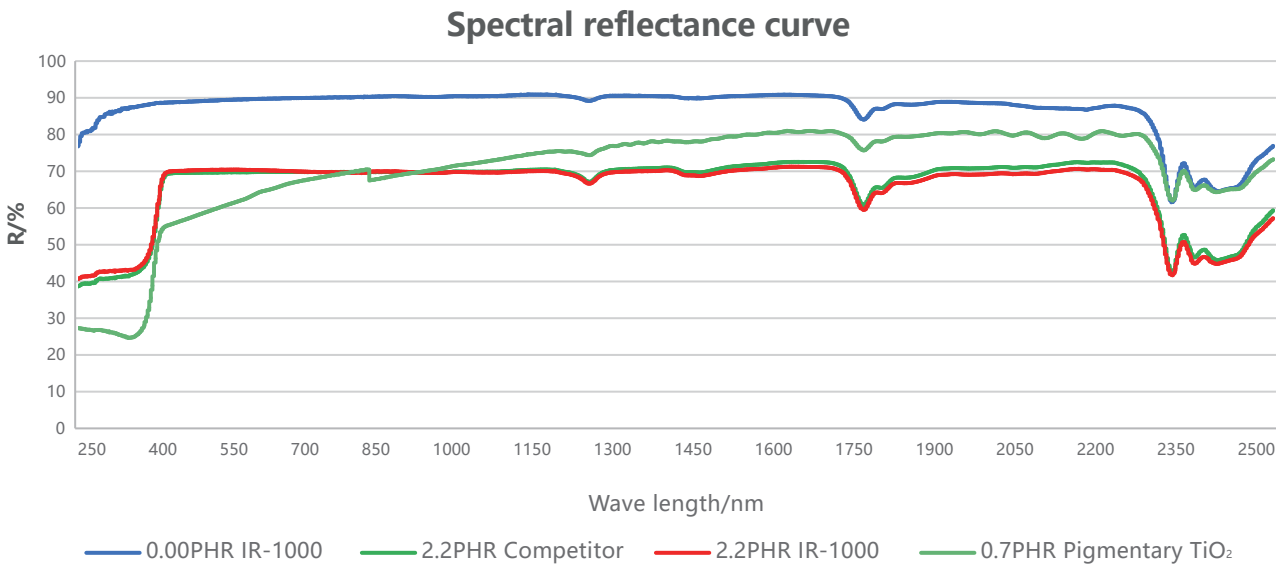
- Agriculture films
- Exterior plastic panels
- Transparent or coloured roofings
- Automotive interior decorations: instrument panel, leather coating

塑料的典型应用

- 大棚膜
- 户外用彩色塑料墙壁板（ASA 共挤）
- 透明和彩色屋顶板
- 汽车内饰件：仪表台、皮革涂层

Plastic film
塑料薄膜

Properties		IR-1000	Competitor	Pigmentary TiO ₂	LDPE
TiO ₂ content, PHR		2.2	2.2	0.7	0
Film thickness, μm		65			
Visible light transmittance (ASTM D1003-13 Procedure A-Hazemeter), %		76	76	52	99
Infrared transmittance,%	Cary 5000 UV-Vis-NIR	70	70	77	90
	Optical transmittance meter	21	21	49	88



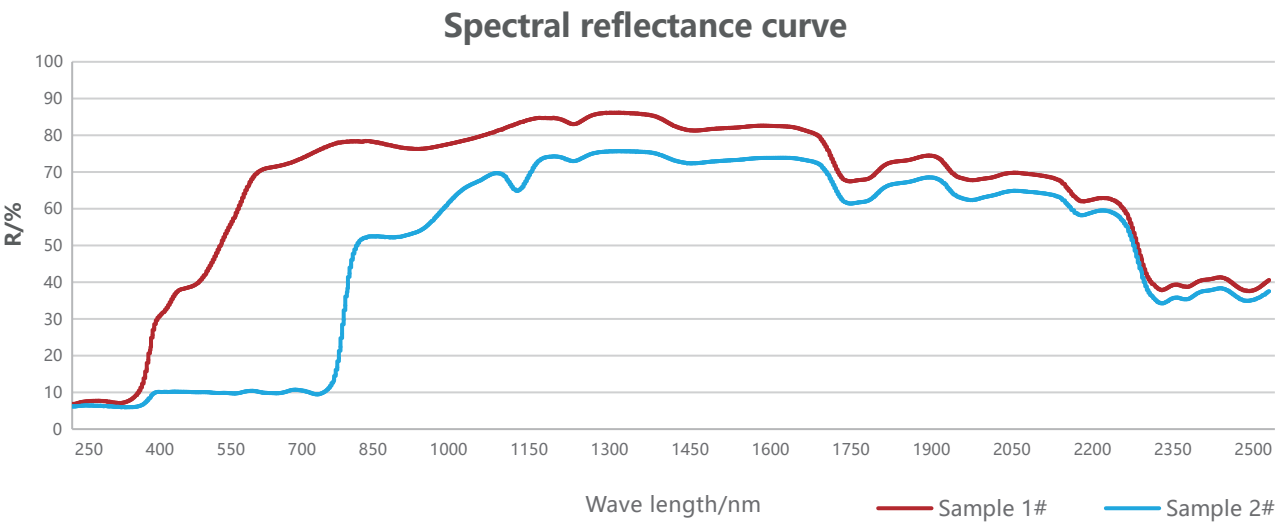
Military
军事用途



Application Example(coating)
应用实例（涂料）

Famous coating enterprise (LB) sample testing data

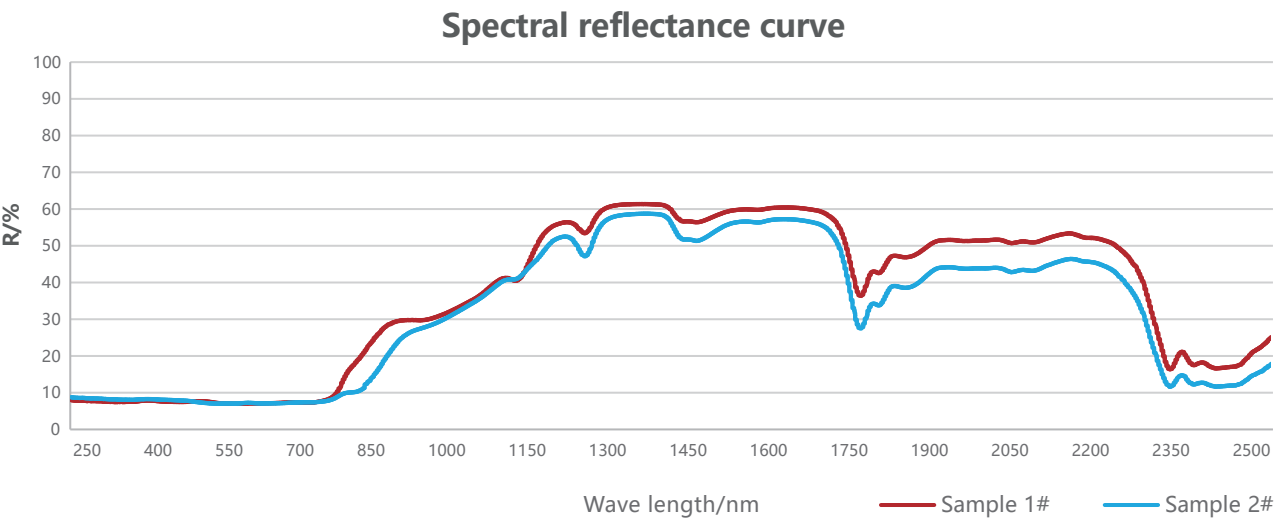
著名涂料企业（LB）样品测试数据



样品(Sample)	明度brightness (L*)	反射比Reflectance ratio	
		TSR 300~2500nm	NIR 780~2500nm
涂料板(coating plate) 1#	79.89	0.69	0.82
涂料板(coating plate) 2#	37.00	0.33	0.63

Application Example(plastic film)
应用实例（塑料薄膜）

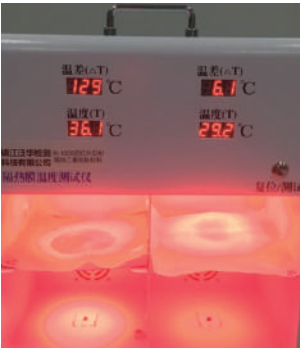
Famous coating enterprise (JZ) sample testing data
著名塑料制品企业（JZ）样品测试数据



样品(Sample)	明度brightness (L*)	反射比Reflectance ratio	
		TSR 300~2500nm	NIR 780~2500nm
薄膜(Thin Film)1# 添加Add IR-1000	27.79	0.21	0.40
薄膜(Thin Film)2# 常规配方(Pigmentary TiO ₂ formulation)	27.73	0.18	0.35

Thin-film insulation temperature difference test
薄膜隔热温差测试

隔热温差(Heat temperature difference), °C				
样品(Sample)	IR-1000添加比例 (Appending proportion)	初始温度 (Initial temperature), °C	实测温度 (The measured temperature)	温差 (temperature difference), °C
薄膜(Thin Film)A	0	23.2	36.1	12.9
薄膜(Thin Film)B	3%	23.1	29.2	6.1
备注(Remark)	隔热温差是测试薄膜隔热性能的重要指标。 Thermal insulation temperature difference is an important index to test the thermal insulation Performance of thin films 温差越大证明辐射到底部的热量越大，隔热性能差。 The greater the temperature difference, the greater the radiant heat at the bottom, and the Poor insulation performance			



Let's reflect.
开启反射时代!

Patent for invention
发明专利



独立研发
国家专利