

Improve energy efficiency

Infrared reflective pigments



Improve energy efficiency with infrared reflective pigments

Infrared reflective (IRR) pigments and dispersions, or "Cool Colors", can be used to significantly reduce the amount of heat absorbed by structures in comparison with other pigments in the same color space, lessening the reliance on air conditioning (AC) systems. This technology improves the durability and longevity, offering enhanced protection against thermal stress.



Global warming mitigation



Energy savings



Health and safety



Exterior durability improvement





Introducing the "cool" concept

Air conditioning for residential and commercial use is increasingly common, putting enormous strain on electricity. Cooling is the fastest growing use of energy in buildings, presenting significant challenges for energy sustainability and affordability.





Standard coating



Cool coating





How it works

Color pigments absorb portions of the visible light spectrum, creating the colors we see. However, they also absorb infrared radiation, which raises surface temperatures. IRR pigments provide color while reflecting infrared radiation, helping to reduce surface temperatures compared to standard pigments in the same color space. By minimizing infrared absorption, these pigments lower heat retention in building exteriors, enhancing energy efficiency, reducing AC usage, improving comfort and extending the durability of exterior material.



Assessing the impact of cool colors

Measuring the "cool effect" of Cool Colors is essential for ensuring optimal energy savings. Total solar reflectance (TSR) is commonly used to asses the reflective properties measuring the percentage of solar energy reflected by a surface.

Our **Innovatint** software helps customers identify TSR values and measures color, cost and reflectivity.



	L	TRS	TRS_UV	TRS_VIS	TRS_IRR1	TRS_IRR2	TRS_IRR3
RAL 9004 Std	29,3	4,80	0,21	2,25	1,12	0,71	0,52
RAL 9004 Cool	28,9	14,76	0,20	1,98	3,68	5,20	3,72



Heat build-up (HBU) tests are also used to measure how much heat a surface absorbs when exposed to an infrared lamp, simulating effects caused by sunlight infrared absorption.





Case study: Barcelona garden houses

In 2022, Vibrantz conducted an experiment where we placed two identical garden houses on the roof of our Barcelona laboratory and with the exact same AC equipment. The garden houses were both painted with 100% acrylic paint with same color RAL 9004, but one applied a standard coating based on Carbon Black (PBk 7) (House A) while the other applied a cool coating (House B) based on Chrome Iron Brown Hematite (PBr 29).

Over the course of three months, House B coated with Cool Colors had nearly 20% AC consumption savings compared to the standard coated House A.

Effective beyond black

Further testing in a similar study, after painting two garden houses grey, showed energy savings of up to **22%.**



House A RAL 9004 Std House B RAL 9004 Cool



Vibrantz cool pigments

Color index	Product name (per region)			IRR	Description		
	Americas	APAC	EMEA	reflectance	Description		
PG17/PBr29	V-775Q/V-785Q			High	Black shade (extra bluish)		
PG17/PBr29		24-3950			Black shade (bluish)		
PG17/PBr29	24-3950 FCP			High	Black shade (bluish); FCP version (*)		
PG17/PBr29	V-781Q			High	Black shade (reddish)		
PG17/PBr29	V-760Q		High	Black shade (brownish)			
PG17/PBr29	-	-	24-3900	High	Black shade		
Cr Free Eclipse	Black 372	Black 372 -		High	Black shade (bluish) with highest TSR; launched in 2024		
PBk33	Nubifer NB-903K			Moderate	Black shade (bluish)		
PBk33	Nubifer NB-803K FCP			Moderate	Black shade (bluish); excels in plastic sorting; FCP version (*)		
PY164	10550Q	10550s 10550Q		High	Dark brown shade;		
PBr24	10408Q	10408s	10408 H	High	Buff shade (redish)		
PBr24	10406Q	10406s	10406 H	High	Buff shade (yellowish)		
PBr24	10411Q 10411s		-	High	Buff shade (extra yellowish)		
PY119	Nubifer Y-905K			Moderate	Buff shade		
PY119	V-9117Q			Moderate	Buff shade (reddish)		
PY53	10401Q	0401Q 10401s		High	Light yellow shade with greenish undertone; 10401N non-toxic grade (no NiTiO3 content)		
PY184	6607B/6616B			High	Bright yellow shade with high color strength		
PO85	6821B			High	Bright orange shade; encapsulated grade		
PR101	Nubifer R-5510			Moderate	Dull red shade		
PG17	Nubicrom 02		High	Olive green shade			
PG17 Eclipse	V-11640Q	-	-	High	Dark olive green shade with higher TSR		
PG26	V-12600Q	V-12600Q	21-4700	Moderate	Dark bluish green shade		
PG50	V-11633Q		Moderate	Bright green shade			
PG50	21-4301			Moderate	Bright green shade; non-toxic Ni&Cr-free		
PB28	10446Q	10446s	10446	Moderate	Reddish blue shade with high color strength		
PB36	V-9248Q	22-5070	22-5070 SPP-2004 Moderate		Greenish blue shade; more opaque in VIS/UV than PB28		
PB29		Nubicoat HWR		Transparent	Unique reddish blue shade		
PV15	Nubix V-5/V-60			Transparent	Unique violet shade (V-5 bluish; V-60 reddish)		

(*) FCP version recommended for food contact applications.

Product names in the list are typical products and Vibrantz Cool pigments range includes other products in the color space of these color index.

Vibrantz cool dispersions

Product name	Americas	EMEA	Description
Infracool® CCW IRR line	\checkmark	-	Non-phthalate plasticizer. APE free, low VOC, broad selection of IRR colorants.
Novapint D-803	-	\checkmark	(PBr 29) Water-based colorant for facade
Monicolor C IR	-	\checkmark	(PBk 32) Water-based universal colorant for architectural applications
Temacolor S TIR	-	✓	(PBk 32) Solvent-based universal colorant for industrial applications
Temacolor UVH IRG	-	\checkmark	(PBk 32) Colorant for UV coatings applications
Temacolor UVH IRB	-	✓	(PBr 29) Colorant for UV coatings applications
Plasticolor CF-02894R	-	\checkmark	(PBr 29) Styrene-free colorants for polyester applications
Plasticolor CF-02895R	-	✓	(PBk 32) Styrene-free colorants for polyester applications
Plasticolor DTP-02918R	-	~	(PBr 29) Plasticizer based colorant for soft-PVC applications



Your partner in sustainable innovation

Our team of color scientists offer technical support through formulation development, testing capabilities and customized energy savings estimation tools. In collaboration with DEKRA (the world's largest independent, non-listed expert organization in the field of testing, inspection and certification), we have created a computer modeling system to simulate real energy savings in various building types and climate conditions, and it can be used as a tool for customized energy savings estimations.

Contact us to learn about how our expanded range of Cool Color infrared reflective pigments and dispersions can contribute to a more sustainable future.

