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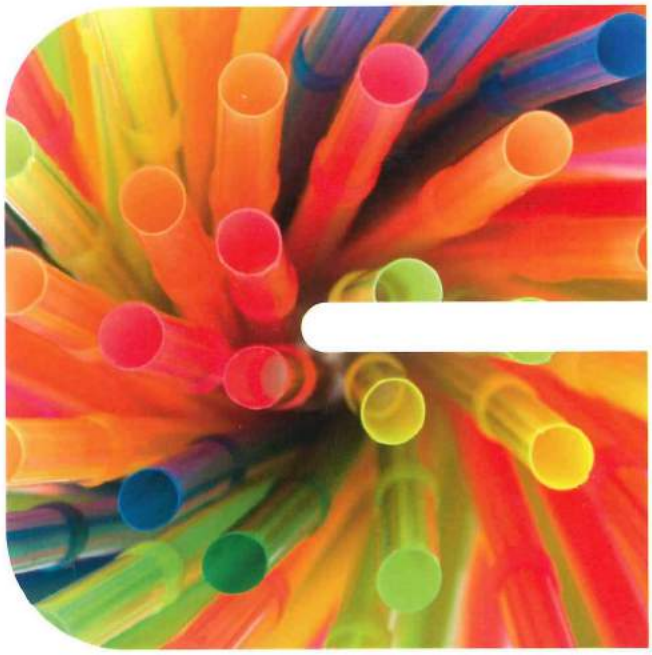
Pigments Plastics
ORGANIC PIGMENTS FOR PLASTICS COLORATION
用于塑料着色的有机颜料



what is precious to you?

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SD 1/3 1/3标准色深	SD 1/3 + 1% TiO_2 1/3标准色深 + 1% TiO_2	PRODUCT NAME 产品名 Colour Index 颜色索引号		POLYETHYLENE (HDPE) 聚乙烯 (HDPE)				PLASTICIZED PVC 塑化PVC			OTHER POLYMERS 其它聚合物			
				SD 1/3 1/3标准色深	Heat resistance 耐热性	Light fastness 耐光牢度	Warpage 低翘曲	SD 1/3 1/3标准色深	Light fastness 耐光牢度	Bleed fastness 耐迁移性	PS	PBT[1]	PC	PA
				g/kg	° C			g/kg						
		GRAPHTOL YELLOW H10G⁺	Full shade 全色			6-7			6					
		Pigment Yellow 81 颜料 黄 81		3.6	200		–	11.5		5	–	–	–	–
			Reduction 冲淡			6-7			7-8					
		PV FAST YELLOW H9G	Full shade 全色			7			7					
		Pigment Yellow 214 颜料 黄 214		2.4	280		○	9.2		5	●	○	–	–
			Reduction 冲淡			6			7					
		GRAPHTOL YELLOW GG⁺	Full shade 全色			6-7			7					
		Pigment Yellow 17 颜料 黄 17		1.1	200		–	4.2		3	–	–	–	–
			Reduction 冲淡			5-6			6-7					
		GRAPHTOL YELLOW 3GP	Full shade 全色			7-8			8					
		Pigment Yellow 155 颜料 黄 155		1.6	260		–	6.1		3-4	●	–	–	–
			Reduction 冲淡			7-8			8					
		PV FAST YELLOW H4G	Full shade 全色			8			7-8					
		Pigment Yellow 151 颜料 黄 151		3.8	290		○	12.0		5	○	–	–	–
			Reduction 冲淡			8			7-8					
		PV FAST YELLOW H2G	Full shade 全色			8			8					
		Pigment Yellow 120 颜料 黄 120		2.9	260		●	10.4		5	●	–	–	–
			Reduction 冲淡			8			8					
		PV FAST YELLOW HG 01	Full shade 全色			7-8			7					
		Pigment Yellow 180 颜料 黄 180		1.1	290		●	4.5		5	●	●	●	–
			Reduction 冲淡			6-7			8					
		PV FAST YELLOW HG	Full shade 全色			7-8			7					
		Pigment Yellow 180 颜料 黄 180		1.6	290		●	5.5		5	●	●	●	–
			Reduction 冲淡			6-7			7					
		GRAPHTOL YELLOW GR⁺	Full shade 全色			6-7			6-7					
		Pigment Yellow 13 颜料 黄 13		0.9	200		–	2.4		3	–	–	–	–
			Reduction 冲淡			5			6-7					
		PV FAST YELLOW H2GR	Full shade 全色			6-7			6-7					
		Pigment Yellow 191 颜料 黄 191		2.3	300		●	9.5		5	●	●	●	–
			Reduction 冲淡			6			5-6					

SD 1/3 1/3标准色深	SD 1/3 + 1% TiO_2 1/3标准色深 + 1% TiO_2	PRODUCT NAME 产品名 Colour Index 颜色索引号		POLYETHYLENE (HDPE) 聚乙烯 (HDPE)				PLASTICIZED PVC 塑化PVC			OTHER POLYMERS 其它聚合物			
				SD 1/3 1/3标准色深	Heat resistance 耐热性	Light fastness 耐光牢度	Warpage 低翘曲	SD 1/3 1/3标准色深	Light fastness 耐光牢度	Bleed fastness 耐迁移性	PS	PBT[1]	PC	PA
				g/kg	° C			g/kg						
		PV FAST YELLOW HGR	Full shade 全色			8			7					
		Pigment Yellow 191 颜料 黄 191		3.5	300		●	11.7		5	●	●	●	–
			Reduction 冲淡			7			6					
		PV FAST YELLOW HR 02⁺	Full shade 全色			6			7					
		Pigment Yellow 83 颜料 黄 83		0.7	200		–	2.2		5	–	–	–	–
			Reduction 冲淡			6-7			7-8					
		PV FAST YELLOW HR⁺	Full shade 全色			6			7					
		Pigment Yellow 83 颜料 黄 83		0.8	200		–	2.5		5	–	–	–	–
			Reduction 冲淡			6-7			7-8					
		GRAPHTOL YELLOW H2R	Full shade 全色			8			7					
		Pigment Yellow 139 颜料 黄 139		1.1	240		○	3.5		5	–	–	–	–
			Reduction 冲淡			7-8			6-7					
		PV FAST YELLOW H3R	Full shade 全色			8			7-8					
		Pigment Yellow 181 颜料 黄 181		4.2	300		●	13.1		5	●	●	–	–
			Reduction 冲淡			8			8					
		GRAPHTOL ORANGE GPS⁺	Full shade 全色			5			5-6					
		Pigment Orange 13 颜料 橙 13		1.7	200		–	5.4		3	–	–	–	–
			Reduction 冲淡			4			4-5					
		PV FAST ORANGE H4GL 01	Full shade 全色			8			7-8					
		Pigment Orange 72 颜料 橙 72		2.0	290		●	5.7		5	●	–	–	–
			Reduction 冲淡			7-8			7-8					
		PV FAST ORANGE H2GL	Full shade 全色			8			7					
		Pigment Orange 64 颜料 橙 64		2.2	300		○	6.9		5	●	○	○	–
			Reduction 冲淡			8			7					
		PV FAST ORANGE GRL	Full shade 全色			8			7-8					
		Pigment Orange 43 颜料 橙 43		2.1	280		–	6.1		4-5	●	●	●	○
			Reduction 冲淡			8			7-8					
		GRAPHTOL ORANGE RL⁺	Full shade 全色			6-7			7					
		Pigment Orange 34 颜料 橙 34		1.7	200		–	4.6		2-3	–	–	–	–
			Reduction 冲淡			5			6					

SD 1/3 1/3标准色深	SD 1/3 + 1% TiO_2 1/3标准色深+1% TiO_2	PRODUCT NAME 产品名 Colour Index 颜色索引号		POLYETHYLENE (HDPE) 聚乙烯 (HDPE)				PLASTICIZED PVC 塑化PVC			OTHER POLYMERS 其它聚合物			
				SD 1/3 1/3标准色深	Heat resistance 耐热性	Light fastness 耐光牢度	Warpage 低翘曲	SD 1/3 1/3标准色深	Light fastness 耐光牢度	Bleed fastness 耐迁移性	PS	PBT[1]	PC	PA
				g/kg	° C			g/kg						
		PV FAST ORANGE 6RL	Full shade 全色			8			7					
		Pigment Orange 68 颜料 橙 68		2.2	300		●	9.1		5	●	●	●	●
			Reduction 冲淡			7-8			7-8					
		GRAPHTOL RED HFG	Full shade 全色			7			8					
		Pigment Orange 38 颜料 橙 38		2.3	280		○	8.9		4	–	–	–	–
			Reduction 冲淡			6			6-7					
		PV FAST SCARLET 4RF	Full shade 全色			7-8			8					
		Pigment Red 242 颜料 红 242		2.3	300		–	8.8		5	●	●	●	–
			Reduction 冲淡			7			7-8					
		PV FAST RED HGR	Full shade 全色			7-8			6					
		Pigment Red 285 颜料 红 285		3.3	290		●	12.0		5	○	–	○	–
			Reduction 冲淡			6-7			5-6					
		PV FAST RED B	Full shade 全色			8			7					
		Pigment Red 149 颜料 红 149		1.3	300		–	5.2		5	●	●	●	○
			Reduction 冲淡			7-8			7					
		GRAPHTOL RED LG	Full shade 全色			4			3-4					
		Pigment Red 53:1 颜料 红 53:1		1.6	270		○	7.1		4-5	●	–	●	–
			Reduction 冲淡			2			2-3					
		GRAPHTOL RED LC	Full shade 全色			4			3-4					
		Pigment Red 53:1 颜料 红 53:1		1.7	250		–	7.2		4-5	●	–	●	–
			Reduction 冲淡			2			2-3					
		GRAPHTOL RED BB+	Full shade 全色			6			7-8					
		Pigment Red 38 颜料 红 38		1.0	200		–	3.3		3	–	–	–	–
			Reduction 冲淡			4			4					
		PV FAST RED D3G	Full shade 全色			8			7-8					
		Pigment Red 254 颜料 红 254		1.5	300		–	6.2		5	○	○	–	–
			Reduction 冲淡			8			8					
		GRAPHTOL RED F3RK 70	Full shade 全色			8			7					
		Pigment Red 170 颜料 红 170		2.2	270		○	7.8		2	–	–	–	–
			Reduction 冲淡			7			7					

SD 1/3 1/3标准色深	SD 1/3 + 1% TiO_2 1/3标准色深 + 1% TiO_2	PRODUCT NAME 产品名 Colour Index 颜色索引号		POLYETHYLENE (HDPE) 聚乙烯 (HDPE)				PLASTICIZED PVC 塑化PVC			OTHER POLYMERS 其它聚合物			
				SD 1/3 1/3标准色深	Heat resistance 耐热性	Light fastness 耐光牢度	Warpage 低翘曲	SD 1/3 1/3标准色深	Light fastness 耐光牢度	Bleed fastness 耐迁移性	PS	PBT[1]	PC	PA
				g/kg	° C			g/kg						
		PV FAST RED HB Pigment Red 247 颜料 红 247	Full shade 全色	2.4	300	7	●	9.4	6-7	5	●	●	●	–
			Reduction 冲淡			6-7			6-7					
		PV FAST RED 3B Pigment Red 144 颜料 红 144	Full shade 全色	1.6	300	7-8	–	5.9	8	5	●	●	●	–
			Reduction 冲淡			7-8			7					
		PV FAST RED BNP Pigment Red 214 颜料 红 214	Full shade 全色	1.5	300	8	–	5.7	8	5	●	●	●	–
			Reduction 冲淡			7-8			8					
		GRAPHTOL FIRE RED 3RLP Pigment Red 48:3 颜料 红 48:3	Full shade 全色	2.0	240	7	●	7.5	6-7	5	●	–	–	–
			Reduction 冲淡			6			5-6					
		GRAPHTOL RED HF2B Pigment Red 208 颜料 红 208	Full shade 全色	1.3	250	7	–	5.1	7-8	4-5	–	–	–	–
			Reduction 冲淡			6-7			6-7					
		GRAPHTOL RED F5RK Pigment Red 170 颜料 红 170	Full shade 全色	1.6	250	7-8	○	–	–	–	–	–	–	–
			Reduction 冲淡			7			–					
		GRAPHTOL RED 2BN Pigment Red 262 颜料 红 262	Full shade 全色	1.1	300	7	–	4.0	7-8	4	●	○	●	–
			Reduction 冲淡			6-7			7					
		GRAPHTOL RED P2B Pigment Red 48:2 颜料 红 48:2	Full shade 全色	1.2	240	6-7	●	5.2	6	5	●	–	–	–
			Reduction 冲淡			5			5-6					
		PV FAST RED HF4B Pigment Red 187 颜料 红 187	Full shade 全色	1.9	260	7-8	●	7.7	7	5	●	●	●	–
			Reduction 冲淡			7			7-8					
		GRAPHTOL CARMINE HF4C Pigment Red 185 颜料 红 185	Full shade 全色	1.3	250	6-7	●	4.5	7-8	5	●	–	–	–
			Reduction 冲淡			6-7			7					

SD 1/3 1/3标准色深	SD 1/3 + 1% TiO_2 1/3标准色深+1% TiO_2	PRODUCT NAME 产品名 Colour Index 颜色索引号		POLYETHYLENE (HDPE) 聚乙烯 (HDPE)				PLASTICIZED PVC 塑化PVC			OTHER POLYMERS 其它聚合物			
				SD 1/3 1/3标准色深	Heat resistance 耐热性	Light fastness 耐光牢度	Warpage 低翘曲	SD 1/3 1/3标准色深	Light fastness 耐光牢度	Bleed fastness 耐迁移性	PS	PBT[1]	PC	PA
				g/kg	° C			g/kg						
		PV FAST RED E4G Pigment Violet 19 颜料 紫 19	Full shade 全色	3.7	300	8	●	14.6	8	5	●	○	○	○
			Reduction 冲淡			8			8					
		GRAPHTOL CARMINE HF3C Pigment Red 176 颜料 红 176	Full shade 全色	1.4	270	7	●	5.4	7-8	5	●	–	●	–
			Reduction 冲淡			7			7					
		PV FAST RED E3B Pigment Violet 19 颜料 紫 19	Full shade 全色	3.0	300	8	○	13.1	8	5	●	○	●	○
			Reduction 冲淡			8			8					
		PV FAST RED E5B Pigment Violet 19 颜料 紫 19	Full shade 全色	2.4	300	8	○	11.4	7	5	●	○	●	○
			Reduction 冲淡			8			7					
		GRAPHTOL RUBINE L4B Pigment Red 57:1 颜料 红 57:1	Full shade 全色	1.0	260	6	–	4.5	6	5	○	–	–	–
			Reduction 冲淡			4			3-4					
		PV FAST PINK E Pigment Red 122 颜料 红 122	Full shade 全色	2.1	300	8	●	7.7	7-8	5	●	○	●	○
			Reduction 冲淡			8			7-8					
		PV FAST PINK E 01 Pigment Red 122 颜料 红 122	Full shade 全色	2.1	300	8	●	8.1	7	5	●	○	●	○
			Reduction 冲淡			8			7					
		GRAPHTOL BORDEAUX HF3R Pigment Violet 32 颜料 紫 32	Full shade 全色	1.0	250	7	–	3.6	7-8	5	–	–	–	–
			Reduction 冲淡			6			7					
		PV FAST VIOLET ER Pigment Violet 19 颜料 紫 19	Full shade 全色	1.7	300	8	○	7.5	7	5	●	○	●	○
			Reduction 冲淡			8			7					
		PV FAST VIOLET BLP Pigment Violet 23 颜料 紫 23	Full shade 全色	0.6	280	8	–	2.9	7-8	4	●	–	–	○
			Reduction 冲淡			7-8			7-8					

SD 1/3 1/3标准色深	SD 1/3 + 1% TiO_2 1/3标准色深+1% TiO_2	PRODUCT NAME 产品名 Colour Index 颜色索引号		POLYETHYLENE (HDPE) 聚乙烯 (HDPE)				PLASTICIZED PVC 塑化PVC			OTHER POLYMERS 其它聚合物			
				SD 1/3 1/3标准色深	Heat resistance 耐热性	Light fastness 耐光牢度	Warpage 低翘曲	SD 1/3 1/3标准色深	Light fastness 耐光牢度	Bleed fastness 耐迁移性	PS	PBT[1]	PC	PA
				g/kg	° C			g/kg						
		PV FAST VIOLET RL	Full shade 全色			8			7-8					
		Pigment Violet 23 颜料 紫 23		0.6	280		–	2.5		4	●	–	–	○
			Reduction 冲淡			7-8			7-8					
		GRAPHTOL BLUE AN	Full shade 全色			–			8					
		Pigment Blue 15 颜料 蓝 15		–	–		–	3.4		4	–	–	–	–
			Reduction 冲淡			–			8					
		PV FAST BLUE A4R	Full shade 全色			8			8					
		Pigment Blue 15:1 颜料 蓝 15:1		0.8	300		–	3.6		4	●	○	○	○
			Reduction 冲淡			8			8					
		PV FAST BLUE A2R	Full shade 全色			8			8					
		Pigment Blue 15:1 颜料 蓝 15:1		0.8	300		–	3.3		5	●	○	○	○
			Reduction 冲淡			8			8					
		PV FAST BLUE BG	Full shade 全色			8			8					
		Pigment Blue 15:3 颜料 蓝 15:3		1.1	300		–	4.0		5	●	●	●	●
			Reduction 冲淡			8			8					
		PV FAST GREEN GNX	Full shade 全色			8			8					
		Pigment Green 7 颜料 绿 7		2.0	300		–	8.9		5	●	●	●	○
			Reduction 冲淡			8			8					
		PV FAST BROWN HFR	Full shade 全色			8			8					
		Pigment Brown 25 颜料 棕 25		1.8	290		–	7.5		4-5	–	–	–	–
			Reduction 冲淡			8			8					
		PV FAST BROWN RL	Full shade 全色			8			8					
		Pigment Brown 41 颜料 棕 41		1.9	300		–	6.9		4	●	–	–	–
			Reduction 冲淡			8			8					

Pigments Plastics
ORGANIC PIGMENTS FOR PLASTICS COLORATION

INTRODUCTION
Clariant's Business Unit Pigments presents and promotes an extensive range of organic pigments under the trade names Graphtol® and PV Fast® which are specifically selected for their suitability and performance in the coloration of plastics.

GRAPHTOL PIGMENTS
Classical and novel organic pigments specifically selected for plastics applications. Graphtol pigments present a wide range of chemistries and technical properties which offer the user economical coloring solutions.

PV FAST PIGMENTS
High-performance organic pigments with excellent heat resistance, high light fastness and very good bleed fastness properties. These pigments are designed for their ease of dispersion in thermoplastic materials and are specifically suitable for fibre, thin wall, critical and technical applications.

This shade card provides information on the main fastness properties of the pigments in polyethylene (HDPE) and plasticized PVC. Guidance on applications in other polymers is also provided.

In addition to the pigments presented in this shade card, Clariant also promotes a number of »regional products« for the coloration of plastics. For further information regarding these products please contact your local Clariant sales office.

ILLUSTRATION OF THE PIGMENTS
The pigments have been illustrated using a special printing method. The standards used to obtain the matchings were injection molded HDPE color plaques with a pigment content equal to 1/3 standard depth of shade (SD 1/3) »full shade« and with 1% titanium dioxide in »reduction«.

Shade deviations in the application are possible and the prints are not suitable for colorimetry measurement or the testing of fastness properties.

TEST CONDITIONS
The values quoted for the fastness properties and the concentrations to standard depth of shade only apply for our test conditions. Any change in operating parameters, e. g. type and settings of the equipment, specific polymer substrate, concentrations, processing temparature and time can result in different values. We therefore recommend customers to conduct their own tests under the relevant working conditions before use.

STANDARD DEPTH 1/3 (SD 1/3)
The value quoted is the weight in grams (g) colorant per kg polymer required to obtain SD 1/3 according to DIN 53235. For HDPE the value relates to the pigment concentration with 1% TiO_2, and for PVC with 5% TiO_2.

HEAT RESISTANCE
Resistance to heat was tested according to DIN EN 12877 at SD 1/3 with 1% titanium dioxide in the injection molding process. The values quoted are the temparatures in ° C at which, after a dwell time of 5 min, a color change equivalent to a $\Delta E^*_{ab} = 3$ (DIN 6174) is obtained.

NOTE TO HEAT RESISTANCE† For the diarylide group of pigments a heat stability of 200 ° C is given due to the potential for thermal decomposition (refer to relevant safety data sheets). This applies even if the shade of the pigment would remain stable at higher temperatures.

LIGHT FASTNESS IN HDPE
The light fastness in white reduction was determined on injection molded plaques at SD 1/3 with 1% titanium dioxide in an artificial light exposure according to DIN EN ISO 4892. For the light fastness in full shade, the same pigment concentration was tested without

titanium dioxide. Assessments were against the 8-step blue wool scale, where 8 refers to very good light fastness and 1 very poor light fastness.

LIGHT FASTNESS IN PLASTICIZED PVC

The light fastness in white reduction was determined at 0.1 % pigment with 0.5 % titanium dioxide in an artificial light exposure according to DIN EN ISO 4892. The same concentration without titanium dioxide was tested for the light fastness of tranparent formulations. Assessments were against the 8-step blue wool scale.

SUITABILITY FOR LOW WARPING APPLICATIONS

Some organic pigments can have a negative influence on the dimensional stability of polyolefins. This behaviour is referred to as the »Potential to induce warpage« and is at its most extreme in HDPE injection molding applications. The influence of a pigment to induce warpage was tested for by measuring the dimensional changes in the horizontal and vertical planes of a rectangular injection molded plate in HDPE comparing colored (0.1 % pigment) and uncolored plates. The plates were injection molded at 280° C. Those pigments which has a heat resistance blow 280 ° Chas been injection molded at 220 ° C.

THE SUITABILITY OF A PIGMENT IN LOW WARPING APPLICATIONS IS INDICATED UNDER THE FOLLOWING KEY:

- ● Suitable – Technically recommended for low warping applications according to internal testing methods.
- ○ Limited suitability – Technically suitable for the application. A preliminary test in the application is required.
- – Not suitable – Technically unsuitable for low warping applications according to internal testing methods.

MIGRATION – BLEED FASTNESS

Fastness to bleeding was tested in plasticized PVC by direct contact of a pigmented film (0.1 %) for 2 h at 140 ° C with a white-pigmented film. Staining of the white-pigmented film was evaluated against the »5 step grey scale for assessing staining« according to DIN EN 20105-A03 whereby »5« denotes no bleeding.

APPLICATIONS IN OTHER POLYMERS

THE SUITABILITY OF A PARTICULAR PIGMENT IN POLYSTYRENE (PS), POLYBUTYLENE TEREPHTHALATE (PBT), POLYCARBONATE (PC) AND POLYAMIDE 6 (PA 6) IS INDICATED USING THE FOLLOWING KEY:

- ● Suitable – Technically recommended for the application according to internal testing methods.
- ○ Limited suitability – Technically suitable for the application, some restrictions may apply.
- – Not suitable – Technically unsuitable according to internal testing methods.

ADDITIONAL PRODUCT RANGES FOR THE COLORATION OF PLASTICS

Further to the PV Fast® and Graphtol® organic pigments, Clariant's Business Unit Pigments promotes for the coloration of plastics Polysynthren®, Solvaperm®, Hostasol® and Fat dyes, as well as Hostaprint® and Hostasin® pigment preparations.

Specific information and technical literature is available on request.

[1] Organic pigments can induce nucleation in Polyethylene terephthalate (PET) therefore preliminary testing is necessary.

用于塑料着色的
有机颜料

COMMENTARY

The information provided in this shade card is based on evaluations and testing carried out under Clariant laboratory conditions. Some organic pigment chemistries are known to interact with additives and impurities present in natural polymers, they can also react with lubricants and additives used during processing. The effects of such interactions can lead to unstable colors and reduced stability. All heat stability values quoted refer to the melt processing temperature of the polymer mix, factors such as insulation, cooling, tooling and shear forces can influence processing temperatures. Processors are advised to confirm all data by testing each color formulation under actual conditions of use.

Further products of Clariant's Business Unit Pigments for the plastics industry:

OPTICAL BRIGHTENERS

Clariant offers a very broad range of products with excellent properties for enhancing the brightness of plastics and man-made fibres:

- Hostalux® KS p and derivatives Hostalux KSN p and Hostalux KSB p for polyester fibers, polyolefins, polystyrene, ABS, polycarbonate and polyamide.
- Hostalux KCB p powder for a broad range of plastics.
- Hostalux KSC p powder for polyvinyl chloride.

介绍

科莱恩颜料部提供并推广一系列以Graphtol® 和PV Fast® 为商品名称的，专门满足塑料着色适用性和性能要求的有机颜料。

GRAPHTOL颜料

为塑料应用领域而精选的经典和新颖的有机颜料。Graphtol 颜料具有广泛的化学和技术特性，能够为使用者提供经济的着色解决方案。

PV FAST颜料

拥有卓越的耐热性，耐光牢度和很好的耐迁移性的高性能有机颜料。这类颜料是为满足其在热塑性材料中易分散而设计的，尤其适应纤维，薄壁制品，及关键技术应用。

本色卡主要提供了颜料在高密度聚乙烯（HDPE）和塑化聚氯乙烯（塑化PVC）中的主要耐性指标。同时也提供了在其他聚合物中的应用指导信息。

除了本色卡中所给出的颜料，科莱恩同时也推广一系列区域性产品用于塑料着色。关于产品更多的信息，请联系您当地的科莱恩销售机构。

颜料说明

这些颜料已用特殊的印刷方法列在色卡中。标准色板通常是用注塑成型的HPDE色片做的，颜料含量达到⅓标准色深的是“全色”，另加入1%二氧化钛的是“冲淡”。

产品应用中可能存在色相偏差，并且印刷品不适合用于比色测试和各种耐性的测试。

测试条件
本色卡中各种耐性指标和达到标准色深的颜料添加浓度都只适用于科莱恩测试条件。任何操作要素的改变，例如设备的类型和设置，聚合物的特性，应用浓度，加工温度和时间等，都会导致测试结果的不同。因此我们建议客户使用科莱恩产品之前根据相关的工作条件安排自己的测试。

⅓ 标准色深（SD ⅓）
根据DIN 53235，⅓标准色深值表示将1千克聚合物着色至⅓标准色深时需要添加的颜料克数。在HDPE测试中使用了1%的二氧化钛，而在PVC测试中使用了5%的二氧化钛。

耐热性
根据DIN EN 12877，耐热性测试采用含有⅓标准色深浓度颜料和1%二氧化钛的聚合物，并通过注塑成型来进行。在指定温度下停留5分钟后，如色片颜色差异ΔE^*_{ab}等于3（DIN 6174），该温度值（°C）即为耐热性值。

耐热性注释*
由于热降解潜在性，给出了联苯胺系列颜料的耐热性值为200°C（参考相关的安全数据）。即使颜料色相在更高温度下还能保持稳定，仍遵守此注释。

耐光牢度（HDPE）
根据DIN EN ISO 4892，冲淡色的耐光牢度是通过把含有⅓标准色深浓度颜料和1%二氧化钛的注塑成型色片暴露在人工光源中测试得到。同样的颜料浓度在不含二氧化钛条件下测试获得全色耐光牢度。测试结果采用8阶蓝羊毛卡来评估，8级代表最好耐光牢度，1级代表最差耐光牢度。

耐光牢度（塑化PVC）
根据DIN EN ISO 4892，冲淡色的耐光牢度是通过把含有0.1%颜料和0.5%二氧化钛的色片暴露在人工光源中测试得到。同样的颜料浓度在不含二氧化钛条件下测试获得全色耐光牢度。测试结果采用8阶蓝羊毛卡来评估。

低翘曲应用的适用性
有些颜料对于聚烯烃材料的尺寸稳定性有负面的影响。这种性质被认为是导致翘曲的潜在因素，尤其出现在HDPE注塑成型应用中。颜料引发翘曲的影响可通过比较已着色（0.1%颜料）和未着色的HDPE注塑成型矩形色片在纵向与横向的尺寸变化来测定。色片通常在280°C下注塑成型，而耐热性低于280°C的颜料则在220°C下注塑成型。

颜料在低翘曲应用的适用性由下面几点注明：

- ● 适合使用 - 根据内部测试方法，技术推荐适用于低翘曲应用。
- ○ 有限使用 - 技术上适合此应用，应用前需预先测试。
- – 不适用 - 根据内部测试方法，技术上不适用于低翘曲应用。

耐迁移性

在塑化PVC上进行耐迁移性测试，将着色的样本（0.1%颜料和1.0%二氧化钛）与白色PVC膜在140°C条件下接触2小时。根据DIN EN20105-A03，耐迁移性数值通过与5阶灰度卡对比得到，其中5级表明颜料没有迁移。

在其它聚合物中的应用

各颜料在聚苯乙烯（PS），聚对苯二酸丁二酯（PBT），聚碳酸酯（PC）和尼龙（PA6）中的适用性由下面几点注明：

● 适合使用 - 根据内部测试方法，技术上推荐使用。

○ 有限使用 - 技术上适合此应用，但可能有一些限制。

– 不适用 - 根据内部测试方法，技术上不适用。

适用于塑料着色的其他产品系列

除了PV Fast® 和Graphtol® 有机颜料，科莱恩颜料部推广Polysynthren®，Solvaperm®，Hostasol® 和Fat染料，同样还有Hostaprint® 和Hostasin® 颜料制剂。

具体信息和技术文献如需要可以提供。

[1] 有机颜料在聚对苯二甲酸乙二酯（PET）应用中会引发成核现象，所以预先测试是必需的。

注释

在本色卡中所给出的信息都是基于科莱恩实验室条件计算和测试得到的。一些有机颜料会和天然高分子材料中的添加剂或杂质发生反应，也能和加工时所用润滑剂或添加剂发生反应。这些反应可能导致颜色的不稳定和牢固性能的下降。色卡所用的耐热性数值是基于聚合物混合料的熔融加工温度，相关因素例如绝缘性，冷却，加工和剪切力都能影响加工温度。所以建议用户先通过在实际使用条件下对单一颜色组分的测试来确定所有数值。

科莱恩颜料部其他用于塑料工业的产品：

荧光增白剂

科莱恩提供一系列拥有卓越性能的产品，用于增强塑料和人造纤维的亮度。

- Hostalux® KS p与其衍生产品Hostalux KSN p和Hostalux KSB p适用于聚酯纤维，聚烯烃，聚苯乙烯，ABS，聚碳酸酯和尼龙。
- Hostalux KCB p粉末适用于多类塑料。
- Hostalux KSC p粉末适用于聚氯乙烯。