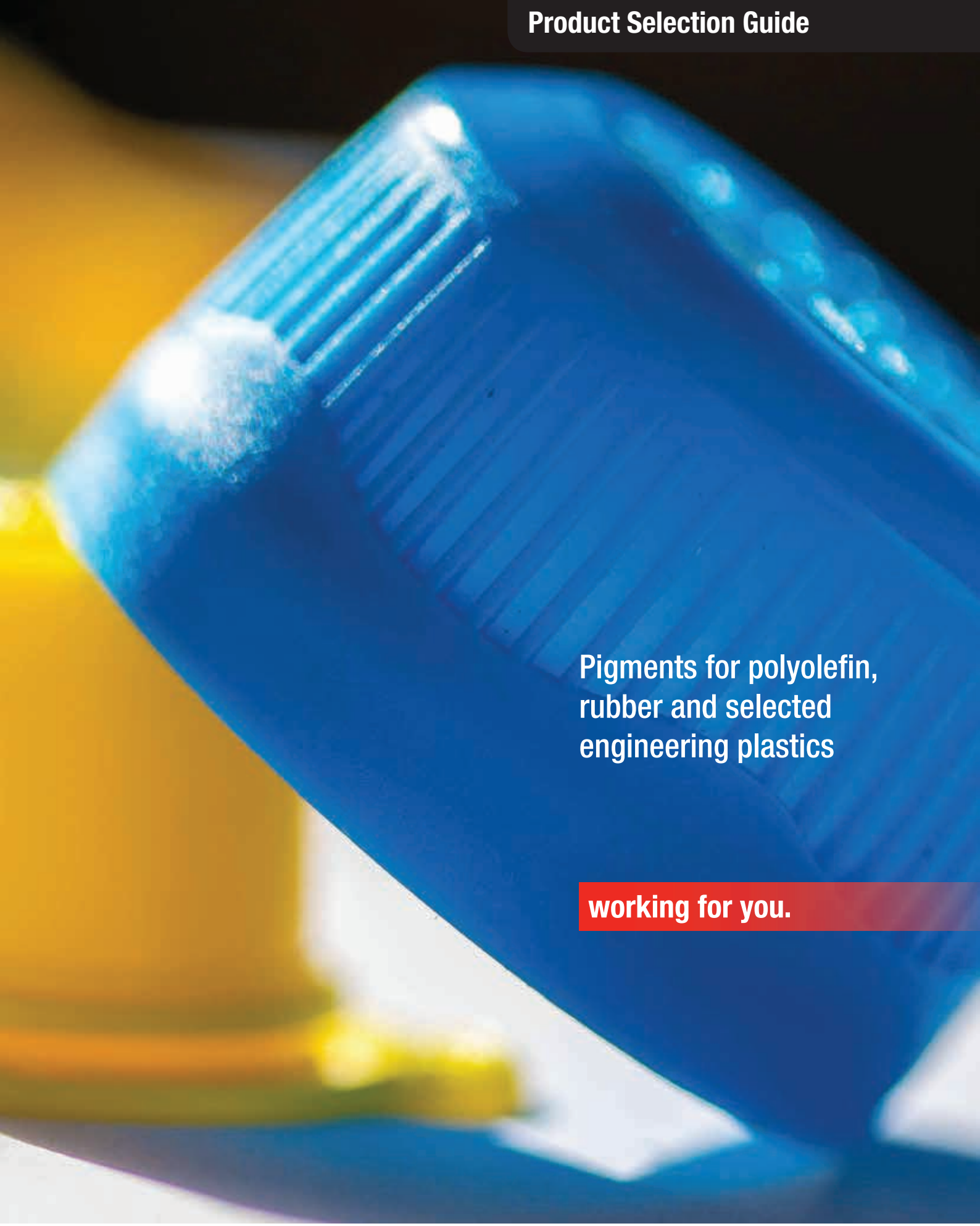
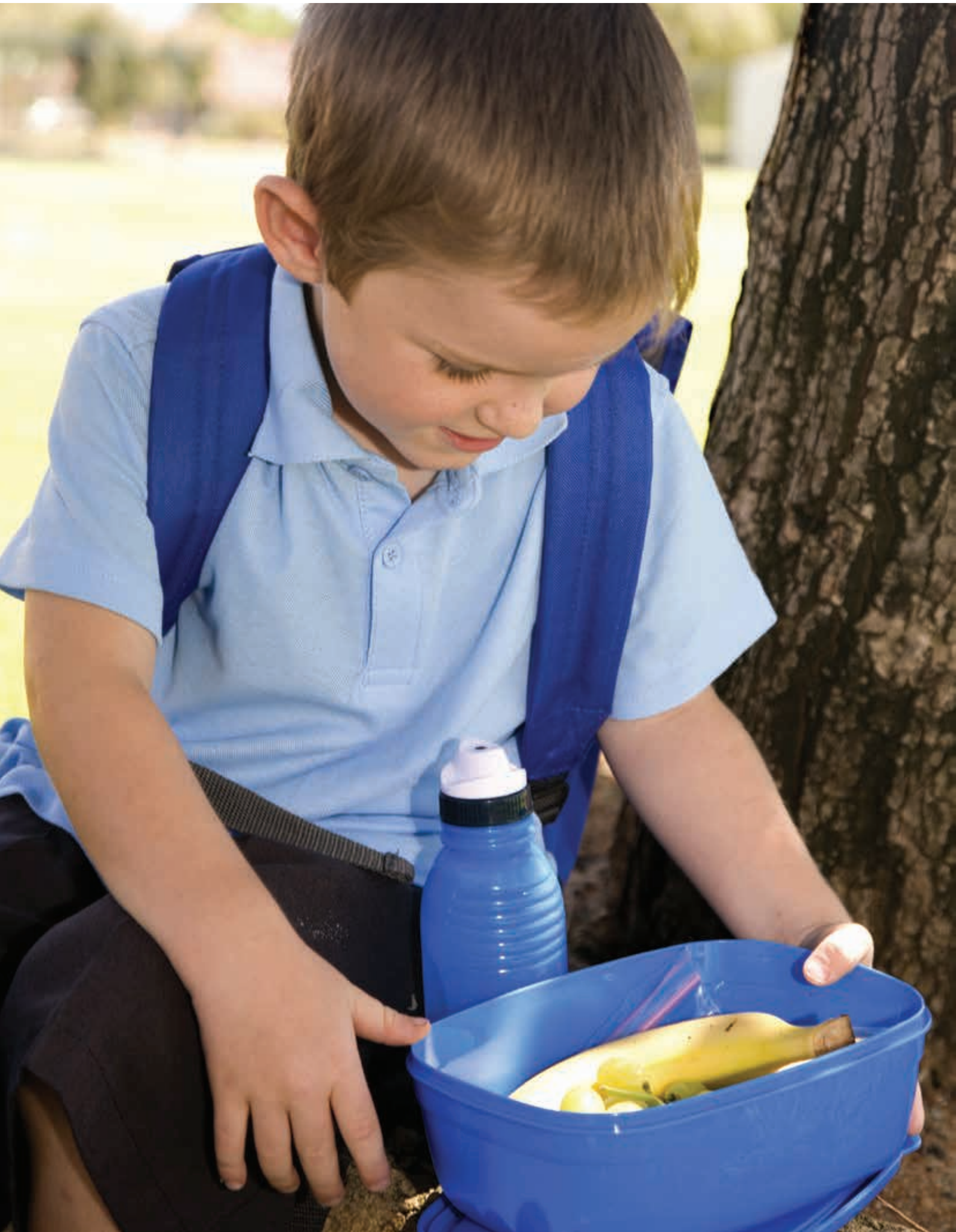
Product Selection Guide



Pigments for polyolefin, rubber and selected engineering plastics

working for you.

SunChemical®
a member of the DIC group
DIC Color & Comfort



A palette of solutions that run the extra mile

We offer a comprehensive range of solutions for intense colors in your plastics. Specially designed for the easy processing of PO, rubber and engineering plastics, our pigment preparations improve polymer operations, resulting in reliable performance, improved working conditions, fast processing and the efficient use of working capital.

Explanation of data

Color shades

All organic pigment shades shown here are based on a full shade concentration of 0.2% powder pigment; violets are an exception, where 0.1% powder pigment was used. In the white reductions, the illustrations are based on the respective powder pigment concentration to achieve 1/3 ISD based on 5% TiO_2.

Inorganic pigment shades are based on a full shade concentration of 2% powder pigment and a ratio of 1:4 for white reductions.

Application performance

A selection of performance data of the most important properties in polyolefin (HDPE) is presented here. All data given is for the corresponding base pigment, unless otherwise stated. Pigment concentrations used are those based on powder pigments.

Organic pigments:
Full shade (FS): 0.1%
White reduction (WR): 0.1% + 1% TiO_2 (ratio 1:10)

Inorganic pigments:
Full shade (FS): 1%
White reduction (WR): 0.5% + 2% TiO_2 (ratio 1:4)

Heat resistance (HDPE)

Heat resistance was determined by injection molding in accordance with ISO 12877-2.

The results show the highest temperature at which the color difference, versus a standard, is no greater than GS 4 on the ISO 105-A02 grayscale for assessing color change.

For most of the inorganic pigments and some high-performance organic pigments, a GS rating of 5 is achieved at the highest testing temperature of 300 °C. Therefore, heat resistance above 300 °C can be achieved under certain circumstances.

Polymer suitability

Possible fields of application are shown in the table, opposite each pigment. Please note that these are intended only as a general guide.

The group of technical polymers includes styrenics as well as engineering plastics. It is advisable to check the suitability of the technical polymer for the desired pigment preparations with the respective pigments, as described in the pattern book for organic and inorganic pigments for plastics.

Migration (HDPE)

Migration resistance was determined in accordance with DIN 53775 by direct contact between the colored test sheet and a white, flexible PVC contact sheet.

Staining of the contact sheet was assessed using the ISO 105-A03 grayscale (GS) for assessing staining, with GS 5 denoting no migration and steps 1 to 5 being subdivided.

Light fastness (HDPE)

Light fastness was determined using Xenon lamp exposure tests in accordance with the equivalent test methods ISO 4892-2 or ISO 105-B02.

The samples were assessed against the 1–8 Blue Wool Scale as described in ISO 105-B02, Blue Wool 8 denoting the highest light fastness.

Weather resistance (HDPE)

Weather resistance was determined using Xenon light exposure tests in accordance with the equivalent test methods ASTM G155, ISO 4892-2, or the internal test method WOM 119/50.

The HDPE samples were exposed for up to 3,000 hours.

Color changes were assessed using the ISO 105-A02 grayscale (GS) for assessing color change, with GS 5 denoting no change and GS 1 denoting the lowest weather resistance.

Warping (HDPE)

Influence on the warping tendency of injection-molded HDPE articles was determined in accordance with ISO 294-4/ASTM D955.

Warping tendency was assessed as follows:

- None (N): No significant influence under laboratory test conditions and widely confirmed in practice.
- Low (L): Slight influence determined in laboratory testing but successful in practice.
- High (H): Significant influence in the laboratory and in practice. Use for large or complex HDPE injection moldings is not recommended.

Pigment content

Average pigment concentration [%] in the respective concentrate is a nominal value. This value is intended only as a guideline. In practice, the specifications for the pigment preparations are set to achieve the correct color appearance and color strength.

Bulk density

Bulk density was determined by the weight of a product sample that can be contained in a vessel of specified volume and is expressed as kg/l. Assessment was in accordance with ISO/R 787-11.

Our pigment preparations are designed to make your life easier

Our broad range of pigment preparations for polyolefins, rubber and selected engineering plastics supports most applications – from prolonged outdoor exposure to the most stringent food packaging requirements. Customers can expect consistent processing behavior, reduced scrap rates, and enhanced productivity.

Key portfolio

Microlen® MCN

Microlen® MCN is a product range based on organic pigments and carbon black incorporated in a low molecular-weight polyethylene homo-polymer at a concentration between 40% and 65%. These products are suitable for polyolefin, rubber and for certain engineering plastics (e.g. polyacetal or styrene copolymers). Microlen® MCN represents the utmost level of dispersion for a pigment in aforementioned applications.

Demanding applications in terms of technical requirements (e.g. thin films/ fibers or bottle crates), but also in sensitivity (e.g. food packaging) can be colored with the sustainable product range Microlen® MCN.

Eupolen® PE

The Eupolen® PE range is based on organic and inorganic pigments as well as carbon black incorporated in a polyolefin carrier at a concentration of between 30% and 65%, depending on the base pigment. Eupolen® PE products are suitable for polyolefin and for certain engineering plastics, and can be delivered in a low dusting powder, micro granule or granule form.

Microlen® MCN

Product	Full shade (FS)	White reduction (WR)	Applications		
			Polyolefin	Technical polymers	Rubber
Microlen® Yellow 1025 MCN C.I. Pigment Yellow 17** Diarylide			■	-	■
Microlen® Yellow 1070 MCN C.I. Pigment Yellow 168 Monoazo salt			■	□	■
Microlen® Yellow 1210 MCN C.I. Pigment Yellow 93 Disazo condensation			■	□	■
Microlen® Yellow 1300 MCN C.I. Pigment Yellow 155 Disazo condensation			■	□	■
Microlen® Yellow 1410 MCN C.I. Pigment Yellow 180 Benzimidazolone			■	□	■
Microlen® Yellow 1415 MCN C.I. Pigment Yellow 13** Diarylide			■	-	■
Microlen® Yellow 1420 MCN C.I. Pigment Yellow 62 Monoazo salt			■	□	■
Microlen® Yellow 1500 MCN C.I. Pigment Yellow 95 Disazo condensation			■	□	■

□ = Limited suitability, ■ = Recommended

* All data are based on the testing concentration as mentioned under “Application performance”.
** At temperatures above 200°C diarylide pigments may decompose. Users are advised to follow the recommendations of ETAD information No. 2.

Application performance in HDPE								Physical properties	
Migration*	Heat*	Heat WR*	Light FS*	Light WR*	Weather (3,000 h) FS*	Weather (3,000 h) WR*	Warping	Pigment content	Bulk density
4-5	200	200	7	6–7	-	-	-	50	0.40
5	260	240	7	7	3	-	N	50	0.53
5	280	280	8	6–7	4	-	N	55	0.41
5	260	260	7	6–7	3–4	-	L	50	0.49
5	300	300	7–8	7	4–5	-	L	60	0.44
4-5	200	200	7–8	6–7	-	-	-	40	0.45
5	250	260	7	7	-	-	L	55	0.42
5	280	280	7–8	6–7	3	-	N	50	0.40

Microlen® MCN

Product	Full shade (FS)	White reduction (WR)	Applications		
			Polyolefin	Technical polymers	Rubber
Microlen® Yellow 1741 MCN C.I. Pigment Yellow 83** Diarylide			■	-	■
Microlen® Yellow 2070 MCN C.I. Pigment Yellow 110 Isoindolinone			■	□	■
Microlen® Orange 2895 MCN C.I. Pigment Orange 13** Diarylide			■	-	■
Microlen® Orange 2910 MCN C.I. Pigment Orange 71 Diketopyrrolopyrrole (DPP)			■	□	■
Microlen® Orange 2925 MCN C.I. Pigment Orange 34** Diarylide			■	-	■
Microlen® Flame Red 3800 MCN C.I. Pigment Red 272 Diketopyrrolopyrrole (DPP)			■	□	■

□ = Limited suitability, ■ = Recommended

* All data are based on the testing concentration as mentioned under “Application performance”.
** At temperatures above 200°C diarylide pigments may decompose. Users are advised to follow the recommendations of ETAD information No. 2.

Application performance in HDPE								Physical properties	
Migration*	Heat*	Heat WR*	Light FS*	Light WR*	Weather (3,000 h) FS*	Weather (3,000 h) WR*	Warping	Pigment content	Bulk density
4-5	200	200	7	7	-	-	-	50	0.52
5	300	300	8	8	4–5	3–4	H	50	0.55
4-5	200	200	6	5–6	-	-	-	55	0.37
5	300	300	7–8	7–8	4	-	L	55	0.33
3–4	200	200	6–7	5	-	-	-	55	0.38
5	300	300	7–8	7–8	3–4	-	L	45	0.44

Microlen® MCN

Product	Full shade (FS)	White reduction (WR)	Applications		
			Polyolefin	Technical polymers	Rubber
Microlen® Red 3840 MCN C.I. Pigment Red 254 Diketopyrrolopyrrole (DPP)			■	□	■
Microlen® Red 3840 LW MCN C.I. Pigment Red 254 Diketopyrrolopyrrole (DPP)			■	□	■
Microlen® Red 3845 LW MCN C.I. Pigment Red 254 Diketopyrrolopyrrole (DPP)			■	□	■
Microlen® Red 3890 MCN C.I. Pigment Red 144 Disazo condensation			■	□	■
Microlen® Red 4060 MCN C.I. Pigment Red 48:3** BONA (Sr)			■	□	■
Microlen® Rubine 4085 MCN C.I. Pigment Red 264 Diketopyrrolopyrrole (DPP)			■	□	■
Microlen® Red 4104 MCN C.I. Pigment Violet 19 Quinacridone			■	□	■

□ = Limited suitability, ■ = Recommended

* All data are based on the testing concentration as mentioned under “Application performance”.
** Products with this C.I. Number may vary in color and resistance properties in different polymer systems.

Application performance in HDPE								Physical properties	
Migration*	Heat*	Heat WR*	Light FS*	Light WR*	Weather (3,000 h) FS*	Weather (3,000 h) WR*	Warping	Pigment content	Bulk density
5	300	300	8	8	4	-	H	60	0.47
5	300	300	8	8	4	-	N	60	0.48
5	300	300	8	8	5	3	L	50	0.58
5	300	300	7–8	7	3	-	H	55	0.45
5	240	260	6	4	-	-	L	60	0.49
5	300	300	7–8	7–8	4–5	3	N	50	0.40
5	300	300	8	8	4–5	3–4	L	50	0.46

Microlen® MCN

Product	Full shade (FS)	White reduction (WR)	Applications		
			Polyolefin	Technical polymers	Rubber
Microlen® Red 4170 MCN C.I. Pigment Red 48:2** BONA (Ca)			■	□	■
Microlen® Rubine 4270 MCN C.I. Pigment Red 57:1** BONA (Ca)			■	□	■
Microlen® Red 4330 MCN Quinacridone			■	□	■
Microlen® Pink 4430 MCN C.I. Pigment Red 122 Quinacridone			■	□	■
Microlen® Magenta 4535 MCN C.I. Pigment Red 202 Quinacridone			■	□	■
Microlen® Violet 5700 MCN C.I. Pigment Violet 37 Dioxazine			■	□	■
Microlen® Violet 5800 MCN C.I. Pigment Violet 23 Dioxazine			■	□	■
Microlen® Blue 6500 MCN C.I. Pigment Blue 60 Indanthrone			■	■	■

□ = Limited suitability, ■ = Recommended

* All data are based on the testing concentration as mentioned under “Application performance”.
** Products with this C.I. Number may vary in color and resistance properties in different polymer systems.

Application performance in HDPE								Physical properties	
Migration*	Heat*	Heat WR*	Light FS*	Light WR*	Weather (3,000 h) FS*	Weather (3,000 h) WR*	Warping	Pigment content	Bulk density
5	220	240	7	6	-	-	L	55	0.41
5	240	260	6–7	4–5	-	-	L	45	0.42
5	290	300	8	8	4	-	L	55	0.43
5	300	300	8	8	4–5	3–4	L	50	0.39
5	300	300	8	8	4	3	L	55	0.40
5	280	260	8	7–8	4–5	3	L	50	0.41
3–4	240	260	7–8	3–4	4	3–4	L	50	0.46
5	300	300	7–8	8	4–5	4	H	50	0.45

Microlen® MCN

Product	Full shade (FS)	White reduction (WR)	Applications		
			Polyolefin	Technical polymers	Rubber
Microlen® Blue 6907 MCN C.I. Pigment Blue 15:1 Cu-phthalocyanine			■	□	■
Microlen® Blue 6911 MCN C.I. Pigment Blue 15:1 Cu-phthalocyanine			■	□	■
Microlen® Blue 7090 MCN C.I. Pigment Blue 15:3 Cu-phthalocyanine			■	□	■
Microlen® Blue 7097 MCN C.I. Pigment Blue 15:3 Cu-phthalocyanine			■	□	■
Microlen® Blue 7098 MCN C.I. Pigment Blue 15:3 Cu-phthalocyanine			■	□	■

□ = Limited suitability, ■ = Recommended

* All data are based on the testing concentration as mentioned under “Application performance”.

Application performance in HDPE								Physical properties	
Migration*	Heat*	Heat WR*	Light FS*	Light WR*	Weather (3,000 h) FS*	Weather (3,000 h) WR*	Warping	Pigment content	Bulk density
5	300	300	8	8	5	5	H	55	0.44
5	300	300	8	8	5	5	H	50	0.46
5	280	280	8	8	5	5	H	55	0.44
5	280	260	8	8	5	5	H	55	0.44
5	300	300	7–8	7–8	4–5	4–5	L	55	0.46

Microlen® MCN

Product	Full shade (FS)	White reduction (WR)	Applications		
			Polyolefin	Technical polymers	Rubber
Microlen® Green 8730 MCN C.I. Pigment Green 7 Cu-phthalocyanine			■	□	■
Microlen® Green 8745 LW MCN C.I. Pigment Green 7 Cu-phthalocyanine			■	□	□
Microlen® Black 0062 MCN C.I. Pigment Black 7 Carbon black			■	□	■
Microlen® Black 067 MCN C.I. Pigment Black 7 Carbon black			■	□	■
Microlen® Black 0068 MCN C.I. Pigment Black 7 Carbon black			■	□	■
Microlen® Piano Black 0077 MCN C.I. Pigment Black 7 Carbon black			■	□	■

□ = Limited suitability, ■ = Recommended

* All data are based on the testing concentration as mentioned under “Application performance”.

Application performance in HDPE								Physical properties	
Migration*	Heat*	Heat WR*	Light FS*	Light WR*	Weather (3,000 h) FS*	Weather (3,000 h) WR*	Warping	Pigment content	Bulk density
5	300	300	8	8	5	5	H	65	0.54
5	300	300	8	8	5	5	L	50	0.48
5	300	300	8	8	5	5	N	50	0.46
5	300	300	8	8	5	5	N	50	0.39
5	300	300	8	8	5	5	N	55	0.53
5	300	300	8	8	5	5	N	40	0.46

Eupolen® PE

Product	Full shade (FS)	White reduction (WR)	Applications		
			Polyolefin	Technical polymers	Rubber
Eupolen® PE Yellow 09-6101 C.I. Pigment Yellow 138** Quinophthalone			■	□	-
Eupolen® PE Yellow 11-5501 C.I. Pigment Yellow 185 Isoindoline			■	-	-
Eupolen® PE Yellow 13-1501 C.I. Pigment Yellow 215 Pteridine			■	□	-
Eupolen® PE Yellow 17-5001 C.I. Pigment Yellow 229 Mono Azo			■	□	-
Eupolen® PE Yellow 17-6001 C.I. Pigment Yellow 191:1 Monoazo salt			■	□	-
Eupolen® PE Yellow 18-0001 C.I. Pigment Yellow 183 Monoazo salt			■	□	-
Eupolen® PE Yellow 18-4101 C.I. Pigment Yellow 139** Isoindoline			■	-	-
Eupolen® PE Yellow 20-8501 C.I. Pigment Yellow 110 Isoindolinone			■	□	-
Eupolen® PE Brown 29-1505 C.I. Pigment Red 101 Iron oxide			■	□	-

□ = Limited suitability, ■ = Recommended

* All data are based on the testing concentration as mentioned under “Application performance”.
** Products with this C.I. Number may vary in color and resistance properties in different polymer systems.

Application performance in HDPE								Physical properties	
Migration*	Heat*	Heat WR*	Light FS*	Light WR*	Weather (3,000 h) FS*	Weather (3,000 h) WR*	Warping	Pigment content	Bulk density
4–5	280	270	8	7	-	-	L	50	0.48
4–5	240	250	7	7	-	-	-	35	0.35
5	300	300	7	7	4–5	4	L	50	0.53
5	300	300	7	6	-	-	N	50	0.52
5	300	300	7	6–7	3–4	-	N	60	0.51
5	300	300	8	6–7	-	-	L	65	0.62
5	240	240	8	7	3	-	L	55	0.56
5	300	300	7–8	8	4–5	4	L	50	0.57
5	300	300	8	8	5	5	N	30	0.67

Eupolen® PE

Product	Full shade (FS)	White reduction (WR)	Applications		
			Polyolefin	Technical polymers	Rubber
Eupolen® PE Red 39-1101 C.I. Pigment Red 178 Perylene			■	□	-
Eupolen® PE Pink 47-9001 C.I. Pigment Red 122 Quinacridone			■	□	-
Eupolen® PE Blue 69-1501 C.I. Pigment Blue 15:1 Cu-phthalocyanine			■	□	-
Eupolen® PE Blue 69-2001 C.I. Pigment Blue 15:1 Cu-phthalocyanine			■	□	-
Eupolen® PE Blue 70-9001 C.I. Pigment Blue 15:3 Cu-phthalocyanine			■	□	-
Eupolen® PE Blue 71-0401 C.I. Pigment Blue 15:4 Cu-phthalocyanine			■	□	-
Eupolen® PE Green 87-3001 C.I. Pigment Green 7 Cu-phthalocyanine			■	□	-
Eupolen® PE Green 87-3501 C.I. Pigment Green 7 Cu-phthalocyanine			■	□	-
Eupolen® PE Green 93-6201 C.I. Pigment Green 36 Cu-phthalocyanine			■	□	-
Eupolen® PE Black 00-6001 C.I. Pigment Black 7 Carbon black			■	□	-

□ = Limited suitability, ■ = Recommended

* All data are based on the testing concentration as mentioned under “Application performance”.

Application performance in HDPE								Physical properties	
Migration*	Heat*	Heat WR*	Light FS*	Light WR*	Weather (3,000 h) FS*	Weather (3,000 h) WR*	Warping	Pigment content	Bulk density
5	300	300	8	7	3–4	-	H	50	0.60
5	300	300	8	8	4–5	3–4	L	50	0.39
5	300	300	8	8	5	5	N	50	0.60
5	300	300	8	8	5	5	H	55	0.59
5	280	280	8	8	5	5	H	50	0.58
5	300	300	8	8	5	5	L	50	0.58
5	300	300	8	8	5	5	H	65	0.66
5	300	300	8	8	5	5	L	50	0.66
5	300	300	8	8	5	5	H	65	0.90
5	300	300	8	8	5	5	N	40	0.43

A partner who transforms with you.

Today's environment requires more than change. It demands transformation — and a partner who's willing to transform with you. Sun Chemical, a member of the DIC group, is a leading producer of printing inks, coatings and supplies, pigments, polymers, liquid compounds, solid compounds, and application materials. Together with DIC, Sun Chemical has over 20,000 employees located at 176 subsidiaries across 63 countries working every day to meet the needs of customers by improving performance on the essentials of business, such as reliable, on-time delivery and consistent product quality. Sun Chemical tailors solutions to unique customer needs and brings new ideas and the latest technology to market. As you move forward into a world of stiffer competition, faster turnarounds, more complex demands and sustainable products, count on Sun Chemical to be your partner.

working for you.

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