



Coloring plastics

HEUCODUR® & VANADUR® & VYNAMON™ & HEUCOSIN™ &
HEUCO® FIT LR & HEUCOPLAST™ & HEUCOPLAST™ EZ

heubach
COMPETENCE IN COLOR



Coloring plastics

When looking around it, becomes obvious that we are surrounded by all kinds of colors, either in the form of natural colors in the living surroundings such as flowers and fauna, or the synthetic colors in our clothing, furniture or utilities.

Many of these colored goods and utilities are made of plastics and are widely used in both indoor and outdoor applications. The versatility in their properties and performances allows for use in every day household goods as well as in high end technical products for the building and automotive industry.

Coloring plastics has been done for a long time with numerous pigments, colorants and preparations designed to color plastics efficiently. However, the versatility on the polymer as well as on the colorant side creates a complex field of options. The search for easy to use as well as high quality colorants has led to the introduction of tailored masterbatches or pigment preparations.

Masterbatches are highly concentrated blends of high quality pigments with a polymeric carrier. They can be made in final colors or as mono-pigment-concentrates which can then be blended to achieve the final color.

To produce these masterbatches specially designed pigments are used which exhibit easy dispersion characteristics as well as high temperature and chemical resistance.

The other option to color plastics is using pigments and colorants during the production of the polymers itself. Also here the need for high temperature and chemical resistance as well as ease of dispersion is mandatory for the colorants used.

The following pages portray Heubach's portfolio to serve the plastic market.

HEUCODUR®

Inorganic pigments have been known for a long time and have been used in polymer applications right from the beginning of plastic converting. Their incomparable high temperature and chemical resistance in combination with ease of dispersion makes them ideal colorants for all kind of polymers. A broad range of inorganic pigments can be used in masterbatches as well as in direct colouring processes. Heubach offers the following varieties for your plastic application.

HEUCODUR® Nickel Rutile Pigments

The structure of rutile yellow is based on the rutile crystal modification of titanium dioxide. These types of pigments offer outstanding hiding power, light fastness and resistance to temperature, chemicals (including acid and alkali), weathering as well as low-warping.

Detailed know-how and process control of each of the manufacturing steps is needed to achieve optimised pigment performance.

For rutile yellows, different colors can be obtained by variation of the composition and calcination temperature/profile. A higher calcination temperature results in darker grades with higher chroma.

In combination with organic pigments HEUCODUR® Yellow can enhance color saturation and light fastness in plastic.

Product Name / Color Index	Technical Information			Application Fields						Full Shade	Reduction 1:1
	Avg. Primary Particle Size [µm] ¹⁾	Oil Absorption [ml/100g] ²⁾	Heat Resistance [°C] ³⁾	PVC	Polyolefins	Polystyrene	ABS	Polyamide	Polycarbonate		
HEUCODUR® Yellow 152 (P) Pigment Yellow 53	~1.1	~17	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow 156 (P) Pigment Yellow 53	~1.2	~16	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow 8G (P) Pigment Yellow 53	~1.0	~16	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow G 9082 (P) Pigment Yellow 53	~1.3	~15	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow G 9116 (P) Pigment Yellow 53	~0.6	~17	800	●●	●●	●●	●●	●●	●●		

Due to the limitation of printing process, some slight variations between the color as illustrated may be observed.

●● Recommended ● Potential Use



HEUCODUR® Chrome Rutile Pigments

Chrome rutiles are available in a large variety of color shades and can be custom formulated to meet specific applications and requirements.

Excellent dispersibility and less shear sensitive colors are offered with the HEUCODUR® chromium and nickel rutile line.

In particular, the products of the 2500 series show a very high tinting strength.

Product Name / Color Index	Technical Information			Application Fields						Full Shade	Reduction 1:1
	Avg. Primary Particle Size [µm] ¹⁾	Oil Absorption [ml/100g] ²⁾	Heat Resistance [°C] ³⁾	PVC	Polyolefins	Polystyrene	ABS	Polyamide	Polycarbonate		
HEUCODUR® Yellow 3R (P) Pigment Brown 24	~0.5	~20	600	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow 2530 (P) Pigment Brown 24	~0.7	~19	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow 252 (P) Pigment Brown 24	~0.9	~19	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow G 9239 (P) Pigment Brown 24	~0.6	~19	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow 255 (P) Pigment Brown 24	~0.9	~18	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow 2550 (P) Pigment Brown 24	~1.0	~19	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow 6R (P) Pigment Brown 24	~1.1	~17	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow 256 (P) Pigment Brown 24	~1.4	~17	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow 2570 (P) Pigment Brown 24	~0.9	~19	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow 259 (P) Pigment Brown 24	~1.5	~16	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow G 9202 (P) Pigment Brown 24	~1.7	~16	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Yellow G 9180 (P) Pigment Brown 24	~1.7	~16	800	●●	●●	●●	●●	●●	●●		

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●● Recommended ● Potential Use

HEUCODUR® (Inverse) Spinel Pigments

Cobalt blue pigments are generated in the typical spinel crystal modification. The color shades range from a red shade blue to a green shade blue by increasing the trivalent chromium content in the crystal structure.

Correspondingly, the hiding power increases with increased chromium content as seen with HEUCODUR® Blue 5-100. HEUCODUR® Blue 550 is a high strength Pigment Blue 28 with a strong reddish hue.

Cobalt titanium green pigments have a structure typical of an inverse spinel. Cobalt blue and green pigments do not cause warpage in polyolefin applications.

Product Name / Color Index	Technical Information			Application Fields						Full Shade	Reduction 1:3
	Avg. Primary Particle Size (µm) ¹⁾	Oil Absorption (ml/100g) ²⁾	Heat Resistance (°C) ³⁾	PVC	Polyolefins	Polystyrene	ABS	Polyamide	Polycarbonate		
HEUCODUR® Blue 550 Pigment Blue 28	~0.9	~30	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Blue 551 Pigment Blue 28	~0.9	~27	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Blue 552 Pigment Blue 28	~0.9	~29	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Blue 2R Pigment Blue 28	~1.1	~42	600	●●	●●	●●	●●	●●	●●		
HEUCODUR® Blue 555 Pigment Blue 36	~0.7	~16	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Blue 5-100 Pigment Blue 36	~0.9	~17	600	●●	●●	●●	●●	●●	●●		
HEUCODUR® Blue 4G Pigment Blue 36	~0.2	~15	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Green 5G (P)* Pigment Green 50	~1.0	~17	800	●●	●●	●●	●●	●●	●●		

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●● Recommended ● Potential Use

*) In accordance with CLP Regulation No. 1272/2008 this product is classified as dangerous substances with Hazard Classes and Category Codes: Skin Sens. 1; H317 / Carc. 1A; H350i / STOT RE 2; H373



HEUCODUR® Brown

Iron chromite brown pigments are typically used in the coloring of PVC as an alternative to standard iron oxides.

HEUCODUR® Black

HEUCODUR® Black 953-1, HEUCODUR® Black 9-100 and HEUCODUR® Black 955 are black spinel pigments based on copper and cobalt, respectively.

Product Name / Color Index	Technical Information			Application Fields						Full Shade	Reduction 1:5
	Avg. Primary Particle Size (µm) ¹⁾	Oil Absorption (ml/100g) ²⁾	Heat Resistance (°C) ³⁾	PVC	Polyolefins	Polystyrene	ABS	Polyamide	Polycarbonate		
HEUCODUR® Brown 869 Pigment Brown 29	~0.6	~25	700	●●	●●	●●	●●	●●	●●		
HEUCODUR® Black 953-1 Pigment Black 28	~1.2	~16	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Black 9-100 (P) Pigment Black 28	~1.5	~17	800	●●	●●	●●	●●	●●	●●		
HEUCODUR® Black 955 Pigment Black 27	~1.4	~18	800	●●	●●	●●	●●	●●	●●		

Due to the limitation of printing process, some slight variations between the color as illustrated may be observed.

●● Recommended ● Potential Use

VANADUR® (Encapsulated) Bismuth Vanadate Pigments

VANADUR® PLUS 9010 9010 is a Silica encapsulated green shade bismuth vanadate pigment. For some applications, the fastness properties of standard bismuth vanadate regarding heat, SO₂ and / or alkali resistance

are insufficient, and since plastics applications require a stable color shade, even at very high temperatures, Heubach developed this highly stabilized Bismuth Vanadate pigment.

Due to the encapsulation, this pigment shows improved application properties like exceptional heat resistance and improved acid, alkali and SO₂ resistance, as well higher Light- and UV-resistance.

Product Name / Color Index	Technical Information			Application Fields						Full Shade	Reduction 1:1
	Avg. Primary Particle Size (µm) ¹⁾	Oil Absorption (ml/100g) ²⁾	Heat Res. in HDPE (5 min) (°C) ³⁾	PVC	Polyolefins	Polystyrene	ABS	Polyamide	Polycarbonate		
VANADUR® PLUS 9010 (P) Pigment Yellow 184	~0.7	~40	300	●●	●●	●●	●●	●	●		

Due to the limitation of printing process, some slight variations between the color as illustrated may be observed.

●● Recommended ● Potential Use

1) according to ISO 13320-1
2) according to DIN EN ISO 787/5
3) AA-00366

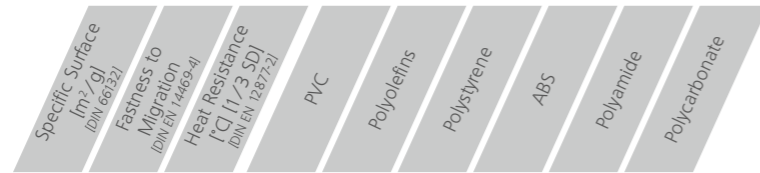
VYNAMON™ organic pigments for plastic applications

VYNAMON™ pigments are organic molecules that behave as pigments, they are insoluble in most polymers, large enough to break the light in specific ways to provide color and have a heat and chemical resistance that is sufficient to be used in plastic applications.

VYNAMON™ pigments are specific molecules that are prescribed by their color index and then modified to fulfil the demanding requirements for dispersion during extrusion and other plastic converting machinery. The heat stability and chemical resistance allows

for their use in a wide range of polymers and a wide variety of interior as well as exterior applications.

The following table gives an overview of Heubach's complete portfolio:



Product Name / Color Index	Technical Information			Application Fields						Full Shade	Reduction 1:25 TiO ₂
	50	5	320	●●	●●	●●	●●	●●	●●		
VYNAMON™ Yellow 118002 Pigment Yellow 180	50	5	320	●●	●●	●●	●●	●●	●●		
VYNAMON™ Yellow 115002 Pigment Yellow 150	39	5	340	●●	●●	●	●	●	●		
VYNAMON™ Yellow 118303 Pigment Yellow 183	22	5	320	●●	●●	●●	●●	●	●		
VYNAMON™ Yellow 119101 Pigment Yellow 191	19	5	320	●●	●●	●●	●●	●	●		
VYNAMON™ Yellow 113901 Pigment Yellow 139	33	5	220	●●	●●	●	●	●	●		
VYNAMON™ Red 325401 Pigment Red 254	27	5	320	●●	●●	●●	●●	●	●		
VYNAMON™ Red 312202 Pigment Red 122	67	5	320	●●	●●	●●	●	●	●		
VYNAMON™ Blue 515100 Pigment Blue 15:1	57	5	280	●●	●●	●●	●	●	●		
VYNAMON™ Blue 515303 Pigment Blue 15:3	55	5	340	●●	●●	●●	●	●●	●		
VYNAMON™ Blue 3R FW-H Pigment Blue 60	44	5	300	●●	●●	●●	●	●	●		
VYNAMON™ Green 600734 Pigment Green 7	41	5	300	●●	●●	●●	●●	●	●●		
VYNAMON™ Green 6Y FW-C Pigment Green 36	50	5	300	●●	●●	●●	●●	●	●●		

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●● Recommended ● Potential Use

HEUCOSIN™

Besides the common use of masterbatches for efficient coloration of plastics, the use of powder pigment preparations is still state of the art. In particular, for engineering plastics such as ABS or Polyamide, the use of powder pigment preparations is very common, since here large volumes of the same color is needed for automotive as well as household goods and kitchen appliances. The ready-made pigment preparation is blended in highspeed mixers to achieve a compound with the desired final color, ready for use by the plastic converter.

The HEUCOSIN™ products are ready to use, and are customized multi-pigment preparations that have been predispersed and adjusted to the most frequently used shades.

All grades exhibit universal processing characteristics and can be easily dispersed in an extensive range of polymers.

To achieve an exceptionally homogeneous structure the different components of a color shade are dry mixed and milled in a three step process resulting in interlocked pigments.

The choice of pigments as used for production of HEUCOSIN™ pigment preparations, ensures very good light and weather fastness as well as the required heat and chemical resistance.

Beside our standard range of HEUCOSIN™ pigment preparation as listed below, we are able to match most color shades with the correspondingly required fastness properties.

RAL	Shade	Name	Fastness Properties				
			Weather	Over-painting	Acid	Alkali	Heat [°C] ¹⁾
1001		G 6191	4 - 5	5	5	5	180
1018		G 7670	4	5	5	3	200
1019		G 2186	4 - 5	5	5	5	180
2004		G 7627	4	5	5	5	200
3000		G 14676	4 - 5	5	5	5	200
3002		G 14677	4 - 5	5	5	5	200
3020		G 14697	4 - 5	5	5	5	200
5002		G 2171	4 - 5	5	5	5	160
5003		G 2017 N	4	5	5	5	160
5007		G 1782	4 - 5	5	5	5	180
5010		G 5303 N	4 - 5	5	5	5	180
5012		G 14555	4 - 5	5	5	5	180
5014		G 3276 N	4 - 5	5	5	5	180
5015		G 1780 N	4 - 5	5	5	5	180
6011		G 1901	4 - 5	5	5	5	180

RAL	Shade	Name	Fastness Properties				
			Weather	Over-painting	Acid	Alkali	Heat [°C] ¹⁾
6018		G 7671	4 - 5	5	5	3 - 4	200
7000		G 1802 N	4 - 5	5	5	5	180
7001		G 1882	4 - 5	5	5	5	180
7005		G 1927	4 - 5	5	5	5	180
7011		G 2033 N	4 - 5	5	5	5	180
7012		G 14329	4 - 5	5	5	5	200
7016		G 1978	4 - 5	5	5	5	180
7023		G 2216 N	4 - 5	5	5	5	180
7030		G 2229	4 - 5	5	5	5	180
7031		G 1792	4 - 5	5	5	5	180
7032		G 7748 N	4 - 5	5	5	5	180
7035		G 1803	4 - 5	5	5	5	180
8012		G 3489	4 - 5	5	5	5	180
8015		G 4489 N	5	5	5	5	180
8017		G 1700 N	4 - 5	5	5	5	180

¹⁾ Heat Resistance: Pigment was exposed at different temperatures up to 250°C in a 2-comp. acrylate base coat for 30 minutes. Temperature, above which, a noticeable shade change can be observed.

Suitability for food contact applications on request.

Due to limitation of printing process some slight variations between the color as illustrated may be observed.

HEUCO® FIT LR





For a long time lead chromates and molybdates have been used in plastic applications, with numerous polymers, in a cost effective way. Since 2015 the new regulations have pushed the plastic converters away from lead containing pigments and made them look for alternative solutions.

Whereas some converters have developed specific color blends using a mixture of organic and inorganic pigments, others are looking for ready made pigment preparations.

HEUCO® FIT LR, powder pigment preparations, have been developed for direct replacement of chrome yellow and molybdate red pigments.

In selecting the pigments the focus was on a good balance of the coloristic properties and the hiding power in the near full shade range, without losing sight of the cost situation.

The following HEUCO® FIT LR grades are suitable for the plastic market, since, besides the before mentioned characteristics, the heat resistance has determined the choice of pigment. HEUCO® FIT LR plastic grades can be used in most common polymers to replace lead containing pigments on a 1:1 basis.

Products	Full Shade	Fastness Properties			Application
		Weather ¹⁾	Migration ²⁾ / Overpainting ⁶⁾	Heat Resistance [°C] ³⁾	Plastics
HEUCO® FIT LR Yellow 1006401P		3 - 4	5 ²⁾	280	● ●
HEUCO® FIT LR Yellow 1007001P		3 - 4	5 ²⁾	280	● ●
HEUCO® FIT LR Red 3022001		4 - 5 ⁵⁾	5 ⁶⁾	170 ⁷⁾	●
HEUCO® FIT LR Red 3022002		4 - 5 ⁵⁾	5 ⁶⁾	170 ⁷⁾	●

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● ● Our Recommendation ● Potential Use

¹⁾ Weather Fastness: Data on resistance to artificial xeno weathering (DIN EN ISO 4892-2, cycle 1, climate M) is determined in a rigid PVC test system after 2000 hours weathering time. Rating of change in color in accordance with DIN EN ISO 105-A02.

²⁾ Migration: Migration was tested in a plasticized PVC system and rated in accordance with DIN EN ISO 105-A02.

³⁾ Heat Resistance: Pigment was exposed in an injection moulding process at different temperatures up to 300°C in a HDPE testing system according to DIN EN 12877-2, procedure B.

⁵⁾ Weather Fastness: Data on resistance to artificial xeno weathering (DIN EN ISO 16474-2, procedure A, cycle 1) is determined in a 2-comp. polyurethane test system after 2000 hours weathering time. Rating of change in color in accordance with DIN EN ISO 105-A02.

⁶⁾ Overpainting: Bleeding was rated, of a white alkyd-melamine topcoat on a pigmented 2-comp. acrylate base coat in accordance with DIN EN ISO 105-A02.

⁷⁾ Heat Resistance: Pigment was exposed at different temperatures up to 250°C in a 2-comp. acrylate base coat for 30 minutes. Temperature, above which, a noticeable shade change can be observed.










HEUCOPLAST™ EZ

In some case the dustiness of powder pigments causes the need for specific exhaust equipment and leads to unproductive cleaning time. This can be overcome with the micro granulated HEUCOPLAST™ EZ pigment preparation.

Heubach's HEUCOPLAST™ EZ are flushed organic pigments that are dust free and pre-dispersed. They have been designed to exhibit very good dispersion characteristics in low shear or single screw extruders. HEUCOPLAST™ EZ are engineered to bring extra value to those customers, who look for extra ease of dispersion during the production of specialized masterbatches.

They can be used in applications like fibres and thin films, in addition to the dust free use of the preparation.

HEUCOPLAST™ EZ are so far offered in the following colors, further colors are under development:

Product Name / Color Index	Technical Information			Application Fields						Full Shade	Reduction 1:25 TiO ₂
	Light Fastness	Fastness to Migration	Heat Resistance [°C]	PVC	Polyolefins	Polystyrene	ABS	Polyamide	Polycarbonate		
HEUCOPLAST™ EZ Red 325401 P Pigment Red 254	8	5	300	● ●	● ●						
HEUCOPLAST™ EZ Red 312202 P Pigment Red 122	8	5	300	● ●	● ●						
HEUCOPLAST™ EZ Blue 515100 P Pigment Blue 15:1	8	4	300	● ●	● ●						
HEUCOPLAST™ EZ Blue 515303 P Pigment Blue 15:3	8	5	300	● ●	● ●						
HEUCOPLAST™ EZ Green 600734 P Pigment Green 7	8	5	300	● ●	● ●						

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● ● Recommended ● Potential Use



HEUCOPLAST™ for PVC

The main polymers used in modern plastic applications are Polyolefins, Polystyrene, engineering polymers and, especially in the building industry, PVC.

Especially PVC demands specific colorant preparations because standard masterbatches based on polyolefins tend to have a negative impact on the mechanical properties and chemical resistance. Therefore users of PVC compounds take mainly tailored pigment preparations with specifically designed carriers that are designed to allow easy flowing and mixing of the base compounds and colors.



Professional shading of rigid PVC

HEUCOPLAST™ is a ready to use pigment preparation for the coloration of rigid PVC, consisting of organic and/or inorganic pigments as well as PVC powder. The color shades of the HEUCOPLAST™ grades are in most cases customer – tailored matches which have been developed with respect to the individual PVC – compound properties.

Production Process

The manufacturing process combines state-of-the-art high volume mixers and milling technology to a unique finishing procedure which ensures highest reproducibility.

Product Properties

As opposed to most powder colorants, the preparations show good flowability and do not show a tendency to dust therefore enabling easy dosing and handling. The dosage depends, of course, on the final application and required color shades, but it is usually in the range of 0.1 to 1.0 parts per hundred.

Product Range

Several HEUCOPLAST™ grades have been specially developed for the shading of white window profiles. They contain a reduced pigment loading, enabling accurate dosing of even very small amounts. Particularly for this purpose black, blue and violet HEUCOPLAST™ colors are available.

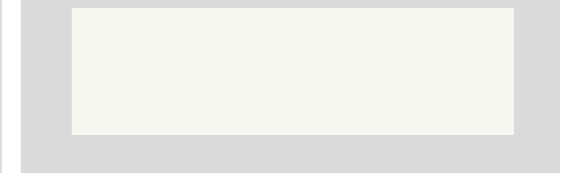


Full Shade ¹⁾	HEUCOPLAST™	RAL (appr.)	Color	Light Fastness of Pigment	Base	
					organic	inorganic
	190 53 *	-	Yellow	7 - 8		x
	490 01	-	Violet	7 - 8		x
	590 11	-	Blue	7 - 8		x
	590 12	-	Blue	7 - 8		x
	690 15 *	-	Green	7 - 8	x	x
	990 23	-	Black	7 - 8	x	
	990 02	-	Black	8	x	

* Further customized shades are available on demand. / ¹⁾ Full shade measured in Ca/Zn compound with 5% pigmentation.

Examples of shading in a Ca/Zn stabilized compound (6% TiO₂)

High variety of white.
Create your own white.



Shading Examples

HEUCOPLAST™	Ca / Zn compound, + 0.1% of pigment	Δ L*	Δ a*	Δ b*	Ca / Zn compound, + 0.2% of pigment	Δ L*	Δ a*	Δ b*
190 53 *		-	- 0.3	+ 0.7		-	- 0.4	+ 1.2
490 01		- 0.8	+ 0.4	- 0.9		- 1.5	+ 0.8	- 1.8
590 12		- 2.0	- 1.2	- 3.3		- 3.3	- 1.7	- 5.4
690 15 *		- 0.3	- 1.0	- 0.2		- 0.5	- 1.8	- 0.5
990 33		- 2.0	-	- 0.7		- 3.7	-	- 1.1

* Customized products. Further shades are available on demand.



Global expertise in matching colors

With globally active production facilities and service centers, Heubach manufactures a wide range of pigments and is able to develop pigment preparations to suit its customers' specific needs. This depth, combined with its ability to match colors on the basis of detailed pigment analyses, enables Heubach to supply its customers with precisely matched solutions within short periods of time.

More performance for your plastic applications

Heubach tailor-made color solutions open up design options for plastic manufacturers, producers and processors, enabling them to enhance the performance of their plastic products both in terms of visual impact and user benefits. With support provided from the laboratory through to final production, customers are able to leverage Heubach's extensive expertise to maximize process efficiency as well as end results.





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Our product specifications, application information and any other information in this document is based on our current state of knowledge at the Revision Date mentioned below. They are non-binding and cannot be taken as a guarantee. The processing company must establish the suitability of individual products itself. As their use lies beyond our knowledge and control, we cannot accept any liability relating to the use of our products in particular applications. In addition to that, the legal rights of third parties must always be considered. The specification agreed between the customer and ourselves is the basis upon which our general sales and delivery conditions are set and is the deciding factor concerning any liabilities. Our standard specification is then valid if no specification has been agreed upon between the customer and ourselves.

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COMPETENCE IN COLOR

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