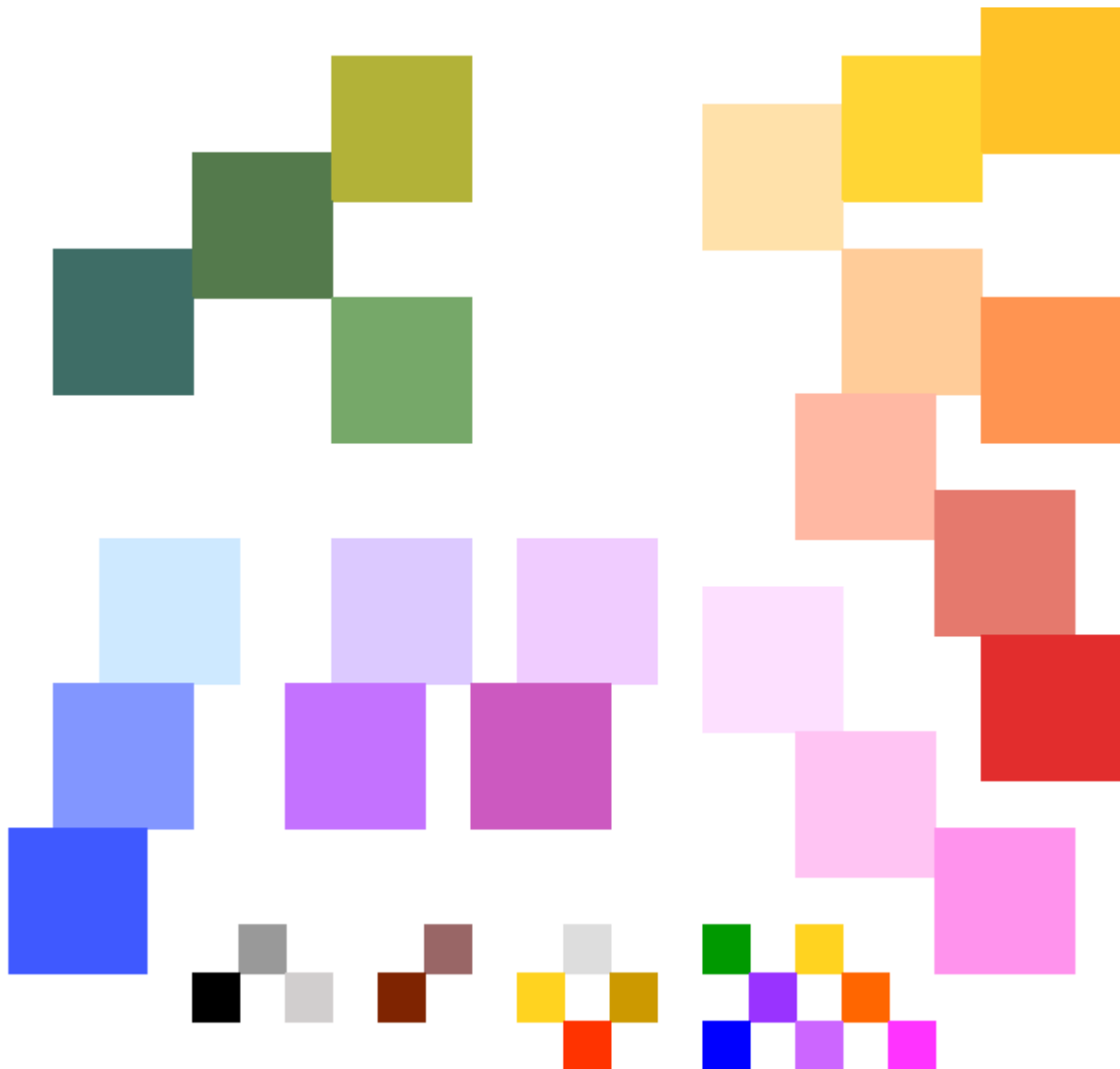


CAPROWAX P™

Masterbatches for Bioplastics/Biocomposites/Blends: PLA, PBS, PHA, PCL, CAPROWAX P™/Blends/BioMineralComposite, Bio-NFC/WPC, Casein, PVOH, Polysaccharides/Derivates, PVAc/Blends, Bio-TPE/UPR, NIPU.

As colourants are used biobased, bio-mineral and/or harmless, inorganic pigments. A waiver of Titanium Dioxide is total or extensive possible. The carrier material is compostable and waterproof.

Colourations of bioplastics comply the specifications of DIN EN 13432.



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> COLOURATION <

After successful tests of Masterbatches with your bioplastics or composites your request will be coordinated with toll manufacturer.


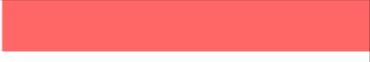












Translucent to transparent, pearlescent or full covering colouration:
 Injection- / Vacuum- / Blow- / Compression- / Melt-Moulding,
 Mono-/Multifilaments, Foils/Sheets, Hotmelts, NF-BioComposites,
 Thermoplastic Plasticine, Foams and Coating.

Pigments are biobased, biomineral or calcined pigmentlike Kaolin and/or of inorganic, synthetic production. They are harmless, light-fast, non-migratory, temperature stable, insoluble in water, comparable with natural, mineral pigments and already mineralised. They are low-dusty incorporated in compostable carrier material and masterbatch pellets are added to different bioplastics in a range of 0,5-6%. Processing at 90-200°C, short time up 220°C. In coloured final products content of each separate pigment is $\leq 1\%$. Colouration of bioplastics comply the specifications of DIN EN 13432.

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Masterbatches for translucent colouration

CAPROWAX P™	Shade chromatic	CAPROWAX P™	Shade chromatic
Red 114 T		Red Y 121 T	
Yellow 310 T		Green 427 T	
Green 413 T		Green 426 T	
Green AR 430 T		Blue AR 530 T	
Blue G 511 T		Blue R 516 T	
Violet B 616 T		Violet R 617 T	
Violet B 630 T		Violet R 635 T	
R: reddish T: translucently, without TiO2	Y: yellowish	G: greenish LP: Laboratory prototype	B: bluish AR: acid resistant

Addition of CAPROWAX P - Masterbatches to different bioplastics: 0,5-4%
Injection- /Vacuum- /Blow- /Compression- /Melt-Moulding, Filaments,
Foil/Sheets, Hotmelts, Thermoplastic Plasticine, Foams and Coating.
All shades of colour are comparable or similar to the product colours.

Application projects with pearlescent pigments

For customer testing: Masterbatches with pearlescent pigments
Test material (LP): 50g Flakes

CAPROWAX P™	Shade	CAPROWAX P™	Shade
Gold 9301		Gold 9302	
Silver 9001		Bronze 9701	
Rot 9101			

Addition of Pearlescent-Masterbatches to different bioplastics: 0,5-6%
Harmless, pearlescent pigments: Mica coated with TiO₂ and/or Fe₂O₃
Preferably pearlescent masterbatch Silver 9001 is additive combinable with
translucent CAPROWAX P - Masterbatches to yield diverse pearlescent
colouration preferably in a proportion of 2:1.

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Masterbatches for chromatic, covering colouration

CAPROWAX P™	Shade chromatic	CAPROWAX P™	Shade chromatic
Red FK 111	LP	Red 112 lw	
Red FK 112	LP	Red 115 BM ww	LP
Red FK 117	LP	Red 116 lw	
Orange FK 205	LP	Orange 203 BM ww	LP
		Orange 204 lw	
Yellow FK 312	LP	Yellow 306 BM ww	
		Yellow 307 lw	
Green 412 lw		Green 416 ww	
		Green 417 ww	
Green FK 440	LP	Green 418 ww	
Green FK 441	LP	Green AR 433 ww	LP
Green 444 BM ww	LP	Green AR 435 ww	LP
BM: Biomineral, natural Calcium Carbonate		ww = TiO2 free	FK: Kaolin, calcined
lw = ≤ 0,1% TiO2 in coloured polymer		LP: Laboratory prototype	AR: acid resistant
Continuation next page >>>>>>>			

Addition of CAPROWAX P - Masterbatches to different bioplastics: 0,5-4%
 A brightening without Titanium Dioxide is possible. The palette of masterbatches is changed to the eco-friendly, calcined, pigmentlike Kaolin (FK) as white pigment. Titanium Dioxide will be used in exceptional cases only or strong reduced. The biomineral, natural Calcium Carbonate, is used as a white pigment with gentle covering brightening.

All shades of colour are comparable or similar to the product colours.
 Injection-/ Vacuum-/ Blow-/ Compression/ Melt-Moulding, Foils/Sheets, Hotmelts, NF-BioComposites, Plasticine, Film, Foams, Coating

Your order of CAPROWAX P™ - Masterbatches see page 7

Masterbatches for chromatic, covering colouration


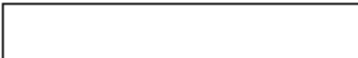









CAPROWAX P™	Shade chromatic	CAPROWAX P™	Shade chromatic
Blue G 509 BM ww	LP	Blue FK G 509	LP
Blue G 510 lw		Blue FK G 512	LP
Blue R 541 BM ww	LP		
Violet B 636 BM ww	LP	Violet R 637 BM ww	LP
Violet FK B 605	LP	Violet FK R 608	LP
Violet B 607 lw		Violet R 610 lw	
Violet B 606 lw		Violet R 609 lw	
Brown FKV 704 bb	LP	Brown FK 705 S	LP
Brown V 704 BM bb ww	LP	Brown 702 lw	
V: vegetable Carbon	bb: biobased	FK: Kaolin, calcined	ww = TiO2 free
BM: Biomineral, natural Calcium Carbonate		lw = ≤ 0,1% TiO2 in coloured polymer	
R: reddish G: greenish B: bluish S: heat stabel up to 220°C		LP: Laboratory Prototype	

Addition of CAPROWAX P - Masterbatches to different bioplastics: 0,5-4%
 A brightening without Titanium Dioxide is possible. The palette of masterbatches is changed to the eco-friendly, calcined, pigmentlike Kaolin (FK) as white pigment. Titanium Dioxide will be used in exceptional cases only or strong reduced. The biomineral, natural Calcium Carbonate, is used as a white pigment with gentle covering brightening.

All shades of colour are comparable or similar to the product colours.
 Injection-/ Vacuum-/ Blow-/ Compression/ Melt-Moulding, Foils/Sheets, Hotmelts, NF-BioComposites, Plasticine, Film, Foams, Coating

Your order of CAPROWAX P™ - Masterbatches see page 7

Masterbatches for achromatic, covering colouration

CAPROWAX P™	Shade achromatic	Description
White FK 005		Kaolin, calcined
White C 004 BM ww		natural Calcium Carbonate
Grey 821 BM ww		natural Ca-Carbonate / Iron Oxide Black
Grey V 825 BM bb ww		natural Ca-Carbonate / vegetable Carbon
Grey FK 822		Kaolin, calcined / Iron Oxide Black
Grey FKV 823 bb		Kaolin calcined / vegetable Carbon
Grey FK 824 S		Kaolin calcined / Iron Oxide Black (S)
Black 801		Iron Oxide Black
Black V 802 bb		vegetable Carbon (E 153)
Black 803 S		Iron Oxide Black (S)
Black V 804 bb		vegetable Carbon (technically)
V: vegetable Carbon FK: Kaolin, calcined LP: Laboratory prototype	bb: biobased ww: TiO2 free	BM: Biomineral, natural Calcium Carbonate S: heat stable up to 220°C

Addition of CAPROWAX P - Masterbatches to different bioplastics: 0,5-4%
A brightening without Titanium Dioxide is possible. The palette of masterbatches is changed to the eco-friendly, calcined, pigmentlike Kaolin (FK) as white pigment. Titanium Dioxide will be used in exceptional cases only or strong reduced. The biomineral, natural Calcium Carbonate, is used as a white pigment with gentle covering brightening.

All shades of colour are comparable or similar to the product colours.
Injection-/ Vacuum-/ Blow-/ Compression/ Melt-Moulding, Foils/Sheets, Hotmelts, NF-BioComposites, Plasticine, Film, Foams, Coating

Your order of CAPROWAX P™ - Masterbatches see page 7

Your order of CAPROWAX P™ - Masterbatches

After a successful test with samples at customers your request will be manufactured batchwise by toll manufacturer.

CAPROWAX P™ COLOUR PALETTE

See colour palettes page 3-6: **Shades of colours + code**

Technical samples: Up to 4 samples a 50g pellets free of charge

Coloured buttons with CAPROWAX P™ 6006 material on request.

For additional processing tests 500g of the standard material CAPROWAX P™ Blue G 510 can be requested. (See page 9)

Supply quantities:	100 kg, 200 kg, 500 kg
+/- 25 kg:	After your selection you will get an offer about location-based, direct delivery
25 kg PE-Bags in carton or on palett	Order with 200 kg and 500 kg need a yearly forecast or 3 months in advance
Market area:	European Union
Prices:	According to offer
Payment conditions:	According to offer
Delivery date:	6 - 7 weeks
Miscellaneous:	Product infos and SDS
Test material of new formulations (LP):	50g Flakes

Informations, quote requests and orders at

Albrecht Dinkelaker

Polymer and Product Development

Blumenweg 2

info@polyfea2.de

D 79669 Zell im Wiesental

Fon: ++49 7625 91 84 58

Banking details/Finance office: On request

VAT-No.: DE165 604 009

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Applications with CAPROWAX P™ materials

Injection moulding



Masterbatches
with compostable carrier material

Vacuum forming Foil / Sheets



Buttons



Hotmelts
Thermoplastic plasticine

Monofilamente

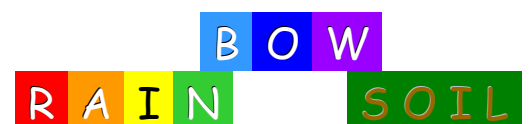


Nature Fibres
BioComposites

Blow moulding



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Masterbatch

CAPROWAX P™ Blue G 510 lw

Compostable carrier material: Bio-Dry-Blend CAPROWAX P 6006-C65 (Intermediate)

Sample material

Customs-Tariff-No.: 3907 99 80

Customer information

Fon: +49 7625 91 84 58

info@polyfea2.de

www.caprowax-p.eu

Product example

Albrecht Dinkelaker

Polymer- and Product Development

Blumenweg 2

D 79669 Zell im Wiesental

Properties / Data / Description

Form	a) 36.08.PV.006	mm	Pellets, Diameter:1,5-3,0/ Size:2,0-3,5
Content of pigments	b)	%	25,0
Colour Index	PB 29		Ultramarine Blue
Colour Index	PW 6		Titandioxide
Colour description	c)		blue, greenish, covering
Lightfastness	d)		7-8
Bulk density	DIN EN ISO 60	g/l	754
Density	DIN EN ISO 1183	g/cm ³	1,21
Residual Humidity (LOD)	105°C/1h	%	< 0,3
Softening beginning	DSC	°C	57-63
Remark	heatstable up to 200-220°C / acid sensitive		

a) internal test norm / b) Formulation with weighing protocol c) 2% Masterbatch in CAPROWAX P 6006

d) Data of pigment producer

Based on the biological sources different values of measurement could be occur

Description

CAPROWAX P™ Blue G 510 lw, a masterbatch with harmless, light-fast, non-migratory, temperature stable, insoluble in water, inorganic pigments partially comparable with natural pigments. Low-dusty incorporated in a compostable carrier material. Coloured bioplastics comply the specifications of DIN EN 13432

Carrier material

CAPROWAX P 6006-C65:

*) calculated

83,7%* organic carbon from biobased resources

Total amount of organic carbon: 71,4%*

A compostable carrier material - as dry-blend-intermediate - is modified with additives in accordance to DIN EN 13432 and is comparable with the tested material at MFPA Weimar

MFPA Weimar

Test certificate: P31/029-05

CAPROWAX P® 6006-00-000 (DIN EN 13432)

No food or feeding stuff

Ecofriendly composition

GM-free, no content of starch or PLA

Without content of aromatic or nitrogeuous substances

Biopolymers and use

Covering colouration of bioplastics/biocomposites/blends as PLA, PBS, PHA, PCL, CAPROWAX P™/Blends, Bio-NFC/-WPC Polysaccharides/Derivates, Casein, PVAc/Bioplastic-Blends, PVOH, Bio-TPE, Bio-UPR, NIPU. For use as colouring additive suited for products of agriculture, garden and environment.

Introduction to recipe for reduced content of TiO₂ (lw)

1-2% Masterbatch (MB) homogenous intermixing with pellets

In coloured products content of TiO₂ is ≤0,1%

Processing temperatures

90-200°C (194-392°F) / short time up to 220°C (428°F)

Drying pellets on demand

50°C (122°F)/12h Avoid heating melt >90°C over long time

Examples of application

Products of injection moulding, vacuum-/blowforming, foils, hotmelts, NF-BioComposites, support material, substrate, coating

Storage/Instruction

Avoid heat and moisture, storage in original containers only

B O W

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R A I N

S O I L

Carrier material based on CAPROWAX P™ 6006

Bio-Dry-Blend CAPROWAX P 6006-C65 is produced as a intermediate in powder form and as a compostable carrier material for masterbatches applications. Modified with additives in accordance with DIN EN 13432 and comparable with CAPROWAX P™ 6006, certified by MFPA, University Weimar
Test material: CAPROWAX P® 6006

Test certificate No.: P31029-05 / DIN EN 13432

83,7% content of organic carbon* from biobased resources

Total content* of organic carbon: 71,4% *) calculated

Portions of carrier material in masterbatches are 60-85%

Maximum range of thermal stability: 180-220°C (356-428°F)

Processing >150°C predrying at 48-50°C/12 h

Ecofriendly: "Free of aromatics and nitrogen, renewable raw materials without genetically modified growing". No content of starch or PLA. No content of food and feeding stuff. (10/2019)

Product surfaces of CAPROWAX P™ - Material are self-cleaning with water or rain just like lotus flowers. Quick degradation in aerob compost or slow rotting in soil works into biomass, mixtures of soil-related, mineral, inorganic substances, carbon dioxide and water. As well under anoxic/denitrifying conditions degradation occurs fully. In the course of composting the brown to black colour of compost or humus change over to the coloured bioplastic and the colourful appearance disappears. Colourations with bio-mineral Calcium-carbonate-Masterbatches support biogenic weathering in soil and waters.

Product information, quote request, order at:

Albrecht Dinkelaker

Polymer- and Product Development

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D 79669 Zell im Wiesental

Fon: 0049 (0)7625 918458

info@polyfea2.de

Ideas increase to pellets

www.caprowax-p.eu

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