

Injection moulding with BioMineralComposites



BioMineralComposites with different content of natural Calciumcarbonat

CAPROWAX P™ 6006-C65-BM42030
CAPROWAX P™ 6006-C65-BM42100
CAPROWAX P™ 6006-C65-BM42150

Use

Suited for products of agriculture, garden and environment, especially suited for low-lime soil or compost. The mineral part support the biogen weathering in soil and natural waters

Injection moulding Wall thickness 0,5-3 mm

Plastification without predrying 130°C, die 130°C, mould 15°C

Drying pellets on demand

50°C (122°F)/12h Avoid heating melt >90°C (>194°F) over long time

Examples of application

Products of injection moulding and vacuum forming, sheets, composites, foils, support material, substrate, frisbee disk, cans, trays, plant plug signs, garden decor, soap dish, edge protection, garden decor, letters, substrate

Order quantities

quantity of testmaterial on request

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BioMineralComposite: CAPROWAX P™ 6006-C65-BM4225

Imitations of coloured stones, melting granules, garden ornamental gravels

Use	Suited for products of agriculture, garden and environment, especially suited for low-lime soil or compost. The mineral part support the biogen weathering in soil and natural waters
Thermplastic processing	The high content of mineral needs adapted heating and cooling
Moulded freely Thermo-plasticine !!! Wear protective gloves !!!	Pellets on non-stick panel at 90°C preheating, after cooling down to 70-80°C shaping/kneading to shapings
Injection moulding of calcite imitation coloured stones	Plastification without predrying 130°C, die 130°C, mould 15°C
Melt granules 1,5-3,5 mm for one-/multilayered pictures !!! Wear protective gloves !!!	In non-stick pans strewing melt granules-pictures free or with templates, after moving templates, melting on a hotplate at 100°C and cool down to room temperature
Drying pellets on demand	50°C/12h Avoid heating melt >90°C over long time
Examples of application	Calcite imitations coloured stones, deco granules, melting granules, garden ornamental gravels, garden decor, letters, substrate coloured with masterbatches of Ultramarine, Iron Oxide, Manganviolet, vegetalbe Carbon.
Order quantities	5kg, 25kg and 100kg or more upon request

Your order of CAPROWAX P™ - Products page 8

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Colouration with BioMineralcomposites and Masterbatches



CAPROWAX P-Masterbatches for Bioplastics/Biocomposites/Blends/Filaments PLA, PBS, PHA, PCL, **CAPROWAX P™/Blends, BioMineralComposites**, Bio-NFC, Bio-WPC, Polysaccharides/Derivates, Casein, PVAc/Bioplastic-Blends, PVOH, Bio-TPE, Bio-UPR, NIPU. Carrier material **based on CAPROWAX P™ 6006** is compostable, waterproof and according to DIN EN 13432. **Customers request will be coordinated with toll manufacturer.**















Covering or translucent colouration:

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

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B O W
R A I N **SOIL**






Masterbatches for translucent colouration

CAPROWAX P™	Shade chromatic	CAPROWAX P™	Shade chromatic
Red 114 T		Red Y 121 T tex	
Yellow 310 T tex		Green 427 T tex	
Green 413 T tex	MB500 	Green 426 T tex	
Green AR 430 T tex	LP 	Blue AR 530 T tex	LP 
Blue G 511 T tex		Blue R 516 T tex	
Violet B 616 T		Violet R 617 T	
Violet B 630 T tex	LP 	Violet R 635 T tex	LP 
R: reddish Y: yellowish G: greenish B: bluish T: translucently			
tex: suited for colouration of filaments LP: Laboratory prototype AR: acid resistant			
MB500 = 500g sample for process engineering experiments			

Addition of CAPROWAX P - Masterbatches to different bioplastics: 0,5-4%
 Injection- /Vacuum- /Blow- and Compression-Moulding, Filaments,
 Foils/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 your shortlist: Coloured buttons of MB-Laboratory prototypes (LP) with CAPROWAX P™-Blends on request

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%
 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

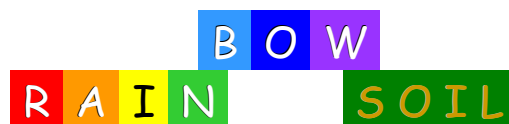
CAPROWAX P™	Shade chromatic	CAPROWAX P™	Shade chromatic
Red FK 111	LP	Red 112 lw	
Red FK 112	LP	Red 115 BM ww	LP
Red FK 117	LP	Red FK 130	LP
Red FK 115	LP	Red 116 lw tex	MB 500
Orange FK 205	LP	Orange 203 BM ww	LP
Orange FK 203	LP	Orange FK 204	LP
		Orange 204 lw tex	
Yellow FK 312	LP	Yellow 306 BM ww	LP
Yellow FK 306	LP	Yellow FK 320	LP
		Yellow 307 lw tex	
Green FK 441	LP	Green 418 ww tex	
Green 417 ww tex		Green 416 ww tex	
BM: Biomineral, natural Calcium Carbonate lw = ≤ 0,1% TiO2 in coloured polymer		ww = TiO2 free FK: Kaolin, calcined LP: Laboratory prototype	
tex: suited for colouration of filaments			
MB500 = 500g sample for process engineering experiments after consultation			
Continuation next page >>>>>>>			

Addition of CAPROWAX P - Masterbatches to different bioplastics: 0,5-4%
 A brightening without Titanium Dioxide is possible. The palette of covering masterbatches is changed to the eco-friendly, soil-related, 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.
Covering colouration: Injection-/ Vacuum-/ Blow-/ Compression-Moulding, Foils/Sheets, Filaments of biopolymers, Hotmelts, NF-BioComposites, Plasticine, Film, Foams, Coating

Your order for Colour-Masterbatches see page 8

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Masterbatches for chromatic, covering colouration

CAPROWAX P™	Shade chromatic	CAPROWAX P™	Shade chromatic
Green 444 BM ww	LP	Green AR 435 ww tex	LP
Green 412 lw		Green AR 433 ww tex	LP
Green FK 440	LP	Blue FK G 543	LP
Blue G 509 BM ww	LP	Blue FK G 509	LP
Blue G 510 lw tex	MB500	Blue FK G 512	LP
Blue R 541 BM ww	LP	Blue FK R 542	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 tex		Violet R 610 lw tex	
Violet B 606 lw tex		Violet R 609 lw tex	
Brown FKV 712 bb	LP	Brown FK 705 S	LP
Brown V 713 BM bb ww	LP	Brown 702 lw tex	
Brown FKV 709 bb tex	LP	Brown FKV 711 bb tex	LP
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	AR = acid resistant
			LP: Laboratory Prototype
tex: suited for colouration of filaments		S: heat stable up to 220°C	
MB500 = 500g sample for process engineering experiments			

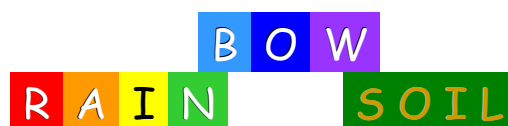
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Your order for Colour-Masterbatches see page 8

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Masterbatches for achromatic, covering colouration

CAPROWAX P™	Shade achromatic	Description
White FK 005 tex		Kaolin, calcined
White C 004 BM ww	MB500	natural Calcium Carbonate
Grey 821 BM ww		natural Ca-Carbonate / Iron Oxide Black
Grey FK 822	LP	Kaolin, calcined / Iron Oxide Black
Grey FK 824 S	LP	Kaolin calcined / Iron Oxide Black (S)
Grey FK V 827 bb	LP	Kaolin calcined / vegetable Carbon tec
Black 801		Iron Oxide Black
Black V 802 bb tex	LP	vegetable Carbon (E153)
Black 803 S tex	LP	Iron Oxide Black (S)
Black V 804 bb	LP	vegetable Carbon (tec)
V: vegetable Carbon	bb: biobased	tec = technically LP: Laboratory prototype
FK: Kaolin, calcined	ww: TiO2 free	BM: Biomineral, natural Calcium Carbonate
tex = suited for colouration of filaments		S: heat stable up to 220°C
MB500 = 500g sample for process engineering experiments		

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Covering colouration: Injection-/ Vacuum-/ Blow-/ Compression-Moulding, Foils/Sheets, Filaments of biopolymers, Hotmelts, NF-BioComposites, Plasticine, Film, Foams, Coating

Your order for Colour-Masterbatches see page 8

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Your order of CAPROWAX P™ - Products

Masterbatches: CAPROWAX P™ + shade + code, colour palette pages 3-7

Technical samples: You can get up to 4 samples a 50g pellets free of charge
For additional process engineering experiments
you can get 500g MB500 samples see page 3-7

New MB-Recipes: CAPROWAX P™- Button of MB-Laboratory prototypes (LP)
upon consultation.

Market area:	European Union
Order quantities +/- 25 kg	100kg, 200kg, 500kg / batchwise manufactured by toll manufacturer
Prices:	According to offer
Payment condition:	According to offer
Delivery date:	6 - 7 weeks
Miscellaneous:	Product infos and SDS
Injection moulding,	CAPROWAX P™ 6006-C65-BM42030
Thermoforming, blow moulding:	CAPROWAX P™ 6006-C65-BM42100
Testmaterial on request	CAPROWAX P™ 6006-C65-BM42150

Imitation of coloured stones	CAPROWAX P™ 6006-C65-BM4225
Melting granules	Testmaterial on request
Miscellaneous:	Product information and SDS

Project with CAPROWAX P™ - basic material

Monofilaments, hotmelt, matrix:	CAPROWAX P™ 6006-00-000
Plasticine, modelling bloc	CAPROWAX P™ 6070-T215
Hydrophobising:	CAPROWAX P™ 6077-1004
Bio-Dry-Blend-NF-Composites:	CAPROWAX P 6006-65-NFxxxx
Scale of projects:	According to agreement
Sampling/Test material:	300g/1000g fragmented or powdered
Material for projects:	upon consultation

Informations, quote requests and orders at

Albrecht Dinkelaker, Polymer and Product Development

Blumenweg 2

D 79669 Zell im Wiesental

info@polyfea2.de

Fon: ++49 7625 91 84 58

Banking details/Finance office: On request

VAT-No.: DE165 604 009

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Processing of CAPROWAX P™ - Pellets

Injection moulding:	Feed section	RT or 50-60°C (122-140°F)
	Plasticising	150-130°C (302-266°F)
	Die	120-140°C (248-284°F)
	Mould	10-25°C (50-77°F)
	Preferred layer thickness	0,4 – 1,0 mm
Compounds Extrusion	Plasticising	140-100°C (284-212°F)
	Die	80-110°C (176-230°F)
	Pellets by string, die-face pelletiser or by steel belt cooling	
Monofilaments	Drying commended	48-50°C/12h (120°F)/12h
	Feed section	RT or 50-60°C (122-140°F)
	Plasticising	120-100°C (248-212°F)
	Spinneret	100-110°C (212-230°F)
String generation	Water quench/cold-air-duct stretching in hot-air-duct	65-75°C (149-167°F)
	Preferred layer thickness	0,2 – 0,6 mm
Thermoforming	Feed section	RT or 50-60°C (122-140°F)
	Plasticising	110-80°C (230-176°F)
	flat film die	80-90°C (176-194°F)
	Polishing rolls at	10-25°C (50-77°F)
	Preferred layer thickness	0,4 – 1,0 mm
Blow moulding	Feed section	RT or 50-60°C (122-140°F)
	Plasticising	120-90°C (248-194°F)
	Parison die	65-80°C (149-176°F)
	Mould	10-25°C (50-77°F)
Drying of pellets	Preferred layer thickness	0,4 – 0,8 mm
	On demand at	48-50°C/12h (120°F)

Technical Data CAPROWAX P™ - Pellets

Properties	Units	Methods	Injection moulding CAPROWAX P™ 6002-00-000	Vacuum forming, Blow moulding, Monofilaments, Foils, Hotmelt, Binder CAPROWAX P™ 6006-00-000/6006-C1-11-000
Density	g/cc	ISO 1183	1,04-1,14	1,03-1,14
MVR 90°C/2,16 kg	cc/10 min.	ISO 1133	4,0-10,0 *)	2,5-10,0 *)
Softening	°C (°F)	DSC	56-59 (133-138)	57-63 (135-145)
Vicat VST A/50	°C (°F)	ISO 306	56 (133)	56 (133)
Shore-Hardness D		ISO 868	54	54
Residual humidity	%	70°C/2h	<0,2	<0,2

Tensile strength and elongation are dependent from temperature and stretching conditions

*) Changes of viscosity may be occur, because of applied nature products

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Practical tests

with products from CAPROWAX P™

Usability

While 1-2 periods of growing season properties are showing a notable fastness against water, moisture and mildewing. Just so appears a good flexibility under cold conditions. Following applications year round and over a longer time are possible now, e. g. plant pots in tree nursery, guard net, harvest devices and geotextiles for landscape protection. For use in greenhouse plant it would be especially advantageous to dispose bio-waste and CAPROWAX P™- products together. After harvest without additional work of separating strings, bound system, nets, pots and trays can biodegrade in composting facilities. In case of a direct and longer contact with soil rotting occurs in space of 1-2 years.

Herbal

Comparable growing tests with plant pots from CAPROWAX P™ and polypropylen don't show significant varieties. Development of roots, plants and flowers was comparable. CAPROWAX P™ doesn't contain aromatic and nitrogen. Only eco friendly colours and pigments are applied.

Composting under field-grown conditions

CAPROWAX P™- materials are homogeneous, biodegradable from aliphatic polyester and modified, herbal triglycerides. Tests with plant pots from CAPROWAX P™ 6002-00-000 (layer thickness of 500 µm) under comparable conditions of DIN V 54900-3 show after 12 weeks biodegradation of 94%.

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