

UNIMAX[®] UNC

MAXITHEN[®] HPC

MAXITHEN[®] HPC

„High Temperature“

Masterbatches for colouring Cable Insulations
Plastics

Masterbatches for Colouring Cable Insulation Plastics

These three product series each represent a range of normalised RAL standard colours for cables, as required by the manufacturers of power and data cables. On request other colour shades can be matched by us on an individual basis and to the same high technical standards as our standard series.

Gabriel-Chemie's product ranges for cables are economical to use due to the low dosage rates required for high colour strengths even in very thin layers. Further, they provide substantial resistance to environmental influences, outstandingly good dispersion and no staining or migration. Needless to say, there is no influence on the electrical insulation capability of any insulation material coloured with either MAXITHEN® or UNIMAX®.

UNIMAX® UNC is an universally applicable colour batch suitable for nearly all polymers used for cable insulation – polyolefins, PVCs, polyamides, polyurethanes, and polyesters – this masterbatch series can be seen as a “one for all”. The logistical advantages of having one solution include minimised warehouse capacity and a reduced risk that the wrong colours are used when polymers are changed in production. Very good colour strength is achieved with dosages rates of only around 1%. The carrier for UNIMAX® UNC masterbatches is a sophisticated polymer system which is highly compatible with most polymers currently used in the cable industry. UNIMAX® UNC is available either using standard pigments or only using pigments which are free from heavy metals.

MAXITHEN® HPC represents our standard range for all polyolefin insulation materials - LDPE, LLDPE, HDPE, LDPE-EVA and PP. In most cases a dosage rate of only 1% is sufficient to achieve the required colour strength in the insulation; cross linking conditions do not influence the colouring properties. MAXITHEN® HPC is based on a LLDPE carrier. MAXITHEN® HPC is available either using standard pigments or using only pigments which are free from heavy metals.

MAXITHEN® HPC “High Temperature” has been designed for colouring cross linkable polyethylene cable insulations which have a high temperature and age resistance and additionally contain high dosages of flame retardant. For example, “T3” formulations have to meet the stringent quality requirements of the automotive sector. The MAXITHEN® HPC “High Temperature” series offers increased stability and resistance during cross linking processing conditions, whether chemical or via radiation, and also protects against critical environmental conditions during the service life of the end product. MAXITHEN® HPC “High Temperature” is based on a LLDPE carrier. To meet our customers' requirements, MAXITHEN® HPC “High Temperature” only uses pigments which are free from heavy metals.

As a competent and reliable partner for cable manufacturers we are in a position to develop individual solutions along with our customers, combining functional masterbatches such as thermal and light stabilisers, flame retardants or processing aids – either combined with colour or not.

UNIMAX[®] UNC - SERIES

For Colouring Thermoplastic Resins in the Cable and Wire Industry

This masterbatch series is a range of universally applicable colour concentrates based on highly loaded organic and inorganic pigments, well dispersed in a thermoplastic carrier system of outstanding compatibility.

UNIMAX[®] - types offer economic dosing due to their extraordinarily high colour strength, therefore an addition of 1% is more than enough for most applications.

FORM OF SUPPLY: Masterbatch in pellet form, packed in UV stabilised 20 / 25kg bags, on pallets covered with a UV stabilised hood (standard packaging). A combined MAXITHEN[®] colour/UV/AO stabiliser masterbatch has been used for colouring and stabilising the packaging, in order to protect both the packaging material as well as its contents.

PROCESSING: UNIMAX[®] - types can be processed on all kinds of generally used extruders. The original colour of the respective base polymers or compounds must be taken into account, especially in the case of highly filled PVC - types.

It is often impossible to obtain identical colour shades when using UNIMAX[®] in different polymers, simply because of the base polymer's different surface gloss or refractive index, which physically prevents the identical shade from being achieved.

When using UNIMAX[®] - UNC it must be ensured that the processing equipment has sufficient plasticizing and dispersion capacity. Varying the temperature profile, especially in the metering zone, may help to improve the results.

This product range has primarily been developed for telecommunication wires, where a number of different polymers are in use.

HDPE, Our UNIMAX[®] - series has therefore been tested in LDPE, LLDPE, PP, TPU and flexible PVC, with a dosage up to 2%. The tests confirmed its excellent compatibility, without having any significant influence on the properties of the respective polymers used. Nevertheless we recommend trials under practical conditions prior to commercial use - samples are available upon request.

UNIMAX[®] UNC - SERIES

For Colouring Thermoplastic Resins in the Cable and Wire Industry

ADVICE:	UNIMAX [®] UNC types should not be stored at temperatures above 50°C, as this may cause the pellets to stick together.
THERMAL STABILITY:	Thermal stability was tested in HDPE with a 2% dosage, processed via injection moulding and with a dwell time of 5 minutes. During the test the mass temperature was increased from 200 to 300°C in steps of 10°C. Our table shows the temperature at which the colour change did not exceed $\Delta E_{ab^*} = 3$ according to DIN 6174.
LIGHTFASTNESS:	Light fastness was tested on injection moulded chips with a 2% addition, and the evaluation was according to DIN 54003, where the value 8 denotes the best, and the value 1 the worst light fastness according to the wool scale. The values shown in our tables are related to the test conditions mentioned; therefore we recommend separate tests for any critical applications due to the possible influences of different processing conditions, pigment concentrations, temperature and residence time conditions, as well as specific polymer types and so on.
STORAGE CONDITIONS: sunlight.	A storage time of 12 months should not be exceeded. The product should be stored in a cool, dry location and be protected from sunlight. Once opened, bags should be kept tightly closed in order to prevent the absorption of moisture from the air. If necessary, goods should be dried before use.

UNIMAX[®] UNC - SERIES

For Colouring Thermoplastic Resins in the Cable and Wire Industry

COLOUR SHADES: According to RAL, BS or Munsell.
Further shades and special matches are offered upon request.

UNIMAX [®]	COLOUR	RAL - CODE	REMARK	Dos. [%]	PE T [°C]	PE Li	PVC Li
UNC 1072	White	9010		1	300	8	8
UNC 2112/60	Yellow	1021	1)	1	240	7	7
UNC 210452	Yellow	1021		1	250	7	7
UNC 33052/51	Orange	2003	1)	1	240	7	7
UNC 33062	Orange	2003		1	280	6	6
UNC 412492	Pink	3015		1	240	5	5
UNC 410872/51	Red	3000	1)	1	240	5	5
UNC 410882	Red	3000		1	240	5	5
UNC 513842	Violet	4005		1	240	6	6
UNC 511602	Blue	5015		1	280	8	8
UNC 610692	Green	6018	1)	1	240	7	7
UNC 611402	Green	6018		1	250	7	7
UNC 616752	Turquoise	6027		1	300	8	8
UNC 811072/11	Brown	8003	1)	1	240	7	7
UNC 811092	Brown	8003		1	280	8	8
UNC 94292	Grey	7035		1	300	8	8
UNC 96652	Grey	7000		1	300	8	8
UNC 94602	Grey	7032		1	280	8	8
UNC 99612	Black	9005		1	300	8	8

1) containing lead pigment

Dos. [%] = dosage rate

T [°C] = heat stability [°C / 5 min. dwell time]

Li = light fastness (blue scale - 8/8 = best result)

All information in this UNIMAX[®] data sheet has been obtained from laboratory tests under ideal and closely controlled conditions. The information should act as a guide only and should not be construed as guaranteeing specific properties or suitability for a particular application. Therefore, trials by customers using their polymers and their conditions are highly recommended.

Gumpoldskirchen, October 2007
(replaces data sheet from April 2005)

MAXITHEN® HPC Cable Range

For Colouring Polyolefins in the Cable and Wire Industry

This masterbatch series is a range of colour concentrates based on highly loaded organic and inorganic pigments, well dispersed in a polyethylene carrier polymer.

MAXITHEN® HPC-types offer economic dosing due to their extraordinarily high colour strength, therefore an addition of 1% is more than enough for most applications.

- FORM OF SUPPLY:** Masterbatch in pellet form, packed in UV stabilised 20/25kg PE bags, on pallets covered with a UV stabilised hood (standard packaging). A combined MAXITHEN® colour/UV/AO stabiliser masterbatch has been used for colouring and stabilising the packaging, in order to protect both the packing material as well as its contents.
- PROCESSING:** MAXITHEN® types can be processed on all kinds of generally used extruders. The influence of the initial colour/whitening effect of highly filled polyethylene (e.g. aluminium-trihydrate filled) must be taken into account when determining the dosage rate of the colour masterbatch. Provided suitable polyethylene grades are used, MAXITHEN® types are designed to achieve a smooth surface and a constant wall thickness of insulation even when processed on high speed cable machinery.
- THERMAL STABILITY:** Tests were carried out in HDPE with a 2 % addition of each masterbatch type, processed via injection moulding and with a dwell time of 5 minutes. During the test the mass temperature was increased from 200 to 300°C in steps of 10°C. The table shows the temperature at which the colour change did not exceed $\Delta E_{ab}^* = 3$ according to DIN 6174.
- LIGHT FASTNESS:** Tests were carried out in injection moulded chips with a 2% addition of each masterbatch type. The evaluation is in accordance with DIN EN ISO 105-B01, where the value 8 denotes the best and the value 1 the worst light fastness according to the wool scale. The values shown in our tables are related to the test conditions mentioned. Therefore we recommend separate tests for any critical applications due to the possible influences of different processing conditions, pigment concentrations, temperature and residence time conditions as well as specific polymer types and so on.
- STORAGE CONDITIONS:** We recommend dry storage at temperatures not exceeding 50°C. Under ideal conditions the products will hold for at least one year, however we do not recommend storing for more than 12 months. Our products should be protected against direct sunlight.

MAXITHEN® HPC Cable Range

For Colouring Polyolefins in the Cable and Wire Industry

COLOUR SHADES: According to RAL in accordance with DIN IEC 60304, BS or Munsell.
Further shades and special matches offered on request.

MAXITHEN®	COLOUR	RAL - CODE	REMARK	Dos. [%]	T [°C]	Li
HPC 1072	White	9010		1	300	8
HPC 214292	Yellow	1021	1)	1	260	7-8
HPC 214762	Yellow	1021		1	260	6
HPC 34882	Orange	2003	1)	1	260	7-8
HPC 35372	Orange	2003		1	270	6
HPC 416702	Pink	3015		1	280	7
HPC 416712	Red	3000	1)	1	240	7
HPC 418022	Red	3000		1	250	8
HPC 518362	Violet	4005		1	280	8
HPC 518372	Blue	5015		1	300	8
HPC 618012	Turquoise	6027		1	300	8
HPC 618022	Green	6018	1)	1	260	7-8
HPC 619482	Green	6018		1	250	7
HPC 813862	Brown	8003	1)	1	260	7-8
HPC 814452	Brown	8003		1	280	6
HPC 97312	Grey	7000		1	300	8
HPC 917712	Grey	7032		1	260	6-7
HPC 917722	Grey	7035		1	300	7
HPC 99612/35	Black	9005		1	300	8

1) containing lead pigment

Dos. [%] = dosage rate

T [°C] = heat stability [°C/5 min. dwell time]

Li = light fastness [blue scale - 8/8 = best result]

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MAXITHEN® HPC Cable Range

“High Temperature”

For colouring polyolefins in the cable and wire industry for cable applications requiring high temperature and age resistance products do not contain heavy metals

This masterbatch series is a range of colour concentrates based on highly loaded organic and inorganic pigments, well dispersed in a polyethylene carrier polymer. MAXITHEN® HPC-types offer economic dosing due to their extraordinarily high colour strength, therefore an addition of 1% is more than enough for most applications.

FORM OF SUPPLY:	Masterbatch in pellet form, packed in UV stabilised 20/25kg PE bags, on pallets covered with a UV stabilised hood (standard packaging). A combined MAXITHEN® colour/UV/AO stabiliser masterbatch has been used for colouring and stabilising the packaging, in order to protect both the packing material as well as its contents.
PROCESSING:	MAXITHEN® types can be processed on all kinds of generally used extruders. The influence of the initial colour/whitening effect of highly filled polyethylene (e.g. aluminium-trihydrate filled) must be taken into account when determining the dosage rate of the colour masterbatch. Provided suitable polyethylene grades are used, MAXITHEN® types are designed to achieve a smooth surface and a constant wall thickness of insulation even when processed on high speed cable machinery.
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LIGHT FASTNESS:	Tests were carried out in injection moulded chips with a 2% addition of each masterbatch type. The evaluation is in accordance with DIN EN ISO 105-B01, where the value 8 denotes the best and the value 1 the worst light fastness according to the wool scale. The values shown in our tables are related to the test conditions mentioned. Therefore we recommend separate tests for any critical applications due to the possible influences of different processing conditions, pigment concentrations, temperature and residence time conditions as well as specific polymer types and so on.
STORAGE CONDITIONS:	We recommend dry storage at temperatures not exceeding 50°C. Under ideal conditions the products will hold for at least one year, however we do not recommend storing for more than 12 months. Our products should be protected against direct sunlight.

MAXITHEN® HPC Cable Range

“High Temperature”

For colouring polyolefins in the cable and wire industry for cable applications requiring high temperature and age resistance products do not contain heavy metals

COLOUR SHADES: According to RAL in accordance with DIN IEC 60304, BS or Munsell.
Further shades and special matches offered on request.

MAXITHEN®	COLOUR	RAL - CODE	Dos. [%]	T [°C]	Li	HM free
HPC 1072	White	9010	1	300	8	+
HPC 222962	Yellow	1021	2	300	6-7	+
HPC 3A2072	Orange	2003	2	290	7-8	+
HPC 4A0552	Red	3000	2	280	7	+
HPC 4A1012	Pink	3015	2	260	7	+
HPC 4A1002	Violet	4001	2	260	7	+
HPC 5M0492	Blue	5015	2	280	7-8	+
HPC 6A4952	Green	6018	2	260	7	+
HPC 6A6122	Turquoise	6027	2	300	8	+
HPC 820832	Brown	8003	2	280	7-8	+
HPC 917462	Grey	7001	2	300	7-8	+
HPC 917732	Grey	7032	2	280	7-8	+
HPC 917742	Grey	7035	2	280	7-8	+
HPC 99612/35	Black	9005	2	300	8	+

Dos. [%] = dosage rate
T [°C] = heat stability [°C/5 min. dwell time]
Li = light fastness [blue scale - 8/8 = best result]
HM free = free of heavy metal, conforms to EU Directive 2000/53/EC (end-of life vehicles), EU Directive 2002/95/ EC & 2002/96/EC (ROHS, WEEE) and EU Directive 2005/618/EC (toxic heavy metals, PBB, PBDE).

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BUSINESS UNITS OF GABRIEL-CHEMIE GROUP:



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Medical



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