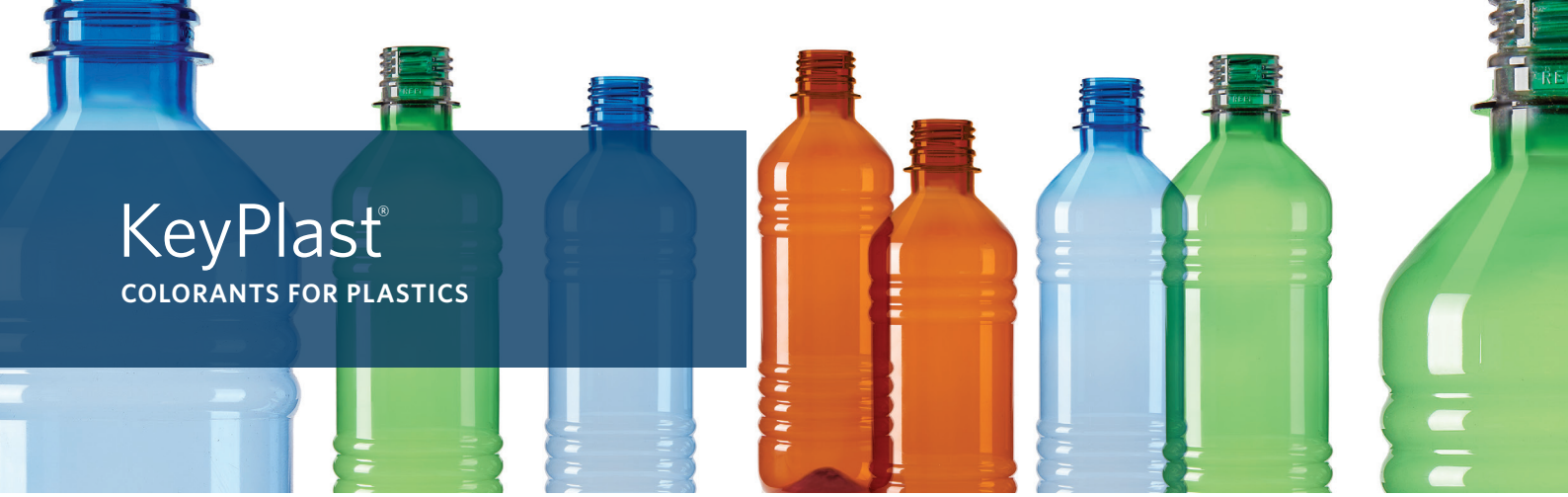
Milliken™

KeyPlast®

A spectrum of bright colorants for plastics



KeyPlast®

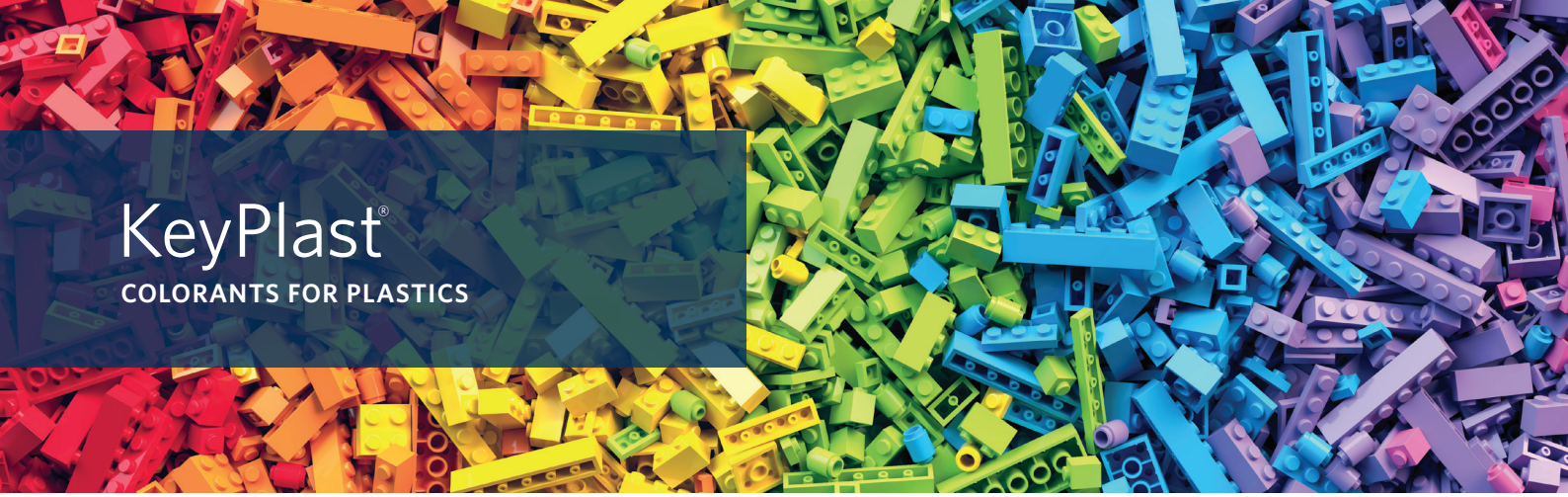
COLORANTS FOR PLASTICS

KeyPlast® colorants can be applied across a broad range of polymers, to include ABS, acrylic, polycarbonate, polyesters, styrenics, PVC and even PLA bioplastics. The charts provided in this brochure depict which shades — ranging from bright, sunshine-like yellows, and warm reds and oranges, to rich blues, greens and violets — work with which types of resin.

- ● Highly recommended
- ◕ Recommended
- ◑ Suitable
- ○ Not recommended

Product Name	Chemical Type	C.I. Generic Name	Thermal Stability	Lightfastness Masstone	Lightfastness Tint	Acrylonitril Butadine Styrene (ABS)	Thermoplastic Acrylic (PMMA)	Polycarbonate (PC)	Polyesters (e.g PET, PETF, PETG)	Polystyrenes (e.g GPPS, MIPS, HIPS)	Polyvinyl Chloride (Rigid)	PLA	Global Food Contact* US[1]	EU[2]	China[3]	LA[4]
KeyPlast FL Yellow 10GN	Coumarin	S.Y. 160:1	300°C (575°F)	7	4	●	●	●	●	●	◑	●	✔	✔	✔	✔
KeyPlast FL Yellow Green 7G	Perylene	S.G. 5	300°C (575°F)	6	4	●	●	●	●	●	●	●	✔	✔		✔
KeyPlast FL Yellow 3R	Thioxanthene	S.Y. 98	300°C (575°F)	7	5	●	●	●	●	●	●	●				
KeyPlast Yellow 6G	Methine	D.Y. 201	300°C (575°F)	8	7	●	●	●	●	●	●	●				
KeyPlast Yellow 4GL	Monoazo	D.Y. 241	280°C (540°F)	7	6	○	●	●	●	●	●	●	✔	✔	✔	✔
KeyPlast Yellow AG	Quinoline	S.Y. 114	300°C (575°F)	7	5	●	●	●	●	●	●	●	✔	✔	✔	✔
KeyPlast Yellow G	Quinophthalone	D.Y. 64	300°C (575°F)	8	7	●	●	●	●	●	●	●		✔		✔
KeyPlast Yellow 3G	Methine	S.Y. 93	300°C (575°F)	7	6	◑	●	◑	●	●	●	●				
KeyPlast Yellow GHS	Anthraquinone	S.Y. 163	300°C (575°F)	7	5	●	●	●	●	●	●	●		✔		
KeyPlast Yellow 2GH	Monoazo	S.Y. 72	280°C (540°F)	6	4	●	◑	○	○	●	○	●	✔			
KeyPlast Orange LFP	Perinone	S.O. 60	300°C (575°F)	7	6	●	●	●	●	●	●	●	✔	✔	✔	✔

*See notes regarding Global Food Contact on page 6.



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Product Name	Chemical Type	C.I. Generic Name	Thermal Stability	Lightfastness Masstone	Lightfastness Tint	Acrylonitril Butadine Styrene (ABS)	Thermoplastic Acrylic (PMMA)	Polycarbonate (PC)	Polyesters (e.g PET, PETF, PETG)	Polystyrenes (e.g GPPS, MIPS, HIPS)	Polyvinyl Chloride (Rigid)	PLA	Global Food Contact* US[1]	EU[2]	China[3]	LA[4]
KeyPlast FL Orange 2G	Thioxanthene	S.O.63	300°C (575°F)	7	4	●	●	●	●	●	●	●	✔	✔	✔	✔
KeyPlast FL Red GL	Coumarin	Proprietary	300°C (575°F)	6	5	●	●	●	●	●	◑	●	✔	✔	✔	✔
KeyPlast Orange MR	Methine	D.O. 47	300°C (575°F)	7	5	●	●	●	●	●	●	●	✔	✔	✔	✔
KeyPlast Red AA-TL	Anthraquinone	S.R. 111	300°C (575°F)	7	4	●	●	●	○	●	●	●				
KeyPlast FL Red 5B	Thioindigoid	Vat Red 41	280°C (540°F)	4	3	●	●	●	●	●	◑	●				
KeyPlast FL Red G	Anthraquinone	S.R. 149	300°C (575°F)	6	5	●	●	●	●	●	●	●	✔	✔	✔	✔
KeyPlast Red 60	Anthraquinone	D.R. 60	300°C (575°F)	7	6	●	●	◑	●	●	●	●	✔	✔		✔
KeyPlast Red AG	Perinone	S.R. 135	300°C (575°F)	8	6	●	●	●	●	●	●	●	✔	✔	✔	✔
KeyPlast Red A2G	Perinone	S.R. 179	300°C (575°F)	7	5	●	●	●	●	●	●	●		✔	✔	✔
KeyPlast Red H	Azo	Proprietary	280°C (540°F)	6	5	●	●	○	●	●	●	●	✔	✔	✔	✔
KeyPlast Red CB	Monoazo	S.R. 195	280°C (540°F)	7	6	●	●	◑	◑	●	●	●	✔	✔	✔	✔
KeyPlast Magenta M6B	Anthraquinone	S.R. 207	300°C (575°F)	7	6	◑	●	●	◑	●	●	●				

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KeyPlast Rubine T	Anthraquinone	S.R. 52	300°C (575°F)	7	6	●	●	●	●	●	●	●	✔	✔	✔	✔
KeyPlast Bordeaux HBL	Anthraquinone	D.V. 26	300°C (575°F)	7	6	●	○	◑	◑	◑	◑	◑		✔		
KeyPlast Violet PT	Anthraquinone	S.V. 14	300°C (575°F)	7	5	●	◑	○	○	●	●	●				
KeyPlast Violet IRS	Anthraquinone	S.V. 13	300°C (575°F)	8	6	●	●	●	●	●	●	●	✔	✔	✔	✔
KeyPlast Blue KR	Anthraquinone	S.B. 104	300°C (575°F)	7	6	●	●	●	●	●	●	●	✔	✔	✔	✔
KeyPlast Blue A	Anthraquinone	S.B. 36	240°C (465°F)	6	4	◑	●	○	○	●	◑	●	✔			
KeyPlast Blue RR	Anthraquinone	S.B. 97	300°C (575°F)	7	6	●	●	●	●	●	●	●	✔	✔	✔	✔
KeyPlast Blue B	Anthraquinone	S.B. 35	290°C (550°F)	7	5	◑	●	○	○	●	●	●		✔		✔
KeyPlast Blue BGL	Anthraquinone	D.B. 60	290°C (550°F)	6	4	○	●	○	●	●	●	●	✔			✔
KeyPlast Green B	Anthraquinone	S.G. 3	300°C (575°F)	7	6	●	●	●	●	●	●	●	✔	✔	✔	✔
KeyPlast Green GH	Anthraquinone	S.G. 28	300°C (575°F)	7	6	●	●	●	●	●	●	●	✔	✔		✔

*See notes regarding Global Food Contact on page 6.

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KeyPlast® colorants can be applied across a broad range of polymers, to include ABS, acrylic, polycarbonate, polyesters, styrenics, PVC and PLA bioplastics.

Leverage the rainbow of hues and shades offered by these colorants to help bring your products to life and to enhance and reinforce your brand's story. KeyPlast colorants may be compliant for global food contact applications. See the chart below and page 6 for more details.

- ● Highly recommended
- ◕ Recommended
- ◑ Suitable
- ○ Not recommended

Product Name	Chemical Type	C.I. Generic Name	Thermal Stability	Lightfastness Masstone	Lightfastness Tint	Acrylonitril Butadine Styrene (ABS)	Thermoplastic Acrylic (PMMA)	Polycarbonate (PC)	Polyesters (e.g PET, PETF, PETG)	Polystyrenes (e.g GPPS, MIPS, HIPS)	Polyvinyl Chloride (Rigid)	PLA	Global Food Contact* US[1]	EU[2]	China[3]	LA[4]
KeyPlast Yellow RNB	Anthraquinone	P.Y. 147	290°C (550°F)	7	6	○	◑	◑	●	●	●	●	✔	✔	✔	✔
KeyPlast Yellow 7GK	Quinoline	P.Y. 138	260°C (500°F)	7	7	◑	○	◑	○	●	●	●	✔	✔	✔	✔
KeyPlast Yellow KG	Azo	P.Y. 180	290°C (550°F)	6	6	●	●	●	○	●	●	●	✔	✔	✔	✔
KeyPlast Yellow 3KLTN	Isoindolinone	P.Y. 110	300°C (575°F)	8	8	●	○	○	○	●	●	●	✔		✔	✔
KeyPlast Orange GP	Benzimidazo-lone	P.O. 64	300°C (575°F)	8	8	●	◑	◑	○	●	●	●	✔	✔	✔	✔
KeyPlast Red KPP	Diketo-pyrrolopyrrole	P.R. 254	300°C (575°F)	8	8	◑	○	○	○	◑	●	◑	✔	✔	✔	✔
KeyPlast Vat Red V	Anthraquinone	P.R. 177	290°C (550°F)	6	6	●	●	○	●	◑	●	◑	✔	✔	✔	✔
MPC Channel Black	Carbon Black	P.Blk. 7	400°C (750°F)	8	8	●	●	●	●	●	●	●	✔	✔	✔	✔
MPC Channel Black Micro-pulverized	Carbon Black	P.Blk. 7	400°C (750°F)	8	8	●	●	●	●	●	●	●	✔	✔	✔	✔

*See notes regarding Global Food Contact on page 6.

Aesthetic Enhancer: All-In-One

Amorphous transparent polymers often have a yellow appearance due to the production technology used to make them. These polymers tend to be color tuned with very low loadings of optical brighteners and/or solvent dyes. KeyPlast's aesthetic enhancer can help here, with its innovative anti-yellowing package. Offering purity, consistency and traceability, these additives – combined with Milliken's strong regulatory and technical support – can help a brand to protect its all-important image.

- ● Highly recommended
- ◕ Recommended
- ◑ Suitable
- ○ Not recommended

Product Name	Chemical Type	C.I. Generic Name	Thermal Stability	Polystyrene (PS)	High Impact Polystyrene (HIPS)	Polycarbonate (PC)	Polyethyleneterephthalate (PET)	Global Food Contact* US[1]	EU[2]	China[3]	LA[4]
KeyPlast Red CB	Monoazo	S.R. 195	280°C (540°F)	◑	◑	●	●	✔	✔	✔	✔
KeyPlast Rubine T	Anthraquinone	S.R. 52	300°C (575°F)	◑	◑	●	◑	✔	✔	✔	✔
KeyPlast Violet PT	Anthraquinone	S.V. 14	300°C (575°F)	●	●	●	◑				
KeyPlast Violet IRS	Anthraquinone	S.V. 13	300°C (575°F)	●	●	◑	◑	✔	✔	✔	✔
KeyPlast Blue KR	Anthraquinone	S.B. 104	300°C (575°F)	◑	◑	●	●	✔	✔	✔	✔

NOTES

Determination of Fastness Properties

Thermal Stability determined at 0.05% in Methyl Methacrylate (MMA). Light Fastness determined at 0.05% in Mass & Tint in MMA under Xenon light.

Color Chips

The colors shown are intended as a general guide only. For a more precise representation, we would be pleased to provide plastic color chips upon request.

Global Food Contact

[1] **US** = Product is compliant with Federal Food Drug and Cosmetic Act (FFDCA) requirements for use in food contact plastics. Compliance is limited by polymer type, maximum loading, food types, and conditions of use.

[2] **EU** = Product has been tested and meets the requirements of Regulation (EU) No 10/2011, latest amended with Commission Regulation (EU) 2020/1245 of 2 September 2020.

[3] **China** = Product is listed and meets applicable requirements in the GB9685:2016 National Food Safety Standard - Standard for Uses of Additives in Food Contact Materials and Articles.' Additional restrictions may apply.

[4] **LA** = Product has been tested and meets the purity requirements of MERCOSUR GMC Res. No. 15/10 'Technical Regulation on Colors in Containers and Plastic Equipment Designed to be in Contact with Foods.

Please contact your Milliken Representative for full global compliance details.

RESIST™

HIGH PERFORMANCE COLORANTS FOR ENGINEERING POLYMERS

Milliken continues to support customers meeting ever-increasing market requirements. The following list of products represent high performance colorants for Engineering Polymers such as Polyamide (PA), PolySulfone, and other high heat polymers and alloys. Milliken recommends testing in your specific system, and under your conditions.

Polyamide resins, also known as Nylon, are polymers often chosen for their ability to withstand elevated or extremely low service temperatures without loss of physical properties. They are used in demanding applications like power tools, automotive parts, gears, and appliance parts. The combination of high processing temperatures and amines present in Nylon polymers make most traditional colorants unsuitable for use.

Milliken offers the following selection of colorants that are known to be stable in most compounds of Nylon 6, Nylon 6,6, glass-filled compounds as well as other Polyamide resins.

- ● Highly recommended
- ◕ Recommended
- ◑ Suitable
- ◔ Process dependent
- ○ Not recommended

Product Name	Thermal Stability*	Process Stability	Lightfastness Tint	Nylon 6 (PA 6)	Nylon 66 (PA 66)	Glass Filled (PA 6 & PA 66)	Flame Retardant (PA 6 & PA 66)	Nylon 46 (PA 46)	Poly Butylene Terephthalate Unfilled & Glass Filled (PBT)	Polyphthalamide (PPA)	Polysulfone (PSU)
RESIST Yellow 9785	325°C	Excellent	6	●	●	●	●	●	●	◕	◕
RESIST Yellow 9187	320°C	Very good	6	●	●	●	●	●	●	◑	◑
RESIST Yellow 9882	335°C	Excellent	5	●	●	●	●	●	●	●	◕
RESIST Orange 7986	305°C*	Very good	6	●	●	●	●	◕	●	◑	◑
RESIST XTR Orange 9798	340°C	Excellent	7-8	●	●	●	●	●	●	●	◑
RESIST Orange 9185	315°C	Very good	6	●	●	●	●	●	●	◑	◑
RESIST Red 9171	320°C	Very good	4	●	●	●	●	●	●	◑	◑
RESIST Red 8382	310°C	Good	5	●	●	●	●	◕	●	◑	◑
RESIST Red 9995	320°C	Excellent	7	●	●	●	●	●	●	●	◕
RESIST Red 9179	335°C	Very good	5	●	●	●	●	●	●	●	◕
RESIST Red 9082	335°C	Very good	5	●	●	●	●	●	●	◕	◕
RESIST Blue 9778	300°C	Excellent	5	●	●	●	●	◕	●	◑	◔
RESIST Green 9687	310°C	Excellent	6	●	●	●	●	◕	●	◑	◑

*Thermal stability is an indication and needs to be checked by polymer type and end applications.

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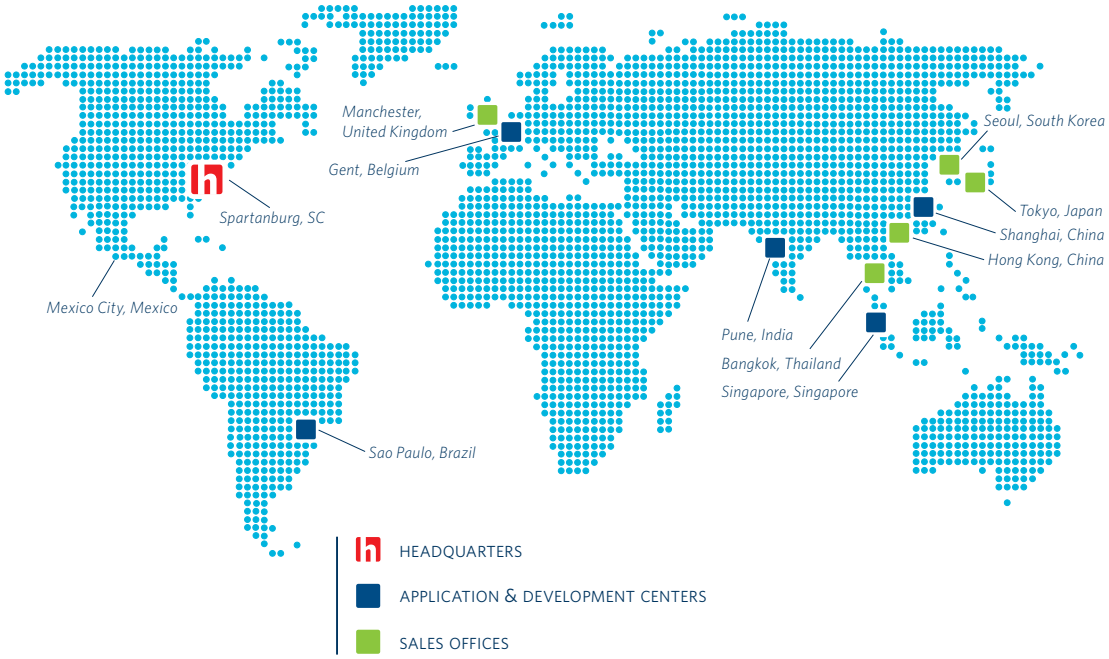

REGIONAL HEADQUARTER OFFICES

NORTH AMERICA

Spartanburg, SC, USA
P. 1.800.910.5592
F. 864.503.2430
millichem@milliken.com

EUROPE

Gent, Belgium
P. 32.9.265.1100
F. 32.9.265.1195
eurochem@milliken.com

LATIN AMERICA

Sao Paulo, Brazil
P. 55.11.3043.7942
F. 55.11.3043.7096
lachem@milliken.com

ASIA

Singapore
P. 65.6377.0770
F. 65.6377.0990
asiachem@milliken.com

Shanghai, China
P. 86.21.6145.5555
F. 86.21.6145.5558
asiachem@milliken.com

Pune, India
P. 91.20.6730.7501
F. 91.20.6730.7514
asiachem@milliken.com

milliken.com

This document is intended for guidance only and does not constitute a Regulatory Declaration of Compliance. Food contact restrictions vary by region and polymer type. Please contact your Milliken representative for more details and for official regulatory documentation.

This brochure supersedes all previous versions.

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