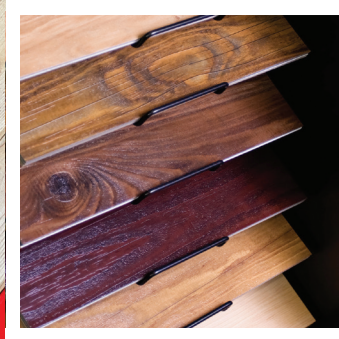


Milliken®
Specialty Colorants
for Wood & Wood Related Finishes



Milliken™



Nerosol Liquid Dyes

Our Nerosol concentrates are specially selected predominantly metal complex acid dyes formulated into solution with glycol ether solvents, water, or ethanol. They are well suited for use in universal water and solvent borne systems for the coloration of wood and wood related finishes and coatings. Notably they offer excellent lightfastness, fast dry times, high color strength, low viscosity, and compatibility in a wide range of solvents.



LIGHTFASTNESS

Most Nerosol liquid dyes are made with a metal-complex group reacted to the dye molecule. The exceptions are noted with an asterisk. The metal-complex group significantly improves the lightfastness or resistance to fade of the product as compared to other dyes. The fastness ratings are included on the Nerosol shade card.

Although Nerosols have excellent lightfastness relative to dyes, they generally do not possess the fastness properties of pigments and therefore are not recommended for exterior paint and coatings applications. Also, the variation in wood, over-coats such as lacquers and varnishes, and the use of UV absorbers and inhibitors can significantly alter actual lightfastness performance. The lightfastness ratings are intended to serve as a guide for relative analysis only.



COLOR STRENGTH

Nerosol dyes are true solutions, not dispersions, and therefore have very little or no filterable solid matter. However, they are high-strength concentrates with typical dye content of 20-35% relative to "pure" powder. The actual dye content may vary, as the product is quality controlled for color strength and not for solids content.



SOLVENT COMPATIBILITY

All Nerosol dyes have good compatibility with a wide variety of solvents. They have complete solubility with alcohols, glycols, glycol ethers, and water. Additionally, they can be used in conjunction with formulations containing ketone, ester and aromatic solvents.

When using ketone and ester solvents, some alcohol or glycol ether should be incorporated into the formulation to help stabilize the dye solution. We recommend a minimum of 15-20% alcohol or glycol ether in this case.

In solvent recipes containing aromatic or aliphatic solvents, an alcohol or glycol ether solvent must be present in the formulation in higher concentrations than any combination of aromatic or aliphatic solvent. Ideally, there should be a 2:1 ratio of alcohol or glycol ether solvent in the formulation relative to the amount of aliphatic or aromatic solvent in order to maintain the dye in solution and prevent precipitation, seeding or color loss.

Wood stained with Nerosol dyes generally will not bleed when over-coated with most water-free finishes. In some cases, however, the dye may be attacked by particularly acidic or alkaline components of a finish, potentially resulting in color shift or color loss. This applies also in the case of peroxide containing finishes (polyesters). It is therefore always recommended that tests be conducted in the laboratory to determine suitability of the dye / stain recipes with particular resin over-coat.



FAST DRYING / FLASH POINT

Nerosol dyes are relatively fast drying, yet they have been formulated with flash points that allow them to be shipped as non-flammable in accordance with IATA and U.S. DOT regulations.

Nerosol US (Universal System) dye liquids are produced using HAPS free, lower flash point solvents and glycol ethers for added flexibility in final coating and finishes formulations. They are labeled as flammable. The Nerosol SN range is formulated with predominantly ethanol and to a lesser degree water.



EASE OF USE / LOW VISCOSITY

Nerosol dyes are readily pourable, easily pumped liquid concentrates that quickly and completely dissolve in the intended solvent systems.



STORAGE STABILITY

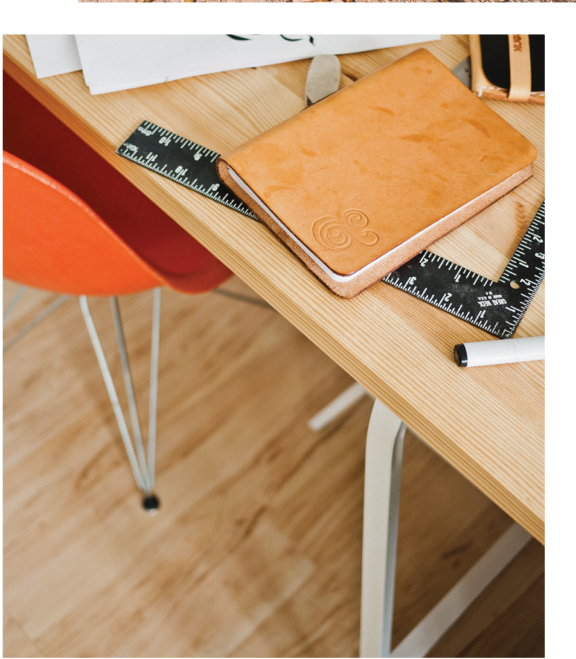
At room temperature and when kept sealed in original containers, Nerosol dyes should remain stable for a minimum of one year. If the dyes are exposed to prolonged cold or freezing conditions, some gelling or precipitation of the dye may occur. This can generally be reversed by heating the dye to approximately 100°F (38°C) and applying agitation.

NEROSOL US

Nerosol US (universal system) dye liquids are produced using HAPS free solvents. They are formulated in lower flash point solvents and glycol ethers for added flexibility in the final coating and finish formulation. They are most compatible with water, alcohols, and glycols.

	Nerosol Yellow US Lightfastness 6-7
	Nerosol Orange US Lightfastness 6-7
	Nerosol Red US Lightfastness 6-7

	Nerosol Bordeaux US Lightfastness 5-6
	Nerosol Brown US Lightfastness 6-7
	Nerosol Black US Lightfastness 7



The information provided above regarding the application of Nerosol dyes is of a general nature. The data are not intended as specifications and, as mentioned previously, laboratory tests should always be conducted to determine compatibility and suitability of the dyes in the user's particular formulation. Wide variations of recipes, application methods and wood used from customer to customer mean that the information is intended as a guide only. Generally, however, Nerosol dyes are suitable for all types of softwood and hardwood commonly used in the furniture and flooring industry. They are effective in coloring difficult hardwoods, such as beech, evenly. Wood stains produced using Nerosol dyes may be applied in a variety of ways, including by spray, roller, wiping and dip processes typically used.







NEROSOL

Nerosol dye liquids are relatively fast drying, but have been formulated with flash points that allow them to be shipped as non-flammable in accordance with IATA and U.S. DOT regulations.

	Nerosol Yellow 2GN* Lightfastness 5-6
	Nerosol Yellow R Lightfastness 6-7
	Nerosol Orange GX Lightfastness 6-7
	Nerosol Red GX Lightfastness 6-7
	Nerosol Red B Lightfastness 6-7
	Nerosol Bordeaux V Lightfastness 5-6
	Nerosol Violet B Lightfastness 5
	Nerosol Royal Blue HF* Lightfastness 4-5
	Nerosol Navy N Lightfastness 6-7
	Nerosol Sap Green D* Lightfastness 5
	Nerosol Golden Brown Y Lightfastness 6-7
	Nerosol Brown 4GLM Lightfastness 6-7
	Nerosol Brown 4RM Lightfastness 6-7
	Nerosol Dark Brown 2R Lightfastness 6-7
	Nerosol Brown MM Lightfastness 6-7
	Nerosol Dark Brown Y Lightfastness 6-7
	Nerosol Black J Lightfastness 7







NEROSOL CRN

Nerosol CRN dye liquids are high flash formulations developed for global requirements. Nerosol CRN dyes can be shipped and labeled as non-flammable. Nerosol CRN liquid dyes are similar in shade and strength as the Nerosol US range.

	Nerosol Black CRN Lightfastness 6-7
	Nerosol Bordeaux CRN Lightfastness 6-7
	Nerosol Brown CRN Lightfastness 6-7
	Nerosol Orange CRN Lightfastness 5-6
	Nerosol Red CRN Lightfastness 6-7
	Nerosol Yellow CRN Lightfastness 7

NEROSOL SN

Nerosol SN dye liquids are produced with solvents that exhibit the least grain raising characteristics and are fast drying. Nerosol SN are compatible with alcohol, ketone, and aromatic solvents. They exhibit some compatibility with ester and hydrocarbon solvents.

	Nerosol Black SN Lightfastness 6-7
	Nerosol Brown SN Lightfastness 6-7
	Nerosol Orange SN Lightfastness 6-7
	Nerosol Red SN Lightfastness 5-6
	Nerosol Bordeaux SN Lightfastness 6-7
	Nerosol Yellow SN Lightfastness 7









Dye Concentration: 20g/L; 5-1/3 oz.gal.

*Lightfastness - Most Nerosol dyes are made with a metal-complex group reacted to the dye molecule. The exceptions are noted with an asterisk.



Keyfast Spirit Solvent Soluble Powder Dyes

The Keyfast Spirit line of dye powders are a long standing and popular solvent soluble metal complex family of dyes that provide added formulation flexibility and strength in solvent based systems. Brilliant, organic, and clean, Keyfast Spirit dyes are particularly suited for the production of transparent and relatively lightfast shades in foil coatings, wood coatings and wood related finishes, metal deco, automotive refinish, decorative concrete, and printing ink applications.

Product Name	Color Index Name	SOLUBILITY (GRAMS / LITER)*									Lightfastness	RESISTANCE TO OTHER CHEMICALS			
		Methyl Ethyl Ketone (MEK)	Methyl Iso Butyl Ketone (MIBK)	Acetone	Ethyl Acetate	Diacetone Alcohol	Ethyl Cellosolve	Ethanol	Toluene	Cyclohexanone		Caustic Soda	Acetic Acid	Soap	Water 80 ° C 30 Min.
Keyfast Spirit Yellow 4G 	SY 42	30	20	50	100	250	100	190	220	50	3-4	5	5	4-5	5
Keyfast Spirit Yellow 2RLS 	SY 62	50	50	100	25	300	250	50	Trace	125	6	5	5	4-5	5
Keyfast Spirit Yellow 2GN 	SY 82	50	200	250	150	400	400	100	50	100	6-7	5	5	4-5	5
Keyfast Spirit Golden Yellow 3R 	Proprietary Blend	50	200	250	150	400	400	100	30	175	6	5	5	4	5
Keyfast Spirit Orange RE 	SO 54	400	100	450	10	200	150	40	Trace	250	6	5	5	5	5
Keyfast Spirit Orange RLN 	SO 99	250	200	275	50	300	425	75	Trace	75	6	5	5	3	3
Keyfast Spirit Red 2BK 	SR 8	200	200	200	50	200	300	100	Trace	75	6	5	4	4	3
Keyfast Spirit Fire Red G 	SR 119	100	50	200	20	200	200	20	Trace	150	6	5	4	3	5

*These gram / liter solubility figures are certainly best case statistics and depending on your specific solvent quality, solvent mix formulation and powder dye moisture conditions, these numbers may vary. Please consult your Keystone technical representative with questions regarding your specific applications and needs.








Product Name	Color Index Name	SOLUBILITY (GRAMS / LITER)*										RESISTANCE TO OTHER CHEMICALS			
		Methyl Ethyl Ketone (MEK)	Methyl Iso Butyl Ketone (MIBK)	Acetone	Ethyl Acetate	Diacetone Alcohol	Ethyl Cellosolve	Ethanol	Toluene	Cyclohexanone	Lightfastness	Caustic Soda	Acetic Acid	Soap	Water 80° C 30 Min.
Keyfast Spirit Red KL 	Y/S SR 122	300	250	200	50	200	300	100	Trace	75	6	5	4	4	3
Keyfast Spirit Red BL 	B/S SR 122	250	200	200	50	200	300	100	Trace	60	6	5	5	4	3
Keyfast Spirit Magenta RBS 	SR 127	20	20	25	20	100	100	100	Trace	75	3-4	4-5	5	4-5	3
Keyfast Spirit Black X-51 	SB 27	250	200	250	100	350	400	140	Trace	100	6	5	5	5	5
Keyfast Spirit Black KR 	SB 29	510	285	250	75	300	350	480	Trace	50	5-6	5	5	5	5
Keyfast Spirit Blue 6G-SS 	SB 70	120	75	150	30	250	150	200	Trace	50	6	5	3-4	3-4	5
Keyfast Spirit Blue 3R 	SB 45	200	50-70	25	10	200	20	10	<10	200	2-3	4-5	4-5	5	4
Keyfast Spirit Royal Blue 	Proprietary Blend	100	50	120	20	200	150	200	Trace	50	5-6	5	3-4	3	4
Keyfast Spirit Brown 2RM 	Proprietary Blend	240	175	250	50	300	250	100	Trace	75	6	5	5	2-3	4
Keyfast Spirit Dark Brown 5R 	Proprietary Blend	250	175	250	50	300	250	100	Trace	75	6	4-5	4-5	2-3	4-5
Keyfast Spirit Green GL 	Proprietary Blend	175	100	125	100	250	150	100	Trace	75	5-6	5	4	2-3	5








*These gram / liter solubility figures are certainly best case statistics and depending on your specific solvent quality, solvent mix formulation and powder dye moisture conditions, these numbers may vary. Please consult your Keystone technical representative with questions regarding your specific applications and needs.



Keyfine UFD Submicron Pigment Dispersions

Keyfine UFD aqueous pigment dispersions are engineered with specific blends of surfactants based on non-ionic wetting and dispersing agents. Characterized by ultrafine pigment size (0.3 - 0.5 microns), this line penetrates easily through multiple substrates. Offering low viscosity, resin-free, and exceptional transparency and brilliance, these products are ideal for use in high performance wood coatings—both interior and exterior.

Product Name	Pigment	Chemistry
Keyfine UFD Yellow GR 	Pigment Yellow 13	Disazo Pigment Dispersion
Keyfine UFD R/S Yellow 	Pigment Yellow 83	Azo Yellow Pigment Dispersion
Keyfine UFD Trans Oxide Yellow 	Pigment Yellow 42	Trans Oxide Pigment Dispersion
Keyfine UFD Y/S Red 	Pigment Red 112	Monoazo Pigment Dispersion
Keyfine UFD Rubine 	Pigment Red 184	Monoazo Pigment Dispersion
Keyfine UFD Red HF 	Pigment Red 188	Naphthol Pigment Dispersion
Keyfine UFD Magenta 	Pigment Magenta 122	Quinacridone Pigment Dispersion







Product Name	Pigment	Chemistry
Keyfine UFD Red RK 	Pigment Red 170	Naphthol Red Pigment Dispersion
Keyfine UFD Trans Oxide Red 	Pigment Red 101	Trans Oxide Pigment Dispersion
Keyfine UFD Blue 	Pigment Blue 15:3	Phthalocyanine Pigment Dispersion
Keyfine UFD Green 	Pigment Green 7	Trans Oxide Pigment Dispersion
Keyfine UFD Brown HFR 	Pigment Brown 25	Benzimidazolone Brown Pigment Dispersion
Keyfine UFD Black 	Pigment Black 7	Carbon Black Pigment Dispersion
Keyfine UFD Black TS 	Pigment Black 7	Carbon Black Pigment Dispersion







Other colors can be made available upon request.

Keytint Pigment Dispersions

Keytint products are aqueous, high performance, surfactant-based pigment dispersions formulated specifically for both interior and exterior wood coatings. This line is designed to provide clean, excellent transparency, high gloss, and uniform color in spray, rolling, and wiping applications. Containing pigments milled to very fine standards, this product easily penetrates porous substrates and is compatibility tested to be used in a variety of water-based surfactant or resin systems.



Product Name	Pigment	Chemistry
Keytint Y/S Red 	Pigment Red 214	Azo Red
Keytint B/S Red 	Pigment Red 23	Naphthol Red
Keytint Oxide Brown 	Pigment Brown 6	Oxide Van Dyke Brown
Keytint Brown 	Pigment Brown 23	Naphthalene-carboxamide
Keytint Raw Sienna 	Pigment Yellow 43	Oxide Pigment
Keytint Burnt Sienna 	Pigment Burnt Sienna Brown 7	Oxide Pigment

Product Name	Pigment	Chemistry
Keytint R/S Yellow 	Pigment Yellow 83	Azo Yellow
Keytint G/S Yellow 	Pigment Yellow 93	Azo Yellow
Keytint White 	Pigment White 6	Titanium White
Keytint Black 	Pigment Black 7	Carbon Black
Keytint Blue 	Pigment Blue 15:3	Phthalocyanine
Keytint Green 	Proprietary Blend	Azo/Phthalocyanine blend

WOOD COATINGS

Product Lines and Expertise

Whether custom formulation and synthesis, product development assistance, or analytical evaluation and testing, our philosophy is the same—to create pragmatic solutions for any wood coating challenge presented to us. Our team’s unparalleled color experience and interpretation of global regulatory requirements are evident in the innovative, reliable, and compliant results we deliver. This is why we claim longstanding relationships with so many successful clients. Your products and processes will work because our solutions do.

Milliken product lines produced specifically for wood and wood related finishes:

PIGMENT DISPERSIONS

Keyfine UFD

Submicron Water
Surfactant Dispersions

Interior and Exterior

Flooring, Furniture,
and Cabinetry

Spray, Wiping, and
Rolling Applications

Excellent Transparency

Keytint

Zero-VOC and Submicron
Based Surfactant Dispersions

Interior and Exterior

Flooring and Cabinetry

Spray, Wiping, and
Rolling Applications

Excellent Transparency

LIQUID DYES

Nerosol

Aqueous Based Metal
Complex Concentrates

Interior

Flooring, Furniture, and Cabinetry

Spray, Wiping, and
Rolling Applications

Solvent and Water Miscible

Transparent

Keyfast Spirit

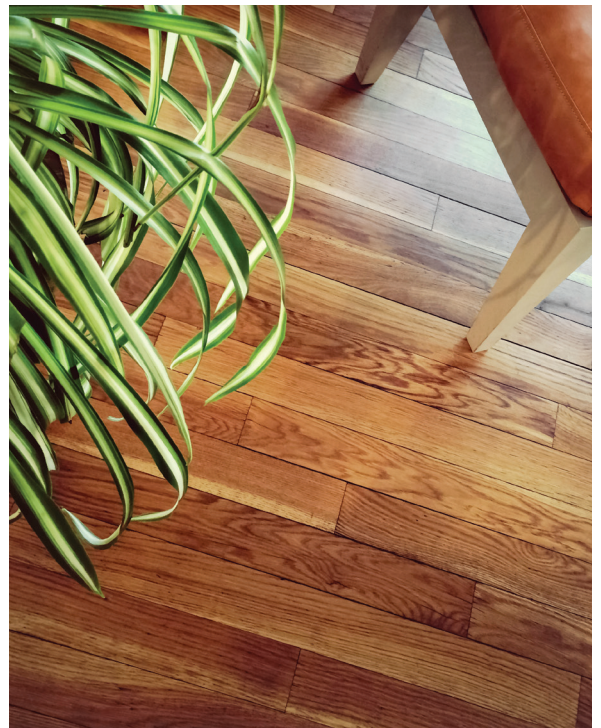
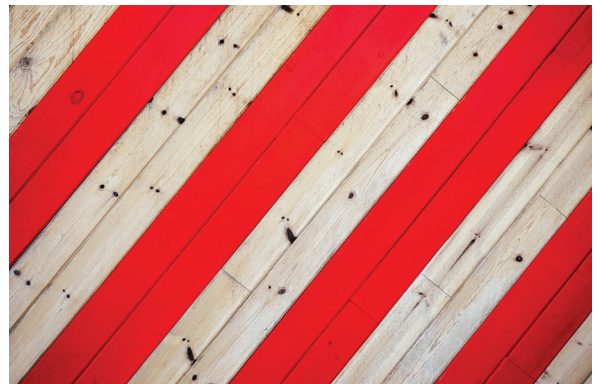
Metal Complex Solvent
Soluble Dyes

Interior

Flooring, Furniture,
and Cabinetry

Spray, Wiping, and
Rolling Applications

Transparent





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