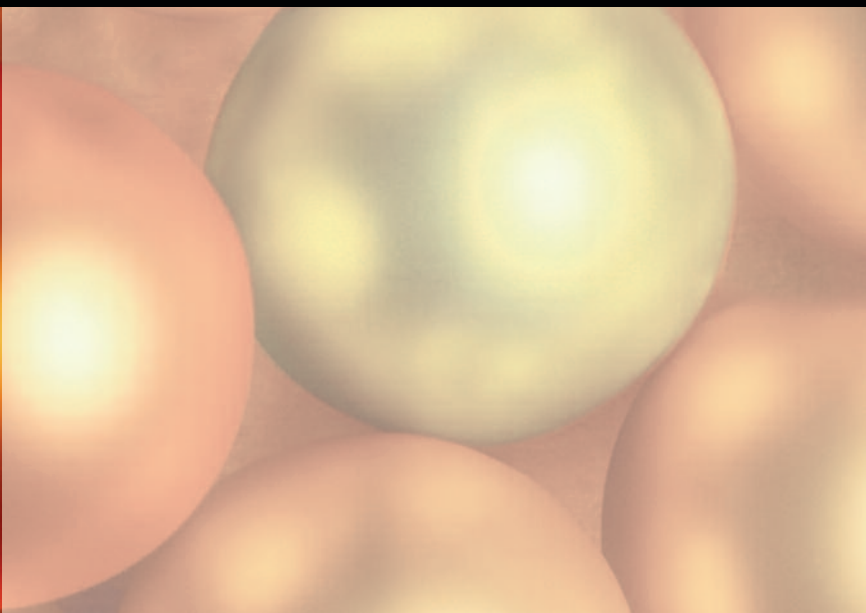
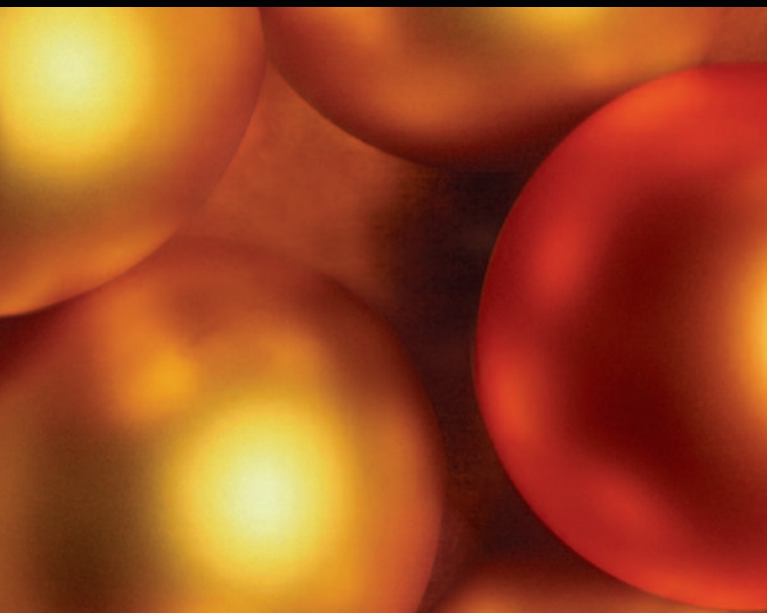


**KEYSTONE**  
KEYSTONE ANILINE CORPORATION

## **KEYFAST SPIRIT**

Solvent  
Soluble  
Dyes





# KEYFAST SPIRIT

## Solvent Soluble Dyes

For over 80 years, Keystone Aniline Corporation has provided innovative, cost effective quality dyes and specialty pigments to a broad range of industrial color applications with specific focus in the inks, coatings, and finishes markets. Keystone is now very pleased to bring you a complete range of the highest quality metal-complex, solvent soluble organic dyes called **Keyfast Spirit Dyes**.

With state of the art testing and applications labs in Chicago and our new facility in Inman, SC, Keystone is here to provide the technical service and support, in addition to the highest quality products, to ensure your company's success.

### GENERAL

Keyfast Spirit dyes are brilliant, organic metal complex dyes with good solubility in cellosolve and many other solvents. Keyfast Spirit dyes are particularly suitable for the production of transparent and relatively lightfast shades in foil coatings, wood stains, general coatings and printing ink applications.

### PHYSICAL PROPERTIES

Solutions of Keyfast Spirit dyes behave like colloidal systems. The solubility chart in this bulletin is to be used as a guide reached under certain conditions, and not a specification. Fastness to chemicals and foodstuffs are also shown in the charts.

The heat resistance of a dye depends to a great extent on the nature of the vehicle and substrate, and on the length of time it is heated. If the medium itself turns yellow, the colored lacquer will change even though the dye itself is fairly stable: the effect is most noticeable in the case of blue dyes, which may appear markedly greener. Similarly, light fastness of a shade depends not only on the dye used but also on the nature of the vehicle as well. The concentration of the dye may also have an influence.

### APPLICATION

Keyfast Spirit dyes are suitable for use in transparent lacquers, flexographic and gravure printing inks, and wood stains, and can be used for coloring certain plastics such as cellulose nitrate, cellulose acetate and polyester resins.

The coloration of nitrocellulose lacquers for producing transparent shades on metalized polyester film and metal foil constitutes an important field of application. These products are by nature suitable for a variety of applications in many other binder systems such as vinyl resins, alkyd melamine baking enamels, shellac resins and acrylic resins.

Suggested formulas for various applications are provided herein. Indications of suitability of the dyes for particular applications are based on internal tests and experience.

An indication of suitability for a particular purpose does not indicate that the dyes will always meet the most stringent requirements. It must also be kept in mind that processing conditions play an important part and it is essential that the user should test the suitability of the dye for his particular process.

## Suggested Formulations for KEYFAST SPIRIT Dyes in Various Media

### 1 Nitrocellulose System (Air Drying)

| Component          |                  |
|--------------------|------------------|
| Keyfast Spirit Dye | 1 parts          |
| Butyl Cellosolve   | 34 parts         |
| NC Lacquer         | 65 parts         |
| <b>Total</b>       | <b>100 parts</b> |

The dye is dissolved initially in Butyl Cellosolve and then diluted with NC Lacquer (15% of NC 1/2 sec.).

**Application:** (1) Coating on metalized polyester film or aluminum foil printing. (2) For leather to get a glossy finish.

### 2 VCVA Co-Polymer System

#### (a) Solution of Solvent Soluble Dyes

| Component          |                  |
|--------------------|------------------|
| Keyfast Spirit Dye | 20 parts         |
| Cyclohexanone      | 100 parts        |
| <b>Total</b>       | <b>120 parts</b> |

#### (b) Resin Solution (Based on Vinyl Resin)

| Component                      |                  |
|--------------------------------|------------------|
| Union Carbide Vinyl Resin VACH | 8 parts          |
| Union Carbide Vinyl Resin VMGH | 8 parts          |
| Solvent Naphtha                | 30 parts         |
| Butyl Cellosolve               | 10 parts         |
| Cyclohexanone                  | 14 parts         |
| Isophorone                     | 30 parts         |
| <b>Total</b>                   | <b>100 parts</b> |

(c) 5-10 parts of solution (a) mixed with 90-95 parts of solution, (b) to get the coating formulation.

**Application:** The above mixture is used for either printing or coating on aluminum foil or metalized polyester film and on cans, depending upon the depth and shade required. The quantum of dyes solution along with the solution can be altered.

### 3 Acrylic Lacquer System

| Component             |                  |
|-----------------------|------------------|
| Keyfast Spirit Dye    | 4 parts          |
| Butyl Cellosolve      | 30 parts         |
| Acrylic Clear Lacquer | 66 parts         |
| <b>Total</b>          | <b>100 parts</b> |

The Keyfast Spirit dye is dissolved in Butyl Cellosolve completely, then the Acrylic Clear Lacquer is added under agitation. The Colored Acrylic Lacquer solution is ready for application.

#### Application:

- Coating/printing of aluminum.
- Coating or printing of metalized polyester film.
- Coating on glass surface, namely bulbs, by spray coating and baking at 150°C for 5 minutes.
- Coating of metal aluminum sheet and baking at 150°C for 5 minutes.

### 4 Shellac System (Air Drying)

#### Shellac Solution

| Component             |                  |
|-----------------------|------------------|
| Dewaxed Lemon Shellac | 55 parts         |
| Denatured Alcohol     | 44 parts         |
| Dibutyl Benzoate      | 1 parts          |
| <b>Total</b>          | <b>100 parts</b> |

| Component          |                  |
|--------------------|------------------|
| Keyfast Spirit Dye | 1 parts          |
| Butyl Cellosolve   | 10 parts         |
| Resin Solution     | 89 parts         |
| <b>Total</b>       | <b>100 parts</b> |

Used for coating on aluminum foil, polyester film, cellophane paper, solvent-based fiber tip pen inks, etc.

### 5 Liquid Inks for H.D.P.E. Woven Bags

| Component                           |                  |
|-------------------------------------|------------------|
| Polyamide Resin (Non-Reactive Type) | 25 parts         |
| Butyl Alcohol                       | 50 parts         |
| Isopropyl Alcohol                   | 25 parts         |
| <b>Total</b>                        | <b>100 parts</b> |

| Component          |                  |
|--------------------|------------------|
| Keyfast Spirit Dye | 1 parts          |
| Butyl Cellosolve   | 10 parts         |
| Resin Solution     | 89 parts         |
| <b>Total</b>       | <b>100 parts</b> |

Keyfast Spirit dye is initially dissolved in Butyl Cellosolve and then added to the resin solution under high speed stirrer.

### 6 Stoving Enamel - Transparent Coatings

| Component                   |                  |
|-----------------------------|------------------|
| Keyfast Spirit Dye          | 2 parts          |
| Butyl Cellosolve            | 18 parts         |
| Coconut Alkyd 70% Solid     | 48 parts         |
| Xylene                      | 20 parts         |
| Melamine Formaldehyde Resin | 12 parts         |
| <b>Total</b>                | <b>100 parts</b> |

Storing at 120°C for 30 minutes. The above formulation can also be used for coating on aluminum base coated materials (aluminum paste to be used for base coating).

### 7 Thermosetting Acrylic Lacquer

| Component             |                  |
|-----------------------|------------------|
| Keyfast Spirit Dye    | 2 parts          |
| Butyl Cellosolve      | 18 parts         |
| Acrylic Clear Lacquer | 55 parts         |
| Xylene                | 20 parts         |
| Melamine Formaldehyde | 5 parts          |
| <b>Total</b>          | <b>100 parts</b> |

Storing at 120°C for 30 minutes.

### 8 Air Drying Lacquer for PVC Articles

| Component           |                  |
|---------------------|------------------|
| Keyfast Spirit Dye  | 1 parts          |
| Acetone             | 20 parts         |
| Cyclohexanone       | 19 parts         |
| PVC/Acrylic Lacquer | 60 parts         |
| <b>Total</b>        | <b>100 parts</b> |

The dye is dissolved in Acetone/Cyclohexanone mixture and then mixed with PVC/Acrylic Lacquer.

### PVC/Acrylic Lacquer

| Component                     |                  |
|-------------------------------|------------------|
| PVC/Acrylic Resin             | 6 parts          |
| <b>Solvent Mixture</b>        |                  |
| Acetone/Toluene/Cyclohexanone | 94 parts         |
| <b>Total</b>                  | <b>100 parts</b> |

### 9 Wood Gloss Finish with Keyfast Spirit Dyes

#### Clear Lacquer

| Component                     |                  |
|-------------------------------|------------------|
| Melamine Polyurethane Lacquer | 100 parts        |
| Melamine Hardener             | 10 parts         |
| Thinner                       | 10 parts         |
| <b>Total</b>                  | <b>120 parts</b> |

#### Colored Lacquer

| Component          |                  |
|--------------------|------------------|
| Keyfast Spirit Dye | 1 parts          |
| Butyl Cellosolve   | 10 parts         |
| Clear Lacquer      | 50 parts         |
| Thinner            | 49 parts         |
| <b>Total</b>       | <b>110 parts</b> |

Initially one coat of melamine resin solution on wooden surface followed by sand papering and then one coat of clear lacquer. Air-dried and followed by colored lacquer coat (two cross coats) and finally, with one clear lacquer coat.

**Solubility:** The solubility values given in the chart represent the amount of dyestuff in grams which dissolves at room temperature in one liter of solvent, without any significant residue. Because of the relatively high concentrations involved, Keyfast Spirit dyes, unlike inorganic salts in water, do NOT form true solutions. It is therefore not possible to give absolute solubility figures. The solubility data given should be used only as a guide especially since the solvents used in most formulations are in practice solvent blends or resin/solvent combinations that will significantly influence results.

**Illustrations:** The printing inks for illustrations were prepared according to the following typical formulation:

| Component          | 1%               | 5%               |
|--------------------|------------------|------------------|
| Keyfast Spirit Dye | 1 parts          | 5 parts          |
| Ethanol            | 20 parts         | 20 parts         |
| Ethyl Cellosolve   | 20 parts         | 20 parts         |
| Melamin NC Lacquer | 59 parts         | 55 parts         |
| <b>Total</b>       | <b>100 parts</b> | <b>100 parts</b> |

Metalized polyester film was used as substrate.



# KEYFAST SPIRIT

## Solvent Soluble Dyes



|                                 |            |  | Solubility (Grams/Liter)  |                                |         |               |                   |                  |         |         |                | Light Fastness | Resistance to Chemicals and Foodstuffs |             |                  |      |                    |             |        |
|---------------------------------|------------|--|---------------------------|--------------------------------|---------|---------------|-------------------|------------------|---------|---------|----------------|----------------|--|-------------|------------------|------|--------------------|-------------|--------|
|                                 |            |  | Methyl Ethyl Ketone (MEK) | Methyl Iso Butyl Ketone (MIBK) | Acetone | Ethyl Acetate | Diacetone Alcohol | Ethyl Cellosolve | Ethanol | Toluene | Cyclo Hexanone |                | Caustic Soda                           | Acetic Acid | Butter Margarine | Soap | Water 80°C 30 Min. | Coconut Oil | Cheese |
| Keyfast Spirit Yellow 4G        | 806-042-50 |  | 30                        | 20                             | 50      | 100           | 250               | 100              | 190     | 220     | 50             | 3-4            | 5                                      | 5           | 5                | 4-5  | 5                  | 5           | 5      |
| Keyfast Spirit Yellow 2RLS      | 806-062-50 |  | 50                        | 50                             | 100     | 25            | 300               | 250              | 50      | Trace   | 125            | 6              | 5                                      | 5           | 5                | 4-5  | 5                  | 5           | 5      |
| Keyfast Spirit Yellow 2GN       | 806-082-50 |  | 50                        | 200                            | 250     | 150           | 400               | 400              | 100     | 50      | 100            | 6-7            | 5                                      | 5           | 5                | 4-5  | 5                  | 5           | 5      |
| Keyfast Spirit Golden Yellow 3R | 806-404-50 |  | 50                        | 200                            | 250     | 150           | 400               | 400              | 100     | 30      | 175            | 6              | 5                                      | 5           | 5                | 4    | 5                  | 5           | 5      |
| Keyfast Spirit Orange RSE       | 506-062-50 |  | 75                        | 50                             | 150     | 20            | 150               | 150              | 50      | Trace   | 50             | 6              | 5                                      | 5           | 4                | 3    | 3                  | 5           | 5      |
| Keyfast Spirit Orange RLN       | 506-438-50 |  | 250                       | 200                            | 275     | 50            | 300               | 425              | 75      | Trace   | 75             | 6              | 5                                      | 5           | 4                | 3    | 3                  | 5           | 5      |
| Keyfast Spirit Red 2BK          | 606-008-50 |  | 200                       | 200                            | 200     | 50            | 200               | 300              | 100     | Trace   | 75             | 6              | 5                                      | 4           | 5                | 4    | 3                  | 5           | 3-4    |
| Keyfast Spirit Fire Red GLS     | 606-089-50 |  | 150                       | 50                             | 400     | 20            | 400               | 350              | 20      | Trace   | 200            | 5              | 5                                      | 4           | 2                | 2-3  | 5                  | 5           | 4      |
| Keyfast Spirit Fire Red G       | 606-119-50 |  | 100                       | 50                             | 200     | 20            | 200               | 200              | 20      | Trace   | 150            | 6              | 5                                      | 4           | 3                | 3    | 5                  | 5           | 4      |
| Keyfast Spirit Red KL           | 606-122-50 |  | 300                       | 250                            | 200     | 50            | 200               | 300              | 100     | Trace   | 75             | 6              | 5                                      | 4           | 5                | 4    | 3                  | 5           | 5      |
| Keyfast Spirit Red BL           | 606-122-52 |  | 250                       | 200                            | 200     | 50            | 200               | 300              | 100     | Trace   | 60             | 6              | 5                                      | 5           | 4                | 4    | 3                  | 5           | 4      |
| Keyfast Spirit Magenta RBS      | 606-127-50 |  | 20                        | 20                             | 25      | 20            | 100               | 100              | 100     | Trace   | 75             | 3-4            | 4-5                                    | 5           | 3-4              | 4-5  | 3                  | 4-5         | 3      |

For more information or samples call: **1-800-522-4DYE**  
In Europe call: **44 1484 341466**

**KEYSTONE ANILINE CORP.** 2501 W. Fulton Street, Chicago, IL 60612 ■ (312) 666-2015 or (800) 522-4DYE ■ FAX (312) 666-8530 ■ [www.dyes.com](http://www.dyes.com)  
**KEYSTONE EUROPE LTD.** Unit 1-2, Bradley Junction, Leeds Road, Huddersfield, U.K. HD2 1UR ■ 44 1484 341466 ■ FAX 44 1484 341544





# KEYFAST SPIRIT

## Solvent Soluble Dyes



|                              |            |  | Solubility (Grams/Liter)  |                                |         |               |                   |                  |         |         |                | Light Fastness | Resistance to Chemicals and Foodstuffs |             |                  |      |                    |             |        |
|------------------------------|------------|--|---------------------------|--------------------------------|---------|---------------|-------------------|------------------|---------|---------|----------------|----------------|--|-------------|------------------|------|--------------------|-------------|--------|
|                              |            |  | Methyl Ethyl Ketone (MEK) | Methyl Iso Butyl Ketone (MIBK) | Acetone | Ethyl Acetate | Diacetone Alcohol | Ethyl Cellosolve | Ethanol | Toluene | Cyclo Hexanone |                | Caustic Soda                           | Acetic Acid | Butter Margarine | Soap | Water 80°C 30 Min. | Coconut Oil | Cheese |
| Keyfast Spirit Black X-51    | 106-027-50 |  | 250                       | 200                            | 250     | 100           | 350               | 400              | 140     | Trace   | 100            | 6              | 5                                      | 5           | 5                | 5    | 5                  | 5           | 4      |
| Keyfast Spirit Black KR      | 106-029-55 |  | 200                       | 150                            | 250     | 50            | 300               | 350              | 200     | Trace   | 50             | 5-6            | 5                                      | 5           | 5                | 5    | 5                  | 5           | 4      |
| Keyfast Spirit Black RBL     | 106-034-50 |  | 200                       | 150                            | 250     | 60            | 350               | 350              | 100     | Trace   | 150            | 6              | 5                                      | 5           | 5                | 5    | 5                  | 5           | 4      |
| Keyfast Spirit Blue 6G-SS    | 206-070-50 |  | 120                       | 75                             | 150     | 30            | 250               | 150              | 200     | Trace   | 50             | 6              | 5                                      | 3-4         | 3-4              | 3-4  | 5                  | 3-4         | 5      |
| Keyfast Spirit Royal Blue    | 206-403-50 |  | 100                       | 50                             | 120     | 20            | 200               | 150              | 200     | Trace   | 50             | 5-6            | 5                                      | 3-4         | 3-4              | 3    | 4                  | 3-4         | 4-5    |
| Keyfast Spirit Brown 2RM     | 306-401-50 |  | 240                       | 175                            | 250     | 50            | 300               | 250              | 100     | Trace   | 75             | 6              | 5                                      | 5           | 4                | 2-3  | 4                  | 4           | 4-5    |
| Keyfast Spirit Dark Brown 5R | 306-402-51 |  | 250                       | 175                            | 250     | 50            | 300               | 250              | 100     | Trace   | 75             | 6              | 4-5                                    | 4-5         | 4-5              | 2-3  | 4-5                | 3-4         | 5      |
| Keyfast Spirit Green GL      | 406-402-50 |  | 175                       | 100                            | 125     | 100           | 250               | 150              | 100     | Trace   | 75             | 5-6            | 5                                      | 4           | 4-5              | 2-3  | 5                  | 5           | 5      |
| Keyfast Spirit Green BL      | 406-406-50 |  | 175                       | 100                            | 125     | 100           | 250               | 150              | 100     | Trace   | 75             | 5-6            | 5                                      | 4           | 4-5              | 2-3  | 5                  | 5           | 5      |

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As a Keystone customer, you will have direct access to professionals who can answer technical questions and provide timely assistance.

Please give us a call or visit our web site at **www.dyes.com**

Please feel free to contact us for samples of our dyes, technical specifications, or for formulating assistance.

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The shades illustrated in this brochure are designed to impart a general idea of the color characteristics of each dye, not a guarantee of how the dye will look in a particular formulation. Variations in formulations and application will affect the dye performance properties. Samples of our dyes are available upon request for testing and approval.

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