



# Protective & Marine Coatings

# SOLVENTS

Revised July 19, 2017

## PRODUCT INFORMATION

12.00

### OVERVIEW

- Film integrity, appearance, and application are significantly affected by the nature of the solvent. A solvent plays a very important role in film formation and durability even though it is not a permanent component.
- There are only two basic performance properties that must be considered in selecting the proper solvent for any end use: solvency and evaporation rate. Solvency is important because, by definition, a solvent must dissolve something.
- The solvent dissolves the resin and reduce the viscosity. Evaporation is subsequently necessary, not only as a part of the drying process, but to control the coating viscosity at various stages of drying. As the solvent evaporates, film viscosity increases.
- A solvent must evaporate relatively quickly during initial drying to prevent sagging, but it must evaporate slowly enough to give sufficient leveling and adhesion.

### ALIPHATICS/AROMATICS

#### ALIPHATIC SOLVENTS

These solvents are used to reduce medium and long oil alkyd enamels such as Industrial Enamel HS and Direct-to-Metal Enamel. They are not strong enough to be true solvents in any resin quality other than alkyds. Aliphatic solvents are non-photochemically reactive, HAPS complying, and non-polar.

- **Mineral Spirits R1K4** - Weak, slow evaporating. Used predominately in alkyds.
- **VM&P Naphtha R1K3** - Weak, fast drying solvent, very good for solvent cleaning galvanized metal.

#### AROMATIC SOLVENTS

Aromatic solvents are economical solvents that are widely used in alkyds, polyesters, and epoxies; either alone or in combination with other solvent types. All aromatics are photochemically reactive.

- **Toluol (Toluene) R2K1** - fast evaporating, strongest aromatic, not HAPS complying.
- **Xylol (Xylene; Reducer No. 4) R2K4** - medium evaporating, most common aromatic, not HAPS complying. Used to adjust viscosity when electrostatic spraying.
- **Hi-Flash Naphtha (100 Flash Naphtha, Solvesso 100) R2K5** - Slow evaporating aromatic. Used as retarder to improve flow or as part of a solvent blend. Not HAPS complying.

### BLENDED SOLVENTS

- **Reducer #54 R7K54** - designed for use with epoxies where a photochemically reactive solvent blend is permitted. It has excellent solvent power and permits application at higher films with and less reduction than when using other blended reducers. It is relatively fast evaporating and used primarily with spray applications.

### BLENDED SOLVENTS

(continued)

- **Reducer #58** - also designed for use with epoxies. It has excellent solvent power. It is slower evaporating than R7K54. Used for brush, roll, and squeegee applications.
- **Reducer 255-C-005** - designed for use with select epoxies. Relatively fast evaporating; used primarily for spray applications.
- **Reducer 100, R7K100** - a slow evaporating solvent for use with epoxies. Over use may cause sagging.
- **Reducer 145, R7K145** - designed for use with select epoxies. Acceptable for brush, roll, or spray application.
- **Reducer 155, R7K155** - a medium-slow evaporating, strong cutting solvent for use in epoxies.

### KETONES

Ketone solvents offer very strong solvency to reduce viscosity rapidly and to increase conductivity. Ketones are widely used in polyurethanes, polyesters, and epoxies and also as part of a solvent blend in many other coating qualities.

- **Reducer R7K195** - 100% MIBK - a very strong, fast drying solvent for use during spray applications in select epoxies.
- **Methyl Ethyl Ketone (MEK) R6K10** - a very fast evaporating polar solvent widely used in zinc rich coatings, and as part of reducer blends. It is also used to increase conductivity of coatings for electrostatic applications. It is not HAPS complying.
- **Acetone R6K9** - an extremely fast evaporating solvent. It is too fast evaporating for most products. Its very low flash point makes it extremely flammable. Acetone has been exempted in Federal EPA regulations as a VOC contributor and it is HAPS complying.

### POLYURETHANE SOLVENTS

Polyurethane solvents are specially formulated for use with polyurethane coatings. They are moisture free and optimized for use on the wide range of substrates and systems to which polyurethane coatings are applied.

- **Reducer R7K69** - a general purpose photochemically reactive reducer for use in polyurethanes.
- **Reducer R7K216** - a general purpose retarder/reducer for improved flow when spraying large areas or when ambient temperatures are over 86°F (30°C).
- **Reducer R7K15** - a strong solvent designed primarily for use with moisture cured urethanes. Relatively fast drying. Ideal for spray applications.
- **Reducer 132, R7K132** - a medium-slow evaporating, strong cutting solvent for use in polyurethanes



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# SOLVENTS

## PRODUCT INFORMATION - SOLVENT SELECTION

12.00

Sherwin-Williams offers reducers and solvents which will assure the correct tailor-made properties are obtained for each coating or application requirement. The following chart provides a list of solvents and blended solvents and some specific properties. For the proper selection of a reducer or thinner, see the respective Product Data Page which then can be tied in with the chart below.

Product Name	Evaporation Rate-Minutes 1*	Solvent Strength 2*	Flash Point 3*	Flow 4*	Set Up Time 5*	Non-Photo-chemically Reactive	Characteristic Summary
<b>ALIPHATIC/AROMATIC</b>							
R1K4 - Mineral Spirits	50	1	105	6	6	YES	Weak, slow evaporating, used predominately in alkyds.
R2K4 - Xylene: Reducer No. 4	11	6	80	4	3	NO	Medium fast evaporating for use in epoxies and alkyds.
R2K1 - Toluene	4	6	40	2	1	NO	Fast evaporating.
R1K3 - VM&P Naphtha	4	2	50	2	2	YES	Weak, fast evaporating, very good for solvent cleaning when using alkyd topcoats.
R2K5 - Hi-Flash Naphtha	40	5	105	6	6	NO	Slow evaporating, overuse may cause sagging.
<b>BLENDED SOLVENTS</b>							
R7K54 - Reducer #54	15	6	55	5	5	NO	Medium-fast evaporating for epoxy spray application.
Reducer #58	20	6	80	8	7	NO	Slow evaporating for epoxies and urethanes, use with brush and roll application.
R7K100 - Reducer #100	40	5	105	6	6	NO	Slow evaporating, overuse may cause sagging.
255-C-005 - Reducer	10	6	40	4	6	NO	Medium to fast evaporating, for use with epoxies.
R7K145 - Reducer #145	18	6	80	6	6	NO	Medium-slow evaporating for use with epoxies; brush, roll, or spray application
R7K155 - Reducer #155	20	7	75	8	7	YES	Medium-slow evaporating, strong cutting solvent for use in epoxies.
<b>KETONES</b>							
R6K10 - MEK	2	10	18	2	2	YES	Very fast evaporating for spray application with zinc rich coatings. Used in small amounts.
R6K9 - Acetone	1	10	1	1	1	YES	Very fast evaporating
R7K195 - Reducer #195	14	8	60	5	4	YES	Medium fast evaporating, for use with spray applications of epoxies.
<b>POLYURETHANE SOLVENTS</b>							
R7K69 - Reducer #69	8	6	35	4	4	NO	Medium-fast evaporating for use with polyurethanes.
R7K216 - Reducer #216	21	9	102	8	8	YES	Slow evaporating for brush and roll application of polyurethanes.
R7K132 - Reducer #132	18	8	108	9	6	NO	Medium-slow evaporating, strong cutting solvent for use in polyurethanes
R7K15 - Reducer #15	12	8	<100	5	7	NO	Medium-fast evaporating for use with moisture cure urethanes.

\*

1. Measure of time in minutes required for 90% to evaporate. ASTM -D3539.
2. Ratings express the approximate ability to dissolve resin and reduce viscosity. Rated 1 to 10 (10 best).
3. Temperature (°F) at which sufficient vapors are given off to ignite by open flame (Closed Cup Method).
4. Rated from 1 to 10 (10 best). Good flow permits paint film to level out into a smooth film of uniform thickness without orange peel, brush marks, etc.
5. Rates from 1 to 10 (10 slow) relative rating of time necessary to obtain surface or dry-free drying of film.