

SPRAY *lite*™

Lightweight Filler System



THE R.J.
MARSHALL
COMPANY

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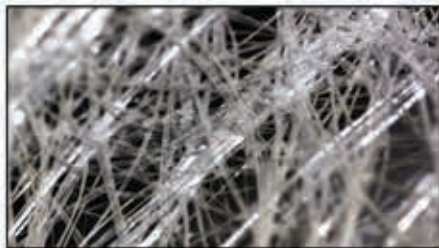
"We have been using Spraylite from the R.J. Marshall Company for eight or nine years in our whirlpool tub and shower manufacturing operation. Spraylite mixes in well and enables significantly higher filler loadings, which reduces our overall laminate cost. It sprays well and rolls out easily, which means lower labor costs. It is less abrasive than other fillers, saving us down-time and maintenance costs on pumps and guns. Our parts weigh less, which reduces shipping costs, and they are stronger - we see fewer warranty and freight damage problems. Our supply of Spraylight has always been very consistent, and we would recommend it whole heartedly to any manufacturer using or considering using a filled system."

-Tom Salvatore, General Manager, Hydro Systems / Valencia, California



"We find that The RJ Marshall Company's Spraylite brings many benefits to our operation. It has enabled us to produce better looking parts that are lighter and stronger as well. Spraylite is consistent and always within specification. It gives us a consistency that we did not find in traditional fillers. We will never go back."

-Rob Zoller, Goeff Donnelly and Bob Hyde of Venco, Nanaimo and Delta / British Columbia, Canada



What is Spraylite?

Spraylite is a sprayable lightweight filler system composed of resin extending, lightweight polymeric microspheres available in three mineral bases: Alumina Trihydrate, Calcium Sulfate (gypsum), and Calcium Carbonate. These volume enhancing spheres are resilient and will not break down during mixing. They are also flexible and will elongate while being sprayed through a mix tip and instantly reshape back to sphere form. Compared to mineral filled systems, Spraylite will give you the same volume of matrix using less resin and filler.

Spraylite Lowers Your Costs

Spraylites are cost effective particulate systems engineered to save you money and improve performance in many different ways.

- **High filler loading means lower matrix costs:**

When compared to unfilled systems, the high volume producing capability of Spraylite can help reduce total raw material costs by displacing resin and reinforcements. Compared to an unfilled standard resin/glass system, Spraylites can provide a savings of up to 15% of your raw material costs. In a Spraylite filled system, cost reductions are achieved by Spraylite's ability to extend your resin volume over typical mineral fillers.

- **Less abrasion means lower maintenance costs:**

The polymeric spheres in Spraylite are less abrasive than typical mineral fillers. This results in less wear on equipment and lower maintenance expenses.

- **Reduced rollout means increased production rates:**

Spraylite's lighter weight matrix improves the ease of air removal from spray-up laminates and significantly reduces drainage, resulting in less rollout effort and working time.

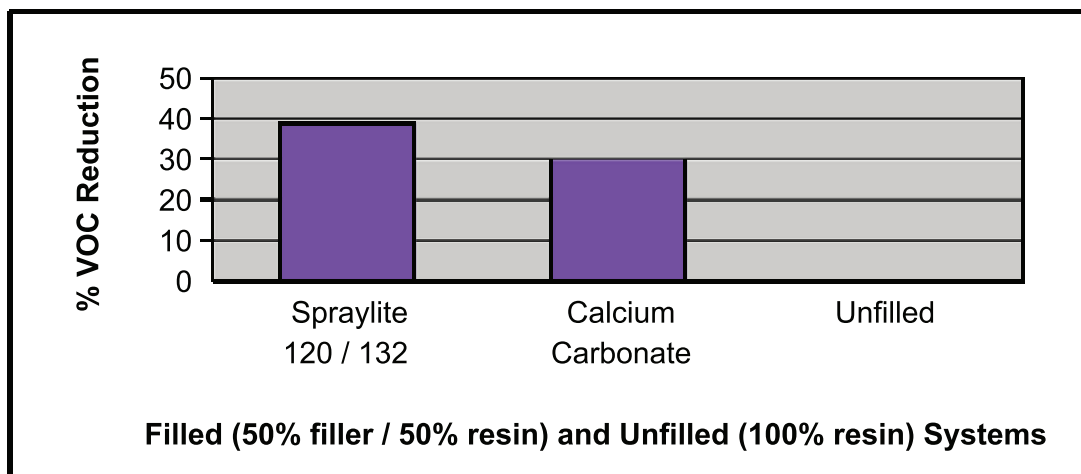
- **Lighter parts = lower shipping costs & easier in-house handling:**

Think of how a 10-15% weight savings will benefit your outbound freight and in-house handling.

Spraylite Lowers Your VOC Emissions

Spraylite is environmentally friendly. It lowers styrene emissions in your workplace and into the atmosphere by simply reducing resin volume per part. Since less resin is used per part, less styrene volume per part will be emitted. When using 50% resin and 50% Spraylite by weight, the chart below shows how much you can reduce your styrene emissions from heavyweight filled and unfilled systems.

Comparison of VOC Reduction in Equal Weight Systems



Spraylite Provides Improved Processing

Spraylite's lower specific gravity means less weight per gallon (WPG) than in conventionally filled systems, allowing you to extend the volume of your mix while, at the same time, reduce the volume of resin. For example, if your current formula calls for 50% resin and 50% calcium carbonate (specific gravity = 2.7), and you replace the calcium carbonate with SL 120/132 (specific gravity = 1.7), the batch weight will be 15% lighter. It is therefore necessary to reduce the batch weight by 15% to get equal volume. You will still be able to make the same number of parts.

Furthermore, Spraylite disperses easily. Spraylite's unique particle distribution promotes rapid air release and reduces drainage. A typical filled system matrix is dense and "stiff," inhibiting air release and making the part harder to rollout. With a Spraylite matrix there is less mass to push with the roller, so rollout tends to be easier once operators gain the feel of a lightweight material. (See Testimonials)

Spraylite Creates High Quality Parts

Spraylite's are engineered to improve the properties and aesthetics of your fiberglass reinforced composite parts.

- **Improved Surface Bond:**

Spraylite's ability to replace resin reduces shrinkage, improves adhesion to surface materials and allows the laminate / surface bond to strengthen.

- **Better Cosmetics:**

Because less resin volume percentage is used in a Spraylite filled system, curing stress due to resin shrink is reduced. The result is less fiber print-through and less in-mold cracking.

- **Equal or Improved Strength:**

Physical testing data provided by an independent laboratory* shows that Spraylite laminates are just as strong as conventional filled laminates of equal thickness: this means equal strength with less weight and more cost savings! If stronger parts are your goal, then Spraylite can be applied at greater thicknesses to achieve a weight equal to your thinner heavyweight parts. Either way, the end result will be parts that are less brittle and more crack resistant than those made with conventional fillers.

- **Flame Retardants:**

Spraylite is available in flame retardant and non flame retardant grades. Alumina trihydrate and calcium sulfate (gypsum) based Spraylites provide Class 2 flame retardancy and smoke suppression, while the calcium carbonate based Spraylite helps you achieve maximum economy.

* BMC Mexico, Evaluation #2007-10



Technical Data

Spraylite is available in three mineral bases: Alumina Trihydrate, Calcium Sulfate (gypsum) and Calcium Carbonate. Each is available in pre-blended or concentrated formats to allow for total flexibility within your operation. The concentrates give you the ability to adjust mix densities to meet your economic and quality requirements. The pre-blends provide the convenience of a one-bag mix, saving you the time and effort of excessive measuring and weighing. Spraylite is blended with laminating resins and sprayed with conventional spray-up laminating equipment.

Calcium Carbonate based

Typical Physical Properties	SL 120	SL 132	SL 110	Concentrates SL 121/ 133
Specific Gravity	1.70	1.70	1.10	0.65
Loose Bulk Density (lbs./cu. ft.)	43	38	27	17
% passing through 325 mesh	98	100	99	99
Flame Retardant	No	No	No	No

Alumina Trihydrate (ATH) based

Typical Physical Properties	SL 220/ 230	SL 210	Concentrates SL 221/ 231
Specific Gravity	1.70	1.10	0.65
Loose Bulk Density (lbs./cu. ft.)	40	28	18
% passing through 325 mesh	90	90	90
Flame Retardant	Yes	Yes	Yes
Decomposition Temperature of ATH ~ 190°C			

Calcium Sulfate (gypsum) based

Typical Physical Properties	SL 420/ 430	SL 410	Concentrates	
			SL 421/ 431	SL 425
Specific Gravity	1.70	1.10	0.65	0.25
Loose Bulk Density (lbs./cu. ft.)	39	26	15	5
% passing through 100 mesh	98	98	98	100
% passing through 200 mesh	84	84	84	99
% passing through 325 mesh	65	65	65	98
Flame Retardant	Yes	Yes	Yes	Yes
Decomposition Temperature of gypsum ~ 80°C				

Shipping Locations:

30 series blends are produced at our Rockwood, MI and Alpine, AL facilities

20 series blends are produced at our Valley Springs, CA facility

10 series blends are produced at our Rockwood, Alpine and Valley Springs facilities

All statements, technical information and recommendations are based on tests we believe to be reliable, the accuracy or completeness is not guaranteed, and the following is made in place of all warranties, expressed or implied. Our only obligation is to replace product proved to be defective. We shall not be liable for any injury, loss or damage, direct or indirect, from using or not being able to use the product. Before using, customer must determine the suitability of the product for the intended use and customer assumes the responsibility. This statement may not be changed except by an agreement signed by an officer of The R.J. Marshall Company.

Mixing

Whether transitioning from a unfilled/ neat system or a heavy weight mineral filled system, we can help. In order to realize Spraylite's maximum benefits, you will need the following pieces of equipment.

- **High Shear Mixer:**

Due to Spraylite's unique physical properties, high shear mixing is necessary to properly wet out and disperse the Spraylite.

- **Day Tank:**

A tank of sufficient capacity, with slow agitation capability, is needed to keep Spraylite in suspension. The current tank being used by filled system laminators will be sufficient.

- **Filter Baskets:**

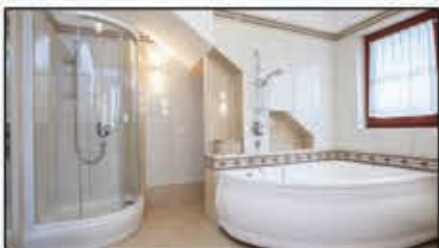
In-line filters should be no smaller than 40 mesh to allow for proper flow of the Spraylite matrix through your system. Experimentation may be needed to determine the exact filter size that will give your shop the proper balance of flow and filtering. If you have questions regarding the filter sizes appropriate for your Spraylite application, contact the R.J. Marshall Technical Service Department at 800-338-7900.

Batch mixing ratios will vary depending on the Spraylite product you select and the final needs of your product. A spreadsheet showing Spraylite's weight and cost savings advantages is available from the R.J. Marshall Technical Service Department. Possible starting point weight ratios for calcium carbonate based Spraylites are as follows:

- 50% Resin, 50% Spraylite 120/132: Results in a 15% volumetric reduction in resin and a 15% weight savings.
- 50% Resin, 40% Calcium Carbonate 10% Spraylite 121/133: Results in a 14% volumetric reduction in resin use and a 14% weight savings.

Due to the Spraylite's volume enhancing effect, the weight of a Spraylite batch will be less than a conventional mineral filled batch. Use this example as a model to calculate Spraylite batch weights. (Results may vary somewhat depending on your operation.)

Example: Conventional batch weight (50% resin, 50% calcium carbonate) = 300 lbs.
Estimated weight savings using 50% SL 120/132 = 15%
 $0.15 \times 300 = 45$
 $300 - 45 = 255$
New batch weight (50% resin, 50% SL 120/132) = 255 lbs.



Mixing continued

Because it is very important to create a homogeneous mixture of resin and Spraylite, adhere to the following steps.

- Always add the resin to the mix tank before introducing the Spraylite. Doing so will ensure adequate wet out of the Spraylite and prevent filler clumping.
- When using a Spraylite concentrate, add the desired amount of concentrate to the resin and mix thoroughly under high shear before adding the mineral filler. Doing so will ensure adequate wet-out of the concentrate.
- An in-tank mix temperature maximum of 85°F is recommended to minimize styrene loss to the atmosphere and a resultant viscosity increase.
- After the resin and fillers are well mixed, periodically stir the material in the mix tank to prevent resin and filler separation, or transfer to a day tank as referenced above.

Application

As with mixing, the application of Spraylite requires only minor adjustments when transitioning from an unfilled or a heavyweight filled system.

- Tip size in an airless system should be .040 or larger. Impingement technology is generally acceptable based on manufacturer's recommendations.
- Using inline heaters, heat the resin & filler matrix to achieve 95°F in the spray gun tip. Inline heaters will also enable you to use a higher loading of Spraylite.
- Spray a very light "pre-wet," or "mist coat," of filled resin (with no glass) against the part exterior to ensure wet-out, improve cosmetics and strengthen the bond between the laminate and substrate.
- If possible, shorten the length of the chopped strands to improve wet-out and air release. (The demands of your part will determine feasibility.) You can apply the chopped stand at over 100 mils per build pass. When the chopping is completed, a follow-up backing of a light mist coat is recommended.
- Quickly perform the rollout with just enough pressure to wet out the fibers. One stroke is usually all that is needed. Excessive rolling effort is not needed with Spraylite systems, as it will damage the laminate.
- Maintain an ambient temperature of 70°F or higher for consistent results.



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