LEVINE & COMPANY, INC.
ROOF CONSULTING & ARCHITECTURAL CONSERVATION
610-642-4081 + WWW.LEVINECO.NET

RIDGEWALKER NEWS

Spring 2015 Vol.10 No.2

Insights into Today's Roofing Issues

Professional Services

- Roof consulting
- Construction documentation and administration
- Condition assessment reports
- Leak investigations
- Cost estimating
- Hands-on surveys and test probes
- Historic building restoration and rehabilitation
- Facilities maintenance plans
- Materials analysis and selection
- Preservation planning

Steep-Slope Roofing

- Slate
- Wood shingles
- Clay tile
- Standing seam and batten seam copper
- Asphalt shingles
- Flashings
- Rainwater conduction systems

Low-Slope Roofing

- Flat seam copper
- Built-up roofing
- Modified bitumen systems
- EPDM
- Fluid-applied systems
- Flashings

Building Envelope

- Exterior masonry
- Windows and doors
- Stained and leaded glass
- Architectural woodwork
- Ornamental ironwork
- Steeples, parapets, and cornices

Competence

- Expertise in roofing technology and building pathology
- Holistic approach to identifying and treating deterioration
- Hands-on, up-close surveys from ladders and high reach equipment
- Principal involvement in all projects
- Attention to detail
- Close client collaboration
- Frequent site visits during construction to monitor quality
- Continuously refining our understanding of building technologies

SOLUTIONS FOR THE ENTIRE BUILDING ENVELOPE

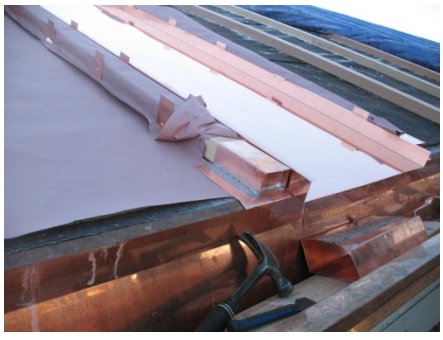
The Mysterious Red Rosin Paper

Rosin paper, also sometimes referred to as building paper, red rosin paper, or slip sheet paper, is a common underlayment component that has been used in building construction since the 19th century. In the construction industry, rosin paper is so commonplace that it is often taken for granted. But, what is rosin paper, really? That is a surprisingly difficult question to answer.

The name "rosin" paper comes from the fact that for decades, rosin was used to size this type of paper.[1] Sizing refers to the practice of treating paper to reduce its ability to absorb liquid. In the 18th and early 19th centuries, most paper sizing was accomplished using a combination of gelatin and alum (aluminum sulfate). Rosin-alum size was discovered later in the 19th century and quickly became the most common sizing agent because it was less expensive than gelatin-alum sizing. The purpose of the alum in rosin-alum size was to facilitate bonding of the rosin to the paper pulp. The drawback was that alum greatly increased the paper's acidity, which, over time, lead to the chemical breakdown of cellulose fibers and degradation of the paper. By the late-1980's, alum-rosin size had largely been replaced with new alkaline sizing agents made from synthetic polymers.[2] Rosin and alum may still be used in sizing agents for some types of paper, but they are not nearly as common as they once were.

The composition of the paper itself is another feature that has changed throughout history. Prior to the 19th century, most paper was made of "rag stock," in which cellulose was derived from cotton, hemp, or linen. During the 19th century, cellulose began to be derived, instead, from a variety of other plants. Eventually, wood became the most popular source. Today's rosin paper is often made from recycled paper. Although the paper's natural color is brown, many manufacturers dye it red, presumably because red is the color most commonly associated with rosin paper. Advertisements and Sweet's Catalog entries dating back to the early 1900's indicate that, even then, rosin paper was commonly red, though the reason is unknown.

Weight, too, has changed, most likely in an effort to reduce the cost of production. Historically, rosin paper weighed between 4 and 12 pounds per 100 square feet.[3] Many current design publications, as well as numerous outline specifications available online still state that rosin paper should weigh between 4 and 6 pounds per 100 square feet. According to current product data from manufacturers of rosin paper, however, the actual weight consistently falls between 3.0 and 3.4 pounds per 100 square feet.



▲ Rosin paper directly below new copper batten seam roofing.

[1] Rosin is a solid form of pine tree resin which has been heated to remove turpentine. This is the same substance used to increase friction or establish a better grip by string instrument players, archers, baseball pitchers, ballet dancers, gymnasts, rock climbers, weightlifters, bull riders, and bowlers.

[2] Thurn, Jim. "History, Chemistry, and Long-Term Effects of Alum-Rosin Size in Paper." https://pacer.ischool.utexas.edu/html/2081/1396/j-thurn-03-alum.html. Dec. 2003. Synthetic polymers include Alkyl Ketene Dimer (AKD) and Alkenyl Succinic Anhydride (ASA).

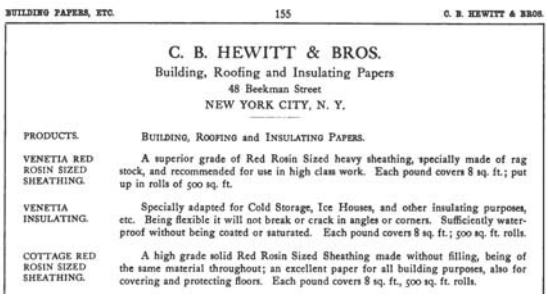
[3] ASTM Special Technical Publication No. 60-B. *Paper and Paperboard Characteristics, Nomenclature, and Significance of Tests*. Philadelphia, 1963.

The Mysterious Red Rosin Paper Cont'd.

For unknown reasons, the ASTM *Test Method for Rosin in Paper and Paperboard* was withdrawn in 1993.

Today, and throughout history, one common use for rosin paper is as a slip sheet between felt underlayment and metal roofing, like flat seam or standing seam copper. Roofing felt is impregnated with asphalt and can become sticky when it heats up or comes in contact with a heated surface (like the underside of a copper roof on a sunny day). The purpose of the slip sheet is to prevent the copper roofing from sticking to the felt and inhibiting necessary thermal movement of the copper. In other words, rosin paper allows the copper to "slip" over the felt as it moves, hence the term slip sheet.

While information about the history and development of rosin paper is hard to come by, imparting an air of mystery to the material, don't stop specifying and using it below metal roofing and gutter liners!



BUILDING PAPERS, ETC. 155 C. B. HEWITT & BROS.

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VENETIA RED ROSIN SIZED SHEATHING.	A superior grade of Red Rosin Sized heavy sheathing, specially made of rag stock, and recommended for use in high class work. Each pound covers 8 sq. ft.; put up in rolls of 500 sq. ft.
VENETIA INSULATING.	Specially adapted for Cold Storage, Ice Houses, and other insulating purposes, etc. Being flexible it will not break or crack in angles or corners. Sufficiently waterproof without being coated or saturated. Each pound covers 8 sq. ft.; 500 sq. ft. rolls.
COTTAGE RED ROSIN SIZED SHEATHING.	A high grade solid Red Rosin Sized Sheathing made without filling, being of the same material throughout; an excellent paper for all building purposes, also for covering and protecting floors. Each pound covers 8 sq. ft., 500 sq. ft. rolls.

▲ An excerpt from a 1906 entry in Sweet's Catalogue of Building Construction advertises red rosin paper manufactured by C.B. Hewitt & Bros.

Project News

Installation of new batten seam copper roofing on Sanders Laboratory of Physics at Vassar College in Poughkeepsie, New York was completed in November, 2014. Levine & Company prepared construction documents and provided construction observation services for the project. Roof replacement was part of a larger, multi-building renovation and new construction Science Project. Sanders Physics highlights include the following:

- 7,700 square feet of new copper batten seam roofing.
- 1,882 square feet of new copper flat seam roofing plus about 1,200 square feet of new copper slip seam wall cladding at new shed dormers and elevator penthouses.
- Approximately 415 linear feet of new copper box gutter, including a sophisticated method of securing gutter straps to the tops of the battens integral with new snow rail brackets.

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P.O. BOX 628
ARDMORE, PA 19003

TO: