KILZ MAX™ PRIMER-SEALER-STAINBLOCKER:

Oil-Based Performance in a Water-Based Formula with Less Environmental Impact

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MILESTONES
KILZ MAX primer was first produced and launched into retail markets in 2011.

ELIGIBILITY
The KILZ MAX primer project is not eligible for academic or small business category awards.

FOCUS AREAS
This project falls into Focus Categories 2 (the use of greener reaction conditions) and 3 (the design of greener chemicals).

ACTIVITIES THAT TOOK PLACE WITHIN THE UNITED STATES
KILZ MAX primer was researched, developed and produced, and is now being sold, in the United States.

ABSTRACT
KILZ MAX primer utilizes specialized resin technology to provide heavy stainblocking and odor blocking – primary features of high volatile organic compound (VOC) solvent- and shellac-based products – in a more eco-friendly, water-based formula. The technology gives users the benefits of solvent- or shellac-based primers – including the ability to block severe stains and odors, tannin stain resistance and more – without the associated drawbacks (high odor, high VOC content, mineral spirits clean-up, etc.) Using the advanced technology that allows the company to replace the solvent with water eliminates approximately 3 pounds of VOCs per gallon (compared to KILZ® Original solvent-based primer). As recently as 2007, we sold over 3.3 million gallons of KILZ Original primer annually. Replacing this higher VOC version with KILZ MAX would reduce the resulting airborne VOCs by as much as 9 million pounds per year.

KILZ MAX primer was launched into test markets in December 2011. Independent testing confirms that KILZ MAX is equal to or better than oil- and shellac-based products on virtually all problem stains, odors and other surface imperfections. Additionally, testing shows that it meets the performance of – and in some categories, exceeds – many products marketed as having similar technology.

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PROJECT DETAIL

KILZ MAX uses resin technology not widely used in the architectural coatings market to achieve stainblocking that matches or exceeds that of higher volatile organic compound (VOC) primer systems.

These higher VOC systems typically use resins that rely on petroleum-based solvents such as mineral spirits to help maintain paint properties. These solvents are not only combustible (and in some cases flammable) they also contribute a significant amount of VOCs during application and product dry time.

Shellac-based primers use ethanol as the primary solvent. The ethanol used in these systems is also flammable and contributes significant VOCs to the environment.

Typical water-based primers use a variety of resin technologies in an attempt to achieve stainblocking. Some acrylics and styrenated acrylics show improvement in stainblocking over vinyl acrylate systems. Quick recoat time with good stainblocking (about one hour or less) is one of the primary features that solvent or shellac systems offer where water-based systems fail. Even with extended dry times (in excess of 24 hours), these water-based systems cannot approach the stainblocking properties of solvent systems.

The KILZ MAX epoxy-based system achieves the stainblocking features of high VOC systems with significantly reduced VOCs and odor in a non-flammable formula. From the environmental perspective, the VOCs of shellac-based primers are near 550 grams per liter (g/L) and quick-dry primers are near 450 g/L.[i] KILZ MAX has a VOC level near 75 g/L – more than seven times fewer VOCs than competitive shellac-based primers and six times less than typical competitive specialty primers. To further illustrate: For every gallon of KILZ MAX sold versus 550 VOC shellac, 3.96 lbs. of airborne VOCs are saved; versus 450 VOC solvent primers, 3.13 lbs. are saved.

This technology addresses multiple problems. First, there's high performance in the area of stain and odor blocking. Typically, this level of performance has only been achieved by high VOC products containing solvents or shellac. KILZ MAX offers comparable performance without the high environmental cost. The lower VOCs (less than 100 per liter) have a significantly reduced impact on air quality, lower the odor for those using the product and make clean-up much easier (since it won't require mineral spirits). Additionally, the disposal of leftover product will have much less impact on the environment compared to high VOC-containing products.

Benefits include the aforementioned significant reduction in airborne VOCs, as well as being able to sell high-performance stainblockers in heavily regulated regions of the country, such as those regulated under the South Coast Air Quality Management District (SCAQMD), the

California Air Resources Board (CARB) and more. Additionally, there are the benefits this technology provides to our brand equity. Being known as a “problem solving” brand, primarily via our stainblocking technology, this builds upon our equity with retail partners and end consumers.

In terms of drawbacks, there is only one that’s notable. This new technology requires specialized equipment for production, which means that we can currently only produce the product in one of our seven manufacturing facilities. Scaling up our other facilities to meet projected demand for the new product will require significant capital investment.

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[i] *VOC sourced from 40 CFR Part 59, National Volatile Organic Compound Emission Standards for Architectural Coatings, TABLE 1 OF SUBPART D.—VOLATILE ORGANIC COMPOUND (VOC) CONTENT LIMITS FOR ARCHITECTURAL COATINGS: Quick-Dry Primer limit 450 g/l, Shellacs: Opaque 550 g/L. Actual VOC levels on Rust-oleum website Zinsser BIN (shellac-based) material safety data sheet (MSDS), 540 g/L VOC. Zinsser Cover-Stain (quick-dry primer) MSDS lists VOC of 433 g/L.*