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To: Lisa Petsko
Terry Viness

September 29, 2007

Subject: Installation Times of Sto Moisture Barrier Products Compared to Competitive Products

Thanks very much for the opportunity to assist with the time study of Sto products. I think we have produced a good, representative analysis of the relative installation times, and of the factors which contribute to them. JPR will be glad to assist further as you expand your knowledge of application times.

Attached is the final report, which reflects the times observed on the days of September 24 and 25. It has an added section addressing advantages and disadvantages of crew and single applicators. The invoice is attached as well. The Excel spread sheets are not included as they were previously sent, as were the file of digital photos.

As mentioned in the report, I am grateful to experienced Sto employees Wade Tompkins and Charles Moore for their physical and intellectual contributions.

Best regards,

Jack Greene

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Time Study Report

Installation Times of Sto Moisture Barrier Products Compared to Competitive Products

Jack Greene, Jackson Productivity Research Inc., September 25, 2007

A. Executive Summary

Sto technical employees applied Sto air barrier products to a typical sheathed wall, and subsequently applied Tyvek products to an identical wall, on September 24 and 25, 2007. Jackson Productivity Research Inc. time studied the work in order to compare application times. The study was sponsored by Lisa Petsko, Product Manager; and by Terry Viness, Sr. Technical Service Manager.

The wall was constructed to represent application under commercial conditions, rather than residential conditions. Tyvek products were applied to meet the published DuPont Flashing Systems Commercial Installation Guidelines, published in 2007. Sto products were applied to meet current guidelines to commercial customers.

Application times were observed, in man minutes, for the 672 square foot wall:

<u>Tyvek</u>	<u>Cover wall</u>		124.53 man-minutes	.185 minutes / SF
	Attach with cap screws		136.14 man-minutes	.203 minutes / SF
<u>Sto</u>	<u>Spray Emerald Coat,</u>			
	embed mesh at joints		69.77 man-minutes	.104 minutes / SF

Different products and methods to enclose windows were also observed. In the walls, 2' by 4' windows were constructed, and the times to enclose each window were as follows:

Using Tyvek peel and stick products, per the commercial manual: 12.41 man minutes.

Using Sto commercial products, EmeraldCoat, RediCorner, StoGard Fabric two man team, spray on; 11.2 Man Minutes.

EmeraldCoat, StoGard Fabric; applicator fabricates bow ties; two man team spray on. 13.9 Man Minutes.

Gold Fill, StoGard Mesh, self sticking; one man trowel on, 10.18 Man Minutes.

Sto Gold, RediCorner; one man roll on 9.02 Man Minutes

StoGard Tape, one man peel and stick 6.44 Man Minutes

I am grateful to experienced Sto employees Wade Tompkins and Charles Moore for their physical and intellectual contributions.

B. Time study detail

Excel spread sheets are included with full detail of time study, which summarize the original time study. Those pages are available on request.

The time study followed Test Protocol, Draft 2 written 8/9/07.

C. Methods Analysis

1. Tyvek

DuPont reportedly offers application tools which may reduce the time to install their products.

The applicators for this trial point out that Tyvek rolls would be quite difficult for one person to apply effectively, especially in a wind or from ladders.

2. Sto Products

a. In the time study detail, the required time to spray and apply mesh to seams and joints is more than 58 man minutes, compared to 11 man minutes to spray the rest of the wall. Clearly a focus should be on tools to accelerate the joint / seam application.

b. Sto products can be applied by one person, which gives them an advantage when the applicator is on a ladder, and in architecture involving changes of plane. If spray guns and rollers can be mounted on extensions, the need for scaffolds or ladders would be lessened and the advantage for Sto would be multiplied.

3. Comments on crews and the balance of work

Whether in the manufacture of widgets or the application of Sto products, the use of a crew will have advantages and disadvantages compared to a single applicator. There is not one single approach which is always the best way, but I want to point out some generalities for consideration.

A crew has the advantage that each member has a task, and the tools in his hand to perform the task. There tends to be less wasted pick up and put down, for instance of a spray gun, or a roller.

The primary disadvantage of crew activity is that the employee with the faster cycle has to wait on the one with the slower cycle. In the application of Sto window products, the man with the spray gun waited on the one who applied mesh or RediCorners. Then the mesh applicator waited for spray.

The actual wait delay will vary with the geometry of the job, for instance if there are several windows there will tend to be work available, while with one window, one applicator or the other might always be waiting.

We observed one window which was sealed with a roller not a spray gun; for windows, roller application seems more suited to one-man application than a spray gun does but for a job with many windows the speed of the spray gun probably will compensate quickly.

Jack Greene
President, Jackson Productivity Research Inc.