

March 31, 2016

Adhesion

Sample Preparation

Several pieces of weathered vinyl composite flooring were obtained from Siemens via Skip Tuttle with the intent of determining if sufficient adhesion values could be obtained to allow the use of the **PRECIDIUM™ MTI Flooring System** over the existing floor.

Two pieces were selected for initial testing. One was cleaned and degreased with GOJO Natural Orange pumice cleaner and the other with Fantastik Original all- purpose cleaner. After being allowed to dry, one half of each piece was then scuffed with Scotchbrite. Prior to coating, all samples were given a solvent wipe with Acetone.

PRECIDIUM™ 2100 thinned with 10% Acetone was then applied by roller to both the surface of the prepared pieces, and to a piece of $\frac{3}{4}$ " plywood to provide a solid backing to pull from. **PRECIDIUM™ 2100** is 100% solids, but due to its high viscosity, is very difficult to apply using a roller or to apply in a thin pass. Thinning with Acetone is recommended in this application.

The samples were allowed to cure for 7 days at ambient conditions prior to testing.

Note: The embedded silicon carbide particles that are in the existing flooring make thoroughly cleaning the floor somewhat difficult. The scotchbrite pads were being torn apart quite quickly, and when solvent wiping the floor it was prone to tearing up the shop towels. Care would have to be taken to ensure that the floor is both well prepared and not covered in fibers.

Test Method

The **ASTM D4541-09** test method is a procedure for evaluating the pull-off strength (adhesion) of a coating from metal substrates, or other rigid substrates such as plastic and wood, using a portable pull-off adhesion tester. Test Method E – Self Aligning Adhesion Tester Type V was followed.

In order to ensure adhesion of the test dollies, both the coating surface and bottoms of the dollies were scuffed with a ScotchBrite Type A – Very Fine pad and solvent wiped with MEK (Methyl Ethyl Ketone). Loctite Hysol E-20HP Epoxy Adhesive was used to attach the dollies. After allowing the epoxy to cure overnight, the dollies were scored around down to the substrate using a circular hole saw on a drill press. A PosiTest AT-CM pull-off adhesion tester was then used to pull the dollies until failure.

Conditions during the test were 23°C and 40% Relative Humidity.

Results

Results are summarized in Table 1 below:

Table 1: Summary of Results

Dolly	GOJO Cleaner		Fantastik Cleaner	
	Scotchbrite and Acetone		Scotchbrite and Acetone	
	(psi)	Mode of Failure	(psi)	Mode of Failure
1	700	Panel	750	Panel
2	750	Panel	800	Panel
3	550	Panel	750	Panel
Average	667		783	

Conclusions

For all surface preparation methods tested, all dolly pulls resulted in cohesive failure of the flooring material. This indicates that the adhesion was greater than the tensile strength of the material itself. In approximately half the results the aggregate layer disbonded from either itself or the backing material; the other half had the entire flooring material come apart down to the plywood beneath.

Despite being a field weathered sample, it is important to note that none resulted in failure between the panel and the coatings. To ensure these results in the field, proper and thorough surface prep will be required, as described in the sample preparation section above.

Pictures



Figure 1: GOJO cleaned panel after completion of adhesion testing

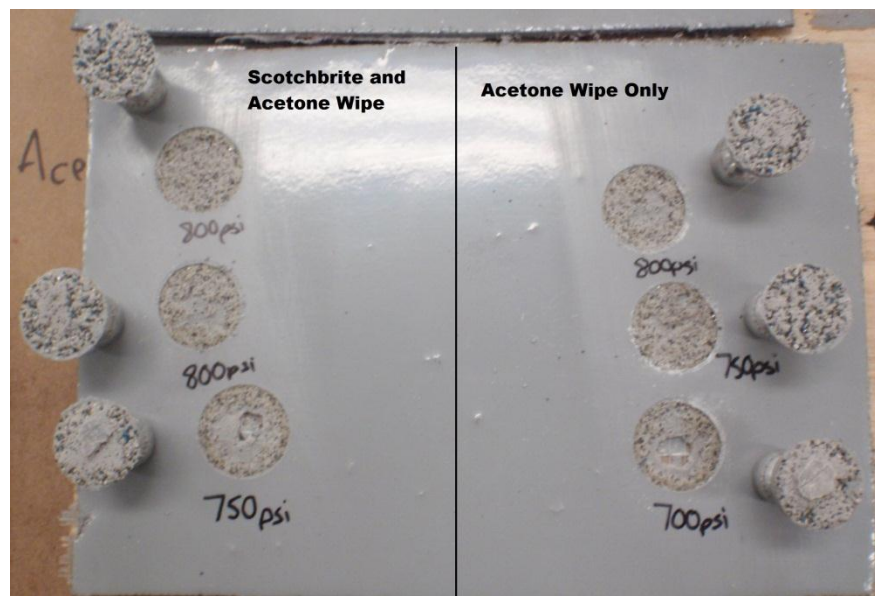


Figure 2: Fantastik cleaned panel after completion of adhesion testing