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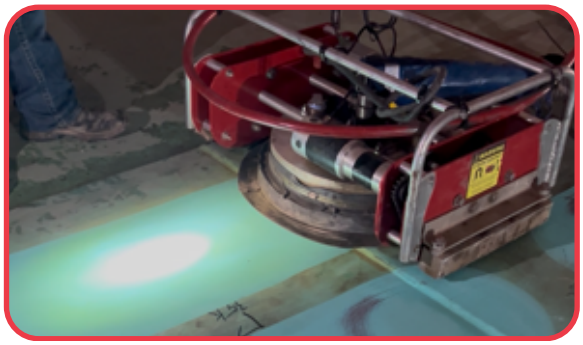
UHP Surface Preparation Case Study:
UHP vs. Media Sweep Blasting

Introduction



This case study evaluates two surface preparation methods, Ultra-High Pressure (UHP) water sweep blasting performed to WJ3 standards, and traditional abrasive media sweep blasting performed to SSPC-SP7 standards, as options for preparing an aged coating system prior to recoat. The substrate consisted of International Enviroline 376-F60, a coating system that had been in service for over 10 years with an existing dry film thickness (DFT) of 25-30 mils.

The purpose of this evaluation was to determine whether UHP sweep blasting could achieve comparable or superior surface profile and coating adhesion results relative to traditional abrasive media sweep blasting.

Test Procedure

Two adjacent test areas were prepared on the existing 376-F60 coating:

- **Area 1 – UHP Sweep Blasted:** Prepared using an AllStream-designed UHP sweep nozzle at 38,000 psi, without the introduction of any grit or media. This method abraded the existing coating and left a clean, roughened surface with zero residual dust. No additional cleaning steps were needed after blasting.

- **Area 2 – Abrasive Media Sweep Blasted:** Prepared via traditional sweep blasting with abrasive media. After blasting, the surface was blown down but not wiped, leaving some residual dust on the surface. This step was designed to replicate the level of surface cleanliness typically achieved on a large-scope field project, rather than an idealized testing condition.

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Following surface preparation, both areas were coated with two separate systems, Sherwin Williams 360 and Tnemec 307, applied at 25-30 mils DFT over the existing coating, bringing the total system DFT to 50-60 mils.

Surface profile was measured on each prepared area using Replica X coarse tape prior to coating application.

Adhesion testing was performed via pull-off (dolly) testing after recoating:

- 3 dollies were pulled on each (360 and 307) within the UHP-prepared area, for a total of 6 dollies.
- 2 dollies were pulled on each (360 and 307) within the media-blasted area, for a total of 4 dollies.

Results

Preparation Method	Anchor Profile	Adhesion Range (PSI)	Exceeded Tester Limits
UHP Sweep Blast	5 - 5.5 mils	2,000 - 3,500	2 Dollies
Abrasive Media Sweep Blast	3 - 4 mils	2,000 - 3,000	Ø Dollies

UHP sweep blasting produced a deeper anchor profile than abrasive media sweep blasting (5-5.5 mils vs. 3-4 mils), without introducing grit or media to the surface. This is a notable result, as it demonstrates that UHP can achieve a more aggressive surface profile than traditional abrasive blasting while also leaving a cleaner, dust-free surface.

Adhesion results further support the strength of the UHP method. All dollies pulled across both testing areas resulted in glue failure. The media-blasted area produced values ranging from 2,000 to 3,000 PSI, while the UHP-prepared area reached 2,000 to 3,500 PSI. Additionally, two dollies within the UHP-prepared area maxed out the pull-off tester at 3,500 PSI, a result not achieved in the media-blast area.

Overall, UHP sweep blasting matched or exceeded the performance of traditional abrasive media sweep blasting in each measured category, achieving a deeper anchor profile, equal or higher adhesion strength, and a cleaner finished surface, all without the need for abrasive media. These results position UHP sweep blasting as a viable, and in several aspects a superior alternative to traditional grit blasting for surface preparation.

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