

MILD STEEL – PREPARATION USING UHPWJ

UHPWJ – WHAT IS IT?

UHPWJ stands for Ultra High Pressure Water Jet. UHPWJ is also known as hydroblasting.

UHPWJ is the process of cleaning a surface using water under very high pressure (around 25,000 – 35,000 psi).

The pressure of the UHPWJ can be adjusted to provide sufficient force to remove all surface contaminants, including tightly adhering surface rust, leaving the surface completely clean.

To ensure that the surface is in fact sufficiently clean to receive a coating system, a visual assessment may be made by comparing the cleaned surface with a series of photographic standards issued by either NACE (National Association of Corrosion Engineers) or SSPC (Steel Structures Painting Council, now Society for Protective Coatings).

CAN UHPWJ REPLACE ABRASIVE BLAST CLEANING?

The answer is no, not for new work, because abrasive blast cleaning is just about the only method that effectively removes millscale and provides a good surface profile. UHPWJ does not remove millscale nor create a surface profile.

The performance of a coating system largely depends on bond strength between the clean steel substrate and the first coat (or primer). Coating failure generally occurs at the steel – primer interface, hence the importance of a surface profile to maximise the bond area. The greater the profile, the greater will be the surface area and the stronger the mechanical and chemical bond.

If the steel is smooth, however, then adhesion of the coating is entirely dependent on a chemical bond, which can vary enormously from product to product. Whilst abrasive blast cleaning provides a good surface profile, UHPWJ does not create a profile at all.

If any millscale is present, then delamination is also very likely to occur. For more information about millscale, please refer to Dulux[®] Protective Coatings Tech Note 1.1.4 Millscale.

WHAT ABOUT FOR MAINTENANCE WORK?

The answer is yes; for maintenance and repaint work over steel that had **originally been abrasive blast cleaned** UHPWJ certainly is suitable.

When steel that had been originally blast cleaned and painted is cleaned using UHPWJ, the process reveals the original profile, which will be just as suitable for painting as it was when originally blast cleaned. Therefore, the all-important profile is already there ready for the new coating system to key into.



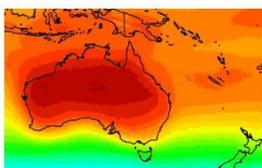
UHPWJ removes all loosely bound material



UHPWJ won't create a profile



Visual standards can be used to gauge cleanliness



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USE OF DULUX[®] LUXEPOXY[®] SEALER

Independent tests¹ have shown that the bond strength of Luxepoxy[®] Sealer to UHPWJ cleaned steel consistently exceeds the minimum recommended for epoxies to newly blast cleaned steel.

The adhesion test results of Luxepoxy[®] Sealer, applied at 20 microns, alone and as part of two different coating systems are summarised in the table below.

ADHESION TEST RESULTS FOR LUXEPOXY SEALER ON UHPWJ STEEL

DESCRIPTION	BOND STRENGTH (MPA)	BOND STRENGTH (PSI)
Luxepoxy [®] Sealer @ 20 µm	15.5	2,330
Luxepoxy [®] Sealer @ 20 µm Durebild [®] STE Glass Flake at 200 µm	13.5	1,980
Luxepoxy [®] Sealer @ 20 µm Durebild [®] STE Glass Flake at 200 µm Weathermax [®] HBR at 65 µm	12.7	1,850

Adhesion values in excess of 3 MPa are generally considered to be good for epoxies applied to newly blast-cleaned steel.

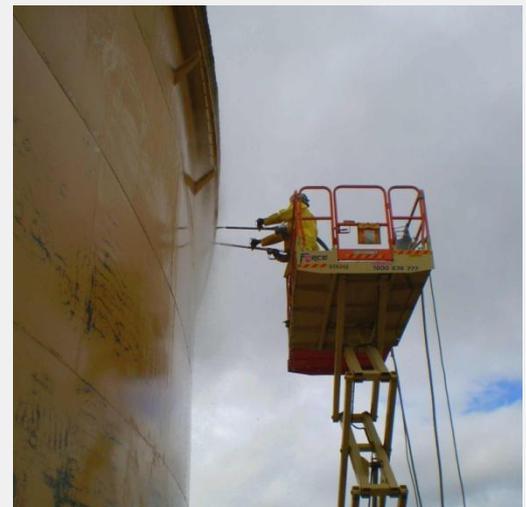
The adhesion values for the Luxepoxy[®] Sealer coating systems to UHPWJ–cleaned steel in this test averaged 15.5 MPa (2,250 psi), demonstrating that UHPWJ, when used in combination with Luxepoxy[®] Sealer, is a viable alternative to abrasive blast cleaning in maintenance situations.

This is handy information for maintenance projects where UHPWJ would be more practical than abrasive blast cleaning, and the steel requires the application of a high performance coating system.

For more information, please contact the Dulux Protective Coatings Technical Consultant in your state.



UHPWJ is fast and non destructive



UHPWJ is ideal for previously painted surfaces that had originally been abrasive blast cleaned

¹ CTI Consultants Report No. C10547, CTI Job 2085, 12 January 2008.