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De-coating with High Speed Waterjets; key parameters and influence on substrate surface roughness.

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Paints are applied to surface to enhance corrosion resistance, improve appearance, or both. Often the coatings need to be removed either as part of the manufacturing operation or later in the life of the equipment to enable maintenance or repair. Waterjet stripping involves the use of water at pressure above 10,000 psi to mechanically remove coatings. High-pressure pumps force water through specially designed nozzles that direct the high-velocity stream to impinge upon the coated substrate. The kinetic energy of the waterjet physically erodes the coating to expose the underlying substrate surface. The effectiveness of waterjet stripping depends on a number of key parameters, including **operating pressure**, **volumetric flow rate**, **nozzle diameter**, **stand-off distance**, **traverse rate** and **impact angle**.

According to ISO 8502 (1995) “The performance of protective coatings of paint and related products applied to steel is significantly affected by the state of the steel surface immediately prior to painting”. One of the principal factors to influence this performance is the **surface profile**. Studies show that adhesion of a coating is improved by increasing the substrate surface roughness.

In this study, a series of tests were conducted for studying the effects of water pressure and stand-off distance on mass loss in paint stripping with the waterjet. Also the effect of paint stripping with the waterjet and gritblasting on the substrate surface roughness was investigated. Experiments on water pressure show that the mass loss will increase by increasing the water pressure. Also, it is shown that the mass loss will increase by increasing the stand-off distance until it reaches the optimal stand-off distance. Surface roughness measurements and three dimensional topography images show that waterjet does not decrease the roughness of substrate surface with compared to the decrease made in secondary gritblasting (overblasting).