

Bristle Blasting Surface Preparation Method for Maintenance

Summary of NACE Paper No. 09004, Lukas Janotta, M.Sc. RWTH

This Abstract summarizes Neil Wilds' work published by NACE International, 2009, focusing on coating adhesion and cyclic corrosion tests for three different surface preparation methods, namely: conventional power wire brushing, grit blasting and Bristle Blasting.

Key concern for end users is the question of how long remedial coating systems will last in corrosive environments. Maintenance carried out in areas which are difficult to access, especially where wet and abrasive blasting with respect to SSPC's surface condition SP 10 or SP 5 is not possible, can be up to 20 times more expensive than the maintenance carried out in the shop. ¹

Surface preparation tools like power wire brushes, grinders or needle scalers are capable of realizing SP 11. However, these surface conditions ultimately lead to adhesion failure of the coating system by generating poor anchor profiles. In contrast, the Bristle Blasting process removes coatings and affords an anchor pattern giving surface profiles that are similar to grit blasting. The main difference between traditional wire brushing and the Bristle Blasting surface treatment is that score markings and striations are eliminated, because bristle tips retract immediately after impacting on the target surface. ²

Performance tests comparing the chosen surface preparation methods were carried out on carbon steel with rust grades A and D, respectively. In both rust grade cases, roughness values R_z were much higher for Bristle Blasting than for standard power tooling techniques. Moreover, the recorded values are similar to those of grit blasting. ³

Cyclic corrosion tests according to ISO 20340 were made under laboratory conditions after applying different coating systems on test specimens simulating Korean shipyard conditions. Pull-off tests show an

improved corrosion resistance for Bristle Blasting due to higher adhesion of coating systems to substrates. Substrates being machined by the power wire brushing method were still corroded and therefore unstable due to disbondment. That is, Bristle Blasting clearly outperforms conventional power tool techniques, and is at least equivalent to and even can exceed the cleaning that is achieved by white metal blast cleaning SP 5 (see Fig. 1). ^{4, 5}

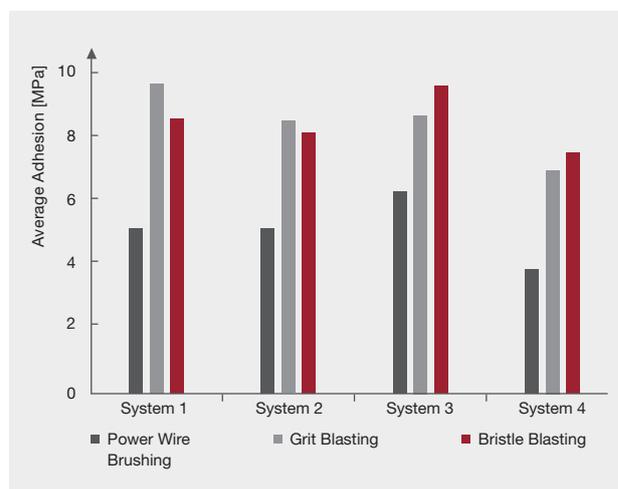


Figure 1: Average Adhesion Test Values ⁵

Key Facts

- Surface condition (cleanliness, roughness) and corrosion resistance equivalent to grit blasting

References: ¹ Wilds, N. "Bristle Blasting Surface Preparation Method for Maintenance". In NACE Corrosion Conference 2009, Atlanta, p. 1
² Ibid., p. 2 | ³ Ibid., p. 3 | ⁴ Ibid., p. 7 | ⁵ Ibid., p. 6

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