Fundamentals of Bristle Blasting Process for Removing Corrosive Layer

Summary of NACE Paper No. 09191, Lukas Janotta, M.Sc. RWTH

This Abstract summarizes Professor Stango's work published by NACE International, 2009, addressing the Bristle Blasting process in depth. The differences between conventional wire brushing and Bristle Blasting will be examined, as well as a comparison between grit blasting versus the Bristle Blasting process.

Conventional brushing processes are characterized by a continuous tool-workpiece contact (Fig. 1a). Thus, a surface texture is generated that consists of grooves, as shown in Fig. 1c. In contrast, the Bristle Blasting process generates surfaces by high-speed direct impact between bristle tips and the steel surface. This is achieved by using an Accelerator Bar which temporarily halts, and subsequently accelerates each bristle thereafter (Fig. 1b).

Moreover, high speed photographic recordings of the bristles have proven that the tip hits the surface with a single strike and leaves a shoveled impact crater that resembles grit blasted surfaces. Thus, the Bristle Blasting tool creates countless impact craters that are closely related to grit and/or shot blasting processes. [4]

Stango's scientific evaluation has demonstrated that conventional standard bristle motion without acceleration and a tool spindle speed of approximately 2600 rpm equates to a grit velocity of 35 m/s for grit type G16 [5]. With the same parameters, the Bristle Blasting process, as shown in Fig. 1d, can realize an equivalent grit velocity of 79 m/s – an enhancement of 125%. [3]

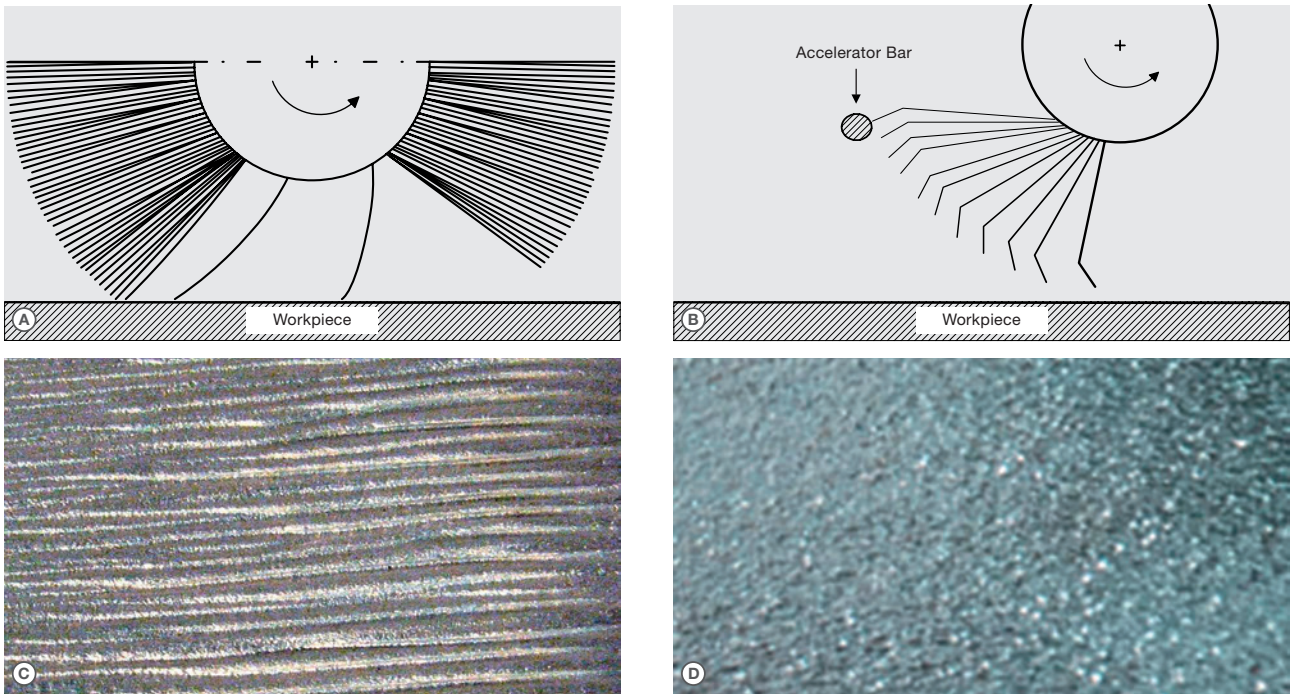

Figure 1: Comparison between Conventional Brushing (A) (C) and the Bristle Blasting Processes (B) (D) [1, 2, 3]

To investigate the surface morphology and cleanliness created by the Bristle Blasting tool, a corroded API 5L pipe with a SSPC Condition D (100% rust with pits) was taken as test specimen. A close look at the resultant surfaces has shown that they exceed the cleanliness and texture expectations of power tool cleaning to bare metal (SP 11), which encompasses both impact and profile producing media as well as surface cleaning media. That is, the surfaces are comparable to near-white blast cleaning (SP 10) or even white metal blast cleaning (SP 5). [2]

Finally, Stango has shown that the results indicate that no corrosive pits remain after bristle blasting, and that the treated surface has a texture/profile that varies from 63 µm to 85 µm throughout the course of tool life (Fig. 2). [2]

Key Facts

- Cleanliness comparable to Sa 2½ (SSPC-SP 10/ NACE No. 2) or even Sa 3 (SSPC-SP 5/NACE No. 1)
- Roughness R_z up to 85 µm along tool life cycle

References: [1] Stango, R.J. and Khullar, P., "Fundamentals of Bristle Blasting Process for Removing Corrosive Layer". In NACE Corrosion Conference 2009, Atlanta, Paper no. 09191, p. 4. | [2] Ibid., p. 7 | [3] Ibid., p. 9 | [4] Ibid., p. 12 | [5] Ibid., p. 8 | [6] Ibid., p. 11

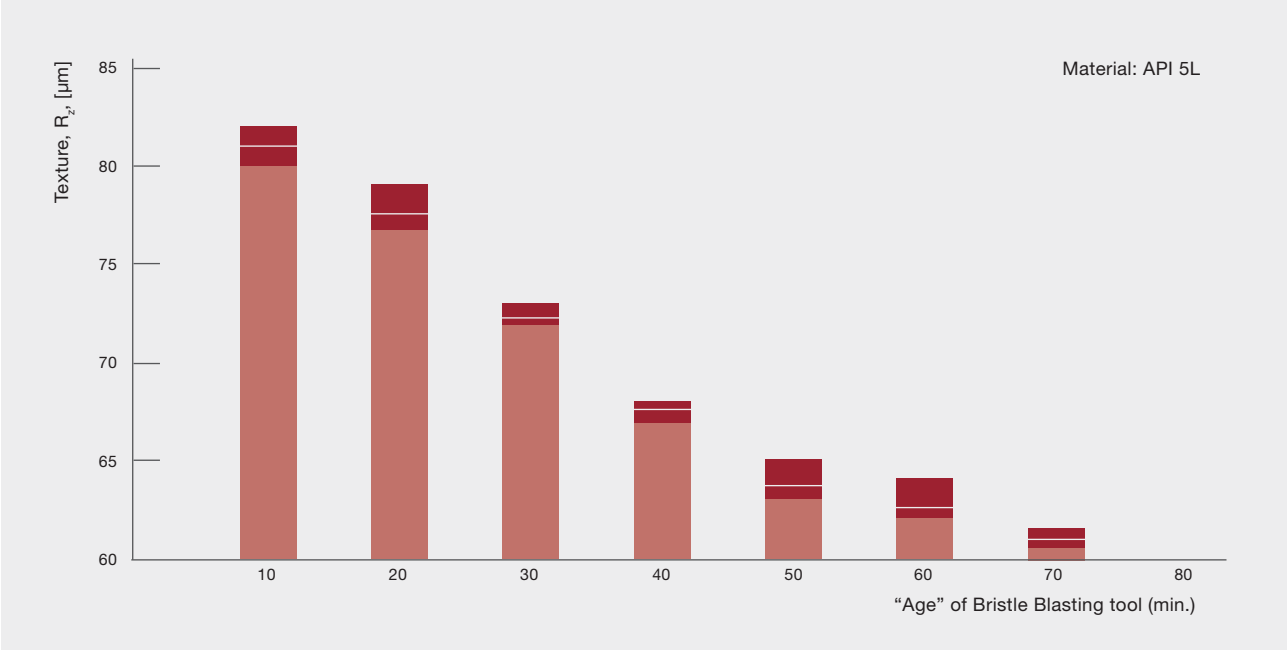

Figure 2: Anchor Profile generated by the Bristle Blasting Process [6]

MONTI - Werkzeuge GmbH
Headquarter
Hennef | Germany
T +49 (0) 2242 9090 630
info@monti.de
www.monti.de

MONTI Tools Inc.
North American Corporate Office
Houston | TX | USA
T +1 832 623 7970
info@monti-tools.com
www.monti-tools.com

MONTI

YOUR SURFACE – OUR PASSION