



**FIGURE 5** Keel block mark from new building stage.

print, there are some attempts to prequalify painting systems that can be applied in water ballast tanks where surface preparation is done by water-jetting.<sup>7</sup>

Technical literature recommends centrifugal blasting equipment that is commonly used in an automated line for abrasive blasting a mixture of grit and shot.<sup>8</sup> The shot is best for breaking and removing hard mill scale common on new steel, while the grit is best for removing rust and imparting the required surface profile, including these new attributes: angularity and peaks density. Besides the advantages of water-jetting, there is one unavoidable drawback that may affect the painting system performance: water-jetting does not create roughness. Figure 5 shows a keel block mark from the new building stage that was treated by power tooling to ISO St3. After UHP WJ, the power-tooled area surrounded by the initial blasting profile can be seen.

Assuming that a surface-tolerant painting system may be prequalified, which will allow the use of UHP WJ, it may be necessary to

ensure good ventilation in order to get a dry surface as soon as possible and minimize flash rust. Another important consideration may be to increase the number of technological openings, which allow a faster evacuation of water.

A proper substrate profile following primary surface preparation is crucial, regardless of the method used for secondary surface preparation. One critical aspect remains the substrate preparation; this can be scheduled, as usual, prior to secondary surface preparation. For small areas that may be polished too much during substrate preparation, the minimum roughness, as mentioned in the primer's paint data sheet, can be obtained by using Bristle Blaster<sup>†</sup> or small grinders.

## Conclusions

Given that a better profile (i.e., meeting PSPC requirements) can be achieved by using a mixture of grit and shot for primary surface preparation, there is potential to incorporate UHP WJ as a secondary surface preparation method in a future version of

the PSPC standard. This can be achieved by introducing a holding point in the inspection plan for checking the blasting profile of primary surface preparation and by allowing the prequalification of new painting systems based on surface-tolerant paints compatible with UHP WJ. Incorporating these prequalified systems will reduce the environmental impact, improve the removal of soluble salts, and increase productivity.

## References

- 1 Resolution MSC.215(82), "Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers" (London, UK: IMO, 2006).
- 2 W. Corbett, "Let's Talk About Surface Profile: Understanding Angularity and Measuring Peak Count/Density Using Stylus Instruments and Optical Grade Replica Tape" (Pittsburgh, PA: KTA-Tator, 2023).  
<https://kta.com/kta-university/lets-talk-about-surface-profile-understanding-angularity-and-measuring-peak-count-density-using-stylus-instruments-and-optical-grade-replica-tape/>
- 3 SSPC-SPCOM-2017, "Surface Preparation Commentary for Metal" (Houston, TX: SSPC, 2017).
- 4 D. Draganovská, J. Brezinová, A. Guzanová, eds., *Surface Characterization After Blasting, Tribology of Machine Elements—Fundamentals and Applications* (London, UK: IntertechOpen Ltd, 2022).
- 5 N.M. Vaxevanidis, et al., "The effect of shot peening on surface integrity and tribological behaviour of tool steels, International Conference on Tribology," AITC-AIT Conference (Parma, Italy: AITC-AIT 2006).
- 6 NACE No. 5/SSPC-SP 12, "Surface Preparation and Cleaning of Metals by Waterjetting Prior to Recoating" (Houston, TX: NACE, 1995).
- 7 N. Cipriano, "Running a tight ship - UHP Water-jetting and Surface-Tolerant Coatings in New-building Applications" *JPCL* (Pittsburgh, PA: PaintSquare, 2015): pp. 14–17.
- 8 SSPC Technology Guide 22, "Use and Retention of Pre-Construction Primers on Steel In Shipbuilding" (Houston, TX: SSPC, 2022).

**TRAIAN RUS is the technical support and account manager for PPG PMC EMEA in Constanta, Romania, email: traianrus@hotmail.com. He has spent more than 25 years in marine and protective coatings and has been a member of AMPP since 2020. *MP***

<sup>†</sup>Trade name