

AMC

AMERICAN METALCASTING CONSORTIUM

VISUAL INSPECTION OF CAST SURFACES



Visual inspection of casting surfaces is a critical step in ensuring the quality of the castings shipped. The decisions regarding inspecting casting surfaces are very subjective and prone to measurement error. Researchers at Iowa State University, supported by the American Metalcasting Consortium, are discovering the underlying issues of the visual inspection process and developing methods to improve the process. As the problem spans the entire metalcasting industry, the work is in cooperation with the Steel Founders' Society of America, the American Foundry Society and North American Die Casting Association.

SUCCESS STORY

Problem: Previous work has shown that the casting inspection process is subject to significant measurement error which negatively impacts the production of castings. "Overmarking" the surfaces of castings results in additional expense and processing delays. "Undermarking" surface indications results in unacceptable castings reaching the customer, or additional rework cycles within the plant. Automated visual inspection of the wide variety of complex shaped parts is not practical.

Solution: The Iowa State team has utilized a simple test to help identify the type of personnel that are naturally suited to visual inspection tasks. This test, which can be administered in less than an hour, classifies people into four categories based on their speed and accuracy. Additional work has identified the search patterns and strategies to ensure the reliable inspection of the entire casting surface, and a methodology is being developed, tested, and disseminated to the casting industry. Methods are currently being developed to help train a right-to-left rastering pattern, which is the same as used for reading.

Benefit: This effort illustrates the need for a methodology in the selection of qualified casting inspectors. The test to classify people based on their inspection abilities is available to the industry via an online tool. The eye tracker developed by Iowa State has identified the need for training of inspectors to improve the coverage area of the casting surface during inspection. These tools are being adapted so that they can be readily deployed on the shop floor.

"Our inspectors are the last line to the customer, and their ability to accurately determine the quality of the casting is vital. This research and improved training saves valuable rework costs, providing higher quality castings and reducing production lead times, improving customer satisfaction."

—Nick Fox, Manager, Galesburg Castings, Inc.



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