



The Materials Science and Engineering Department, in collaboration with the College of Engineering, is now sending its annual Elements News as a monthly electronic newsletter. In conjunction with the green initiatives at Iowa State University, we hope to decrease impact on the environment, provide ease of use and handling, lower costs, rapidly disseminate updates, and continue to have a positive impact on our students, alumni, faculty, and staff. The existing top-quality content will not change. We are confident you will continue to enjoy Elements, and as always, we welcome your input! Please email Marla Williams at marlawil@iastate.edu with comments and suggestions.

Ammonia Tank Research

Fig. 1 - Anhydrous ammonia nurse tank.



Fig. 2 - Optical micrograph of a stress corrosion crack in a failed steel nurse tank.

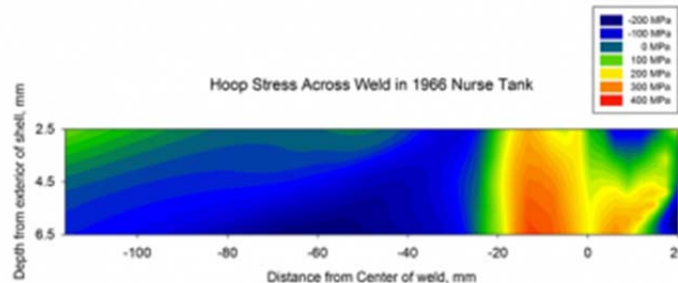


Fig. 3 - Residual stress distribution in a steel nurse tank manufactured in 1966. The weld centerline lies at 0 on the x-axis. Positive stresses are tensile.

December 21, 2011

Picture the scene: an early April morning at a Calamus, Iowa farm co-op. Two workers were pumping pressurized liquid ammonia into a nurse tank for a farmer who planned to apply the ammonia to the soil in a cornfield later that day. Suddenly, an ear-splitting concussion rocked the work site as a weld on the nurse tank ripped open. The explosion hurled one man against a nearby truck, knocking him unconscious. His coworker pulled him away from the cloud of toxic ammonia vapor, but he inhaled ammonia while saving his unconscious friend and later died of inhalation burns. The surviving worker suffered permanent, disabling lung and skin damage.

[Read more.](#)

MSE Highlights

- MSE Professor Dan Shechtman accepts [Nobel Prize](#) and returns to ISU in February
- ISU [Material Advantage](#) wins Best Student Chapter eighth year in a row
- Rare Earth [faculty search](#) underway

