

# NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering  
Materials Laboratory Division  
Washington, D.C. 20594



February 26, 2021

**MATERIALS LABORATORY FACTUAL REPORT**

Report No. 19-054 Addendum

## A. ACCIDENT INFORMATION

Place : Fort Worth, Texas  
Date : April 24, 2019  
Vehicle : DOT-117R100W tank car UTLX 209301  
NTSB No. : RRD19FR007  
Investigator : Paul Stancil

## B. COMPONENTS EXAMINED

1. UTLX 209301 reference shell plate coupon 40" x 40" x 7/16" from the right-center side of Shell 2 (Ring 2).

## C. DETAILS OF THE EXAMINATION

UTLX 209301, a derailed specification DOT-117R100W tank car transporting denatured ethanol became punctured, released product and was exposed to a pool fire. The tank car was originally a specification DOT-111A and was retrofitted in 2016 to DOT-117R by the addition of a jacket, thermal protection, and head shields. The tank car was initially used in crude oil transportation and was repurposed to ethanol transportation. The purpose of this laboratory investigation is to determine the hardness of a shell plate coupon from the right-center side of Shell 2 (Ring 2).

Tank car UTLX 209301 is fabricated from non-normalized steel AAR TC-128 Gr.B (Appendix M from Association of American Railroads, Safety and Operations, Manual of Standards and Recommended Practices, Section C-111, Specification for Tank Cars, October 2003).

## HARDNESS TESTING

The hardness was measured on a sample (approximately 1" x 2") cut from the Shell 2 plate coupon in accordance with ASTM E18-20 (using a Wilson Hardness Rockwell 2000, ITW Test and Measurement GmbH, Esslingen, Germany). The table below summarizes the hardness values from five test replicates.

<u>Replicate</u>	<u>Hardness (HRBW)*</u>
1	84.1
2	84.3
3	84.4
4	84.4
5	84.8

Michael Budinski  
Chief, Materials Laboratory Division

\*The hardness values may be approximately converted to a tensile strength value in accordance with ASTM A370-19 Table 3.

<u>Hardness (HRBW)</u>	<u>Tensile Strength (psi)</u>
84	81000
85	82000