U.S. Department of Transportation
Research and Special Programs Administration

400 Seventh Street, S.W.
Washington, D.C. 20590

DOT-E 10589
(THIRD REVISION)

MAR 29 1996

EXPIRATION DATE: September 1, 1996
(See Appendix A for PTE expiration dates)

(FOR RENEWAL, SEE 49 CFR SECTION 107.105.)

1. GRANTEE: Monsanto Chemical Company, St. Louis, Missouri
(See appendix A of this exemption for the parties to the exemption)

2. PURPOSE AND LIMITATION: This exemption authorizes the use of an acoustic emission non-destructive testing procedure for evaluating the continuing qualification of tanks that are mounted on or form part of a railroad freight car structure.

3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR 173.31(c).

5. BASIS. This exemption is based on Monsanto Chemical Company's application dated April 17, 1991, and supplemental letters dated October 28, 1993, December 13, 1994, and April 27, 1995 submitted in accordance with 49 CFR 107.103 and the public proceeding thereon.

6. HAZARDOUS MATERIALS (49 CFR 172.101): Hazardous materials authorized in tank cars by 49 CFR Part 173; by an exemption issued under 49 CFR Subpart B of Part 107 or as authorized in accordance with 49 CFR 171.12 or 49 CFR 171.12a.

7. PACKAGING(S) AND SAFETY CONTROL MEASURES:

a. PACKAGING: Packagings prescribed are DOT specification tank car tanks, or tank car tanks built to an Association of American Railroads (AAR) specification, that are - in lieu of the required hydrostatic qualification test method - qualified by an acoustic emission test method.

b. TESTING:

i. The acoustic emission test must be in accordance with the procedures outlined in the "Procedure for Acoustic Emission

Evaluation of Tank Cars and IM-101 Portable Tanks," Issue 4, December 1993.

ii. For each tank designated for the acoustic emission test, details in reference to design, actual configuration, history of service, and previous test and qualification evaluation results must be documented prior to test.

iii. For each tank designated for the acoustic emission test, a detailed description of the sensor location arrangement and the purpose of the arrangement must be documented prior to test.

iv. Each tank design must have a stress analysis performed to verify that the applied loads produce sufficient stress levels throughout the tank envelope to stimulate adequate acoustic emission activity. The stress analysis must take into consideration the tank geometry; material of construction; thickness of materials; and geometrical discontinuities, such as reinforcements, pads, manways, nozzles, and outlets.

v. As an alternative to the finite element analysis, strain gauge data must validate that the entire tank envelope is sufficiently stressed to stimulate adequate acoustic emission activity by the applied loads.

vi. As appropriate, the applicant shall use calculation, laboratory test evidence, stress analysis, or comparitive non-destructive testing of representative tank car designs, to establish and support the adequacy and sensitivity of the acoustic emission instrumentation, the test procedure, and the cumulative signal strength category (damage detection rating system). For each car tested, the minimum detectable defect size shall be stated for the principal parts of the pressure envelope.

c. MARKING:

i. Each tank must be marked "DOT-E 10589" in four inch letters and numerals on a contrasting background above the tank specification number.

ii. After successfully passing an acoustic emission test, the tank must be marked "AE TANK TESTED" followed by the date of the test and the date of the next required test in the tank test stenciling location specified in the AAR, Specifications for Tank Cars, Specification M-1002, Appendix C.

d. In addition to the non-destructive testing procedures outlined in the AAR's "Procedure for Acoustic Emission Evaluation of Tank Cars and IM-101 Portable Tanks," the following elements apply—

i. The loading parameter (i.e., applied load, deflection or pressure) must be continuously recorded during each test.

ii. For the jacking tests, the instrumentation must be triggered to begin data aquisition immediately upon reaching the specified upward deflection.

e. Acoustic emission testing personnel shall maintain a NDT Level I or NDT Level II certification. Employers shall establish the written company practice for qualification and certification of NDT personnel according to The American Society for Nondestructive Testing, Incorporated's Recommended Practice SNT-TC-1A. Personnel with Level I certification may perform the test, but only under the supervision of an individual maintaining at least a Level II certification. All acoustic emission testing personnel shall maintain professional competency by participating in a continuing education or professional development program, or annual refresher course, or by having an annual review by employer's acoustic emission training personnel.

8. SPECIAL PROVISIONS:

a. The grantee shall furnish the AAR Tank Car Committee all data documentation, as described in Appendix H2 of the "Procedure for Acoustic Emission Evaluation of Tank Cars and IM-101 Portable Tanks." The AAR Tank Car Committee shall collect and compile the data documentation to ensure accuracy and reliability.

b. At least thirty days prior to an acoustic emission test, the exemption holder shall provide the Federal Railroad Administration (FRA) with the results of stress analysis, test procedure, supporting documentation, and the qualifications of each individual scheduled to perform the test. FRA review is required prior to performing the acoustic emission test under this exemption. This requirement is applicable, however, to the first two tank tests only, unless extended by the FRA, and is intended for the purpose of validating the applicability of requirements prescribed in this exemption.

c. For each tank that is tested under the terms of this exemption, data documentation, as described in Appendix H2 of the "Procedure for Acoustic Emission Evaluation of Tank Cars and IM-101 Portable Tanks," must be made available to the FRA upon request.

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Research and Special Programs Administration, Department of Transportation, Washington, D.C. 20590.
Attention: DHM-31.

The original of this exemption is on file at the above office. Photo reproductions and legible reductions of this exemption are permitted. Any alteration of this exemption is prohibited.

Dist: FRA