DEPARTMENT OF TRANSPORTATION
HAZARDOUS MATERIALS REGULATIONS BOARD

WASHINGTON, D.C. 20590

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[49 CFR Part 178]

[Docket No. HM-71; Notice No. 70-26]

TRANSPORTATION OF HAZARDOUS MATERIALS

Spec. 3HT Cylinders—Tensile Strength Limitation

The Hazardous Materials Regulations Board is considering amending § 178.44 of the Department's Hazardous Materials Regulations to increase the maximum allowable tensile strength of specification 3HT steel cylinders from 160,000 p.s.i. to 165,000 p.s.i. This proposal is based upon a petition submitted by the Compressed Gas Association, Inc.

Specification 3HT presently permits a wall stress at the burst pressure of 140,000 p.s.i. (⅞×105,000 p.s.i. maximum wall stress at test pressure) under minimum wall thickness conditions. It also limits the tensile strength of the steel to 160,000 p.s.i. maximum.

The Board is advised by the petitioner that standard heat treatment practices allow for a 20,000 p.s.i. variation in tensile strength properties. Therefore, it is possible to have tensile properties equal to the wall stress at the burst pressure, i.e., both at 140,000 p.s.i. Tensile properties are obtained from test bar specimens taken from one cylinder out of each lot of 200 or less. When tensile properties at the low limit are produced, there is no allowance for minor variations in heat treatment response for individual cylinders in the lot, some of which may have tensile properties 2,000 to 3,000 p.s.i. below those found on the test specimens. As such, some cylinders may not meet the minimum burst pressure requirement (i.e., ⅞×the test pressure) even though all of the specification design and fabrication requirements are adhered to.

The petitioner contends that increasing the upper limit of the tensile strength to 165,000 p.s.i. will preclude the possibility of cylinders not meeting the minimum burst pressure requirement by insuring a minimum spread of 5,000 p.s.i. between the minimum tensile strength and maximum wall stress. At the same time, there would be a negligible effect on the toughness and ductility properties of the metal, as controlled by the elongation and flattening test requirements of the specification.

The Board believes that the petition has merit. To assure the quality control of new cylinders, the Board also believes that for cylinders subjected to reheat treatment during the process of original manufacture, it is necessary for the manufacturer to make sidewall thickness measurements, to verify that the cylinder meets specification requirements after the final heat treatment. The sidewall thickness and heat treatment response vary and by varying affect the burst pressure. By raising the ultimate tensile strength to 165,000 p.s.i., heat treatment response variations of a negative nature will be reduced or eliminated. Should reheat treatment be necessary the sidewall thickness measurement will reduce adverse results due to loss of sidewall during reheat treatment.

In consideration of the foregoing, it is proposed to amend 49 CFR Part 178 as follows:

In § 178.44–21 paragraph (a) (2) would be amended; in § 178.44–22 paragraph (b) would be added to read as follows:

§ 178.44 Specification 3HT; inside containers, seamless steel cylinders for aircraft use made of definitely prescribed steel.

§ 178.44–21 Acceptable results of tests.

(a) * * *

(2) Tensile strength shall not exceed 165,000 p.s.i.

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§ 178.44–22 Rejected cylinders.

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(b) For cylinders subjected to reheat treatment during original manufacture, sidewall measurements must be made to verify that the minimum sidewall thickness meets specification requirements after the final heat treatment.

Interested persons are invited to give their views on the proposal discussed herein. Communications should identify the docket number and be submitted in duplicate to the Secretary, Hazardous Materials Regulations Board, Department of Transportation, 400 Sixth Street SW., Washington, D.C. 20590. Communications received on or before March 23, 1971, will be considered before final action is taken on the proposal. All comments received will be available for examination by interested persons at the Office of the Secretary, Hazardous Materials Regulations Board, both before and after the closing date for comments.

This proposal is made under the authority of sections 831–835 of title 18, United States Code, section 9 of the Department of Transportation Act (49 U.S.C. 1657), and title VI and section 902(h) of the Federal Aviation Act of 1958 (49 U.S.C. 1421–1430 and 1472(h)).

Issued in Washington, D.C., on December 11, 1970.

W. M. BENKERT,
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CARL V. LYON,
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SAM SCHNEIDER,
Board Member, for the Federal Aviation Administration.

[F.R. Doc. 70-16880; Filed, Dec. 15, 1970; 8:49 a.m.]