ISO Standards Summary as compared to US DOT 49 CFR

Recommendations for UN Model Regulation

ISO Standard CD 21172

Gas Cylinders - Welded steel pressure drums up to 3000 litre capacity for the transport of gases - Design and construction

	ISO 21172	49 CFR 179.300 & 179.301 (DOT 106A and 110AW)
Type and General Requirements	Cylindrical and spherical drums Volumes 150 L to 3000 L ("For purposes of meeting UN transport regulations, a limit of 1000 L should be used".)	Cylindrical tanks Openings in heads only. Water Capacity 1500 pounds to 2600 pounds 3rd party inspector for foreign made tanks No insulation
Safety Margin (Burst/Test)	From 1.6 to 2.25 (See design qual test below)	None reqd for 106A500 and 106A800. Others 2.5
Min Test Pressure	1. Vapor press of content at 70C for lp liq gas 2. Press of contents at 65C for a hp liq gas 3. 1.5 times charge press at 15C for perm gas 4. Min of 10 bar 5. Min values listed for 4 toxic gases	173.31: The greater of the following: 133% of the sum of : vapor press at 46C(115F) for non-insulated cars or 41C(105F) for insulated cars plus static head, plus gas paddin press; 133% of max loading or unloading press; 300 psig for PIH mat'ls; Min values in packaging authorization sections Filling limits, outages, etc. found in 173.314
Material	ISO 4978 or 9328-1 to -4 for carbon steel, ISO 9328-5 for austenitic stainless steel	Carbon or stainless steel iaw Sect 179.300-7
Design stress at TP	77% of Yield stress	For 106A, max stress at TP no more than 15, 750 psi.
Wall thickness (min.)	Calculated from press, shape conditions (sect. 5.4) Absolute min for handleability -calculation (sect 5.5)	Calculated from pressure. (Sect 179.300-6) Absolute min iaw 179.301Table
Manufacturing method	Shell section from a single plate, dished ends from a single plate formed by machine. Cold pressed dished ends normalized after pressing.	DOT 106A forge-welded heads convex to pres DOT 110AW fusion welded heads concave to press.
Welding qualification	Procedures to ISO 9956 and Welders to ISO 9606	Procedures, welders and fabricators iaw AAR Specifications for Tank Cars, Appendix W
Welded joints	Longitudinal and circumferential seams by automatic or semi automatic process. Long seam full penetration butt weld. Circ seam butt weld or joggle joint weld. (No joggle for corrosive gases). Postweld heat treat temperature and time	Longitudinal welds fusion welded. DOT 106A forge-welded heads DOT 110AW fusion welded heads Circumferential welds. Postweld heat treatment iaw AAR Specificatio App W.

	certified by the manufacturer.	
Pressure Relief Devices	None.	PRD(s) of approved type Req'd. Total discharge capacity to prevent press build up ov 82.5 % of tank TP. Rupture disc settings per 179.301. Fusible plugs at 175F, vapor tight at 130F.
Design qualification tests	**Not required for drums meeting shape and thickness requirements based on design calculation of Clause 5** Cycle testing to 12,000 cycles from 10%TP to TP Burst test to 2.25TP up to 60 Bar TP 2.0 TP from 60 to 120 bar TP 1.6 TP greater than 120 Bar TP	None.
Physical tests	2 (3?)Tensile test specimens, 2 Bend test specimens	None.
Impact test	Charpy test iaw ISO 148, 6 samples	None.
Radiography	X-ray ea seam iaw ISO 1106-1	AAR Specification for Tank Cars, App. W. Circumferential welds in tanks less than 36 in dia, no radiotape req'd.
Hydrostatic test	Ea drum Proof test to TP or Pneumatic test	Ea tank Hydro test w/expansion in water jacket to TP. PE < 10% total.
Leak test	Ea drum after fitting w/valves etc. to 6 Bar	Ea tank after fittings installed to 100 psig.
Ultrasonic test	Measure wall thickness ea drum iaw prEN1714	None.
Other criteria		
Recommendations (i.e. accept as is, accept conditionally, reject)		