

(5) US DOT 49CFR Accumulator (Gas Springs) Exemption Requirements:

Accumulators intended to function as shock absorbers, struts, gas springs, pneumatic springs or other impact or energy-absorbing devices are not subject to the hazardous materials transportation requirements of the US Department of Transportation (DOT) 49CFR provided each meets the exemption requirements of 173.306(f)(4)(i thru iv):

- i) Has the gas capacity not exceeding 1.6 liters and a charge pressure not exceeding 280 bar, where the product of the capacity expressed in liters and charge pressure expressed in bars does not exceed 80 (i.e., 0.5 liter gas space and 160 bar charge pressure, 1 liter gas space and 80 bar charge pressure, 1.6 liter gas space and 50 bar charge pressure, 0.28 liter gas space and 280 bar charge pressure);
- ii) Has a minimum burst pressure of 4 times the charge pressure at 20 degrees C for product not exceeding 0.5 liter gas space and 5 times the charge pressure for products greater than 0.5 liter gas space capacity;
- iii) Design type has been subjected to a fire test demonstrating that the article relieves its pressure by means of a fire degradable seal or other pressure relief device, such that the article will not fragment and that the article does not rocket; and
- iv) Accumulators must be manufactured under a written quality assurance program which monitors parameters controlling burst strength, burst mode and performance in a fire situation as specified in paragraphs 1) through 4). A copy of the quality assurance program must be maintained at each facility at which each accumulator is manufactured.

(6) IATA/ICAO Accumulator (Gas Springs) Exemption Requirements -- Special Provision A114:

Articles, containing gas intended for to function as shock absorbers, including energy absorbing devices or pneumatic springs are not subject to IATA/ICAO regulations provided:

- a) each article has a gas space capacity not exceeding 1.6 litres and a charge pressure not exceeding 280 bar where the product of the capacity (litres) and charge pressure (bars) does not exceed 80 (i.e. 0.5 litres gas space and 160 bar charge pressure, 1 litre gas space and 80 bar charge pressure, 1.6 litre gas space and 50 bar charge pressure. 0.28 litre gas space and 280 bar charge pressure);
- b) each article has a minimum burst pressure of 4 times the charge pressure at 20 degrees Celsius for products not exceeding 0.5 litre gas space capacity and 5 times charge pressure for products greater than 0.5 litre gas space capacity;
- c) each article is manufactured from material which will not fragment upon rupture;
- d) each article is manufactured in accordance with a quality assurance standard acceptable to the appropriate national authority; and
- e) the design type has been subjected to a fire test demonstrating that the pressure in the article is relieved, by means of a fire degradable seal or other pressure relief device such that the article will not fragment and the article does not rocket.