



Use and Refilling of ANSUL® Gas Cartridges

Pitfalls for not Adhering
to Standards

Published Standards

Published standards from the National Fire Protection Association (NFPA), Occupational Health and Safety Act (OSHA), Underwriters Laboratories and Factory Mutual Laboratories, state that materials other than those furnished by the manufacturer **shall not** be used in dry chemical extinguishers. This, of course, means that a manufacturer's cartridge refilled by anyone not authorized to do so by the manufacturer of the original equipment would not be acceptable.

In this technical bulletin, we will discuss certain pitfalls which could occur from not adhering to these standards.

1. Use of non-ANSUL® cartridges in ANSUL extinguishers
 - A. External threads do not fit cartridge receiver
 1. Galls threads do not fit cartridge receiver
 2. Cartridge strips threads and blows out upon being punctured
 3. Does not seat tightly against gasket...
 - a. Impossible to puncture cartridge seal
 - b. After puncturing some gas leaks past threads
 - B. Different design of cartridge seal and its assembly into cartridge body could result in the inability to puncture the cartridge seal when used in an ANSUL extinguisher
 - C. May puncture inadvertently during shipment or handling
 - D. These non-ANSUL cartridges will not be refilled by Johnson Controls or Authorized ANSUL Agents
 - E. Void all warranties
2. Refilling of ANSUL cartridges by other than authorized agents may result in...
 - A. Threads not checked with "Go" and "No Go" thread gauges with cartridges having dangerously worn threads not being junked
 - B. Damaged threads not being repaired
 - C. Depth and condition of cartridge seal seat not checked
 - D. Dangerously rusted or damaged cartridges being refilled
 - E. Cartridges weakened by being involved in a fire being refilled
 - F. Weight of empty cartridge not checked before refilling
 - G. Use of cartridge seal not manufactured by Johnson Controls
 1. Disc may rupture at temperatures of 110 °F (43.3 °C) or lower
 2. Disc may rupture at temperatures and pressure too high for built-in safety factor
 3. Disc may rupture unpredictably at any temperature because of faulty material and manufacturing defects
 4. May require pipe dope or some other sealing compound to effect temporary sealing of gas. This procedure is not recommended.

Published Standards (Continued)

2. (Step 2 Continued - Refilling of ANSUL cartridges by other than authorized distributors/agents may result in...)
 - H. Reuse of ANSUL seal body with a new rupture disc not to specification. Used seal body is also more subject to leaking gas.
 - I. Cartridge being under-filled with consequent poor performance
 - J. Cartridge being overfilled
 1. A 3/8 ounce (10.6 g) overfill in a carbon dioxide filled Model 5 cartridge can cause rupture of seal disc at 130 °F (54.4 °C) (standard filling will result in seal disc rupture at 194 °F (90 °C) or more).
 2. A 1 ounce (28.3 g) overfill in a nitrogen filled Model LT-20-R cartridge can cause rupture at 130 °F (54.4 °C) (standard filling will result in seal disc rupture at 360 °F (182.2 °C) or more).
 3. A 4 ounce (113.4 g) overfill in a carbon dioxide filled PS-30 cartridge can cause rupture at 115 °F (46.1 °C) (standard filling will result in seal disc rupture at 170 °F (76.6 °C) or more).
 - K. Failure to subject cartridge to 4 hour 115 °F (46.1 °C) water bath test to cull out leakers
 - L. Poor paint finish because of...
 1. Failure to clean thoroughly
 2. Paint allowed to get on threads
 3. Instructions partially obliterated
 - M. Corrosion caused by improper re-painting or metal preparation
 - N. Labeling not to DOT requirements
 - O. Rubber stamped instructions not reproduced after painting
 - P. Threads not treated with proper lubricant to prevent rusting. Rusted external threads make proper seating of cartridge difficult and can cause freezing to threads of cartridge receiver.
 - Q. Incorrect shipping cap may be used with possibility of failure upon seal disc rupture
 - R. Gas purity and moisture not to applicable standards
 - S. Failure to re-weigh before shipping
 - T. Failure to re-hydrostatic test 3A and 3AA cartridges every five or 10 years as required by Department of Transportation (DOT).
 - U. Void all warranties

Summary

Johnson Controls has had over 70 years' experience in the manufacture, refilling and testing of gas pressure cartridges for dry chemical extinguishers. The large volume of extinguishers produced by Johnson Controls permits us to manufacture all gas cartridges used in ANSUL fire extinguishers. This volume also justifies elaborate equipment for testing every critical feature of ANSUL gas cartridges. This is important since the gas pressure cartridge is the heart of a cartridge operated dry chemical fire extinguisher.

Over the years, rigid standards for refilling ANSUL cartridges have been developed. As new inspection procedures have been added, labor saving tools for automation have kept pace allowing us to absorb the costs of the added inspection steps in Johnson Controls cartridge filling department.

The tools, fixtures, gauges and other test equipment required to fill and test gas cartridges to the standards of Johnson Controls, represent a sizeable capital expenditure. Only the factory and authorized agents for refilling ANSUL cartridges realize the volume necessary to justify this expenditure. Cartridge refill volume is also important in keeping material and labor costs at a level so that the extensive quality control in this operation does not become uneconomical.

A few ANSUL gas cartridges are being refilled by those not authorized to do so. We, like the NFPA and other agencies, wish to discourage this practice. Those not authorized to fill ANSUL cartridges cannot possibly afford to install proper tools, fixtures, gauges and other equipment when their volume of ANSUL cartridges refilled totals a few hundred cartridges a year or less. Likewise, when volume is small, certain obvious short cuts in testing procedures must be taken so that the operation shows a profit.

In summary, Johnson Controls heartily concurs with the NFPA, OSHA and other agencies concerning the fact that spare and refill cartridges other than those furnished by the manufacturer shall not be used in dry chemical fire extinguishers. Again, the gas cartridge is the heart of an ANSUL dry chemical fire extinguisher. To assure proper functioning of the extinguisher, the cartridge must be serviced by those qualified to do so.

Note: The converted metric values in this document are provided for dimensional reference only and do not reflect an actual measurement.

ANSUL and the product names in this material are marks and/or registered marks. Unauthorized use is strictly prohibited.