



# Standard Practice for Transfiling Compressed Air or Nitrogen and Safe Handling of Small Paintball Cylinders<sup>1</sup>

This standard is issued under the fixed designation F2773; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

## INTRODUCTION

This standard is intended to provide basic procedures for the safe handling and transfilling of small (not bulk) paintball compressed air cylinders commonly used with a paintball marker for propulsion of a paintball.

This practice is written within the current state-of-the-art of transfilling compressed gas technology. The intent is to revise this specification whenever substantive information becomes available which justifies revising existing requirements or adding new requirements.

## 1. Scope

1.1 This practice is intended to satisfy the demand for information on the basic procedures for the safe handling and transfilling of small (not bulk) paintball compressed air cylinders commonly used with a paintball marker for propulsion of a paintball. This standard does not address issues dealing with the transfilling, storage, and handling of supply cylinders that may be used in transfilling smaller cylinders.

1.2 The compressed air fill procedures are written for the pressure cylinder transfilling method most commonly used by paintball field or store operators, or both.

1.3 This document should not be confused with federal, state, provincial, or municipal specifications or regulations; insurance requirements; or national safety codes.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations, such as and not limited to DOT, CGA, and OSHA, prior to use.*

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee F08 on Sports Equipment, Playing Surfaces, and Facilities and is the direct responsibility of Subcommittee F08.24 on Paintball and Equipment.

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## 2. Referenced Documents

2.1 *ASTM Standards*:<sup>2</sup>

F1979 Specification for Paintballs Used in the Sport of Paintball

F2272 Specification for Paintball Markers

2.2 *CGA Standards*:<sup>3</sup>

CGA C-6.1 Standards for visual inspection of high pressure aluminum compressed gas cylinders

CGA C-6.2 Guidelines for visual inspection and requalification of fiber reinforced high pressure cylinders

2.3 *Federal Standards*:<sup>4</sup>

CFR 49 Parts 100 to 185

## 3. Terminology

3.1 *Definitions*:

3.1.1 *blow-down valve, n*—valve which is part of a fill station assembly, and which is intended to vent gas from the paintball cylinder being filled.

3.1.2 *fill station, n*—device designed to attach to a supply cylinder and to a paintball cylinder which facilitates transfilling the paintball cylinder.

3.1.3 *paintball, n*—spherical ball, commonly with a diameter of 0.68 in. (17.3 mm), comprised of a shell and a fill,

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from Compressed Gas Association (CGA), 4221 Walney Rd., 5th Floor, Chantilly, VA 20151-2923, http://www.cganet.com. Available from

<sup>4</sup> Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, http://www.access.gpo.gov.

conforming to Specification F1979 and designed to be expelled from a paintball marker conforming to Specification F2272.

#### 4. General Considerations

4.1 Persons, who are transfilling compressed air, should be trained in the hazards associated with compressed air or nitrogen, or both.

4.2 Always wear eye protection while filling cylinders.

4.3 Always have any required MSDS at the location that the filling takes place.

4.4 Always read and understand all fill station instructions.

4.5 Ensure that there is proper ventilation in the filling area.

4.6 The receiving cylinder (paintball cylinder) must be of a refillable type (that is, not disposable) and pressure rating that it can safely hold stamped or marked on the cylinder.

4.7 Supply cylinders must be secured and supported, such as fastened to a wall or similar immovable structure (that is, not free standing).

#### 5. Fill Stations

5.1 Fill stations and related equipment should be rated the same as the supply tank.

5.2 Fill stations should be used for the purpose of transfilling compressed air or nitrogen, or both, for the paintball industry only.

5.3 Fill stations shall be supplied with instructions by the manufacturer or distributor of the product.

5.4 Fill stations should be marked or tagged with safety warnings.

5.4.1 Read owners manual before using.

5.4.2 Use only with compressed air or nitrogen.

5.4.3 Do not use for oxygen.

5.4.4 Close bulk tank valve when not in use.

5.4.5 Vent down system.

5.4.6 Never add or introduce oil to the fill station, cylinder, or regulator/valve.

#### 6. Cylinder Inspection

6.1 Ensure that the regulator is properly attached to the cylinder.

6.2 Ensure that the regulator is in good, serviceable condition.

6.2.1 Ensure that the proper cylinder safety burst disk is installed correctly.

6.3 Visually inspect the cylinder condition before each fill.

6.3.1 Cylinders must be stamped or labeled with a DOT (Department of Transportation) or potentially TC (Transport Canada) mark working pressure, manufacturer's code or name, serial number, and hydrostatic test date.

6.3.1.1 An example of an aluminum cylinder shoulder stamping:

TC - 3ALM 310

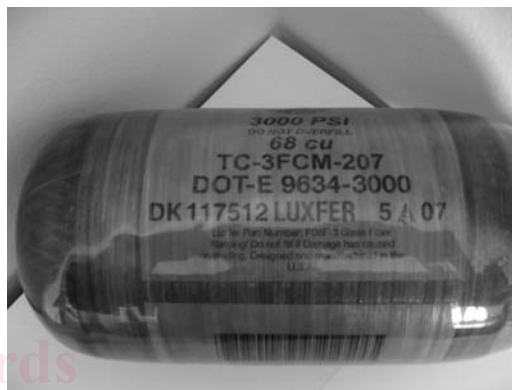
DOT - 3AL 4500 A12345 LUXFER 12 A 04

6.3.1.2 DOT - 3AL 3000 M4625 04^03 A051391  
The cylinder neck layline translates as follows:

DOT	Department of Transportation (a Federal Agency)
3AL	The specification standard the cylinder conforms to
3000	The working pressure rating of the cylinder
M4625	The manufacturer's name or number of the cylinder
04^03	The hydrostatic test date of the cylinder. The first two digits are the month. The ^ is the testing agency mark. The last two digits are the year. The above date would be valid to use until April 1, 2008.
A051391	The serial number of the tank.

NOTE 1—Re-qualification period for cylinders is typically five (5) years for 3 AL aluminum cylinders.

(1) An example of a composite wrapped tank label:



The label translates as follows:

68cu	Cylinder size in cubic inches
TC-3FCM-207	Transport Canada approval
DOT	Department of Transportation
E9634	Exemption number
3000	Cylinder working pressure
DK 117512	The serial number of the tank
LUXFER	Cylinder manufacturer
5 ^ 07	The hydrostatic test date of the cylinder The first two digits are the month The ^ is the testing agency mark The last two digits are the year The above date would be valid to use until May 1, 2010

(2) After hydrostatic testing, the retest date will look like this:



Label attached to bottle with epoxy

G7	
12 7 7 07	
The first two digits are the month	
The G7 is the re-testing agency RIN (Re-testers identification number)	
7 7	
The RIN number is read in a clock wise direction, G777	
Contact D.O.T. for RIN information	
The last two digits are the year	
The above date would be valid to use until December 1, 2010	