

Guidelines for Paintball Cylinders

Introduction

This guideline applies to paintball cylinders that have a water capacity of 500 millilitres or more where the gas in the cylinder is air or carbon dioxide (CO₂). Cylinders used for paintball that are smaller than this are not regulated, however, all cylinders need to be managed with a high degree of caution.

What rules govern paintball cylinders?

Paintball cylinders are regulated by the Hazardous Substances (Compressed Gases) Regulations 2004. The regulations may be viewed at www.legislation.govt.nz.

How do I know if the capacity is more than 500 millilitres?

Cylinders manufactured overseas often refer to the capacity in ounces or cubic inches. You must be careful when establishing the relationship between ounces, cubic inches and millilitres as paintball cylinders may also be marked with the gas capacity and not the water capacity. For example:

- A US cylinder has the empty capacity in cubic inches. A cylinder marked with a filled gas capacity of 7.0 cubic feet at 4,500 psi has an empty “internal volume” of 45 cubic inches, effectively a water capacity of 737 millilitres;
- A small all-metal aluminium cylinder for CO₂ for paintball sold in Europe that holds 12 oz of CO₂, or 350 grams, has a water capacity of 466 millilitres (assuming it has been rated at 0.75 fill ratio);
- Effectively, any cylinder of more than 12 ounces is subject to the hazardous substances rules. The 12 ounce CO₂ cylinder with a fill ratio of 0.75 equates to 16 ounces or 16 x 29.574 (American conversion) = 473 millilitres.

If you know the empty internal volume the conversions are

- 500 millilitre = 16.9 ounces [US, liquid]¹
- 500 millilitre = 17.6 ounces [UK, liquid]
- 500 millilitre = 30.5 cubic inches

If the capacity of your cylinder is more than these quantities there are certain rules that must be followed.

What rules apply when importing paintball cylinders?

A cylinder that holds 500 millilitres or more of a non flammable gas must have appropriate test certificates. There are three test certificates to consider as well as a manufacturing inspection report:

¹ The two types of ounces have slightly different definitions. The Imperial fluid ounce is 1/160 of an imperial gallon, about 28.4 millilitres. The U.S. fluid ounce is defined to be 1/128 of a U.S. gallon, about 29.57 millilitres. These two definitions, one using English units and one metric, are not meant to concur exactly and are a common source of confusion.

- Cylinders must be manufactured to an approved design that has been verified and has a ***design verification test certificate*** to confirm it is acceptable. The design is allocated a “LAB Number” by ERMA New Zealand. You can look up the approved designs on the ERMA New Zealand cylinder register, see <http://www.ermanz.govt.nz/search/gcreg.xls>. There are only a limited number of designs that are accepted.
- The first batch of cylinders manufactured or imported into the country will have to obtain a ***pre-commissioning test certificate***. The pre-commissioning certificate will require certain tests to be carried out at an approved testing laboratory. The tests may include destructive testing to confirm the design is satisfactory. This requirement may be waived by ERMA New Zealand for small quantities of cylinders (less than 10), but only for one-off imports. The importer must apply for such a waiver in conjunction with a testing laboratory.
- Any subsequent imports of cylinders must have a ***test certificate for imported cylinders***. The import certificate will demand checks to confirm that the cylinders are in compliance with the design verification certificate and include a visual inspection, a check on the cylinder markings, and possibly other tests although these are not to the same extent as required for pre-commissioning.
- Cylinders must have a manufacturing certificate issued by an inspection agency (recognised by ERMA New Zealand) at the place of manufacture. The identity of the inspection agency is stamped on the cylinder.
- Design verification certificates, pre-commissioning certificates and import certificates are issued by test certifiers. ERMA New Zealand maintains a record of all test certificates. The ERMA New Zealand Website has a register of test certifiers.

How do I obtain a Test Certificate?

Test certificates are obtained from a test certifier. There is a list of test certifiers on the ERMA New Zealand website at: <http://www.ermanz.govt.nz/search/tc.html>. Select your region and tick the box “Cylinders and Fittings”. Choose a test certifier near you.

Test certifiers are private individuals with the necessary skill who are approved by ERMA New Zealand. They will charge for their services.

What about the valve and fittings?

Paintball cylinder fittings such as **valves, regulators and adaptors** are also subject to controls. Like cylinders, they must be manufactured to a standard specified in the Hazardous Substances (Compressed Gases) Regulations and marked as required by the standard. The legislation is only concerned with fittings connected to paintball cylinders of 500 millilitres or more.

What if only one cylinder is imported?

While the preferred option is to purchase an approved cylinder, the legislation does allow for the importation of a single cylinder or a small number of cylinders of the same design. An application must be made to ERMA New Zealand for a waiver of the pre-commissioning test certificate. Check with ERMA New Zealand **before** you purchase a cylinder that is not approved as there is an application fee and no guarantee that the waiver will be granted. A cylinder testing laboratory or periodic tester must make the application on your behalf.

How do I know if my cylinder may be legally used?

A new paintball cylinder must be permanently marked with the following information:

- a) the register number (LAB No.) of the cylinder design;
- b) the manufacturer's serial or batch number;
- c) the name or mark of the manufacturer of the cylinder;
- d) the test pressure specified in the standard to which the cylinder was designed;
- e) if the cylinder will contain a permanent gas (*air is a permanent gas*), the charging pressure, at 15°C, of the refillable cylinder;
- f) the water capacity of the cylinder;
- g) the weight of the cylinder when empty, excluding the cylinder's valve and any attachment to the cylinder that is not permanent;
- h) if the gas is liquefiable, the weight of the refillable cylinder, including the valve but not the valve cover (if any) (*carbon dioxide is a high pressure liquefiable gas*);
- i) the month followed by the year that the cylinder was manufactured. Should the year precede the month it must be specified as four digits;
- j) the mark of the recognised inspection agency that issued the manufacturing certificate.

An in-service cylinder must be tested as set out below and, following inspection, be marked with:

- k) the month followed by the year of each periodic test ; and
- l) the mark of the periodic tester who conducted the periodic test.

Valves and fittings also need to be marked to identify among other things the manufacturer, design standard, batch number, operating pressure, month followed by year of manufacture.

Does my cylinder need to be tested?

The time between inspections will vary depending on the gas and construction of the cylinder.

Fibre wrapped composite cylinders should be inspected every three years, aluminium cylinders need to be inspected every five years.

A person must not use a cylinder beyond the maximum life specified in the design standard.

Who will test my cylinder?

Cylinders have to be inspected and tested by a test certifier, also referred to as a periodic tester, at a cylinder testing laboratory. There is a list of periodic testers on the ERMA New Zealand Website.

Who may fill my cylinder?

An **approved filler** is the only person who can fill a compressed gas container with compressed gas. This rule applies to paintball cylinders with a capacity of 500 millilitres or more. Only cylinders that have been approved, i.e. those identified with a valid LAB No. and which have a current periodic test certificate may be filled.

An approved filler must hold a test certificate issued by a test certifier that confirms the person is competent to fill cylinders. The approved filler must know and be able to describe the gases and containers they charge, including:

- the properties of the compressed gases they handle;
- the factors that can trigger failure of a compressed gas container;
- the potential adverse effects from failure of a container associated with the different forms of compressed gas including asphyxiation;
- the requirements for visual inspection and safe charging of compressed gas into a container and can demonstrate the procedures for safe filling of compressed gas containers.

An approved filler certificate must specify the forms and classes of gases and types of containers covered by the certificate.

No formal training courses seem to be available for approved fillers. Training is an issue for the industry to address.

Which cylinders have been approved?

The register of approved cylinders may be found on the ERMA New Zealand website at:

<http://www.ermanz.govt.nz/search/gcreg.xls>

The following LAB Nos. are relevant to paintball cylinders:

LAB No.	Manufacturer	Capacity	Pressure	Gas
2046	Luxfer	1.10l (68cui)	4,500psi	HPA
2153	Catalina	1.84lb (20oz)	1,800psi	CO2
2154	Catalina	1.12lb (12oz)	1,800psi	CO2
2089	SCI	1.47l (91cui)	4,500psi	HPA
2090	SCI	1.1l(68cui)	4,500psi	HPA
2209	Shanghai	0.7l (45cui)	3,000psi	HPA
2190	Catalina	0.73l (47cui)	3,000psi	HPA