

# **Cylinder Testing Standards**

## **IS EN 1968:2002 and 1802:2002**

In March 2002, European standards for cylinder testing were changed. The old standard BS 5430 part 1 (steel cylinders) & part 3 (aluminium) was withdrawn and replaced by new standards - IS EN 1968:2002 for Steel Gas Cylinders, and IS EN 1802:2002 for Aluminium Gas Cylinders. This is the first time we have had an Irish Standard for inspecting and testing cylinders, up to now we have been using BS 5430. CFT advised their approved test houses to implement the new standards from 1st February 2003.

### **EN 1089 and ISO 13769**

In addition with the testing standards, a new gas cylinder identification standard was introduced - EN 1089 Parts 2 and 3 which sets new requirements for reminder and precautionary labels and colour coding of cylinder's shoulders. Stamp marking is now to ISO 13769:2002.

## **The Changes**

### **Test Periods**

The hydraulic test period has been changed from 4 to 5 years. This has been done mainly to bring it into line with standards for testing other industrial compressed gas cylinders. Similarly visual inspection periods have changed from 2 years to 2½ years after a hydraulic test.

The new standard doesn't extend the test expiry for cylinders with a current test-due date. In other words, cylinders tested before the new standards came into force with a 2-year interval, will still need re-testing at the expiry date of that interval test/inspection. The test date will be punched into their CIP (VIP) sticker.

Don't forget that as before, the hydraulic test period is not affected by the date of the visual inspection. For example, say you don't use your cylinder for a year or so then have it visually inspected 3½ years after it's hydraulic test. The cylinder will only then be in test for a further 18 months. This is because you will need another hydraulic test five years after the last, regardless of the visual inspection date.

### **More Stringent Testing**

The up side of the new standard is that cylinders need testing less frequently. The down side of the new standards is that there is a specific requirement to clean all but the very lightest of corrosion. This means that cylinders will require shot blasting more often. It is imperative therefore, that the best air filling practice be adopted, i.e. always vent the cylinder's valve

before attaching it to a compressor. Compressors should be maintained to their manufactures' specifications and the air quality being checked at least every six months.

In addition, criteria for failing cylinders are now more strict. The new standard accepts less damage, set (the degree to which the cylinder permanently stretches during a hydraulic test) or corrosion on a cylinder before it's scrapped.

### **Test Date Stamps and Stickers**

The test or inspection date stamp punched into the cylinder will from now on show the year followed by the month (as opposed to the month first). To avoid confusion, the new test stamps use a four figure year, so a stamp issued in April 2003 will now read "2003/04" rather than the old standard which would read "04.03" (i.e. the month first). This could lead to confusion at the next inspection. If a cylinder was only visually inspected then a "V" is stamped after the date. The letter "H" is not stamped after a hydro test.

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### **Sample cylinder stamp marking**

As well as stamping the cylinder with the test date, CFT has for a long time been adding the punch-out CIP stickers to make it easy to see when the cylinder is next due for test. The new standard now makes this reminder label mandatory.

### **Contents Labels**

According to the new standard EN 1089 part 2, Cylinders must now bear stickers showing their intended contents, and associated hazards, e.g. Breathing Air, Nitrox or Trimix. This includes a standard green "COMPRESSED GAS" warning diamond on cylinders containing air and also a yellow "OXIDIZING" warning diamond for Nitrox cylinders where the O<sub>2</sub> content is over 25%.

Don't forget that the label does not guarantee what the cylinder actually contains. Trimix or Nitrox cylinder may still be filled with ordinary air. It is therefore remains vital that you know precisely what the cylinder actually contains (witness and test fills as before).

### **Colour Coding**

This is the biggest area of confusion on the new standard. Cylinders containing "air or synthetic air shall be identified using the colours white plus black" [EN 11089 Part 2]. The regulations state that the cylinders must be correctly colour coded for 'divers at work' (i.e.

professional divers or paid instructors, not recreational divers). This means that anyone earning an income from diving should have black and white quadrants painted on their cylinder's shoulder. All new diving cylinders will come with this coding anyway, but many older cylinders won't have it. In theory, this shouldn't affect recreational divers who can still legitimately dive with cylinders of any colour.

Dive shops and centres operate as a “place of work” and includes people filling or handling cylinders. The safe-bet answer is to have old cylinders repainted as and when they receive their periodic inspection or test. As “best practice” CFT is recommending that all cylinders be coloured coded.

### **Air Fills**

It is not in itself illegal for a dive shop to fill a cylinder which does not have, say, a contents label conforming to EN 1089 Pt 2. However, if anything at all were to go wrong as a result of the cylinder having not in fact been safe or the contents mis-identified, then they may well be legally liable for failing in their "duty of care" to ensure that only safe cylinders are filled. It is therefore up to the filler to decide whether a cylinder is safe to fill. If they are not completely satisfied they have every right to refuse to fill the cylinder.

### **Luxfer Aluminium Cylinders**

Questions are raised about the safety of the older aluminium cylinders in circulation and how rapidly they could deteriorate between test. Luxfer recommend that testing all the older 6351 alloy aluminium cylinders still stands at 2 years between inspection/test. The testing period for these cylinders should not be extended to the 2½ years of the new standards. Luxfer now recommend that cylinders of 15 years or older should be inspected every year and if they are in “heavy service” every 6 months.

### **Mini Cylinders**

Cylinders of 0.5 litres or less are NOT covered by the new standards although a new standard is in preparation. These will continue to be tested to the BS 5430 Part 6 with the test intervals remaining 2 and 4 years for inspection and hydraulic test respectively. It is recommended that air receivers and filters on compressors (including cylinder banks) require inspection and test every 5 years.

### **New Cylinders**

EN 1089 cylinder identification standard requires that all cylinders must have a test reminder (CIP) and a hazard warning label. This applies to all new cylinders unlike the old standard BS 5430. The inspection/test date stamped on the CIP sticker must start from the date of manufacture stamped on the cylinders' shoulder and not the date of sale.

If you are importing a new cylinder from the UK, or else where, the valve may have been removed for safe transport. Before the cylinder is re-assembled it must be inspected to ensure that it complies with EN 1968 or EN 1802. This means that the valve and cylinder threads are inspected and gauged and there is no thread miss-match. The valve is then tightened, with a certified torque wrench, to the necessary torque. If the cylinder is already assembled ensure that the threads have been gauged on assembly otherwise the cylinder or valve threads may fail at its first inspection.

**All cylinders must carry a sticker indicating that it has been inspected and assembled according to EN 1802 or EN 1968 and when the next inspection/test is due.** This sticker may be issued by a CFT approved test centre or issued by a National Accreditation Board (NAB) centre or in the UK, an IDEST or UKAS accredited test centre. An in house, un-approved cylinder stickers are not accepted.

## Summary

- Hydraulic test is now every 5 years
- Visual test required every 2.5 years
- Test dates are based on date of manufacture
- Tighter requirements now for removal of corrosion found during inspection
- Tighter criteria for passing cylinders in hydro and visual tests
- To prolong cylinder life best filling practice must be adopted
- Maintain Compressors to Manufacturer's recommendations
- Compressor air quality to be checked every six months
- CIP or similar reminder label is mandatory on **all** cylinders (new and old)
- In-house and unapproved stickers are not acceptable
- Cylinder must have hazard warning diamond labels to show intended contents, green for compressed air, yellow for an oxidizing gas (Nitrox) above 25% O<sub>2</sub>
- New cylinders will have B&W quadrants on shoulders
- Best Practice suggests all cylinders will have B&W quadrants applied at next test date
- Filling stations must be completely satisfied with a cylinder before filling it
- Special test requirements/intervals for older aluminium cylinders
- Self contained breathing air equipment and air banks should be tested every five years.

John Hailes.

Cylinder Inspection Programme.

20 July 2004



## CIP OPERATORS

The following operators have been accredited by CFT to inspect and test diving cylinders to EN 1802: 2002 and EN 1968:2002 and their unique stamp mark.

**Achill Diving Services**  
Derreens,  
Achill,  
Co. Mayo.

Contact Dave Curtis  
086 6090677

[curtisachill@hotmail.com](mailto:curtisachill@hotmail.com)



**Aquaventures Ltd.**  
The Stone House,  
Baltimore,  
Co. Cork.

Contact Gerry Smith  
028 20511

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**FirstStage Diving,**  
Unit 6 Dunshaughlin Bus. Park,  
Dunshaughlin,  
Co. Meath.

Contact Kevin Seagraves  
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**Flagship Scuba**  
Grand Canal Basin  
South Dock Road  
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Contact: Rory Golden  
01 – 6670988

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**Great Outdoors**  
3 Claredon Market  
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Contact: Paul Donnelly  
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087 2477927

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**Industrial Pressure Testing Ltd.**  
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IPTL is fully accredited to the NAB, reg. No. 9001..

**Lambay Diving & Watersports Ltd**  
51 Westhaven,  
Huntstown,  
Dublin 15.

Contact: John Holden  
01 8215231  
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**LMS Marine.**  
Forquan  
Milford  
Co Donegal

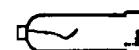
Contact: Laurence Strain  
074 – 53686  
086 8041595



**Mid-West Dive Centre**  
Rivermount  
Clarina  
Co Limerick

Contact: Larry Power  
061 – 353552  
086 2461048

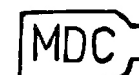
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**Munster Dive Centre**  
St Finbarr's Road,  
Cork.

Contact Matthew Cooper  
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**North West Dive Centre**  
Bramble Cottage  
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Co Leitrim

Contact: Francis Jenkins  
071 – 9856043/9856046  
086 8243798  
[nwdive@indigo.ie](mailto:nwdive@indigo.ie)



**The Scuba Store,**  
4 Shop Street,  
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Contact Kieron Murphy  
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