

IDEST BULLETIN NO 25 - JUNE 2012

The Bulletin for Test Houses Approved by the Inspectorate for Diving Equipment Servicing and Testing

Factair

In bulletin 24 August 2011 we printed an article stating that IDEST has obtained the sole franchise to market the Factair unit in the UK. This regrettably is not the case and the Factair range of SafeAir Testers should be purchased as normal from either Factair directly or from their existing distribution network

IDEST is however looking to offer its own range of Divecheck units which are an easy to use manual check unit for checking the levels of CO, CO₂, oil and water in dive cylinders. For further details please contact IDEST directly.

Notes on valve servicing.

The Standards say that when a valve is removed from a cylinder it should be examined to check that the elastomers i.e. "O" rings, etc are in good condition. (Any questions ring me)

We recommend that they are replaced. There is then no doubt about their suitability.

To service the valves and save time on the overall operation, some test houses say it is preferable to strip the valve and put it into the ultrasonic bath to clean, whilst the rest of the cylinder examination proceeds and then to reassemble the valve and finally to gauge the stem.

Vent to out doors

It has been pointed out, quite correctly, that if cylinders are discharged into an indoor working area it can potentially damage hearing. It is suggested that it is better to use a manifold with hoses and clamps to which the cylinder should be attached and to use either a silencer or a line through the wall to atmosphere.

One test house has an elegant system whereby there is a line to atmosphere via a change over ball valve from their charging manifold. The cylinders can be either connected to the charging system for filling or, by changing the valve over, to atmosphere for discharging. Only a small length of common hose is used and is purged after discharge but prior to filling any other cylinders.

Quarantine areas

When cylinders are awaiting examination it is advised that they are stood in a secure "quarantine area" where there is no chance that they can be damaged and where it is obvious that they are the ones to be serviced. A similar area might also be advantageous for "finished" cylinders, of course this is dependent on available space.

Stamping

Most cylinder stamping is done correctly but just to confirm that all cylinders must be stamped in the following manner

Test house stamp followed by technician numbers, then year and month

 Z1/2 2011/09

When the year cannot be confused with the month ie when we are in 2013 the date can be shown as

 Z1/2 13/09

Cylinder stamping must not be vertical. It must be exactly as the standard shows; round the cylinder shoulder

Cylinder failures

We have had reports that filling stations have seen rust on 3 ltr cylinders that are almost new. Have any test houses seen rust occurring in any cylinders that were less than 2-3 years old? There is growing concern regarding internal corrosion due to ingress of water when a cylinder is breathed down to empty!

If you see air leaking from ANY cylinders, **DO NOT CONTINUE FILLING**. Please quarantine the cylinder, note the date of manufacture, name of manufacturer, date and location of its last test (if any) and then **contact us immediately**.

Quadrant Labels

It has been noticed that the blue quadrant labels were being sold on E-Bay by an individual in the Birmingham area. This is an infringement of the IDEST Intellectual Property Rights, in other words it's our Trade Mark.

The name of the individual was discovered by a piece of sleuthing and given to Trading Standards who are dealing with the infringement.

They were apparently supplied by an IDEST station. This is illegal and we are in discussions with a solicitor in London.

Some shops are sending cylinders for testing without the valves and are servicing the valves themselves. This is not allowed. The shops are then sticking quadrants on the returned cylinders, also without authorisation.

If there is an incident with such cylinders any HSE investigation would look into the competence of the person who conducted the cylinder inspection.

It has been agreed that the neck label should be redesigned and in future the name of the station, area (e.g. Dartford) and post code would be printed along with a telephone number and that all stations be advised that, if they had any stock of non-personalised labels, IDEST would take these back and credit the station towards the cost of replacing them with the personalised ones. It should also be stressed that only personalised labels with the companies name, post code and telephone number should be used in future.

Sample label

Accreditation vs Certification.

People keep saying that they are an accredited test house/station and are accredited to test "this type of cylinder and that type of cylinder". This is incorrect. UKAS has accredited IDEST as a certification organisation and as such IDEST **certifies** that technicians are competent to test to the relevant standards.

Air gun cylinders

IDEST is **not** accredited for providing certification of persons other than undertaking inspections of cylinders for breathing appliances. Our accreditation does **not** cover providing certification of those undertaking inspections of compressed air cylinders that have air gun valves and gauges fitted.

American D.O.T cylinders cannot be tested by IDEST certified stations However D.O.T Cylinders manufactured to old HSE standards or those with a CE mark on them can be tested, otherwise cylinders can only be tested to the standards shown here

IDEST Code of Practice COP 11,
BS EN 1802:2002
BS EN 1968:2002
BS EN ISO 11623:2002
EN ISO 22434:2006

Valve cylinder compatibility

IDEST were called to a filling station that had been asked to fill a cylinder for a customer and when it was being filled the valve was pushed up in the cylinder neck and the "O" ring blew. This of course caused a major upset to the person filling the cylinder. When examined it was seen that the cylinder had a G3/4 threaded neck and the valve had an M25 thread.

This valve had been replaced by an individual who obviously did not know the difference.

When inserting the valve it must have become harder to tighten because the chrome plating on the valve had been removed by an adjustable spanner as the valve was forced home. Surely this would have indicated to the person trying to mate the two wrong items that it was an incorrect combination.

The cylinders history was traced and it was found that the serial number on the worksheet of the original test house did not quite match the serial number on the cylinder. It was eventually determined that the work sheet was for this cylinder so **PLEASE** ensure that any transferred numbering is correct. It does not take more than a second to re-read the serial number and ensure there can be no potential legal problems.

Galvanic Action

We know that steel corrodes rapidly in seawater, it's a well-known fact. This is why ships need sacrificial anodes. These anodes are made from zinc because it corrodes before steel. This is due to something called Galvanic Action.

There is a table (below) of the levels of the reaction of different metals.

There is also a reaction between aluminium and steel. This is another combination that does not go well in seawater.

They are all very close on the galvanic table but are still in different positions and hence, especially in sea water a galvanic reaction will occur. When the old pillar valves were produced and used, the aluminium ones were anodised and only used in aluminium cylinders.

Pillar valves made for use in steel cylinders were made from brass and were chrome plated. Pillar valves are not manufactured now, so the ones still in use today will be old and, because of that fact, any anodising will probably be worn, leaving bare aluminium. Therefore an aluminium valve in a steel cylinder is not a good combination.

Another problem with steel and aluminium is that they GALL, this means they "stick" together and excessive force used to unscrew the valve can tear the aluminium threads making the valves unsafe.

ADVICE IS DO NOT UNDER ANY CIRCUMSTANCES USE AN ALUMINIUM PILLAR VALVE IN A STEEL CYLINDER

The Electrochemical Series

The Electrochemical Series (electromotive series) consists of a list of metals which have been arranged in order of their standard potentials relative to Hydrogen electrode

| Element | Electrode Potential (Volts) |
|--------------|-----------------------------|
| Platinum | +1.20 |
| Mercury | +0.80 |
| Gold | +0.80 |
| Silver | +0.80 |
| Copper | +0.34 |
| Hydrogen | +0.00 |
| Lead | 0.13 |
| Iron (steel) | 0.44 |
| Chromium | 0.74 |
| Zinc | 0.76 |
| Aluminum | 1.67 |
| Magnesium | 2.37 |
| | |

IMPORTANT!! Metals which are higher in the electrochemical series displace metals lower in the

series, which means when connecting two metals, the one with the lowest potential will corrode.

Valves

IDEST test stations see a variety of valves on cylinders for diving applications. Over 50 years' experience in the manufacturing industry, design and process has taught us that some of these suffer quite a level of punishment in their lifetime.

The most intense use tends to be by schools and clubs. Those who have witnessed valve body manufacture will also appreciate that the valve body material, made of brass, experiences some torture during its fire and brimstone process.

We often read on forums that the body is referred to as being a *casting*. Any self respecting manufacturer will in fact use a *forging*.

Casting is when a molten metal is poured into a mould where it sets solid into, as close as possible, its final form.

Forging (also known as hot brass stamping) is where a red hot billet of metal is struck between two dies into, as close as possible, its final form.

Both processes require subsequent operations to prepare the part for machining.

The big plus for forged bodies is the directional alignment of the grain flow through the piece. This results in resistance to impact and fatigue and makes the material more ductile. Casting on the other hand has no grain flow and hence not a great directional strength.

Tool design and metal selection for forging are critical.

Illustrated data sheets are available showing all of the possible faults. The best comparison is the poor old plant in gardening books that has contracted every blight going.

After clipping (removal of surplus metal) the valve body is now ready for machining.

The brass is of a type that facilitates good machining but even so stresses are still encountered within the metal. On current diving cylinder valves these stresses are relieved by temperature in an oven.

The proof of the pudding is in the eating!

Approval of a valves resistance to impact is demonstrated by the *pi* mark proudly displayed on the completed valve.

New /Replaced Standards

BS EN 1089 – 3:2011 Transportable gas cylinders
Gas Cylinder identification (excluding LPG)
Part 3: Colour Coding (supersedes EN1089:-
3:2004)
EN ISO 22434:2006 Transportable Gas Cylinders -
Inspection and maintenance of cylinder valves
(ISO 22434:2006)
(supersedes EN 14189:2003)

Time Intervals Between Tests

When a cylinder overruns its visual inspection date, common sense must prevail. Give the cylinder its visual but show clearly that the next hydraulic test is still due on the anniversary of the previous hydraulic test. It cannot be allowed to go for another two and a half years. If it's nearly five years since a hydraulic test then it might be prudent to carry out the hydraulic test instead of the visual, but date the next hydraulic test five years from this latest test date.

Bulletin

Future copies of the bulletin will be sent by email only so will you please confirm your email address to Pat, by acknowledging receipt of this newsletter.

Replacement IDEST Cylinder Stamps

If you have a worn stamp and wish to purchase a replacement, please contact the administration office. We are in the process of ordering a new batch. Cost is £75.00 plus vat. Individual orders will cost in the region of £150 per stamp.

And Finally

Welcome to the following new test houses that have received certification recently

| | |
|--|----|
| North West Dive Shop Co Leitrim Ireland | 7H |
| First 4 Diving Technical Services Bradford | 7J |
| Pro-Dive Scuba Centre Hull | 7K |
| Divers Warehouse Bradford | 7M |
| Breathing Air Systems Engineering Dublin | 7N |
| Jem Divers, Somerton | 7P |
| and | |
| Haven Diving Services Milford Haven | 7Q |

The following test houses have had their certification withdrawn and will no longer be able to stamp cylinders

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Forward Diving
Patersons Safety Systems
STATS
Adventures in Diving

Contacts

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Information in this document has been obtained from the following sources.

Galvanic Action Mr Trevor Handley
Cylinder valve manufacture - Mr Tony Jarram
Procurement and Manufacturing Manager at
Midland Diving Equipment Ltd.