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Volume 24, Issue No 2

Welcome to the second IDEST Torque of 2024. With time passing quickly ahead of the main UK diving season our inspectors are busy. In this issue learn about action taken on unauthorised use of the IDEST stamp, uncontrolled labels, and complaint investigation.

We clear the confusion regarding how to punch out the dates on quadrant labels, stamp cylinders, and why you shouldn't charge more for Pi or Rho cylinders.

We also have information on excess pressure control, risk of hypoxia by oxidation, care of pressure gauges and more.

Finally, we inform you of some IDEST price increases, and give you the opportunity to enter the IDEST Prize Survey.

Unauthorised IDEST stamp use

We take misuse of the IDEST cylinder stamp very seriously. That is why they remain the property of IDEST. We were therefore quick to action recently when we became aware of a business that is not within the IDEST scheme using one of our stamps (1W).



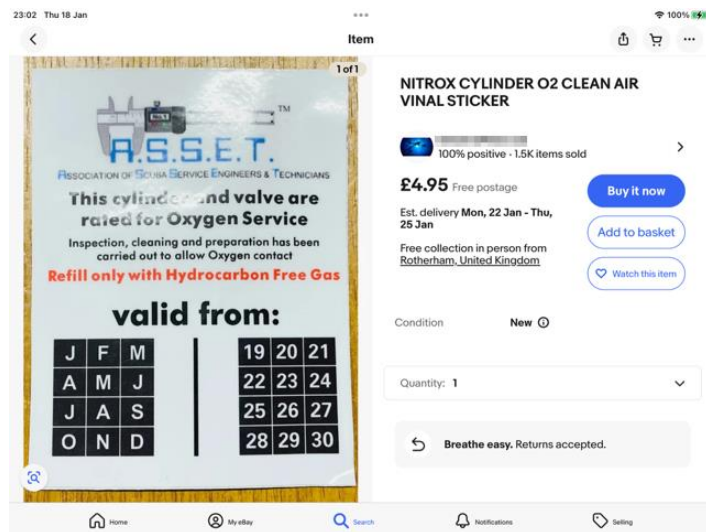
We contacted them and are pleased to report that they agreed to immediately cease using our stamp and it has now been returned to us. Following their prompt action we offered to work with them should they wish to join our scheme in the future.



Please report any suspicious cylinder activity to us, especially any that misrepresent themselves as part of the IDEST scheme.

eBay stickers

Like misuse of the IDEST cylinder stamp, we are also watchful for 'home brew' stickers that occasionally appear in the online marketplace. A recent case, reported by one of our centres, involved a recognised dive business selling at first appearance A.S.S.E.T. oxygen service labels.



We all lament the cessation of A.S.S.E.T. as an organisation and we wish Stewart a well-earned, long and happy retirement. In this case we were jubilant when he was able to contact the business concerned and persuade them to remove the stickers from sale (with only 7 sold).

Again, please keep us informed if you spot any concerning online sales, especially those that purport to be part of IDEST or another credible scheme.

Failing a warranted cylinder

An unusual situation was reported to us recently. A cylinder was inspected and failed while still under warranty. Apparently, there were some strange marks on the inside just below the neck threads. The cylinder was sawn into two pieces and then returned to the supplier as part of a warranty claim. We know the cylinder manufacturer of this brand use an independent metallurgist and they probably can't do all their usual checks now the cylinder is in two pieces so the warranty claim may be refused on this basis alone.



We therefore recommend that where a cylinder within warranty, or subject to a warranty claim, is failed it should not be altered at all. The issue should be discussed with the supplier/manufacturer to seek guidance and arrive at a satisfactory outcome for the customer.

How to punch out quadrant labels

We've received a complaint from one of our centres that they are seeing many quadrant labels that are not punched out correctly. A quick search around the internet looking at cylinders recently for sale confirms this as a real issue...



Next test not punched out



Last test incorrectly punched out



Next test incorrectly punched out

The IDEST reference document is Technical Information Sheet T015, Quadrant Labels for Visuals & Hydros. So let's be clear and get this right...

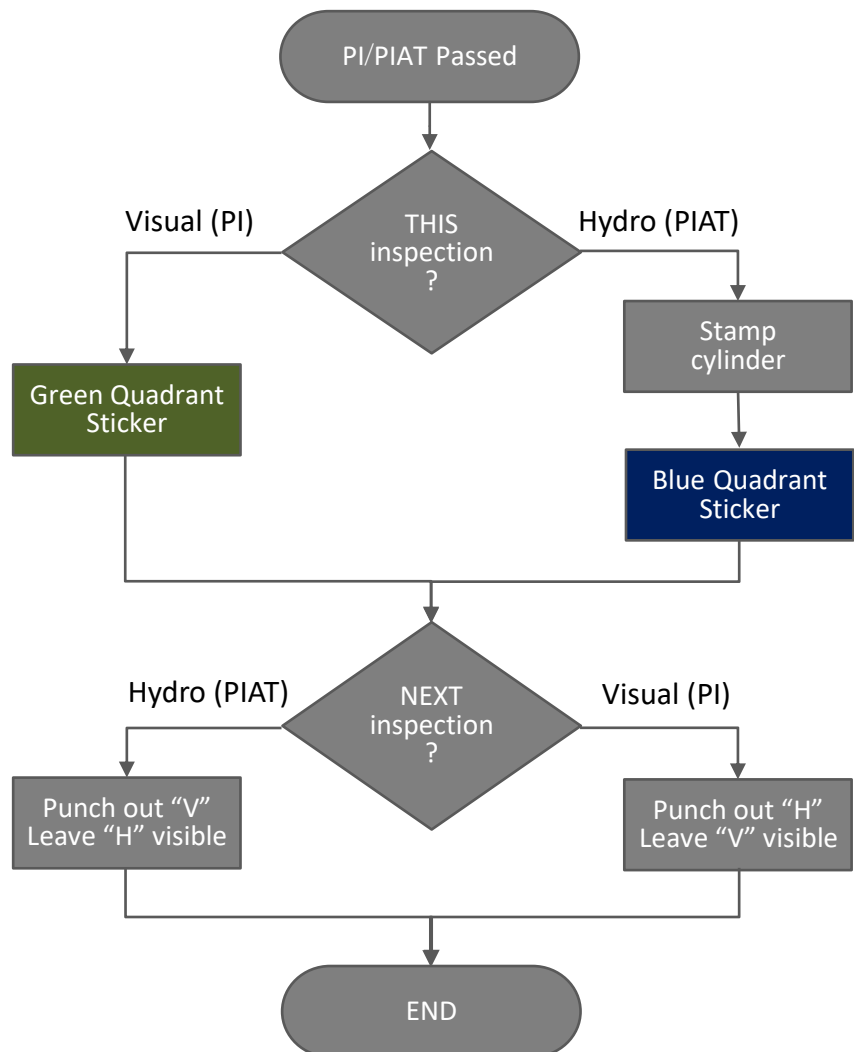
Apply the Green Quadrant if you have just completed a 'visual' periodic inspection (PI). Apply the Blue Quadrant if you have just completed a 'hydro' periodic inspection and test (PIAT).

Punch out the month and the year of the next due inspection, removing the letters and numbers completely. Typically for a recreational diver this period will be the 30 months (2½ years) from the current date.

For the next inspection H or V leave the letter corresponding to the next test visible and punch out the letter for the test that is not due. i.e. if hydro is due next leave the H visible and punch out the V; if visual is due next leave the V visible and punch out the H.

Remember do not stamp the cylinder for a 'visual' periodic inspection (PI), only stamp the cylinder if you have just completed a 'hydro' periodic inspection and test (PIAT).

The Green Quadrant label was introduced in 2020, and we allowed a transition period for centres to use up stocks of the earlier Blue Quadrant which had "V" as an option on Last Test. This transition period has ended, please ONLY use Green Quadrant labels for visuals now onwards.



IDEST Price Increases

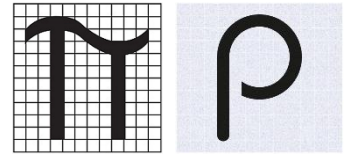
We try very hard to minimise our costs as an organisation but in the current economic climate some increases are unavoidable and regrettably from 1st March 2024 there will be an increase in scheme charges. Full pricing can be found in document D044, but a few headline items are as follows:



- Renewal Inspection for Test Centres (includes one technician) from £555 to £600
- Additional Test Centre Technicians (each) from £110 to £125
- Renewal Inspection for Inspection Centres (includes one technician), no change £555
- Additional Inspection Centre Technicians (each) from £110 to £125
- Annual Registration, no change £140.

Surcharges for Pi or Rho cylinders?

We were recently contacted by a keen airgun sport enthusiast who reported difficulty in finding a centre willing to test his Pi (π) marked cylinder. He also informed us he had posted his experience on a popular UK Airgun Forum looking for advice and received some worrying reports:



- "I was told originally test fee was £45 when I dropped my bottle off in Feb 2024 because of the pi symbol I was told it would be £75".
- "I was told don't bother bringing any in that have Pi".
- "I was advised to fill the Pi stamping with car body filler and spray it".

Firstly, let's be clear that the adulteration of any construction mark on a cylinder would result in a mandatory failure requiring removal of the cylinder from service, with the potential of also being a criminal offence.

Secondly, comment from the powers that be tells us that no matter what a cylinder is "used for" it's the same diving/breathing gas whether it is released to atmosphere through some piece of metal, a gun, or breathed in and out by a human being. So Airgun cylinders are in our scope.

Now, let's think about Pi (π) and Rho (ρ) marking... In the EU the Pi Mark is essentially the same as CE Marking; however, it applies to certain types of Transportable Pressure Equipment (TPED), such as gas cylinders. Pi and Rho marking are not mandatory for cylinders for breathing gas, such as diving cylinders, but their presence is not problematic. The UK Government says Pi marked TPE (cylinders) placed on the GB market by 31 December 2022 can remain in use and be re-filled, used and further made available on the market after 1 January 2023, as long as it complies with RID/ADR. Following Brexit Great Britain introduced the Rho conformity mark as the equivalent to Pi marking. As of 1 January 2023, TPE placed on the market in Great Britain must carry the Rho mark. Ideally TPE cylinders placed on the GB market in future will carry both the Pi and Rho marks to make them universally acceptable.

As of this date we are not aware of any divergence between the requirements for compliance with RID/ADR in UK and Transportable Pressure Equipment Directive (TPED) in EU, and therefore PI/PIAT of Pi (and Rho) marked TPE does not give rise to any issues.

In short Pi and Rho cylinders used exclusively by **private individuals**, can be tested by IDEST centres, and **should not incur any surcharges**.

One point to note, Pi and Rho marked cylinders owned and used by **commercial operators** MUST carry a valid ADR inspection within the last 10 years to be eligible for PI/PIAT under the IDEST scheme. If the last valid ADR inspection was over 10 years ago then only those appointed under ISO17020 by the VCA can test. We are actively working on a solution to this so watch this space!

VCA test centre complaint

We recently received a complaint from a Vehicle Certification Agency (VCA) appointed test centre. They had received an empty CO2 fire suppression cylinder for refilling with CO2. They stated, their filler observed the cylinder to be painted red but with large patches of rust visible under the paint and a large number of dents and pitting throughout. The cylinder had a periodic test stamp of 23/09 from an IDEST test station and the VCA test centre further commented "*We have scrubbed the paint from the cylinder and found extensive pitting across the surface as well as large areas where car body filler (or similar) has been used to hide pitting before overpainting. The line pitting alone would see the cylinder rejected at visual inspection however the wall thickness of the cylinder at the deepest pitting would also fail the wall thickness test*".



We visited the VCA test centre to discuss the matter face-to-face, with the following findings:

1. The cylinder tested was outside the scope of the IDEST certification.
2. The visual inspection was inadequate, and a more invasive inspection should have seen the corrosion and failed the cylinder.
3. The use of the IDEST Stamp was improper as the cylinder tested was outside of the IDEST scheme.

We then visited the IDEST centre to discuss the findings. The centre confirmed they had tested the cylinder but were adamant that at the time the external condition apart from some rusting on the base did not warrant any further investigation. As part of a constructive dialogue there were further discussion regarding scope of the IDEST scheme and use of our stamp.

Not too long afterwards the centres triennial inspection became due, so we deployed a different IDEST inspector to visit. The centre passed muster and there were no adverse findings, and we were pleased to recertify them for another 3 years.

We remind everyone to be cognisant of the scope of the IDEST scheme and terms of use of the IDEST logo and stamp. If in doubt, please ask for guidance.

Tales from an inspection

As an IDEST Inspector I will admit to being somewhat conflicted. It's always great when everything goes to plan during the inspection, especially if the centre is on top of their documentation and procedures so we can move quickly to the practical side. However, when something turns up during the actual cylinder test - thread issues, stuck valves, broken or missing parts, corrosion etc then things are immediately more informative. Seeing how the technician evaluates the problem and the actions they take really gives good insight into their competence. It also provides a conversation point and added interest.



During a recent inspection this valve spindle stem nut broke into two during reassembly of a valve after service. As I had observed good care being taken during reassembly it is likely it had been over torqued and weakened prior to being brought into the centre.

Care of pressure gauges

We probably don't give much thought to pressure gauges, apart from their specification in accordance BS EN 837, and annual calibration. However, their accurate use is intrinsic to safe and proper periodic inspection of cylinders. Indeed BS EN ISO 18119:2018+A1:2021, paragraph 14.2.3.3 states "*The pressure indicated on the pressure gauge shall not be less than the test pressure and shall not exceed the test pressure by 3 % or 10 bar, whichever is lower*" so accuracy and reliability is important.

To prevent misapplication gauge manufacturers advise... pressure gauges should be selected considering media and ambient operating conditions. The pressure gauge must be mounted free from vibration and should be aligned so that it is easy to read. All pressure gauge dials must be mounted vertically unless any other position has been marked on the front dial. With any deviation, the position indicator on the dial must be observed.

Typically pressure gauges are calibrated in the vertical, upright position and should be mounted as such. The accuracy may be reduced by any positional error due to gravity. We were therefore intrigued to see a gauge mounted horizontally during a recent centre inspection. We asked for it to be corrected.



A recent article from the process industry lists the eight most common causes of gauge failure as Mechanical vibration, Pulsation, Extreme temperature, Pressure spikes, Overpressure, Corrosion, Clogging, and Mishandling/abuse. How does your setup look?

Also think about the safety levels of your gauge per BS EN 837

- "S1" with blow-out device in case back
- "S2" blow-out device in case back or blow-out back
- "S3" with solid baffle wall and blow-out back

If your gauge as a blow-out back, then don't defeat this safety feature by hard mounting onto a wall for example.

Correct excess pressure control

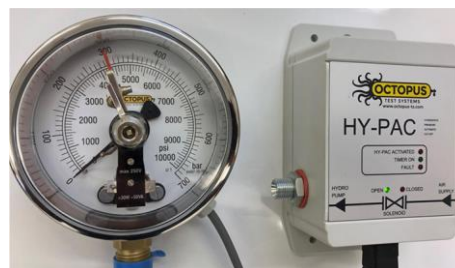
Every triennial inspection now includes confirmation that the test system is equipped with a suitable excess pressure control device in accordance with BS EN ISO 18119:2018+A1:2021, Annex D.2 Test equipment which states *"a suitable system control device shall be used to ensure that no cylinder is subjected to a pressure in excess of its test pressure, +3 % or 10 bar, whichever is lower"*.

We see a number of different solutions for this important criterion and IDEST has no preference provided the setup is of sound engineering practice and meets the requirements of the standard.

A system we see quite frequently is the Octopus HY-PAC (Hydrostatic Pressure Automatic Cut-off) system. This flexible electronic excess pressure control can be highly acceptable in achieving compliance but ONLY when used correctly, per the manufacturer's operating manual.

*"The contact gauge is set to the desired **over pressure** by moving the needle to the required pressure on the gauge scale."*

All too often we observe operators setting the contact gauge to the test pressure and using the HY-PAC as primary pressure control, rather than secondary over-pressure shut-off.



If you are observed operating in such a manner during an IDEST inspection, you will be asked to evidence an additional excess pressure control device in your test setup.

Cylinder corrosion as a cause of death

A scientific report^[1] in 1975 concluded "Corrosion of compressed air breathing tanks may result in dangerous oxygen depletion" and recommended all "breathing tanks should have a routine visual inspection on a regular basis".

This remains equally true today as reinforced by a new scientific report^[2] published in December 2023. The report abstract:

"Without an adequate supply of oxygen from the scuba apparatus, humans would not be able to dive. The air normally contained in a scuba tank is dry and free of toxic gases. The presence of liquid in the tank can cause corrosion and change the composition of the gas mixture. Various chemical reactions consume oxygen, making the mixture hypoxic. We report two cases of internal corrosion of a scuba cylinder rendering the respired gas profoundly hypoxic and causing immediate hypoxic loss of consciousness in divers".

Figure 2

Internal condition of the scuba cylinder from case 2



Sadly, in cases where breathing gas becomes hypoxic by oxidation the risk of fatality underwater is extremely high. It is a salient reminder of the importance of regular inspection and the contribution of Scheme members to safety of divers.

[Image source] reproduced under fair use in the interests of education and safety.

^[1]Temple JD, Bosshardt RT, Davis JH. SCUBA tank corrosion as a cause of death. J Forensic Sci. 1975 Jul;20(3):571-5. PMID: 1151318.

^[2]Druelle A, Daubresse L, Mullot JU, Streit H, Louge P. Hypoxic loss of consciousness in air diving: two cases of mixtures made hypoxic by oxidation of the scuba diving cylinder. Diving Hyperb Med. 2023 Dec 20;53(4):356-359. doi: 10.28920/dhm53.4.356-359. PMID: 38091597.

Correct cylinder stamping

Having mentioned quadrant labels it seems timely to refresh on cylinder stamping as we do see some variation here too. The IDEST reference document is Technical Information Sheet T004, Stamping of Cylinders.

The form of the stamp, the mass of the mallet, the way the cylinder is secured, the skill of the operator all impact the quality of the resulting stamping. If your stamping is hit and miss, then please review and improve.



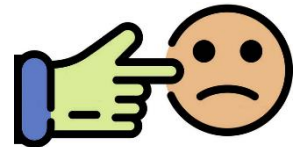
Correct stamping – [IDEST mark] YY/MM

The requirements are well laid out in BS EN ISO 13769:2018 Gas cylinders — Stamp marking, summarised as follows:

- stamp markings shall be applied legibly so that the integrity of the cylinder is unaffected.
- hard metal stampings shall not be applied to the cylindrical part of the cylinder.
- stamp marking shall be legible and durable under all operating conditions.
- stamp marking tools shall have radii to prevent the formation of sharp notches.
- for composite cylinders, use of an encapsulated printed label is permitted.
- periodic inspection stamping to include the date and identification of the inspection body.
- the order of time elements is most significant digits (the year) to the left.

Feedback and errata ...

We are always grateful to receive comments and feedback from our centres and are delighted to share these where they are of interest or benefit to others.



Moisture in cylinders – we weren't forceful enough in the last Torque for one of our readers who commented "*poorly maintained compressors/filters are a [prime] source of water ingress into cylinders. The motor industry for instance uses diving cylinders in their pit lanes and they don't frequently change their filter cartridges despite my best attempts to tell them to*". We agree!

Correct use of Quadrant Labels - "*Could a memo be sent out to all members explain how to use the Quadrants. I'm seeing so many on Facebook with cylinders recently tested up for sale but the markings are wrong or confusing. There are centres who are using up old stock of blue quadrants, which is confusing with the non-stamping for visuals*". Hopefully the article in this addition puts everyone on the right track.

In the last Torque in our article on adoption of the M26 thread we made use of the colloquial term "DIN 5/8". Several of our readers pointed out we should have used the correct terminology "BSP G5/8".

Our thanks to everyone who commented, please keep the feedback coming!

Your chance to WIN £100!

We're inviting certified IDEST technicians to enter our prize online feedback survey.



The competition is sponsored by IDEST Ltd, the training arm of IDEST.

Each eligible entrant who completes the survey will be entered into a draw to win a £100 credit to spend in the IDEST online shop. The survey takes less than 10 minutes to complete. The closing date is Friday 31st May 2024.

Find the online survey >>> [here](#) <<<

For those reading a printed copy please find the survey here: <https://forms.gle/smAziravuAw6SNrZ8>

Missing Torque?

Have you missed any edition of Torque? Don't worry, all of the past issues can be downloaded from the members section of the IDEST website. Take a look!



IDEST Test Centre Update

We have had the following changes to the IDEST Test Centre listing since the last issue of Torque.

New centres

None

Leaving centres

None

Temporarily suspended centres

Apeks Marine Equipment Ltd [8K]
Diving Services & Maintenance (UK) Limited [9T]
Sub-Aqua Services [9K]
Malakoff [6T]
Ipswich Scuba [8G]

Suspended centres

Sabre Safety [8T]
Scuba Scene [7Y]
Xambor Water Sports Ltd [9Y]
Ocean Addicts [7X]

The use of blue or green quadrants or the IDEST stamp to validate a cylinder test or inspection at any suspended centre is not recognised. Temporary suspension indicates that active dialog is underway in the hope of resuming testing in due course.

For a list of valid certified IDEST inspection centres always refer to the IDEST website.



A final thought...

We hope you've enjoyed reading this issue of Torque. Please let [Alison](#) have your feedback on this issue and suggestions for topics in upcoming editions. Thank you!

E&OE