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Issue No 2

Here we are with issue number 2 of Torque, keeping you up-to-date and providing a little additional knowledge concerning cylinder testing. This issue covers Shore Hardness, with an article that explains it in more detail and how 'O' rings used in the servicing of diving equipment fit into the spectrum.

If you have any other topics that you would like more information about, do get in touch with us and we will try to include it the next issue of Torque due in November.

Keeping up the standards

Should each IDEST Test Centre provide a different standard of service?

Or

Should all IDEST Test Centres provide the same high standard of service?

IDEST Code of Practice, CP11:2011, is the Code of Practice to which all IDEST Test Centres and technicians are assessed regardless of the BS, EN or ISO standards' content. It includes clear guidelines as to what centre technicians must be providing in terms of a service.

However, inspections and feedback from customers suggest that this is not always the case.

The main points to remember are:

- Every cylinder going through a Periodic Inspection or Test must have the valve overhauled and a new manufacturers service kit fitted.
- When internal shot blasting takes place it is imperative that the tester re-examines the internals of the cylinder to make sure no grit is left inside or trapped in the cylinder threads.
- All old stickers and glue from the external surface of the cylinder must be removed. New stickers, identifying the proposed gas content and IDEST quadrant labels must be affixed.
- Stamping should be done in a neat manner and in the order as directed in ISO 13769:2002 and should be readable for the coming years until the next inspection.
- There are unscrupulous people about, who try to imitate the IDEST

logo, so it means that the stamp must be as clear as possible.

Shore Hardness explained

The durometer scale was defined by Albert Ferdinand Shore, who developed a device to measure Shore hardness in the 1920s. The term durometer is often used to refer to the measurement as well as the instrument itself. Durometer is typically used as a measure of hardness in polymers, elastomers, and rubbers.

The unit of hardness given by the test is known as the Vickers Pyramid Number (HV) or Diamond Pyramid Hardness (DPH). The hardness number can be converted into units of pascals, but should not be confused with pressure, which also has units of pascals.

Durometer is one of several measures of the hardness of a material. Higher numbers indicate harder materials; lower numbers indicate softer materials.

Hardness may be defined as a material's resistance to permanent indentation. The durometer scale was defined by Albert Ferdinand Shore, who developed a device to measure Shore hardness in the 1920s. The term *durometer* is often used to refer to the measurement as well as the instrument itself. Durometer is typically used as a measure of hardness in polymers, elastomers, and rubbers.

Method of measurement

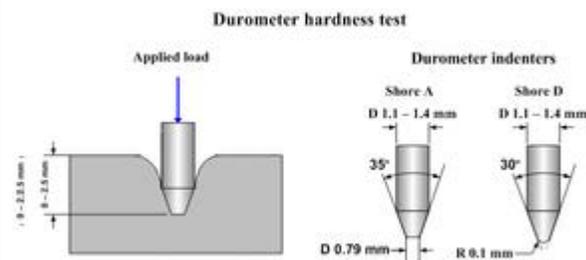


Diagram of a durometer *indenter* or *presser foot* used for Shores A and D

Durometer, like many other hardness tests, measures the depth of an indentation in the material created by a given force on a standardized presser foot. This depth is dependent on the hardness of the material, its viscoelastic properties, the shape of the presser foot, and the duration of the test. ASTM D2240 durometers allows for a measurement of the initial hardness, or the indentation hardness after a given period of time. The basic test requires applying the force in a consistent manner, without shock and measuring the hardness (depth of the indentation). If a timed hardness is desired, force is applied for the required time and then read.

The material under test should be a minimum of 6.4 mm (0.25 inches) thick.

Durometer scales

There are several scales of durometer, used for materials with different properties. The two most common scales, using slightly different measurement systems, are the ASTM D2240 type A and type D scales. The A scale is for softer plastics, while the D scale is for harder ones. However, the D2240-00 testing standard calls for a total of 12 scales, depending on the intended use; types A, B, C, D, DO, E, M, O, OO, OOO, OOO-S, and R. Each scale results in a value between 0 and 100, with higher values indicating a harder material

Durometers of various common materials

Material	Durometer Scale	
Bicycle gel seat	15–30	OO
Chewing gum	20	OO
Sorbothane	30–70	OO
Rubber band	25	A
Door seal	55	A
Automotive tire tread	70	A
Soft wheels of roller skates and skateboard	78	A
Diving use O-ring	70–90	A
Hard wheels of roller skates and skateboard	98	A
Ebonite rubber	100	A
Solid truck tires	50	D
Hard hat (typically HDPE)	75	D

Job Sheets – Content & Usage

We are finding that a lot of job sheets have a lot of unnecessary data on them. We are at present trying to produce a standard work sheet that can be used when the new ISO comes into force.

Request for images of unusual valves

We recently received images and information from one of our centres that they were having difficulty obtaining spares for a particular cylinder valve. IDEST contacted the supplier/manufacturer to clarify the situation. The company explained the



situation clearly and as a result IDEST produced, with their approval, a Technical Information Sheet T009 (*Early APEKS Cylinder Valve Spares Discontinued*).

So, our technicians out there may know of other cylinder valves that they are having difficulty obtaining spares for. In which case we would like to receive any images of these valves along with information relating to the spares problem so that we can create a suitable Technical Information Sheet and post it out to all our centres.

Ambient temperature 20 °C

When carrying out Master vs Working gauge comparisons as required by CP11:2011, these gauge comparisons must be at 20 °C. You will note that all of your calibration certificates will have that figure quoted. It also makes for a reasonable working temperature.

Use of a pressure snubber

What is a snubber?

Well the term originated in the electronics industry where there were voltage transients, spikes, in the circuitry. These “spikes” caused serious problems in the systems and so a device was developed to “snub” them. It was also noticed that there were similar occurrences in fluid systems, hammering in water pipes or in your pressure system when testing cylinders. This occurs when your pump compresses the water. It “bangs” and does not do your gauge any good. You may have seen them connected in your household hot-water system. They are spherical things connected to your pipework but are obviously a different device to the electrical snubbers but the name has transferred across the industries. It is possible to purchase these pneumatic/hydraulic snubbers to fit into your system.

Dive Team cylinder valve spares update

IDEST contacted Sea & Sea some weeks ago concerning Dive Team Cylinder Valves DT1000 service kits as some centres are having difficulty obtaining them.

Sea & Sea advise that these service kits are available from them.

As with all DIN thread outlets do check with the 6H 5/8 BSP thread gauge that they do comply.

MDE Nylon 66 white HP inserts

It has come to our attention that some of these HP inserts are still in use and are not being replaced. These inserts were used in the early DIN/I and MK 1B cylinder valves and went out of production over twenty years ago. The current MDE service kits provide a Brass replacement.

