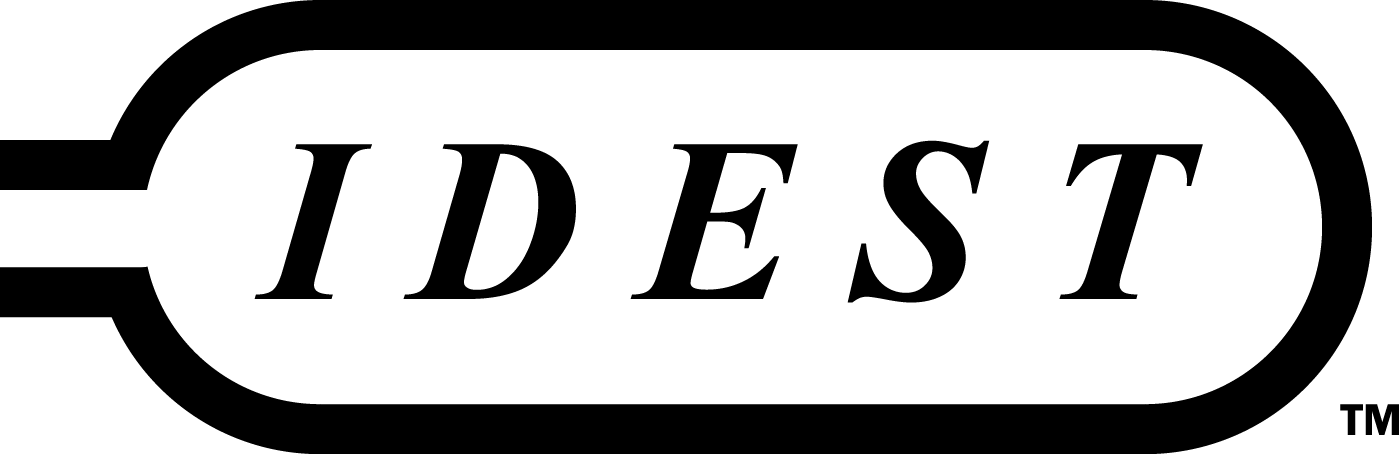
Withdrawn

***Scuba Industries Trade Association Ltd. trading as IDEST***

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**SPECIMEN**

**WRITTEN PROCEDURES**

**FOR**

**Inspection and test centres Operations manual**

**D002**

**IDEST SPECIMEN WRITTEN PROCEDURES**

For every activity carried out during the testing or examination of a cylinder, there must be a Written Procedure.

These **Specimen Written Procedures** have been produced to make the production of personalised procedures simpler for those test centres and cylinder testing technicians applying for IDEST approval.

Read each Specimen Written Procedure carefully and if it **EXACTLY** describes what you do, type it **EXACTLY** onto your own headed notepaper. **DO NOT** copy this document directly onto your notepaper if it is not reflective of your method.

To make alteration/copying easier, this electronic version of these Specimen Written Procedures is available as a guide to assist you to re write your procedures manual and is in the order required to comply with the requirements of BS EN ISO 18119:2018 +A1:2021.

If the Written Procedure does not **exactly** match what you do or intend to do, alter the details of the centre’s procedure so that it does. This should be easy to achieve since the document is written in Microsoft Word and you can delete, replace, or overwrite the electronic version.

Each Written Procedure must describe **exactly** the technique that you use and the equipment that you employ.

It may be prudent to have a copy of **section 8.3** printed on a separate sheet and posted somewhere prominent in the booking-in area of the shop/filling centre.

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Name of company : Insert name of test centre

Address : Insert test centre’s address

Line 2

Line 3

# 1. SCOPE

Insert test centre name undertakes the following services and testing activities in accordance with BS ISO18119:2018+ A1:2021 For aluminium and steel seamless cylinders and BS EN ISO 11623:2023 For composite cylinders (if within the centre’s scope) and in compliance with IDEST CP11:2022

1. The Periodic Inspection and Testing of Transportable Gas Cylinders (Cylinders) up to 150 litres nominal volume.
2. Service and repair of valves for use with cylinders.
3. The conversion of cylinders to Oxygen service.
4. Maintenance is not covered by CP11 and is not carried out by this test centre. Maintenance shall have the meaning of re-tapping or other refurbishment of the cylinder neck threads, heat treatment or other repair work involving cutting, machining or re-distribution of cylinder metals, with the exception of stamping undertaken as part of the requirements of ISO 13769.
5. H.O.T. and AA6351 Cylinders will not be tested at this test centre

# 2. TEST CENTRE ORGANISATION

2.1 Insert test centre is a company owned and managed by   
Insert owners name, the qualified Cylinder Technician/s  
is/ are Insert technician/s names. When future growth demands, additional Technicians will report directly to the senior technician who will direct actions and answer immediate questions. Where further information / reporting is required, reference is made to the applicable manufacturer’s technical department.

Include your Organisation Chart HERE

2.2 This document sets out the services offered by this test centre, the inspection and testing procedures to be followed and the actions to be taken in the event of a Cylinder or its Valve failing to pass Inspection or Test.

2.3 This test centre will maintain IDEST Approval by annual proof of compliance and triennial re-inspection in accordance with current IDEST standards. The Technician(s) will maintain their certification in accordance with current IDEST Standards.

# 3. QUALIFICATIONS AND TRAINING

Any Person who carries out inspection or testing in this facility will hold an IDEST Ltd training certificate, Asset Cylinder Testers Certificate, or confirmation of in-house training using one of the IDEST in-house training logs.

Certificates are to be displayed in the public area of the premises.

### 3.1 Visual acuity check

A check on each technician(s) eyesight by a qualified optician on a   
2 yearly basis, will be required to comply with the scheme. A copy of the optician’s certificate must be kept in their personal file. All technicians must be able to show that their visual acuity can meet the standard 6/6 with correction if necessary

# 4. EQUIPMENT

4.1 A minimum of the following Personal Protective Equipment is provided for each person working in the test centre:

* Gloves
* Safety Glasses
* Full Face Shield (used for blocked valve procedures)
* Ear Defenders
* Safety Shoes

4.2 All cylinders will be discharged to atmosphere in a safe place barring public access. The area used for discharging cylinders will be identified with signage requiring ear protection to be worn.

4.3 During Inspection, the following means are used to hold Cylinders without causing undue damage.

Insert what is in use, can be more than one

* Roller and Strap Vice
* Suitably padded ratchet clamp
* Bessie clamp
* pneumatic clamp
  1. Equipment to enable air to be released from a cylinder with a blocked valve is as follows. (See procedure ***8.5***)
* Electric hand drill.
* 1-2mm drill bit.
* Full Face Shield.
* Heavy Duty Gloves or Gauntlets.
* Overalls.

4.5 A low-pressure air supply (less than 5 bar) is used to inject air into the cylinder before valve removal. The exhausting of this air will confirm the valve is not blocked and the cylinder is at atmospheric pressure (See Procedure ***8.4***)

4.6 A wire brush is used to clean threads without removal of metal.

* 1. The following means are used to measure external defects:
* Individual pits are measured using a digital dial gauge with needle probe suitably mounted on a V Block.
* A pit gauge with gauge discs is used to determine extent of pit which is then measured using a vernier calliper.
* General corrosion is measured with an Ultrasonic Thickness Gauge and by comparison with the original wall thickness.
  1. The following means are used to remove valves.
* A specific spanner for each type of valve fitted.
* A clamp wrench for “A Clamp” Type Valves
* A screw in adaptor with lock nut for DIN Type

Valves

* 1. The following tools and equipment are used to remove coatings from cylinders:
* Wire Brush
* Various Picks
* Plastic or thin metal scraper
* A suitable, similar non-aggressive method
  1. Lint free cloths or other suitable wipes are available for use in the workshop
  2. The following facilities are provided for Internal cleaning of cylinders, or sub-contracted to external company and reference written agreement and relevant standards?

Insert what is in use, can be more than one

* Rotary Internal Shot Blaster
* A device using low pressure air and mild abrasive sand that is rotated around the inside of a cylinder to remove dirt and corrosion products
* Cylinder tumbler and ceramic chippings (brown Aluminium oxide # 16 / ceramic cylindrical pellets 4 x 8mm) for general cleaning of Steel Cylinders.
* Cylinder tumbler and glass beads or ceramic cylindrical pellets 4 x 8mm for general cleaning of Aluminium Cylinders.
* A flail, using abrasively coated filament, mounted on a shaft with a sufficient length to reach all parts of the cylinder

4.12 Internal inspection Equipment

The following equipment is used for internal inspection including neck threads:

Insert what is in use, can be more than one

* A 12 Volt “drop-light” and mirror for general viewing of internal surfaces and neck threads
* A tv system with optics at right angles and a 90° field of view for a more detailed inspection.
* A borescope

Note: Name of Inspection Centre acknowledge a drop-light and mirror alone are unacceptable for close internal inspection

* 1. If external cleaning and refinishing, other than general cleaning, for inspection, is carried out then the following facilities are provided for both the cleaning and refinishing of cylinders:

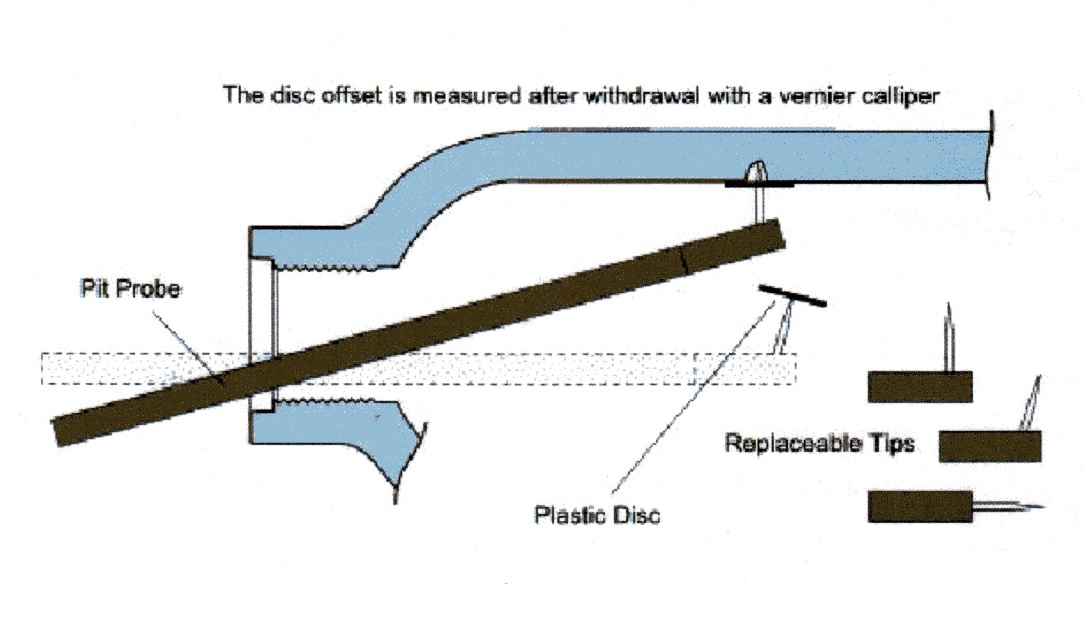
1. Internal and external shot blasting is carried out in-house in accordance with BS 7079 (and the equivalent for Aluminium) External refinishing is carried out in-house.

OR (delete as required)

1. A contract with insert name of sub-contractor for repainting both Steel and Aluminium Cylinders, which takes into account the need to coat the substrate within a given time after preparation to prevent the re-formation of oxide. Suitable primer and finish coatings to be applied in order to provide adequate protection in the marine environment. Preferably cold or low temperature curing paint systems should be used. If a heat-cured system is used particular reference should be made to the effects of heat and time on the integrity of a cylinder (Particularly Aluminium). Where a heat-curing paint system is chosen it should be used after discussion with, and confirmation in writing from, the technical department of the cylinder manufacturer.

Copies of the correspondence confirming the above facilities and standards can be found at the end of this section.

4.14 Cylinder wall thickness will be measured with:

* An Ultrasonic Thickness Meter
  1. The following equipment is used to determine the depth of internal defects:
* Individual pits will be measured by introducing a needle probe on the end of a rod into the cylinder. The needle probe will have a plastic or card disc pushed onto its end. When pushed into the pit the needle extends through the disc. On withdrawal from the cylinder, the offset of the disc **from the end of the needle is measured with a digital calliper and then compared with the original wall thickness.
  1. The following male and female thread gauges are held:
* 25 x 2mm to BS 3643
* G 5/8 to BS 2779 (Plug only)
* If other sizes are in use list here  
  (For example)G 3/4 to BS 2779
  1. No coating thickness gauge is used at this testing centre because H.O.T. Cylinders are not tested.
  2. Scales to measure the tare weight are not used by this testing centre. Or Include equipment detail if Tare weight is measured.
  3. The following test equipment is used to carry out the Hydraulic Test:
* A Test Rig including an Over Pressure Control Device for
* A Jacket Method (fixed Burette) volumetric expansion rig.

or

* A Proof Test Rig including safety screen.
  1. The Hydraulic Test equipment is fitted with the following gauges:
* A Working gauge, 100mm 700 Bar / 10,000 psi EN 837.
* A Master gauge, 150mm 700 Bar / 10,000 psi EN 837.
* Digital gauges may be used providing they meet or exceed

the above requirements.

* 1. The Working gauge used on the test rig will be compared with the master gauge monthly and the results recorded on a gauge comparison chart. The current chart must be displayed in clear view of the test rig. The old chart must then be filed as part of the centre’s *records.*
  2. Testing for cracks in AA6351 Aluminium alloy.

(delete as required)

* Visual Eddy Current equipment is used at this test centre as AA6351 Aluminium cylinders are tested
* Visual Eddy Current equipment is not employed at this test centre as AA6351 Aluminium cylinders are not tested.
* Visual Eddy Current testing is sub contracted to (Insert name of sub-contractor) and the centre has written confirmation on file.
  1. A stopwatch or similar device, with audible alarm, is used to time the duration of the tests.
  2. The cylinder will be drained by being inverted and supported safely over a drain hole. A thin plastic tube can be inserted to aid air access to the interior of the cylinder.
  3. Cylinders are dried by the following method:

Delete as applicable:

* Warm air dryer is used to dry the cylinders after testing.
* A steam generator is used to raise the temperature until

hand hot, followed by blowing air with and air lance until

dry.

* Hot water and Dry Air
  1. Sufficient hand tools shall be available to the technician for the servicing of cylinder valves
  2. An Ultrasonic bath with a cleaning solution compatible with cylinder valves will be available for the technician to use.
  3. A torque wrench that is in calibration will be used to refit cylinder valves
  4. Stamp marking is carried out in accordance with EN ISO 13769. Metal number punches are available for marking cylinders on completion of test. No’s 0 – 9, and a “/” of between of 2.5 – 5.0 mm high are available depending on cylinder size.

* 1. A stamp carrying the unique registration of the test centre will be stamped on the shoulder of cylinders on completion of successful test. (See procedure ***17.4***)
  2. Where shot blasting and re finishing of cylinders has been contracted out to the following organisations with which formal facilities in writing have been arranged.

**EXTERNAL CLEANING**

Company Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Address : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Telephone : \_\_\_\_\_\_\_\_\_\_\_\_

Telephone : \_\_\_\_\_\_\_\_\_\_\_\_

**INTERNAL CLEANING**

Company Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Address : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Telephone : \_\_\_\_\_\_\_\_\_\_\_\_

**PAINTING**

Company Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Address : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Telephone : \_\_\_\_\_\_\_\_\_\_\_\_

# 5. ACCURACY AND CALIBRATION OF EQUIPMENT

* 1. The pressure gauges listed in 4.20 have accuracy equal to, or better than that required by, and are maintained in accordance with, EN 837
  2. The hydraulic working gauge will be calibrated monthly by comparison with a chart produced in-house, a copy of this chart will be mounted adjacent to the working gauge. For the procedure and sample calibration chart, (see procedure **19.1**)

5.3 Tare balance or scales are not used at this test centre.

5.4 The coating thickness gauge is not required by this test centre because HOT cylinders will not be tested.

* 1. Calibration traceable to national standards will be arranged at the interval stated in 5.6. Calibration certificates will be held on file. The following items will be calibrated and have a unique identifier.
* Hydraulic Test Rig Master gauge
* Torque Wrench
* Thread Gauges
* Tare Balance (if used at this test centre).
  1. Periodicity between Calibrations
* Hydraulic test rig master gauge

The hydraulic test rig master gauge will be calibrated every 12 months

* Hydraulic test rig working gauge.

The hydraulic working gauge will be compared with master gauge monthly.

* Torque wrench

The torque wrench will be calibrated every 12 months

* Thread Gauges

Thread gauges will normally be calibrated every 12 months.

Note: Experience may show that over a period, calibration is not changing significantly or alternatively certain calibrated items are used infrequently. Under these circumstances an increased period between calibrations may be negotiated with and approved by the inspector, however, no period may exceed those stated in the appropriate standard. If a plug gauge is dropped onto a hard surface, it must be re-calibrated.

# 6. DOCUMENTATION

A copy of this document is available to all technicians and is readily available in the workshop/office.

* 1. An example of the centre’s “IDEST standardised format Booking In form (D078)” containing the required information can be found at the end of this section
  2. An example of the centre’s “IDEST standardised format Worksheet (D032)” containing the required information can be found at the end of this section
  3. An example of the centre’s “IDEST standardised format Test Certificate (D079)” containing the required information can be found at the end of this section

6.4 The following standards and codes of practice are held on file:

**Mandatory – Must be Held**

* IDEST CP11:2022
* BS EN ISO 18119:2018 +A1:2021 (cylinder testing)
* BS EN ISO 11623:2015 (composite cylinder testing if required)
* ISO 13769 (Stamp marking)
* BS EN ISO 7225:2007 + A1:2012 (Cylinder Precautionary Labels)
* BS EN ISO 22434:2011 (Cylinder Valve maintenance)
* BS EN ISO 24431:2016 (Inspection at time of filling)
* BS EN ISO 25760:2015 (De-valving)
* BS EN ISO 13341 (Fitting Valves)
* UK DIVING COMMITTEE RISK BASED ASSESSMENT

**Normative – should be held**

* BS 341:1985 (needed for Imperial taper threads (if required)
* BS 2779 (Imp Parallel Thread)
* BS 3643 Pt 1 & 2 (ISO Metric Screw Threads)
* BS EN ISO 228-1:2003 (Pipe Threads) (If required)

6.5 Manufacturers’ cylinder and valve drawings for each type to be inspected or tested are held in a separate file in the workshop

Insert specimen copies of

a) Booking in form

b) Cylinder Test Sheet

c) Test Certificate

HERE

# 7. QUALITY ASSURANCE

* 1. In order to prevent loss or wrong goods being handed to the customer, each cylinder presented for testing or inspection has a label affixed to it. This label will identify the cylinder with a unique job number. These details will be checked against the booking in form that the customer will be required to sign on receipt of goods.
  2. In order to prevent personnel from returning incomplete work to the customer, a workshop procedure check list is used, see **8.2** and **17.8** See also the worksheet in section **3.**
  3. Worksheet contains the required Q&A checklist required ensuring completion of all processes. (Example worksheet in section **6**)

# 8. WRITTEN PROCEDURES

## 8.1 Major Equipment Operation Manuals

Copies of operating instructions and procedures for all major equipment in use are available to all technicians

## 8.2 Workshop Procedure Checklist

The following General Procedure is designed to prevent any steps in the handling of cylinders from being overlooked and should be read in conjunction with your current worksheet.

Note: The reliability and effectiveness of working procedures may be affected by the number of cylinders to be handled at one time (batch) and the facilities available. Therefore, the centre should consider the maximum number of cylinders (batch size) that an individual technician will be able to handle at any one time to 5.

This procedure is designed for use with a maximum batch of 5 per technician.

Inspection, testing and valve servicing will be carried out in accordance with manufacturers requirements, IDEST code of practice CP11, BS EN ISO 18119:2018 +A1:2021, BS EN ISO 11623:2023 and other applicable standards. This test centre will maintain approval in accordance with IDEST CP11:2022.

Complete booking-in form, noting owners name, address and telephone number. include Cylinder Make/Model and Serial Number to identify the individual cylinder(s) note the usage that the cylinder has been put to. Ensure that the disclaimer statement has been signed by customer. (See procedure **8*.3***)

Write job number and customer name onto an (write in method of identifying cylinders) enter the customer’s name, job number, make, serial number and water capacity, specification, working pressure, test pressure and date of manufacture onto the work sheet.

Apply risk assessment to determine the correct inspection type and periodicity record decision on worksheet.

1. Record if a PIAT (Periodic Inspection and Test including Hydrostatic pressure Test) or visual inspection is required and that the valve is to be serviced or replaced.
2. Ensure that the cylinder is at atmospheric pressure, if not carry out a blocked valve procedure.
3. Carry out external cleaning; dispatch for shot blasting if required, see procedure **(4.13)**
4. Inspect the external condition, clean as required, measure and note any defects and compare with wall thickness and rejection limits in BS EN ISO 18119:2018 +A1:2021, BS EN ISO 11623:2023 as appropriate.
5. Remove the valve. Clean, then gauge the valve stem threads and set the valve aside for servicing etc.
6. Gauge the neck threads note type, condition and any defects. Ensure compatibility between the valve stem and cylinder neck.
7. Inspect the internal condition, clean, re-inspect, measure and note any defects and compare minimum wall thickness with measured wall thickness and rejection limits in the standards.
8. Carry out any supplementary tests such as Eddy current, ultrasonic, or check weighing.
9. Carry out a hydraulic test (if required) according to the equipment operating instructions. If Proof test, ensure dry before and after test. If Volumetric test then compare the permanent set with the rejection limits in the standards.
10. Drain and dry the cylinder thoroughly (Check for residual moisture)
11. Carry out any required re-finishing.
12. Check the operation of the valve; carry out a full-service including replacement of service parts.

* Remove excess lubrication then clean in ultrasonic cleaner. Inspect all cleaned components and reject those that are suspect.
* Replace all O-rings, thrust washers, seat and any damaged or worn components.
* Re-assemble with drawings in view. Use correct lubricants. Do not over tighten

1. Install the valve into the cylinder using the torque value stated in BS EN ISO 13341:2010 or to manufacturers recommended torque value if lower.
2. Fill cylinder to its working pressure with appropriate gas check for leakage
3. Complete the quality assurance section on worksheet, transfer relevant information to booking in sheet and test certificate.
4. Complete test cert and affix to cylinder. Place cylinder in a suitably marked area to await collection by customer.
5. In the event of the cylinder shell failing, the shell must be quarantined to await destruction and the customer advised.
6. In the event of the valve failing then the cylinder must be quarantined and the customer offered a replacement valve
7. Cylinders without valves will not be returned to customer and will be treated as failed cylinders. It is acceptable for customer to supply a serviceable valve for the test centre to check and install it to make the cylinder serviceable.

## 8.3 Booking in Procedure

1. Customer’s goods left for inspection or testing, shall be booked into the centre on a “Booking-in Form”.
2. Complete the booking-in form, noting owner’s name, address, telephone number(s) and other contact details.
3. Details of the goods are to be recorded and any serial numbers noted.
4. Any special requirements should also be noted e.g., completion date, additions, O2 Cleaning etc.
5. Any special requirements should also be noted e.g., completion date, additions etc.
6. Ensure the cylinder usage section is complete\*.
7. A label will be affixed to the goods, which shall contain the customer’s name and job number.
8. The customer will be given a receipt containing the job number and date of deposit.
9. The job number from the Booking-in Form will be transferred to the worksheet.
10. Ensure customer signs the form, paying particular attention to the destruction of a failed cylinder or failed valve clause.
11. Give the customer the tear off receipt.
12. Cylinders intended for a change of gas service shall be evaluated in accordance with ISO 11621. (Ref IDEST O2 Clean Book)

Note\*: It is important that the customer states what he/she uses the cylinder for as Commercial, Private, MoD, Media could have different requirements. Only then can an accurate Risk Assessment be made.

### 8.3.1 Risk Assessment procedure

In order to determine the sequence of inspection and test procedures the technician will apply a risk-based assessment of use based on the use of the cylinder

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Diving Industry Sector** | **Sponsor** | **PIAT** | **PI** | **\*Risk of Water Ingress** |
| **Comercial offshore** | International Marine Contractors Association (IMCA) | 5 Years | 2½ years | 6 Months |
| **Comercial inshore** | Association of Diving Contractors  (ADC) | 5 Years | 2½ years | 6 Months |
| **Media** | BBC | 5 Years | 2½ years | - |
| **Scientific, archaeological and aquarium** | Scientific Diving Supervisory Committee (SDSC) | 5 Years | 2½ years | 6 Months |
| **Defence** | Ministry of Defence (MoD) | 5 Years | 2½ years | 6 Months |
| **Police** | Association of Chief Police Officers (ACPO) | 5 Years | 2½ years | - |
| **Recreational** | British Sub Aqua Club (BSAC) and Scottish Sub-Aqua Club (SSAC) as National  Governing Bodies for the sport | 5 Years | 2½ years | - |

1. Using the above guide, the technician will determine the Dive sector that applies to the cylinder.
2. Having determined the sector and the test regime required the technician can then by reference to the information on the cylinder regarding previous tests determine the current inspection or test required (PI or PIAT)
3. The technician conducts the appropriate inspection (PI) or periodic inspection and test.
4. Once the PI or The PIAT have been completed the technician will evaluate the results to determine the next inspection and the cylinder stamped and labelled **(See procedure 17.5)**
5. Where the cylinder shows signs of water ingress or is in use in a sector where enhanced inspection is required the technician must label the cylinder accordingly. **(See procedure 17.5)**

## 8.4 Procedure to confirm cylinders are at ambient pressure.

The Pressure Check

Example:

1. Wear safety glasses and ear defenders throughout this procedure. In a well-ventilated area closed from public access or connected to discharge pipe work, open the cylinder valve carefully and listen for the sound of gas-flow. If gas flows out, lay the cylinder down and/or chock it to prevent falling and rolling.
2. Allow the gas to discharge until flow has stopped, or no gas comes out and the cylinder is (apparently) empty.
3. Using a pump or air gun with a protected nozzle inject air at low-pressure (less than 5 bar) into the cylinder through its open valve.
4. The cylinder is deemed to be at atmospheric pressure if air flows freely in and out of the valve. The valve can then be removed.
5. If previous steps show no sign of gas-flow in or out of the open valve, treat as a blocked or an inoperable valve. Do not attempt to remove the valve, refer to blocked valve procedure in 8.5

## 8.5 Procedure to remove a blocked valve:

The Inoperable Valve Procedure

Example:

If a blocked valve is diagnosed:

1. Wear a face shield, gloves, ear defenders and overalls throughout this procedure.
2. Securely clamp the cylinder.
3. Ensuring that the technician’s body and other personnel are kept to one side, remove the hand-wheel, cap-nut and valve spindle.
4. Using an appropriate tool, attempt to loosen the valve seat.

**Caution**, there is a risk of seat thread failure as the seat is rotated, make sure to keep body and other personnel to one side during this operation.

1. If gas is not released by this action replace the valve spindle and cap-nut and proceed as follows:
2. Ensure that any surface to be drilled is horizontal. Make a centre punch mark on the valve body in such a position that it lies in the centre line of the debris tube and below the line of the valve orifice.
3. Fit a 1.0 – 1.5mm drill bit into the chuck of a drill and set for slow speed.
4. Carefully drill a hole at approximately 30° to the horizontal, until it pierces the airway.
5. The sound of gas-flow should be heard. At this point, stop drilling, carefully withdraw the drill bit taking care to guard against pneumatically ejected swarf and wait for the sound of gas-flow to stop.
6. When the gas-flow has completely stopped and the cylinder is empty, the valve can be removed.

## 8.6 Procedure to remove an unblocked valve:

(The De-valving procedure)

Example:

If cylinder has a fully serviceable valve, proven by the gas-flow completely stopping and the cylinder has proven empty, the valve can be removed.

1. Securely clamp the cylinder using a clamping device that has suitable protection to prevent damage to cylinder.
2. Using a special tool, or adapter specifically designed to remove the valve safely and an extension bar of suitable length, the valve can be loosened; once loosened the valve can be removed by hand.
3. Care must be taken to ensure that the special tool or adapter is fitted correctly. In the case of an adapter that screws into the G5/8 outlet then the adapter must bottom out and the lock nut tightened to ensure load is taken on the valve and not just on the threads.
4. Under no circumstances should a hammer or any other form of percussive equipment be used to remove the valve.

## 8.7 Cylinders not requiring de-valving

Not within IDEST’s scope.

## 8.8 Cylinders Requiring Shot Blasting

### 8.8.1 External Blasting In-House

Use equipment detailed in section **4.13a**

### 8.8.2 External Sub-Contracted

External cleaning and finishing is contracted out. For procedures see **4.13b** and documents at the end of section 4.

### 8.8.3 Internal Shot Blasting In-house

Internal cleaning is carried out using a rotary internal shot blaster; the manufacturer operation instructions and procedures can be found in 8.1 These instructions are also displayed on a work board next to the shot blasting machine in the workshop.

# 9. External Inspection of Cylinders

Procedure for the external inspection of the cylinder and to confirm satisfactory internal condition before re-valving:

1. If after cleaning, the external condition renders a cylinder unfit for further service, it shall be rendered unserviceable as per procedure (section 18.1)
2. After removing labels, loose paint, corrosion, and stripping any suspect areas; the outside surface of the cylinder will be inspected.
3. The external surface of each cylinder shall be inspected for pitting, dents, gouges, bulges, laminations, or excessive wear, heat damage, and general corrosion as described in Table B.1, B.2 & B.3 (18119). Scoring and other damage will be measured using equipment described in Section4.14 and 4.15 and compared with the minimum wall thickness stated on the manufacturers drawing. Cylinder wall thickness will be determined by use of an ultrasonic thickness gauge.
4. Using a light and optical means described in section 4.12, a visual inspection of the internal surfaces including base and shoulder will be carried out.
5. Where necessary the internal surface of the cylinder will be cleaned using the equipment described in 4.13, to remove corrosion scale and to expose pitting and other flaws.
6. Internal corrosion and flaws will be measured using the equipment described in 4.15 All defects will be measured and compared as stated in 2 above.
7. Depth of defects will be calculated and expressed as a percentage of wall thickness thus:

Depth of Flaw

------------------- x 100 = % of wall thickness

Wall Thickness

1. All defects shall be compared with the rejection limit tables in BS EN ISO 18119 +A1:2021. Due consideration will be given to size of cylinder and its duty when making decisions regarding situations that may be considered borderline.
2. Only those cylinders found to be in satisfactory condition and with defects that are within acceptable limits will be returned to service.

## 9.1 Procedure for measuring wall thickness:

Example:

* Calibrate the ultrasonic thickness gauge on its calibration standard.
* Set the correct range for the anticipated thickness and cylinder material.
* Apply gel to the surface of the cylinder and apply the probe.
* Read the wall thickness.
* If in doubt, recalibrate and remeasure.

## 9.2 External Pit depth measurement procedure

Individual pits are measured using a digital dial test indicator (DTI) with needle probe mounted on a V Block:

* The V Block base (magnetic) in secured to the cylinder surface
* The DTI needle is placed onto the surface of the cylinder away from the pit and the bezel zeroed.
* The needle is then moved to a position at the base of the pit and the measurement noted from the DTI.
* Pit depths outside the permitted limits will render the cylinder unserviceable and should be removed from service as per procedure 8.18

# 10. Inspection of Cylinder Neck Threads

Example:

## 10.1 Cylinder to Valve Threads

If the threads are visually satisfactory, clean, full form and free of damage, the thread form of both valve stem and neck threads will be identified using calibrated thread gauges.

Using the appropriate series of gauges, the threads will be checked to ensure that they are within tolerances.

* Male and Female parallel threads will be checked with “Go” and “Not Go” ring or plug gauges. The “Go” gauge should screw smoothly over the full length of the thread. The “Not Go” gauge should not go. \*
* Male tapered threads will be gauged with two plain ring gauges and female tapered threads with two plain plug gauges. These individually check both large and small ends of the thread. The gauges have a step ground on to them. The flat of the cylinder neck or the end of the valve stem should lie between the top and bottom flat of the step.
* If available, both male and female tapered threads can be checked using full form gauges.
* This process will have the effect of both testing and identifying both valve stem and cylinder neck threads.
* G ¾ valves with eight pitch stems will not be fitted into cylinders designed for use at pressures exceeding 200 bar.
* Incompatible valves will be replaced. Only serviceable valves with compatible threads will be reassembled. Cylinders or valves with unserviceable threads will be rejected and set aside for destruction.

It is common engineering maintenance practice to allow up to two threads engaged on a NOT-GO gauge. This is the maximum that should be allowed.

## 10.2 Other Neck Surfaces

Face, O-ring seat, external neck surface, etc. shall also be examined to ensure they are free from cracks and imperfections.

## 10.3 Damaged Neck threads

Damage of any sort to neck threads is considered a mandatory failure and the cylinder will be rendered unserviceable ref **18.1**

## 10.4 Neck Ring and Collar attachments

Not within the scope of IDEST scheme

# 11. Internal Visual Inspection

## 11.1 Procedure for internal cleaning:

Example:

Prior to carrying out an internal visual inspection, the cylinder shall be depressurized and, if necessary, purged in accordance with ISO 25760 prior to valve removal.

Internal cleaning is carried out using a rotary internal shot blaster. The operating instructions and procedures can be found in the manufacturer’s data in section **8.1.**

Only the manufacturer’s recommended abrasive must be used.

The manufacturer’s recommended pressures must be selected.

Alternative cleaning may be done by equipment listed in section **4.11**

**Note:** For seamless aluminium-alloy cylinders susceptible to sustained-load cracking (e.g., those manufactured from AA 6351 or AA 6082 alloy), the internal side of the shoulder shall be examined visually and the neck area shall be examined using a non-destructive examination method such as eddy current testing.

**Note:** Reduced pressures and special abrasives are required for use with aluminium, see manufacturer’s data

**Note:** If cylinders are sent out to third party for internal cleaning there must be a letter saying that the contract firm will carry out this procedure to the correct levels. Ref Section **4.13b**

## 11.2 Internal Visual Inspection

Using a light and optical means, described in **4.12**, a visual inspection of the internal surfaces, including base and shoulder, will be carried out.

Where necessary, the internal surface of the cylinder will be cleaned using the equipment described in **4.13**, to remove corrosion scale and expose pitting and other flaws.

Internal corrosion and flaws will be measured using the equipment described in **4.15.** All defects will be measured and compared as stated above.

Depth of defects will be calculated and expressed as a percentage of wall thickness thus:

All defects shall be compared with the rejection limit tables in the appropriate BS EN ISO Standards. Due consideration will be given to size of cylinder and its duty when making decisions regarding situations that may be considered borderline.

### 11.2.1 Procedure to measure internal pit depth:

* Individual small defects are measured by introducing a needle with a plastic disc pushed onto its end into the Cylinder. When pushed into a defect the needle extends through the disk. On withdrawal from the Cylinder, the offset from the end of the needle to the disk is measured with a Vernier Calliper and then compared with the maximum allowable depth of defect listed in BS EN ISO 18119 +A1:2021
* The protrusion of the needle is set to the maximum allowable depth of defect listed in BS EN ISO 18119 +A1:2021. When introduced into the defect, if the needle does not go all the way in, the depth is within the acceptable limit. If the needle goes all the way in the defect exceeds the limit.
* General and local corrosion is measured with an ultrasonic thickness gauge and by comparison with original wall thickness.

### 11.2.2 Internal cleaning of steel cylinders

Example:

* Internal cleaning is carried out using a rotary internal shot blaster. The operating instructions and procedures can be found in the manufacturer’s data at the end of this section.
* Only the manufacturer’s recommended abrasive must be used.
* The manufacturer’s recommended pressures must be used.
* Note: Reduced pressures and special abrasives are required for use with aluminium, see manufacturer’s data. See also 4.14

**Note:** If cylinders are sent out to an external firm for internal cleaning there must be a letter saying that the contract firm will carry out this procedure to the required standards.

### 11.2.3 Internal cleaning of aluminium-alloy cylinders

Example:

* Internal cleaning is carried out using a water-based pressure washer with silica particles (sand). The operating instructions and procedures can be found in the manufacturer’s data at the end of this section.
* Only the manufacturer’s recommended abrasive must be used.
* The manufacturer’s recommended pressures must be used.

Note: Reduced pressures and special abrasives are required for use with aluminium, see manufacturer’s data. See also **4.13**

Note: If cylinders are sent out to a third party for internal cleaning there must be a letter saying that the contract firm will carry out this procedure to the correct levels.

# 12. Supplementary Tests

## 12.1 Evaluation of the type

Evaluation of the type and/or severity of an imperfection found on visual inspection may require additional tests or methods of examination, e.g. ultrasonic techniques, check weighing or other non-destructive tests.

## 12.2 Procedure for Eddy current test in Aluminium cylinders

Example:

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* A copy of the operating instructions for the Visual Plus/Visual Eddy equipment is held on file.
* The equipment will be calibrated using the “test standard” and the “Null” and “Gain” correctly set.
* The appropriate test probe is screwed into the neck thread, resetting the null to ensure the correct screen presentation.
* The probe is then slowly unscrewed from the thread and any anomalies noted

## 12.3 Hammer Test for foot rings

Not within scope of IDEST Scheme

# 13. Cylinder Repair

**Policy for “Maintenance” of cylinders and valves:**

Example:

Maintenance, will not be carried out. It is not normally cost effective to carry out “maintenance” on small cylinders, which will therefore be condemned in accordance with **18.1**.

# 14. Pressure Test

## 14.0 Over Pressure Control Device (OPCD):

A device that will prevent the hydraulic test rig from exceeding the test pressure by 3% or 10 Bar whichever is the smallest must be fitted. This OPCD must be in addition to the control valve that controls the output pressure of the pump.

### Option 1 – Pre-set Pressure relief valve

A spring-loaded pressure relief device set to the test pressure plus 3% or 10 Bar whichever is the lower. This has the disadvantage that the rig can only test to one test pressure without the device being changed. This device is for safety only, the test must be controlled by a separate throttle valve.

### Option 2 – Working gauge with electrical contacts & solenoid

A working pressure gauge fitted with electrical contacts that can be set to close a solenoid operated valve on the inlet line if the pressure rises beyond the test pressure by 3% or 10 Bar whichever is lower. The gauge contacts can be reset each time a test pressure is changed. This device is for safety only, the test must be controlled by a separate throttle valve.

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### Option 3 – Low Pressure Regulator

In the Low-Pressure inlet line to the test rig a low-pressure inlet to regulated low pressure outlet regulator is fitted. As the hydraulic pump will normally operate on a ratio of 1 :100 by controlling the input pressure to the hydraulic pump it can be made to stall at the working pressure plus 3% or 10 Bar whichever is lower. A chart showing the input pressure for each test pressure will be needed to set the overpressure pump stalling point. This device is for safety only, the test must be controlled by a separate throttle valve.

## 14.1 Pneumatic Test

Not within scope of IDEST Scheme.

## 14.2 Proof Test

Example:1

* Place cylinder in test stand,
* fill with water and connect test hose,
* ensure connector is tightened correctly and the ‘O’ ring seal is not visible.
* Thoroughly dry the cylinder, **(see 14.2.1**)
* Increase the pressure to check for leaks observe the pressure gauge for 30 seconds, A fall in pressure will indicate that there is a leak in the system.
* The cause of any leaks must be cured before proceeding with the test.
* Bleed down the system rapidly to remove any residual air in the system
* Place screen around test rig and start pump.
* Run pump up to test pressure. Once at pressure stop the   
  pump and start timer.
* The timer should be set for a period of 30 seconds. During  
  this time the cylinder should be observed for signs of leakage.
* On completion of the test period the test rig must be  
  de-pressurised.
* If any leakage is indicated over the body of the cylinder or there are signs of bulging then the cylinder must be failed. Should a leak come from the cylinder connection point then a repeat test using a new ‘O’ ring may be done to confirm the serviceability of the cylinder. A second failure will prove that the cylinder is unfit for further service.
* Remove cylinder from test stand and dry with the minimum of delay. (see **17.1.1**)

### 14.2.1 Procedure for drying prior to and after proof testing

Example:

After filling with water, fitting the test adapter and hose connected to the test manifold, the cylinder will be dried.

* The excess water will be wiped off.
* Low-pressure compressed air, or a suitable alternative method, will be used to dry the surface, neck and connector of the cylinder. Confirm dry using a dry paper towel
* During the proof test cycle the cylinder will be inspected for any signs of water leakage. This may indicate a problem or a defective test.
* On completion of a test the Cylinder will be wiped over using a dry paper towel to confirm test result before disconnecting from test rig

### 14.2.2 Test Equipment

Refer to Section 4

## 14.3 Hydraulic Volumetric Expansion Test

### 14.3.1 Example: Jacket Fixed Burette

* Fill the cylinder with water and fit the test adapter and hose.
* Lift the cylinder into the water jacket using appropriate equipment and attach the hose to the hydraulic pump connector in the jacket wall.
* Fit lid and clamp securely.
* Fill the jacket with water and bleed all air off.
* Close the pressure release valve and start the pump.
* Raise the pressure to the cylinder’s working pressure and hold for 30 seconds. Check for leaks
* Release the pressure. Correct any leaks before proceeding.
* Zero the burette.
* Using the test pressure recorded on the work sheet raise the pressure. Hold to the test pressure for 30 seconds.
* Note the expansion reading on the burette.
* Release the pressure; allow the rig to settle for 30 seconds then note the reading on the burette.
* Permanent set is calculated as follows:

Percentage stretch =

* In accordance with BS EN ISO 18119:2018 +A1:2021 and BS EN 11623:2023, a maximum amount of permanent set will be confirmed from the manufacturing standard or from the manufacturer’s data. An expansion in excess of the stated value will result in failure.

### 14.3.2 Example: Non-Jacket Fixed Burette

* Fill the cylinder with water and fit the test adapter and hose.
* Lift the cylinder onto the test stand using appropriate lifting equipment and attach the hose to the hydraulic pump connector.
* Close the pressure release valve and start the pump.
* Increase the pressure to check for leaks observe the pressure gauge for 30 seconds. A fall in pressure will indicate that there is leakage in the system.
* The cause of any leaks must be cured before proceeding with the test.
* Bleed down the system rapidly to remove any residual air in the system.
* Add water to the pump reservoir and zero the burette.
* Using the test pressure recorded on the work sheet raise the pressure to that value.
* Hold to the test pressure for 30 seconds.
* Note the expansion reading on the burette.
* Release the pressure; allow the rig to settle for 30 seconds then note the reading on the burette.
* Permanent set is calculated as follows:

Percentage stretch =

* In accordance with BS EN ISO 18119:2018 +A1:2021 and BS EN 11623:2023, a maximum amount of permanent set will be confirmed from the manufacturing standard or from the manufacturer’s data. An expansion in excess of the stated value will result in failure.

# 15 Inspection of Valve and Other Accessories

## 15.1 Procedure for the inspection and maintenance of valves

(as required by BS EN ISO 22434:2022)

1. After confirming that the cylinder is at atmospheric pressure:
2. Remove the valve using a suitable tool. See 4.8.
3. A label must be attached to identify the valve with a specific cylinder.
4. The valve will be inspected for scoring, deformity of the body and 'O'-ring groove, forging defects and loss of metal.
5. The stem threads will be cleaned and visually inspected for gouging, burrs, forging defects. and loss of thread material and wear.
6. If the valve is visually satisfactory, the threads will be wiped clean with a lint free cloth, gauged and identified.
7. The valve will be disassembled, removing hand-wheel, SELOC pin, spring and nut, cap-nut, ‘O’-rings, thrust and anti-wear washers, shaft or spindle, and seat “plug or seal”.
8. The valve body and other components will be cleaned using an ultrasonic cleaner, degreaser, and mild acid solution
9. The components will be thoroughly rinsed and dried.
10. Worn or damaged components and those required to be changed by the manufacturer will be discarded and replaced.
11. Valve will be re assembled using the appropriate lubricant.
12. The valve will be checked for correct action.

# 16. Replacement of Cylinder Parts

Not within scope of IDEST Scheme

# 17. Final Operations

## 17.1 Drying Cleaning & Painting

Procedure(s) for drying that ensures that the cylinder is dry with a minimum of delay before re-valving:

### 17.1.1 Drying & Cleaning

**Option: 1 - Blown Hot Air.**

The drying method utilises hot air blown into an inverted cylinder. The heater is thermostatically controlled to prevent the air temperature exceeding 120° C.

* Immediately after the test water has been drained from the cylinder it is inverted and placed onto the drier.
* Hot air is allowed to circulate and evaporate all of the moisture within the cylinder.
* When the water has nearly all evaporated, the cylinder wall temperature will start to rise.
* When the wall temperature becomes “hand hot”, the cylinder will be removed from the drier and inspected using an optical means.
* If there is no sign of moisture, drying is complete. If moisture is visible then the cylinder is returned to the drier for a further period.
* Once drying is complete the valve will be replaced, and closed If a valve cannot be replaced immediately then the cylinder must be sealed to prevent ingress of further moisture.

**Option: 2 - Boiling hot water and dry air.**

* Immediately after the test water has been drained from the cylinder it is quarter filled with boiling water and capped off.
* The cylinder is rolled until it feels hand-hot.
* The boiling water is drained away and the cylinder is placed inverted in a stand.
* A lance connected to a cold dry air source is inserted into the cylinder to blow droplets out. This air is allowed to circulate and evaporate all of the remaining moisture from within the cylinder.
* The cylinder will be removed from the stand and inspected using an optical means.
* If there is no sign of moisture, drying is complete. If moisture is visible then the cylinder is returned to the stand and cold, dry air is used for a further period.
* Once drying is complete the valve will be replaced, or the cylinder plugged to prevent further ingress of moisture.

**Option: 3 - Steam and cold dry air /hot air**

Steam and cold dry air blown into an inverted cylinder.

* A steam generator thermostatically controlled to prevent the steam temperature exceeding 100° C is used to supply a source of steam at atmospheric pressure.
* Immediately after the test water has been drained from the cylinder it is inverted and placed onto the drier.
* A lance with a cold dry air supply is inserted into the cylinder and used to remove droplets.
* The air lance is removed and replaced with a live steam supply which is inserted into the cylinder.
* Hot steam is allowed to circulate and evaporate all of the moisture within the cylinder.
* When the wall temperature becomes “hand-hot”, the cylinder can be removed from the drier and inspected using the optical means.
* If there is no sign of moisture, drying is complete. If moisture is visible then the cylinder can be left in the stand in an inverted position for a few minutes to see if the residual heat in the cylinder has evaporated the remaining moisture. Failing that the air lance can be used to complete the process.
* Once drying is complete, the valve will be replaced or the cylinder plugged to prevent ingress of further moisture.

NOTE: if the centre procedure is of a different method, then a suitable procedure must be written.

### 17.1.2 Painting and Coating

External cleaning and refinishing are carried out in-house

A number of methods are used which include:

* The use of detergents and solvents for light cleaning
* Scrapers wire brushes and mild abrasives
* A shot blasting cabinet with the recommended grades of abrasive materials
* A dedicated paint area or spray booth for the application of coatings
* The coatings used must be of a cold or low heat curing type see 17.1.22 and 17.1.23 for maximum permitted drying temperatures.
* If any of the above procedures are sub-contracted to an external supplier see **(4.13b)** and documents at the end of section **4**.

### 17.1.2.2 Seamless Steel Cylinders

The temperature of a seamless steel cylinder shall not exceed 300 °C since overheating may change the mechanical properties of the cylinder.

### 17.1.2.3 Seamless Aluminium-Alloy Cylinders

Cylinders manufactured from AA 6XXX heat-treatable aluminium alloys (e.g. AA 6061) shall not be heated to temperatures exceeding 175 °C. Only testing facilities that can control heat input and record time and temperature shall heat cylinders. The total cumulative time at temperatures between 110 °C and 175 °C shall be limited to the time recommended by the cylinder manufacturer. Cylinders heated in accordance with these provisions shall not require further testing.

## 17.2 Re-Valving of Cylinder

### 17.2.1 Compatible stem and neck threads

Procedure to ensure that only compatible valve stem and neck threads are assembled together:

1. If the threads are visually satisfactory, the thread form of both valve stem and neck threads will be identified using calibrated thread gauges.
2. Using the appropriate series of gauges, the threads will be checked to ensure that they are within tolerances.

* Male and female parallel threads will be checked with “Go” and “Not-Go” ring or plug gauges. The GO gauge should screw smoothly over the full length of the thread the “Not-Go” gauge should not go \*.
* Male tapered threads will be gauged with 2 plane ring gauges and female tapered threads with 2 plain plug gauges. These individually check both large and small ends of the thread. The gauges have a step ground onto them. The flat of the cylinder neck or the end of the valve stem should lie between the top and the bottom flat of the step.

1. This process will have the effect of both testing and identifying both valve stem and cylinder neck threads.
2. Aluminium valves will not be fitted into steel cylinders.
3. G ¾ valves with 8 pitch stems will not be fitted into cylinders designed for use at pressures exceeding 200 Bar.
4. Incompatible valves will be replaced with compatible valves. Only gauged valves with compatible threads will be reassembled. Cylinders or valves with incompatible threads will be rejected and set aside for destruction.

\* Note: It is common engineering maintenance practice to allow up to 2 threads on a Not-Go gauge. This is the maximum that should be allowed on an M25 x 2 thread.

### 17.2.2 Procedure for re-assembly, re-filling and leak testing.

On satisfactory completion of testing and/or inspection each cylinder will be reassembled, filled and leak tested.

1. Thread compatibility will be assured according to 17.2.1
2. A new O-ring will be fitted to the valve stem (PTFE tape on tapered threads)
3. The valve will be screwed into the neck thread hand-tight.
4. The valve will be tightened using a torque wrench and suitable adaptor.
5. The correct torque values will be applied according to EN13341.
6. The cylinder will be filled to its working pressure with the appropriate gas.
7. The cylinder will be leak-tested by immersion in water.
8. If no leaks are detected it will be labelled according to **17.5** and **17.6**

## 17.3 Check Cylinder Tare

Refers mainly to liquified gasses, which is not within the scope of IDEST scheme

## 17.4 Procedure for Re-Test Markings

Example:

**Steel & Aluminium Alloy Cylinders**

Before being returned to the customer all cylinders will be stamped in accordance with ISO 13769:2018. The marking will consist of the unique IDEST centre mark, test date year using 2 figures (YY), a ‘slash’ then the test month as 2 figures (MM). Stamping on steel cylinders must be painted to prevent corrosion.

Shape

Description automatically generated with medium confidenceExample: YY / MM

The cylinder shall be labelled in accordance with BS EN ISO 7225:2007+A1:2012 to denote the contents. An adhesive label to the same effect plus a next inspection/test label will be affixed as required.

**Composite Cylinders**

The labelling of composite cylinders must be in accordance with   
BS EN ISO 11623.

The label will be adhesive and display:

* Name of centre carrying out the test
* The contact details of the test centre
* The standard to which the test has been carried out
* Date of the test
* Date of the next test required

This label should then be covered with a layer of resin to make it waterproof.

## 17.5 Reference to Next Inspection Date

Since 2020, IDEST have used the Green Quadrant Label to reference Periodic Inspection (**PI** or “Visual”) and a Blue Quadrant to reference Periodic Inspection and Test (**PIAT** or “Hydro”)

Chart

Description automatically generated

1. From an initial PIAT, the technician will determine the periodicity of the next inspection using the risk-based assessment.
2. A green quadrant will be used following a PI. This will be attached to the cylinder as close as possible to the previous PIAT stamp to which it refers. The cylinder will not be stamped.
3. The quadrant will indicate the period to the next examination and to whether that examination will be a PI or a PIAT.
4. Where the next inspection is determined as a PIAT, the cylinder will be stamped as in 17.4, and a Blue Quadrant affixed.
5. The Blue quadrant will be punched to indicate the periodicity of the next inspection which will be a PI (Visual)

## 17.6 Identification of Contents (Labelling)

Before being returned to the customer all cylinders will be labelled in accordance with BS EN ISO 7225:2007 +A1:2012 to identify their contents.

## 17.7 Records

After the periodic inspection, all required cylinder information will be recorded on the test certificate.

This information shall be held for 6 years which is the time required to conduct 2 periodic inspections plus 1 year.

(Sample Test Certificate required)

## 17.8 Procedure to identify completed jobs

Procedure to positively indicate whether a job is competed or not to prevent the return of incomplete or un-valved cylinders to the customer:

* 1. When the technician has finished the job and all final checks are complete, they shall affix a coloured adhesive sticker to the repair tag / label. See Labelling.
  2. Other staff members are instructed not to return any goods that appear to have been inspected, tested, or repaired unless a coloured completion sticker has been attached by the technician.
  3. All staff members are instructed that ONLY the technician who completed the work, may affix the coloured sticker.
  4. If any errors, omissions, problems or deficiencies are discovered after the cylinder has been returned to the customer, the technician (or other staff member) shall immediately report the problem to management. Serious problems shall be recorded in writing using the complaints procedure and form D029
  5. Management or other responsible staff member shall contact the customer and recall the cylinder.
  6. The original details, Job No. and remedial action for any cylinder recalled under such circumstances, will be noted on a new work sheet. The new work sheet and the original work sheet shall be stapled together.

# 18. Rejection and rendering equipment unserviceable

Only those cylinders found to be in a satisfactory condition and with defects that are within acceptable limits will be returned to service.

Records of failed cylinders or valves will be maintained by the test centre using IDEST Form D035 – “Record of Failed Cylinders and Valves”, and MUST be reported each quarter to IDEST Administration using IDEST Form D037 – “Quarterly Failure Report”

## 18.1 Segregation and Destruction of condemned CYLINDERS

Example:

1. The customer is informed of the requirement to destroy condemned cylinders on the booking-in form (D078) See end of section 6.
2. The customer is required to sign to this effect.
3. All cylinder details will be recorded on the worksheet.
4. The reason for failure will be recorded on the worksheet.
5. The word **FAILED** will be written indelibly on the side of the cylinder.
6. The cylinder will be consigned to await destruction.
7. The following methods may be used for rendering cylinders unserviceable:
   1. crushing or shredding the entire cylinder by mechanical means.
   2. burning an irregular hole in the top dome equivalent in area to approximately 10 % of the area of the top dome or, in the case of a thin-walled cylinder, piercing in at least three adjacent places.
   3. jagged cutting of the neck and shoulder.
   4. irregular cutting of the cylinder in two or more pieces including the shoulder.
   5. bursting using a safe method.
8. The pieces of destroyed cylinder will be consigned to scrap and not returned to the customer.
9. The failed cylinder details will be recorded on D035 “Record of Failed Cylinders and Valves”.
10. The failed cylinder details will be reported quarterly to IDEST Administration Office by submitting on D037 “Quarterly Failure Report”

## 18.2 Segregation and Destruction of condemned VALVES

Procedure and system of working to ensure that condemned Valves are segregated and their destruction recorded.

The customer is informed of the requirement to destroy condemned valves on the booking in form. **See 6.1**. The customer is required to sign to this effect.

1. All Valve details will be recorded on the work sheet **See 6.2**
2. The reason for failure will be recorded on the worksheet
3. The word FAILED will be written indelibly in the side of the Valve.
4. The Valve will be consigned to a separate area of the workshop to await destruction.
5. Either the Valve will be cut in two pieces or saw cut made into the face or the O-ring groove or DIN threads.
6. The pieces of the destroyed cylinder will be consigned to scrap.

## 18.3 Return of Failed cylinders

Procedure to prevent the return of cylinders without valves to members of the public:

Example

The average customer has neither the knowledge nor the equipment to ensure that valves are correctly and safely matched to a cylinder. Therefore, it is the policy of this centre not to sell valves to customers. The following procedure will be followed when such requests are received:

* Sales staff will advise the customer that it is company policy not to sell cylinder valves for self/home/DIY installation.
* Sales staff will advise the customer that the valves in pressure vessels are under considerable stress and are easily mixed up with possible fatal consequences. For their own safety, and those who fill cylinders valves must be checked with calibrated gauges by a qualified technician.
* The customer will be offered the opportunity to bring their cylinder to the test centre to have its neck threads gauged and a compatible valve fitted at no extra charge.

If a rejected cylinder cannot be recovered:

* the owner shall be notified, and the cylinder shall be condemned.
* If the owner agrees, the testing facility shall render the cylinder unserviceable as in 18.1.
* If the owner does not agree with this disposition, at a minimum the markings (e.g. UN marking) that allow the cylinder for legal transport in the country where it is periodically inspected and tested shall be made illegible.
* In case of any disagreement, the customer should be referred to the disclaimer section, agreed as a condition of contract and signed by the customer on the booking in form (ref specimen form **6.1**)

# 19. Centre Operational Procedures

## 19.1 Procedure to produce a gauge comparison chart

Example

The hydraulic test rig Working gauge will have its calibration checked against the Master gauge every month. The following procedure is used to produce the required chart:

* Enter the left-hand column of the form contained at the end of this section.
* Plug the outlet from the test manifold and open the valve to the master gauge.
* Start the pump and raise the pressure reading on the Master gauge in steps equal to the differences recorded on the calibration chart.
* At each step, note the reading from the Working gauge in the ’rising’ column of the chart.
* This procedure must be done for both ‘rising’ pressures and for ‘falling’ pressures. The readings for the ‘falling’ pressures recorded in the ‘falling’ column of the chart.
* When the calibration chart is complete, depressurise and isolate the Master gauge.
* The produced calibration chart must be affixed to the wall alongside the working gauge and in plain sight of the technician carrying out the test.
* When carrying out a test, apply the appropriate correction obtained from the calibration chart to the reading on the Working gauge to obtain an accurate reading.
* Previous calibration charts must be filed in a separate folder for future comparison.

## 19.2 Calibration procedures traceable to National Standards.

Example:

The following Calibration Laboratory has been identified to conduct IDEST/UKAS accredited calibration.

Company Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Address : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Telephone : \_\_\_\_\_\_\_\_\_\_\_\_

1. Thread gauges
2. Master pressure gauge
3. Torque wrench
4. Scales (if required)

Note: Not all items listed in 1 to 4 above can necessarily be calibrated by the same laboratory. Use a separate sheet for each calibration laboratory.

The Calibration certificate must be issued by a UKAS accredited calibration laboratory in accordance with BS EN ISO 17025 accreditation.

This centre acknowledges that Certification to BS EN ISO 9001 or a Manufactures Certificate of Conformity (CofC) are not acceptable.

## 19.3 Procedure for inspection and maintenance log.

Example:

* A formal inspection of all tools in use will be made on a monthly basis and the results logged and retained as part of the centre’s records.
* All equipment and tools will be inspected prior to use.
* Defects and deficiencies will be rectified before the equipment/tool is used.
* Where a defect is beyond in-house maintenance, arrangements will be made either to send the equipment to the manufacturer/specialist, or to arrange on-site service/repair.
* Defective equipment will be either repaired or replaced.

## 19.4 Customer relations policy

The following is a statement of our customer relations policy and procedures.

Example:

**POLICY**

* Copies of this document will be available to all staff members. All staff members will read the contents of this document and its contents will be explained as required.
* Company policy towards customers both internal and external is as follows:
* To provide the best possible service to customers and their representatives.
* To avoid personal animosity, respect other's culture, religion, race, sex, and age.
* To be helpful and polite in dealing with the customer regardless of situation or context.
* Where difficulties arise, staff will ensure that management are informed or consulted explaining the problem accurately and steps taken to rectify the situation.
* Management will ensure that where a customer's problems cannot be resolved by staff that they will take personal charge to conclude the matter.
* Management will ensure that all staff members are made aware of the company policy regarding customer relations and customers rights under the law.

## 19.5 CUSTOMERS REQUESTS

* Customer requests will be dealt with promptly.
* Where a customer requests completion of work for a particular date, all efforts will be made to meet that date with due regard to other priorities, schedules and availability of materials.
* Customers will be given a realistic date of completion of work.
* Where an agreed completion date cannot subsequently be met, the customer will be offered an alternative solution wherever possible

*(e g., loan of a cylinder)* and a new completion date agreed.

## 19.6 Communication

* Staff will pass information to and from customers and others (staff, management and other customers) accurately and promptly.
* Promises made to customers will be followed up and every effort made to honour such promises.
* Where something promised to a customer cannot be fulfilled in the stated time or manner, the customer will be contacted as soon as practicable and an alternative offered to mutual satisfaction.

## 19.7 BOOKING-OUT PROCEDURE

* On completion of the work, the technician will price the work and all materials, which will be detailed on the Booking-in Form.
* Staff shall ensure that the Quality Assurance requirements have been satisfied before returning goods to the customer.
* Staff shall ensure that any comments/recommendations from the technician about the customer’s goods are communicated to the customer.
* The customer must sign the acceptance part of the Booking-in Form.
* Where goods are collected by someone other than the owner, their name and address must be clearly recorded on the Booking-in Form.

## 19.8 Complaints procedure

* Regardless of the nature of a complaint or the ability of staff to resolve the issue, all complaints must be reported to management *(on the appropriate form?)* immediately.
* All complaints shall be dealt with as quickly as possible, to maintain the good will of the customer.
* Where the cause of the complaint requires investigation, all efforts will be made to carry out that investigation immediately. Where this is not possible then the investigation will be carried out at the earliest possible opportunity.
* Where an investigation cannot be carried out in-house or the manufacturer is involved, the goods must be despatched immediately.
* In all circumstances, the customer will be informed about actions taken and the time scale involved.
* Where the subject of the complaint is clearly the responsibility of the company, staff will immediately take steps to resolve the problem to the satisfaction of the customer and with due regard to the customer’s statutory rights.
* In circumstances where staff are unable to resolve the problem or the customer is unwilling or unable to accept the solution offered, the problem must be reported immediately to management.

**Note:** In all circumstances the key to resolving customer complaints can be defined as follows:

**Quick reaction**

**Positive action**

**Keep the customer informed**

## 19.9 The following workshop safety procedure will be adhered to

Example:

## 19.10 COMPANY SAFETY POLICY

Company safety policy will be adhered to and applicable sections of Health and Safety at Work etc act 1974 applied.

In an emergency, the first priority of all operatives is to minimise injury to themselves, co-workers and the public.

Only if the operative is sure there is no personal risk shall they take remedial action.

## 19.11 SAFE WORKING PRACTICES

It is required that all operations are carried out in a safe manner and in accordance with company policy and procedures and with due regard to British Standards, Health and Safety at Work etc act 197, Factories Act, other statutory requirements, and industry norms. All work will be carried out in a safe manner; staff must not put themselves, colleagues or the public at risk.

## 19.12 COMPRESSED AIR HAZARD

Compressed air is potentially dangerous; staff will observe the following precautions whenever working with tools, rotating equipment and compressed air:

* Wear eye, face, hand and ear protection as appropriate.

## 19.13 Lifting heavy objects

SCUBA cylinders are heavy and that weight is considerably increased during hydraulic testing. For example, a 15 litre SCUBA cylinder full of water can weigh as much as 30 kg. This is more than can be handled safely by a single individual.

* Use lifting equipment or manpower appropriate to the weight.
* Wear foot protection.

## 19.14 ACCESS AND OBSTRUCTION

All working areas, entrance and exit doors will be kept clear and free from obstructions. Floor and workbenches will be kept clean and tidy. Spillage will be cleaned up and slippery surfaces allowed to dry, sanded, or similar.

## 19.15 SAFETY FEATURES/PROTECTIVE DEVICES

Over pressure relief devices and limit switches are provided for the protection of personnel and equipment.

Protective devices, etc. will be checked on a regular basis to prove their correct operation.

When maintenance operations are undertaken, before returning equipment to service, all protective devices will be proven to manufacturers' specification.

Where test equipment incorporates safety features, the safety devices will be checked on a regular basis for correct function.

Due note shall be taken of the Pressure Systems Regulations, (written scheme of examination) and manufacturers’ test procedures.

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