Pressure Test Bays

Option A-Permanent Structured Test Bay

These Test Bays are normally constructed in either a new build workshop or an existing facility that is upgrading the existing pressure test capabilities and to meet client contract commitments.
Blue Manta would work alongside the client from the outset to ensure that all design and construction are suitable for the clients requirements.

Specifications and Details:

Permanent Constructed Pressure Test Bay

The pressure test bay must be a full enclosure of convenient dimension to house the equipment to be tested.

The minimum length of the pressure test bay must be based on the consideration of the maximum length of the tool to be tested.

The width of the bay should be designed so as to allow a forklift in along with the equipment to be tested. Even if there is a provision for an overhead crane, this should be considered in the event the overhead crane does not work.

Note that a larger room allows testing of several items connected together, with considerable time savings

Design features are to be based on calculation for 25,000 psi maximum test pressure or to whatever customer requirements are.

Working Pressure	Test Pressure	Acceptable Threads
7,500psi	10,000psi	NPT
10,000psi	15,000psi	Autoclave Medium Pressure
15,000psi	20,000psi	Autoclave Medium Pressure
20,000psi	30,000psi	Autoclave Medium Pressure
25,000psi	30,000psi	Autoclave High Pressure

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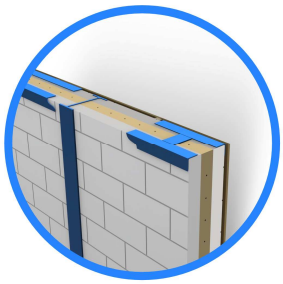
Option A-Permanent Structured Test Bay

Construction

For the construction the walls can be either at least 200 mm of concrete with reinforcing rods or of two thicknesses of high-strength solid bricks with a cemented reinforcing wire mesh between the two brick layers.



Internal side of the walls should be lined with energy-absorbing material such as wood or compressed wood fibre panels of at least 7/8 in.

The floor of the test area should be of concrete at least 200 mm thick with proper drainage and slope to permit easy evacuation of any spilled fluid. The floor areas around the vices must be covered with nonslip coating or industrial matting. Proper provision must be made to anchor blind flanges, vises and stands to secure the equipment during testing.

Sump

A sump complete with filter system must be present to be able to collect and trap all fluids being used for testing and a small sump pump is required to drain all fluids from sump to recycle the same fluid for test purposes

Doors

The doors must connect the four walls into a continuous barrier. One or two doors positioned at the short ends of a rectangular enclosure are recommended for the equipment. The door must span the entire width to allow the forklift inside if the overhead crane is not working. Doors should be preferably mounted on rollers with a automatic latch when closed. The door(s) must be made from successive layers of steel and wood.

Doors must have two layers of steel of at least 0.25 in. [6 mm] thick with energy-absorbing material, such as wood or compressed wood fibre panels of at least 7/8 in. inserted between the steel layers

Windows and Inspection Hatches

Direct viewing of the equipment under test is permitted only through a bulletproof glass window.

Pressure Test Unit

The pressure test unit consists of a high-pressure pump (normally air-operated) and a control panel. The high-pressure pump must be located inside the test bay. The control panel is located outside the safety enclosure, close to the viewing hatch or CCTV monitor. It houses the pump controls, a pressure gauge and pressure recorder monitoring the test pressure, indicators and safety devices.

No high pressure fittings need be in the control room. The pressure sensors will be electronic.

The fittings for test pumps and equipment must be equal to or higher than the rating of the highest pressure pump in the system.

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Safety Devices

The door locks must be interlocked with the pump air supply and the pump bleed-off system, so that initial pressure cannot be applied unless the doors are locked. The door lock is completely released only when the pressure is totally bled off, preventing access inside the enclosure when the tested piece is under pressure.

A pressure switch turns on a flashing light or lighted flashing warning sign as soon as pump pressure is applied.

Cameras

There must be a minimum of two cameras. The first camera must be along any of the longitudinal walls. This camera must be fixed and have the capability to move up, down, left, right, and zoom and light the area if needed. Ideally, if it has the flexibility to travel up and down the height of the wall would be an improvement.

The second needs to be mounted on the wall opposite and parallel of the main door and at the same height as the vice. The camera needs to be fixed and have the capability to zoom in and light the area if needed

Fittings and Lines

The WP of all fittings and lines in the test bay must be equal to or higher than the highest pressure pump in the system. Therefore, the test bay's permanent equipment must have connections rated for the highest test pressure with a 1.5 Safety Factor hence: the permanent equipment requires premium type fittings (e.g., Autoclave fittings).

Test Fixtures, Caps and Test Plugs

All test fixtures, caps and test plugs must be used only in the pressure test bay and must be clearly marked with:

- Working Pressure
- Maximum Test Pressure
- Local identification number
- FOR SHOP USE ONLY – not for offshore / rig location use

Adapters, blanking plugs and test plugs must have full traceability and must have a working pressure rating greater than or equal to the working pressure of the equipment to be tested. A full list of test fixtures referenced with individual identification number and ratings must be kept next to the pressure bay control panel.

All test fixtures, caps and test plugs must be certified at a minimum frequency of 1 year or according to the manufacture's specifications, whichever is lower. The frequency of the usage can call for more stringent requirement which must be decided by the individual location. At a minimum visual inspection must be performed before and after each usage for any signs of damage on the body or the threads.

Gauges and Recorders

Gauges used on the test unit control panel must have a range such that routine measurements are performed in the 25 percent to 75 percent full-scale range. Accuracy and resolution should be at least 0.5 percent of full scale. Gauges and recorders must be calibrated at regular intervals according to the manufacturers' specifications. All gauges and recorders must be certified at a minimum frequency of 6 months or per the manufacture's specifications, whichever is less. The frequency of the usage can call for more stringent requirement which must be decided by the individual location.

Pressure Test Records

Pressure tests must be recorded, showing time, using a hard copy device. Either
a circular plot from a pressure recorder or a hard copy log from a computer device can be used. If a chart recorder is used, it must be fitted with a clock rotation speed appropriate for the duration of the test. 2 to 4 hour clocks are recommended for the standard 3 to 15 minutes hydrostatic tests.

Hard copy plots must be retained in the equipment quality file. The hard copy plot must be marked with the following information

- Identification of equipment tested (All items of equipment must be listed.)
- Identification of pressure measuring/recording device
- Type of test (annual, major, operational)
- Test fluid (optional)
- Test Pressure
- Result of tests and remarks
- Date of test
- Name and signature of tester or of supervisor
- Name and signature of third party witness (when required)

Pressure Data Logger

Specifically designed for harsh workshop environments, the brush finished stainless steel unit incorporates a high brightness 17" TFT display and is operated from a fully sealed IP67 keyboard and pointer device (optional touch screen version available).

Features:

- IP65/67 Sealed Unit
- Large 17" TFT Display
- Slim Robust Stainless Steel Construction
- Industrial Grade' Components
- Proven 'Rugged Laptop Style' Hard Disk Drive
- Standard Operating System – IT supported
- USB & Serial ports
- Network ready
- Auto Voltage Supply Input
- Suitable for all climates

Option A-Permanent Structured Test Bay

Test Bay Quality File

A test bay must have a quality file, containing:

- Manufacturer's bulletins for all test equipment
- A list of all test fixtures and adapters with their pressure ratings
- Certification and traceability documents for all the test bay pressure equipment as required
- Calibration certificates for the pressure gauges
- A schematic drawing of the pressure bay setup and of the safety interlocks
- Detailed test procedures and safety instructions.

All testing equipment must be tagged with the following information:

- Last test pressure and date
- Company performing third party testing
- Date of recertification