Inspectorate for Diving Equipment Servicing and Testing
Tel: +44 (0)1883 622690 Accredited ISO/IEC 17024:2012

Technical Information

MIS-MATCH OF CYLINDER VALVES *T008*

Guidance on cylinder/valve mismatches by PRESSURE

Several IDEST Test Centres have recently reported in 2016 of receiving from manufacturers 232 bar valves to fit into 300 bar cylinders. This has raised some concerns since there is clearly an incompatibility issue.

Type 1 - 232 bar valve in a 300 bar cylinder

In this instance the rating for the valve is below that of the cylinder. Although the threads can be compatible at perhaps M25 x 2 the pressure rating is not. Manufacturers place a rating on the valve based on the maximum safe pressure that the valve will operate at. To subject such a valve to a further 68 bar (29%) would be considered unsound engineering practice. This configuration would also allow the owner to fill their cylinder to 300 bar, however, due to the outlet fitting only a 232 bar rated regulator could be fitted. This can further cause issues as a 232 bar rated regulator is being subjected to a higher pressures than it is designed for. Hoses on the regulator system may also not be rated to this higher pressure thus being a potential source of unsafe diving practices.

Type 2 – 300 bar valves in a 232 cylinder

The outlet configuration of a 300 bar valve is completely different to that of a 232 bar rated valve. This 300 bar outlet design was introduced as a safety measure so that owners could not connect a 232 bar whip to a 300 bar cylinder.
Dive centre staff filling cylinders would identify that the valve outlet was rated at 300 bar and probably fill the cylinder to 300 bar as a consequence. Checking the working pressure of the cylinder at the time of filling may not be done so there is a risk of over-charging the cylinder by a further 29%.

Conclusion

There is clearly an incompatibility issue which raises concerns over safety of the fillers and owners, not to mention unsound engineering practice. There is no guidance in any British or European Standards on such a mismatch, however, in BS EN 5430, BS EN 1802 and BS EN 1968 there is the phrase ***'The appropriate valve shall be fitted to the cylinder…'***.

The HSE, in their **Diving Information Sheet No 10**, state that ***'Mixing these standards is considered unsound engineering practice',*** when they are referring to valves being manufactured to two different standards and being fitted to incompatible cylinder neck forms. In the event of an accident the HSE would consider this mismatch as '**unsound engineering practice'.**

IDEST Safety Sticker – FOC

To address, but not solve, this potential safety issue IDEST has designed and printed the following sticker. Please contact the Admin Office for a supply of **20 stickers FOC.**

Technical Information Sheet