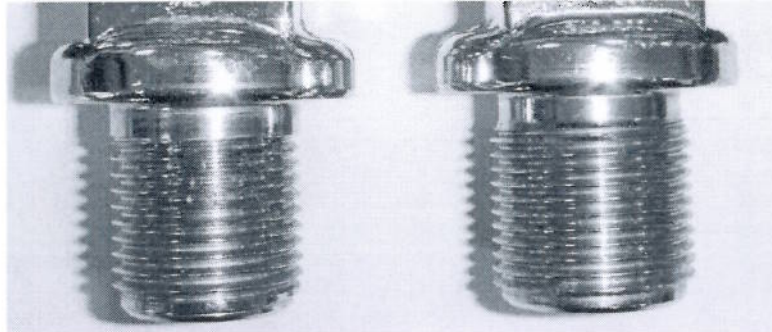


## Mismatching Valve Threads



M25 and G3/4 Valve Threads

There have been several incidents where the threads of diving cylinder valves have failed during charging. This has resulted in the valve being discharged from the cylinder with considerable force often causing injury. The cause of these failures is often due to the valve and cylinder having incompatible thread forms. The force exerted at the base of the valve of an “average” SCUBA cylinder is in the order of several thousand kilograms. Significant injury can be inflicted by a valve that is discharged from a cylinder with this magnitude of force.

Threads are commonly made to two different standards:- BS 3643 (25 mm parallel thread) and ISO 228 (G3/4 inch parallel thread) (although there are others). As can be seen in the photo, the 2 types of thread appear similar. Unfortunately it is possible for a 25mm threaded valve to be inserted into a G3/4 inch threaded cylinder neck.

**Mismatched threads will often survive several fills before failing.**

When being fitted, parallel threaded valves should screw in smoothly without binding or feeling loose. However, a 25mm valve stem when inserted into a G3/4 inch cylinder neck will feel very loose until the valve is screwed in about half way. At this point the threads begin to bind and excessive force is then required to fully screw the valve home. To the inexperienced the resulting connection would appear robust.

Specialist thread gauges should be used to check that threads on valves and cylinder necks are compatible. Additionally, it is important that the valves are tightened to the torque specified in the applicable standards or manufacturer’s instructions. Too little torque can lead to the valve working loose, whereas excessive torque damages the threads and weakens the integrity of the connection.

Valves should not be fitted, or re fitted, into diving cylinders without confirmation by a competent person that the threads of both the valve stem and the cylinder neck are undamaged, within their tolerances and are compatible. Valves should then be fitted using the correct tools to the correct torque value.

More information on the fitting of cylinder valves can be found in Diving Information Sheet no 10: <http://www.hse.gov.uk/pubns/diveindx.htm>