Weldability

SAFETY PRECAUTIONS AND RECOMMENDED PROCEDURES FOR WELDING AND CUTTING EQUIPMENT

Rubber Hose

Use only hose in good condition, fitted with special hose connections attached by permanent ferrules. Do not expose the hose to heat, traffic, slag and sparks from welding and cutting operations, oil or grease. Scrap it as soon as it becomes leaky. Good hose will re-pay the cost many times by long life, safe operation and elimination of waste through leaks.

Pressure Regulator

Always treat a regulator as a precision instrument. Do not expose it to knocks, jars or violent pressure caused by the sudden opening of the cylinder valve. Release the pressure on the control spring when shutting down. Never use a regulator on any gas except that for which it was designed. Do not use regulators with broken gauges.

Blowpipes/Cutters

For lighting up and extinguishing any type of blowpipe the maker's instructions should always be followed. To clean the nozzle use the manufacturer's nozzle cleaner set.

Goggles

Goggles should be worn at all times during welding and cutting.

ASSEMBLY OF EQUIPMENT

1. Stand both cylinders vertically. Oxygen cylinders are painted black. Acetylene cylinders are painted maroon, and Propane cylinders ate painted red.

2. See that jointing surfaces in cylinder valves and regulators are FREE FROM OIL AND GREASE.

3. Open the valve on the oxygen cylinder momentarily in order to snift the cylinder valve, dislodging dirt or obstructions, then close valve.

4. Open the fuel gas cylinder valve as in item 3.

5. Screw the oxygen regulator into the oxygen cylinder valve. The cylinder valve and the regulator inlet stem, and the regulator outlet connection have a right-hand screwed thread.

6. Screw the fuel gas regulator into the gas cylinder valve. The cylinder valve, the regulator inlet and the regulator outlet have left-hand screwed threads.

7. Tighten the regulator into the cylinder valve. Do not use excessive force, but make certain that the joints are gas-tight.

8. Connect the hose to the screwed outlets of the regulators by means of the screwed connections secured in the ends of the hose. Blow the hose through before attaching to regulator or to blowpipe in order to remove dust or dirt, or chalk when the hose is new. OXYGEN MUST NOT BE USED FOR THIS PURPOSE.

9. Connect the other end of the hose, that fitted with a hose check valve: to the blowpipe, the fuel gas hose to the left-hand connection, the oxygen hose to the right-hand connection. Keep the blowpipe control valves closed.

10. Fit the appropriate sized nozzle to the blowpipe. To obtain best possible results from **Weldability** blowpipes always use **Weldability** precision nozzles.

LIGHTING-UP PROCEDURE

Welding Blowpipe.

11. Open the cylinder valves slowly by means of the cylinder key. Do not open suddenly or there may be serious damage to the regulator and the possibility of an accident. Open the cylinder valves spindle one turn only. Open the fuel gas control valve on the blowpipe and adjust the regulator to give the correct working pressure (this ensures that any air or oxygen is purged from the hose).

Repeat the above procedure for the oxygen side.

12. a. Open the fuel gas control valve and light gas preferably by means of a **Weldability** sparklighter making sure that the sparklighter is held at right angles to the nozzle.

    b. Reduce or increase the acetylene supply to the blowpipe valve until the flame just ceases to smoke.

    c. Slowly turn on the oxygen by the blowpipe control valve until the white inner cone in the flame is sharply defined with the merest trace of an acetylene haze. The blowpipe is now correctly adjusted for welding.

Cutting Blowpipe.

a. Proceed with assembly of the equipment exactly as outlined for the Welding Equipment, but remember the following points.

b. After fitting the correct size cutting nozzle, open the cylinder valves and after purging both hoses, set the working oxygen pressure on the regulator with the oxygen passing through the cutting oxygen valve on the cutter, hence out through the nozzle. Shut all the valves on the blowpipe, open the fuel gas valve slowly and ignite the gas. Open the heating oxygen valve on the cutter slowly, and adjust the flame to neutral. Now depress the cutting oxygen lever and again adjust the heating gas controls to give a neutral flame. Depress the cutting oxygen lever, and the cutter is ready for use. These instructions apply to the nozzle mix type cutters since these are of the most modern design.

c. When cutting with a combined welding/ cutting torch, the oxygen valve on the shank should remain fully open and all adjustments to the oxygen stream made with the oxygen valve on the cutting attachment, as detailed in **b** above.

CLOSING-DOWN PROCEDURE

13. a. **Welding Equipment**

Turn off the acetylene first by the blowpipe control valve and then the oxygen. Close the cylinder valves. Open the blowpipe valves one at a time to release the pressure in the hose, i.e. open the oxygen valve and close it; open the fuel gas valve and close it. Unscrew the pressure regulating screws on the oxygen and acetylene regulators.

b. **Cutting Blowpipes**

On completion of the work, close the oxygen cutting valve, then the fuel gas and heating oxygen valves. Close the cylinder valves, open and close the cutter, oxygen and fuel gas valves one at a time to release pressure in the hose, unscrew the pressure regulating screws on the oxygen and acetylene regulators.

14. It is most important to emphasise the earlier instructions, that prior to re-lighting either the welding blowpipe or the cutter, the hoses must be purged to ensure a pure and adequate supply of oxygen/fuel gas.

Back-fires may occur by one of a combination of circumstances, e.g. defective equipment, incorrect gas pressures, incorrect lighting-up procedure or careless handling of the blowpipe in use, such as permitting the nozzle to touch the work, overheating the tip of the nozzle, or working with a loose nozzle.

Usually the back-fire is arrested at the injector in case of low pressure equipment or the source where the gases are mixed, e.g. the head of the cutting blowpipe, and if prompt action is taken in turning off first the oxygen, and then the fuel gas valve, no damage occurs and the blowpipe may be re-lit as soon as the cause of the trouble has been eliminated.

In some cases, however, a back-fire may pass beyond the torch and go back into either the oxygen or the fuel gas hoses; it is then termed a 'flash-back' and its effect is more serious in that it may result in immediate damage to hoses and regulators. In extreme cases there is also a possibility of injury to the operator. The outward signs of a flash-back may be a squealing or hissing noise; sparks coming out of the nozzle; heavy black smoke; or the blowpipe handle may get hot. If the flame burns back far enough it may even burst through the hose.

Both blow-backs and flash-backs can be avoided by adherence to recommended procedure in the case of equipment. Investigation shows that such occurrences often occur purely through over-familiarity leading eventually to neglect of ordinary safeguards. For example, the blowpipe, on lighting, may have incorrect regulator pressure settings, or a light being applied before the flow of fuel gas is properly established.

If the flame snaps out when the blowpipe is in use it is because:—

a. The regulator pressure and/or gas flow, are incorrect — they are either too high or too low.

b. The nozzle has been obstructed.

c. The nozzle is held too close to the work.

d. The nozzle has become overheated.

When this happens, completely shut both the blowpipe valves, check the regulator setting, cylinder pressures, and re-light in accordance with the procedure. In the case of 'd', close the acetylene valve, reduce oxygen flow to a trickle, and plunge the nozzle and head into cold water.

Hose Check Valves

The hose check valve is a safeguard which will operate independently and without attention from the operator. This device is essentially a non-return valve, the purpose of which is to prevent back feeding or the reverse flow of gases, it must in all cases be fitted to the inlet connections of the blowpipe.

Flash-Back Arrestors

The **Weldability** flash-back arrestor is a device to be fitted on the outlet of a regulator or manifold. It contains:

- Non Return Valve (prevents reverse flow of gases)
- Flash-back extinguisher
- Gas shut-off

The non-return valve prevents gas from flowing in the wrong direction i.e. from torch to the gas source.

The flash-back extinguisher stops and extinguishes a back-fire in the event of a flash-back.

The gas shut-off interrupts the supply of fresh oxygen and fuel gas to the torch.

PLEASE ENSURE THESE INSTRUCTIONS ARE GIVEN TO THE OPERATOR

Ref.: MSDS041