I am **invisible ... !**

I am **silent ... !**

I have **no smell ... !**

I help to **burn fiercely ... !**

Hazard !
Oxygen Enrichment

Oxygen Enrichment – A Critical and Hazardous Situation

Common risks & hazards – Be aware and be safe!

The air we breathe contains about 21% oxygen. Without oxygen we would die in a matter of minutes. It may be hard to believe, but oxygen can be also dangerous! Every year several incidents are reported where workers' oxygen enriched clothing catch fire. Fires in oxygen enriched atmosphere start easily and are very intense, so the people suffer very serious burns, which are often fatal.

Cause & Effect

Most cases of injury caused by fire in oxygen enriched atmospheres are the result of failure of safety procedures. Most failures follow a familiar pattern and reveal:

- Incorrectly applied working procedures
- Insufficient training and supervision
- Inadequate management controls

Know the Hazard of Oxygen Enriched Atmosphere

- Oxygen gives no warning – the human senses do not detect oxygen enrichment
- Normally, air contains 21% oxygen, but becomes hazardous when the concentration increases. There is no sharp limit even a few percent more increases the hazard.
- Clothing and hair can easily catch fire in an O_2 enriched atmosphere
- Textiles can burn fiercely when they are enriched with oxygen
- Clothing, skin and equipment should be free of oil or grease
- Don't smoke or use open fire, ignition will start immediately

Observe the regulations – Know your responsibilities

Oxygen enrichment is often the result of:

- Leaks from damaged or poorly maintained equipment
- Leaks from poor connections
- Opening valves deliberately or accidentally
- Using an excess of oxygen in welding, flame cutting or similar process
- Poor ventilation where oxygen is being used

Before entering a confined space, a safe system of work must ensure workers are not exposed to oxygen enriched atmosphere.
A safe system of work would typically be in the form of a comprehensive "permit to work" and would include considerations of:

- Risk assessment and method statements
- Physical isolations
- Safe access and egress
- Gas oxygen monitoring
- Standby man and rescue equipment
- Fire fighting equipment

Improper Use of Oxygen:

- Powering pneumatic tools
- Inflating vehicle tyres, rubber boats etc.
- Cooling or freshening air in confined spaces
- Cooling persons
- Replacing air or inert gas
- Pressurising and purging systems
- Dusting benches, machinery or clothing
- Starting diesel engines

Never use oxygen in equipment not designed for it!

For further information visit

www.eiga.org

This leaflet contains only a summary of the hazards with an oxygen enriched atmosphere and methods that can be used to control the risks in the workplace.

Visit the EIGA website to obtain free downloads of the following important documents:

EIGA SAG NL 79/04	- The hazards of oxygen enriched atmosphere
EIGA TP 12/05	- Fire hazards of oxygen enriched atmospheres
IGC Doc 4/00	- Fire hazards of oxygen and oxygen enriched atmospheres
IGC Doc 10/81	- Reciprocating compressors for oxygen service (under revision)
IGC Doc 27/01	- Centrifugal compressors for oxygen service
IGC Doc 33/97	- Cleaning of equipment for oxygen service

Additionally, the following documents contain important information and can be purchased, see www.bcga.co.uk

BCGA Report TR1, 1984	- A method for estimating the offsite risks from bulk storage of liquefied oxygen
BCGA Doc TR2, 1999	- The probability of fatality in oxygen enriched atmospheres due to spillage of liquid oxygen
BCGA Doc GN 5, 1998	- The safe application of oxygen enriched atmospheres when packing food

These will help you to train your staff and create safe systems of work in your operations when using oxygen.

European Industrial Gases Association (AISBL)
Avenue des Arts 3-5
B-1210 Brussels
info@eiga.org - www.eiga.org