



**OXYLANCE SURECUT SYSTEM**  
**EXOTHERMIC CUTTING RODS**  
**READ ALL SAFETY INFORMATION BEFORE USING**

ALL CUTTING OPERATIONS SHOULD BE PERFORMED IN ACCORDANCE WITH O.S.H.A. 29 CFR, STANDARDS 1910.251, 1910.252, AND 1910. 253 AND ANSI Z49.1:1999 . SEE PAGE 2 FOR ANSI Z49 SAFETY CLOTHING REQUIREMENTS. Observe all company safety policies and the safety policies of the company where cutting is being performed, and all local regulations.

**SAFETY: READ ALL SAFETY INFORMATION BEFORE USING SURECUT SYSTEM**

1. **DO NOT OPERATE SURECUT SYSTEM WITHOUT PROPER FIRE RESISTANT CLOTHING. SEE PAGE 2.**
2. **USE ONLY PURE OXYGEN WITH THESE CUTTING RODS. NO OTHER GAS IS REQUIRED.**
3. Inspect all Surecut rods, holders, and oxygen hose for contamination from oil, grease, or other substances that can have a reaction with pure oxygen. **DO NOT USE CONTAMINATED EQUIPMENT.**
4. Check all parts of oxygen system for leaks. **DO NOT USE CUTTING SYSTEM IF LEAKS ARE PRESENT.**
5. Remove all combustible materials from work area or move work to an area free of combustibles. If project cannot be moved or the fire hazard cannot be removed, use a guard or shield to confine heat, sparks, and hot slag from causing a fire. Provide a fire watch and insure that adequate fire extinguishers are available.
6. Insure that material to be cut contains no flammable or explosive material.
7. Insure that material to be cut contains no substances that will create harmful fumes and/or explosive vapors.
8. Provide fresh air breathing equipment and ventilation where dangerous smoke and fumes may be created.
9. **NEVER USE OXYGEN FOR A BREATHING SUPPLY – USE ONLY APPROVED COMPRESSED AIR**

**SINGLE LIQUID OXYGEN CONTAINERS MAY NOT SUPPLY THE REQUIRED VOLUME OF OXYGEN. IT WILL BE NECESSARY TO ADD AN EXTERNAL VAPORIZER OR MANIFOLD TWO (2) LIQUID OXYGEN CONTAINERS TOGETHER. A SINGLE LIQUID OXYGEN TANK WILL SUPPLY 350 TO 400 CFH. CONTINUOUS CUTTING WITH SURECUT RODS CAN USE IN EXCESS OF 500 CFH.**

**STORAGE AND HANDLING:**

**WARNING: EXPLOSIONS OR FIRE CAN OCCUR WHEN OXYGEN CONTACTS SOME SUBSTANCES.**

All Oxylance products are cleaned for Oxygen Service. You **MUST** handle and store Surecut cutting rods and related equipment so they are protected from **contamination from oil, grease, or any substance that may have a reaction with Oxygen.** **NEVER** use any cutting rods, holders, or Oxygen hose that have been contaminated.

**EQUIPMENT REQUIRED**

1. **FIRE RESISTANT PROTECTIVE CLOTHING, APPROVED FOR FLAME CUTTING OPERATIONS, (SEE PAGE 2).**
2. **Eye protection should be a full-face shield and safety goggles (See Page 2 for ANSI Z49 requirements)**
3. Surecut Holder and Surecut Cutting Rods
4. High Flow Oxygen Regulator (One regulator per holder. **NEVER** use multiple Surecut holders on a single regulator)
5. Oxygen system capable of supplying required **VOLUME** and **PRESSURE** for the size rods being used.
6. Oxygen lance hose. Hose I.D. is dependant on length of hose and diameter of Surecut rod being used. The minimum recommended hose diameter is 5/16" I.D. Use 3/8" I.D. for lengths over 100 feet long.
7. Ignition source for igniting Surecut Rods. (12 / 24 volt battery, welding machine or Oxy / Acetylene torch)

**EQUIPMENT SETUP**

1. Place Oxygen Cylinders in a location protected from heat, sparks, and hot slag. Insure that cylinders are secured so they cannot be turned over or damaged by other equipment operating in the area.
2. Route oxygen hose and welding leads to protect them from heat, sparks, and hot slag from the burning operation. Insure oxygen hose and welding leads do not create a trip hazard. Insure hose and leads are protected from damage by other equipment operating in the area. Use an oxygen hose long enough to keep the cutting operation a safe distance from oxygen cylinders.
3. Attach Regulator and Oxygen hose . Turn on oxygen and check system and control valve for leaks. **DO NOT OPERATE IF THERE ARE ANY OXYGEN LEAKS.** Attach welding leads to power source.

**WARNING: DO NOT PERFORM CUTTING OPERATIONS WITHOUT FIRST READING ALL SAFETY MATERIAL ENCLOSED AND REVIEWING OSHA AND ANSI REQUIREMENTS**

The following information on Safety Clothing and Safety in Welding, Cutting and Allied Processes is based on ANSI Z49.1:1999 and OSHA Standard 29 CFR. Portions of this information is reprinted with permission from ANSI / AWS. The complete ANSI Z49 standard is available from Global Engineering at (800) 854-7179, or the American Welding Society, 550 N.W. LeJeune Road, Miami, Florida 33126. For complete copies of OSHA 29 CFR 1910.251, 1910.252, and 1910.253 and all OSHA safety requirements can be downloaded from the World Wide Web at [www.osha-slc.gov](http://www.osha-slc.gov).

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#### **EYE PROTECTION (ANSI Z49.1:1999 Page 6 PARAGRAPH 4.2.1.2)**

**OXY-FUEL GAS CUTTING:** Goggles or other approved eye protection shall be worn during all oxy-fuel gas cutting operations.

**OXYLANCE RECOMMENDATION:** Due to the amount of spatter and slag from exothermic cutting, OxyLance **REQUIRES** either a tinted full-face shield and clear goggles or a clear full-face shield with tinted goggles. The shade of the tint should be 3 or 4 for thin material (under 1"), 4 or 5 for 1" to 6" material, and 5 or 6 for material over 6" thick.

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#### **PROTECTIVE CLOTHING (Based on ANSI Z49.1:1999 PAGE 9 PARAGRAPH 4.3 TO PAGE 10 PARAGRAPH 4.6) TO REDUCE THE POTENTIAL OF PERSONNAL INJURY, ALL UNDER GARMETS SUCH AS WORK SHIRTS AND PANTS SHOULD BE COVERED BY FLAME RESISTANT GARMETS AND SHOULD BE FREE OF GREESE AND OIL.**

1. Clothing shall be selected to minimize the potential for ignition, burning, or trapping hot sparks or slag.
2. Clothing shall provide sufficient coverage, and be made of suitable material to minimize skin burns caused by sparks, spatter or radiation. **OxyLance recommends Aluminized clothing designed for repelling sparks or slag and reflecting the heat away from the operator.**
3. **Gloves:** All Surecut operators shall wear protective flame-resistant gloves. **OxyLance recommends Aluminized Kevlar gloves for the best possible protection. DO NOT USE CLOTH OR THIN LEATHER GLOVES SUCH AS TIG WELDING OR GARDENING TYPE GLOVES.**
4. **Jackets:** Durable flame-resistant jackets shall be worn to protect the front of the body. **OxyLance recommends an Aluminized Kevlar Jacket for the best protection from sparks or slag and for its ability to reflect heat away from the operator.**
5. **Leggings:** Flame-resistant leggings or other equivalent means shall be used to give added protection to the legs. **OxyLance recommends Aluminized Kevlar Leggings for the best protection from sparks or slag and for reflecting heat away from the operator.**
6. **Capes and Sleeves:** Cape sleeves or shoulder covers with bibs made of leather or other flame-resistant material shall be worn during cutting operations. **OxyLance recommends an Aluminized Kevlar Jacket for its ability to deflect sparks or slag and to reflect heat away from the operator.**
7. **Other Protective Clothing:** Properly fitted flame-resistant plugs in the ear canals, or equivalent protection, shall be used where hazards to the ear canals exist. Caps made from flame resistant material shall be worn under helmets, when necessary, to prevent head burns.
8. **Noise Control:** Noise shall be controlled at the source when feasible. When control methods fail to bring noise exposure within allowable limits, personal protective devices such as earmuffs or earplugs shall be used.

**Respiratory Protective Equipment:** When controls such as ventilation fail to reduce contaminants to allowable levels or when, implementation of such controls are not feasible, respiratory protective equipment shall be used to protect personnel from hazardous concentrations of airborne contaminants.

1. Only approved respiratory protective equipment shall be used.
2. Whenever the use of respirators is required, a program to establish the proper selection and use of respirators shall be implemented.
3. Compressed air for air supplied respirators or other breathing equipment shall at least meet the Grade D requirements of the Compressed Gas Association ANSI / CGA G-7.1, Commodity Specification for Air. **DO NOT USE OXYGEN FOR BREATHING AIR IN CUTTING AND WELDING APPLICATIONS.**

**TRAINING:** PERSONS PERFORMING CUTTING OPERATIONS SHALL BE TRAINED IN THE PROPER USE OF, AND UNDERSTAND THE REASONS FOR, PROTECTIVE CLOTHING, PROPER EQUIPMENT SET UP AND MAINTAINENCE.

ACCORDING TO TESTING BY OUTSIDE AGENCIES THE SMOKE AND FUMES FROM OXYLANCE THERMIC SURECUT RODS ARE WITHIN ALLOWABLE EXPOSURE LIMITS, **HOWEVER;** THE MATERIAL THAT IS BEING CUT WITH SURECUT RODS MAY CONTAIN, OR BE COVERED WITH, SUBSTANCES THAT PRODUCE HAZADORUS SMOKE AND FUMES. **OPERATORS MUST WEAR RESPIRATORY PROTECTION THAT IS SUITABLE FOR THE MATERIAL BEING CUT.**

FOR A COPY OF THE OXYLANCE MSDS SHEET CALL TOLL FREE (800) 333-9906 OR (205) 322-9906. MSDS SHEETS CAN BE DOWNLOADED FROM OUR WEB PAGE AT, [www.oxyLance.com](http://www.oxyLance.com)

## OPERATING INSTRUCTIONS

1. Purge hose and holder prior to putting Surecut Rod in holder. With holder pointed in a safe direction, slowly crack open oxygen valve and purge hose and holder. Insure full flow with no restrictions.
  2. Adjust Oxygen pressure according to thickness of material to be cut and diameter of Surecut Rod being used.
  3. Surecut rods have a pressed crimp near the holder end. **CRIMPED** end of the rod goes in the holder. **DO NOT OPERATE WITH WRONG END OF ROD IN HOLDER.**
  4. Surecut holders incorporate a brass collet and rubber grommet to seal the rods in the holder. Insert the **CRIMPED** end of rod in the holder. **SURECUT ROD MUST BE INSERTED THROUGH THE BRASS COLLET AND FULLY SEAT AGAINST THE RUBBER GROMMET**
  5. Tighten collet nut until brass collet is fully compressed and rod is secured in holder.
  6. Slowly depress oxygen valve to purge rod and check for Oxygen leaks (**DO NOT LIGHT ROD WITH OXYGEN LEAKS**). Insure oxygen flows freely through rod. **DO NOT ATTEMPT TO LIGHT SURECUT ROD WITH RESTRICTED OR NO OXYGEN FLOW.** Release oxygen control valve completely prior to heating end of rod.
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## IGNITING SURECUT RODS

Igniting Surecut rods can be accomplished with one of the following three methods.

**Igniting with a battery pack (12 or 24 volt) or welding machine (set at 125 amps). Polarity does not matter.**

1. Secure Surecut rod properly in holder
2. Point rod in safe direction
3. Depress the oxygen control valve to purge the rod. Release oxygen control valve
4. Strike the tip of the Surecut rod on the striker plate slowly depress Oxygen control valve
5. As the rod begins to burn remove from striker plate and move to material to be cut

**Lighting Surecut Rods with an Oxy Acetylene or Propane torch**

1. This method will require a helper to light and hold the Oxy Acetylene torch
2. Light the Oxy Acetylene or Propane torch
3. Hold the tip of the Surecut rod in the torch flame until the tip is red hot and slightly molten
4. Slowly depress the Surecut Oxygen control valve until Surecut rod begins to burn on its own
5. Remove the tip of the rod from the flame and begin cutting operation

**IF SURECUT ROD DOES NOT IGNITE**

1. Check Oxygen flow to end of rod. Insure that end of rod is open.
2. Check Oxygen system for proper pressure and volume and that there are no leaks.
3. Correct problem and repeat ignition process, making sure the end of the rod is properly heated.

Cutting can begin as soon as Surecut rod is fully ignited. Rod can be extinguished at any time during cutting operation and can be re-ignited. Check oxygen flow prior to applying heat to the tip of partially burned rod.

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## OXYGEN PRESSURE

Oxygen pressure will vary according to the material to be cut. Pressure range is from 30 psi to 150 psi. Pre set the regulator to the proper pressure and ignite the Surecut Rod. Adjust pressure with Surecut rod burning and oxygen control valve full open. If adequate volume of oxygen is not available, pressure will drop and rod will not burn properly. **DO NOT OPERATE SURECUT RODS WITH LOW OXYGEN PRESSURE OR VOLUME.**

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## CUTTING WITH OXYLANCE SURECUT RODS

Surecut Rods will rapidly cut most ferrous and non-ferrous metals, as well as concrete and refractory. The cutting speed will depend on the material type and its oxidation rate, or its melting temperature. Materials that do not oxidize have to be melted and blown away. Melting and blowing material away will require an increase in oxygen pressure.

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## PIERCING

To pierce thick material, start with the rod at a slight angle to the face of the material to be pierced and allow the material to begin to melt. Gradually reduce the angle until the rod is pointed straight into the base material and work the rod in and out of the hole. Piercing thick material may cause the outer tube to burn back exposing the inner fuel tubes or wires. When piercing, the rod may need to be removed from the hole occasionally to allow the fuel tubes / wires to burn off even with the end of the rod. Oxygen pressure may need to be increased for piercing thick material. Do not exceed the maximum recommended pressure of 150 psi. For material up to 2 inches thick the pressure can be as low as 50 psi for 1/4" rods and 60 to 70 psi for 3/8" rods. Lower pressures will cut slower and result in a smaller diameter hole. Higher pressure will increase the speed of the pierce and will make a slightly larger hole.

## CUTTING TECHNIQUES

For most applications using the drag method of cutting with the tip of the rod pointed back towards the cut will produce the fastest travel speed. Cutting techniques will vary according to the material, thickness, position and direction of cut i.e. flat, vertical, horizontal. For cutting thick material, operator will need to hold the rod nearly perpendicular to the cut and move the rod in and out of the cut in a sawing motion.

For thin material, the rod can be held at a steep angle to the cut and travel much faster. Operator will have to adjust the Rod angle for optimum cutting speed.

For material such as concrete, refractory, and cast iron, the cutting method is to melt the material and then allow the oxygen pressure to blow the molten material away from the cut. Cutting this type of material will be slower than cutting carbon steel, stainless steel or aluminum and requires higher Oxygen pressure. **DO NOT EXCEED MAXIMUM PRESSURE OF 150 psi.**

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## GOUGING

For gouging cracked welds or for removing weld metal that would normally be gouged with a carbon arc process the rod can be pushed into the cut with the rod held almost parallel with the material to be cut. In this type application the Oxygen pressure can be reduced according to the amount of metal to be removed. For small cracks or removing small welds use the 1/4" rod with Oxygen pressure down to 30 to 40 psi. For larger welds or cracks increase Oxygen pressure to 50 to 70 psi. For very deep cracks or heavy welds over 1" use the 3/8" rods and adjust Oxygen pressure according to the amount of material to be removed. Gouges as deep as 1 inch can be accomplished with one pass.

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## SAFETY SUMMARY

1. **ALWAYS** WEAR PROPER FIRE PROOF PROTECTIVE CLOTHING (**SEE PAGE 2**)
  2. **ALWAYS** WEAR PROPER EYE AND FACE PROTECTION (**SEE PAGE 2**)
  3. **NEVER** USE OXYGEN FOR BREATHING – USE ONLY APPROVED COMPRESSED AIR
  4. **ONLY USE PURE OXYGEN WITH SURECUT RODS. DO NOT ATTEMPT TO USE AIR OR ANY OTHER GAS**
  5. **NEVER** OPERATE SURECUT SYSTEM WITH **OXYGEN LEAKS ANYWHERE** IN THE SYSTEM
  6. **NEVER** OPERATE MORE THAN ONE HOLDER PER REGULATOR
  7. **NEVER** OPERATE SURECUT SYSTEM IF REGULATOR AND HOSE ARE FREEZING UP
  8. **NEVER** OPERATE CUTTING SYSTEMS ALONE. ALWAYS HAVE A FIRE WATCH OR SAFETY PERSON STANDING BY TO ASSIST OPERATOR
  9. **NEVER** STORE SURECUT RODS OR RELATED EQUIPMENT WHERE IT CAN BECOME CONTAMINATED WITH OIL, GREASE OR OTHER SUBSTANCES THAT WILL REACT WITH OXYGEN
  10. **DO NOT** USE RODS OR EQUIPMENT THAT ARE CONTAMINATED
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