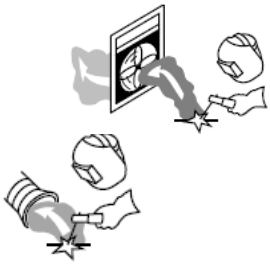
SAFE USE GUIDE
Submerged Arc Flux

Date:	11 MAR 2016
SUG No.	SUG001
Version:	3.0

IMPORTANT. This Guide contains important safety and health information – **READ Both Sides**. **Before welding, please read and understand the Warnings and Instructions on the Product Container and the Safety Data Sheet (SDS), previously MSDS, for the product you are using.** See your Safety Director or Supervisor to obtain a copy of the SDS. You may also obtain a copy of the SDS and sign up to receive update alerts at www.lincolnelectric.com/sds or from your Lincoln Electric Distributor.

WELDING SAFETY

⚠ WARNING

HAZARD	SAFETY PRACTICES
Electric shock can kill 	• Wear dry gloves free of holes or split seams. Change as necessary to keep gloves dry. • Do not touch electrically "hot" parts or welding electrode with bare skin or wet clothing. • Insulate yourself from the work piece and ground using ***dry*** plywood, rubber mats or other dry insulation. • If the area is wet and your body cannot be insulated from work piece with dry insulation, use a semiautomatic, constant-voltage welder or stick welder with voltage reducing device. • Keep electrode holder and cable insulation in good condition. Do not use if insulation is damaged/missing.
Fumes and gases can be dangerous  **See Health Hazards Page 2**	• Read the warnings and instructions on the consumable label and Safety Data Sheet (SDS) available in the workplace (ask your supervisor). Provide additional ventilation and exhaust where special ventilation is needed or if welding in a confined area. • Know what the base metal is, and determine if there is any paint, plating, or coating that could expose you to toxic fumes and/or gases. Remove it from the metal being welded, if possible. • Position your head away from the welding fume plume to keep the amount of fume you breathe as low as possible.
Use adequate ventilation and/or exhaust 	• Use adequate ventilation and/or exhaust to keep the air you breathe clear and comfortable. Your work area should have enough ventilation and/or local exhaust at the arc to control your exposure to the welding fumes and gases so the applicable exposure limits are not exceeded. If you have any concern about ventilation or your exposure level, ask your employer to confirm that exposures do not exceed those limits by obtaining and analyzing a representative sample of air in the breathing zone. • If you start to feel uncomfortable, dizzy or nauseous, you may be overexposed to fumes and gases, or suffering from oxygen deficiency. Stop welding and get some fresh air immediately. Notify your supervisor and co-workers so the situation can be corrected and other workers can avoid the hazard. Be sure you are following these safe practices, the consumable labeling and SDS and improve the ventilation in your area. Do not resume welding until the situation has been corrected. • Use a respirator if exposure to welding fume cannot be controlled or if welding outside and natural air movement is not enough to keep welding fume out of your breathing zone.
Welding sparks can cause fire or explosion 	• Do not weld on containers which have held combustible materials unless procedures for the safe welding and cutting of such containers are carefully followed (see AWS F4.1). • Remove flammable materials from welding area or shield from sparks & heat. • Keep a fire watch in area during and after welding. • Keep a fire extinguisher in the welding area. • Wear flame resistant clothing and headgear that is free of frayed edges.
Arc rays, sparks & spatter can burn eyes and skin 	• Select a proper filter lens which is comfortable for you while welding. • Always use a helmet when welding. • Wear flame resistant clothing which provides full coverage for your skin while welding. • Use earplugs when welding to keep sparks and spatter from damaging your ears. • Use non-flammable welding screens to protect others.

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DUST & WELDING FUME

Dust from this product: This product contains fluorides, manganese and crystalline silica.

Welding Fume: Submerged Arc Welding produces very small amounts of fume which may contain particles from the consumables, base metal, and base metal coating. These complex particles contain one or more of the constituents listed below. Gases produced when welding may include carbon monoxide, carbon dioxide, fluorine, nitrogen oxides, and ozone which may be produced from ultraviolet radiation from the arc.

HEALTH HAZARDS

Crystalline silica is on the IARC (International Agency for Research on Cancer) and NTP (National Toxicology Program) lists as posing a cancer risk to humans. Respiratory overexposure to crystalline silica present in dust from this flux can cause severe lung damage and silicosis, which can be progressive and may lead to death. Repeated exposure to fluorides may cause excessive calcification of bone and ligaments of the ribs, pelvis and spinal column. May cause skin rash.

Welding fumes may contain compounds which are reported to have the following health effects of overexposure. Listed below are materials with significant potential health effects that are commonly found in welding fume. This list is not specific to any particular welding consumable or process.

- **Barium** overexposure may cause severe stomach pain, slow pulse rate, irregular heartbeat, convulsions, and muscle spasms.
- **Chromium and its compounds** are on the IARC and NTP lists as posing a cancer risk to humans. Some forms of chromium are known or suspected to cause lung cancer in processes other than welding, and asthma has been reported.
- **Cobalt** may cause respiratory irritation, lung damage, asthma, and chronic bronchitis. Skin contact may cause dermatitis.
- **Fluorides** can cause abdominal pain, diarrhea, muscular weakness and convulsions. In extreme cases it can cause loss of consciousness and death. Repeated exposure to fluorides may cause excessive calcification of the bone and calcification of ligaments of the ribs, pelvis and spinal column. May cause skin rash.
- **Manganese** overexposure may affect the brain and central nervous system, resulting in poor coordination, difficulty speaking, and arm or leg tremor. This condition can be irreversible.
- **Nickel** and its compounds are on the IARC and NTP lists as posing respiratory cancer risk, and are skin sensitizers with symptoms ranging from slight itch to severe dermatitis.
- **Silica** overexposure can cause severe lung damage (silicosis or cancer). Crystalline silica is present in submerged arc flux.
- **Titanium dioxide** is listed by IARC as a Group 2B carcinogen (possibly carcinogenic to humans based on animal studies).

Materials used in base metal coatings may include cadmium, lead, zinc and various organic materials which have health effects. Refer to the SDS for the coating being used.

DISPOSAL INFORMATION

Refer to the SDS and contact your Supervisor or Environmental Manager to determine your company's approved waste disposal or recycling procedures for welding products and by-products according to Federal, State and Local regulations.

Important note: Some welding fluxes contain trace levels of Naturally Occurring Radioactive Material (NORM). Based on the radiological status of these materials, the scrap flux and waste slag generated from the use of these fluxes should be acceptable for disposal in RCRA Title D landfills. Consult the applicable regulations and authority with jurisdiction prior to disposal.

REFERENCES

For additional information on welding safety, please refer to www.lincolnelectric.com/safety which contains links to the following, most of which are available free of charge:

- **Safety Data Sheet (SDS)**
- **Lincoln Interactive Welding Safety DVD**
- **Lincoln Safety Publication E205**
- **OSHA Publication 2206** (29CFR1910)
- **ANSI Z49.1** "Safety in Welding, Cutting and Allied Processes"
- **AWS F4.1** "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping"