Material Safety Data

TRW, Inc. - Nelson Stud Welding Division 28th St. & Toledo Ave., Lorain, OH 44055 Tel: 216.245.6931	Emergency Telephone No. **24 Hour** 216.245.6931
Trade Name Carbon Steel Welding Stud	C A S No. 65997-19-5
Chemical Name Steel AISI Codes: 1008, 1010, 1015, 1016, 1018, 1022, 1035, 1038	Synonyms Steel
Prepared By A. L. Lott, Ph.D., CIH	Date of Issue/Revision February 1, 1986

1. Hazardous Ingredients

Material	%	ACGIH (TLV) *	OSHA (PEL) *
Iron	98.6 min.	5.0	10.0
Manganese	1.0 max.	5.0(C) dust 1.0 fume	5.0(C) NE

In its manufactured and shipped state this material is considered non-hazardous. The welding process may liberate metal fumes as well as oxides of carbon and nitrogen.

(C)=Ceiling limit which must not be exceeded any time

*All values are in milligrams per cubic meter of air

2. Physical Data

Appearance Metallic	Odor None	Melt Point ≈2750°F	Specific Gravity NA
Vapor Density (Air = 1) NA	% Volatile By Volume NA	Bulk Density NA	Boiling Point NA
Vapor Pressure NA	% Solubility (H_2O) NA	Evaporation Rate (BuOAc = 1) NA	Other NA

3. Fire and Explosion Hazard Data

Flash Point & Method
NA

Flammable Limits
NA NA
LEL UEL

Extinguishing Media
NA

Special Fire Fighting Procedures
None — Steel products in the solid state present no fire or explosion hazards.

Unusual Fire and Explosion Hazards
At temperatures above the melting point may liberate fumes of iron and manganese oxides.

4. Physiological Effects

LD50 Oral (Ingestion)	LD50 Dermal (Skin Contact)	LC50 (Inhalation)
NE	NE	NE

Primary Route of Exposure	Threshold Limit Value (TLV)
Inhalation of fumes and oxides of carbon and nitrogen generated during the welding process	NE for Steel — See Section 1

Effects of Overexposure

Acute — Inhalation of high concentrations of freshly formed oxide fumes and dusts of iron and other metals whose particle size is in the respirable range can cause an influenza-like illness termed Metal Fume Fever. Typical symptoms last 12 to 48 hours and are characterized by fever, chills, muscle aches, metallic taste in the mouth and irritation of the throat. Overexposure to carbon monoxide may cause headache, dizziness, nausea, weakness, and mental confusion. Overexposure to nitrogen oxides may cause respiratory tract irritation and delayed pulmonary edema.

Chronic — Inhalation of high concentrations of iron oxide over prolonged periods of time may lead to a benign pneumonconiosis (siderosis). Inhalation of high concentrations of ferric oxide over prolonged periods may enhance the development of lung cancer in workers who are exposed to other pulmonary carcinogens and toxins.

Prolonged exposure to high concentrations of manganese dust or fume may result in a central nervous system disorder (manganism). Effects can include speech defects, personality disorders and impairment of gait and equilibrium.

5. Emergency and First Aid Procedures

For overexposure to fumes and particulate matter, remove exposed person to fresh air. If breathing is difficult or has stopped, administer oxygen or artificial respiration as indicated. Seek medical attention promptly.

Metal Fume Fever is normally self-limiting and should be treated symptomatically by a physician.

If particulate matter enters the eye, flush with water for at least 15 minutes. If irritation persists, seek medical attention.

Overexposure to carbon monoxide and nitrogen oxides should be treated symptomatically by a physician.

6. Physical Hazards

During the welding process molten metal is produced. Proper precautions should be taken to avoid contact with molten or hot metal as it can produce severe burns.

7. Special Protection Information

Ventilation

During welding, natural or local exhaust ventilation should be provided to maintain exposures below the limits cited in Section 1. Any welding in confined spaces normally requires local exhaust ventilation. Design details for local ventilation systems maybe found in the latest edition of "Industrial Ventilation: A Manual of Recommended Practices" published by the ACGIH Committee on Industrial Ventilation, P.O. Box 16153, Lansing, MI 48901.

Respiratory

For exposures in excess of those cited in Section 1, by less than a factor of 10, use as a minimum a NIOSH/MSHA ½ face piece respirator with cartridges approved for dusts and fumes with an exposure limit of not less than 0.05 mg/M3. Carbon monoxide and nitrogen oxide exposures are not expected to be a problem unless welding is conducted in a confined space. If exposure to metal fumes and particulates may exceed 10 times the cited limits or, if welding is to be performed in a confined space, consult your resoiratory equipment supplier for selection of the proper equipment.

Eye Protection

Appropriate welding goggles or helmet is recommended for protection against ultraviolet radiation and particulate matter.

Protective Gloves	Other
Protective gloves should be used during welding, burning, grinding, and handling operations.	Appropriate protective clothing to protect against burns from hot or molten metal.

All chemicals should be handled so as to prevent eye contact and excessive or repeated skin contact. Appropriate eye and skin protection should be employed. Inhalation of dusts and vapors should be avoided.

8. Chemical Reactivity

Conditions Causing Instability

NA Stable

Incompatibility (Materials to Avoid)

Strong Acids: Reaction will generate hydrogen

Hazardous Decomposition Products

NA

Special Sensitivity

NA

9. Storage Information

Precautions to be Taken in Handling and Storing

No special precautions necessary. Protection from the elements may be desirable to prevent the formation of rust.

10. Spill, Leak, and Disposal Information

Steps to be Taken in Case Material is Spilled or Released

NA to steel in the solid state. Good housekeeping practices should be employed to avoid accumulations of dust, etc.

EPA RCRA ID Number

NA

Waste Disposal Method

Scrap metal may be reclaimed or disposed of in a landfill in accordance with all local, state and federal regulations.

11. Additional Comments

1 The elements in these steels have not been listed by the I ernational Agency for Research on Cancer (IARC) Monograph or the National Toxicology Program (NIP) as potential carcinogens.

2 This material is designed for use with a ceramic ferrule. C isult the material safety data sheet for the ferrule for the hazards associated with its use.