Material Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 11/20/2006 Reviewed on 11/17/2006

1 Identification of substance

· **Product details**

· **Trade name: UTP 6820 MoLC**
· **Application of the substance / the preparation** electrodes for welding

· **Manufacturer/Supplier:**
Boehler Thyssen Welding USA Inc.

PO Box 721678
HOUSTON, Texas 77272-1678

phone 281 499 1212
fax 281 261 7895

· **Information department:** QS department

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2 Composition/Data on components

· **Chemical characterization**
· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**			
7440-47-3	chromium		10-25%
13463-67-7	titanium dioxide		10-25%
7440-02-0	nickel	Xn, Xi; R 40-43	2.5-10%
471-34-1	calcium carbonate		2.5-10%
7439-98-7	molybdenum		≤2.5%
7439-96-5	manganese	Xn; R 20-48	≤2.5%

· **Additional information:**
Warning: This product contains or produces a chemical known to the state of California to cause cancer.

3 Hazards identification

· **Hazard description:**
General: Different kinds of fume and dust occur during the welding and grinding process. Chromium-VI compounds and nickel oxides might occur, which are classified as carcinogenic. In addition irritant substances such as fluorides and manganese oxides as well as fine dusts (mostly iron oxides) occur. Health Hazards (acute and chronic) Welding electrodes and wires are non-hazardous solids at ambient temperature.
Actual exposure should be determined by monitoring the fume in the operator's breathing zone. Compounds of Chromium and Nickel in the fume should be considered possible carcinogens per OSHA29. CFR 1910. 1200. No clear association, however, has been established between Cr and Ni in welding fume and the development of cancer. Short term overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat or eyes and may aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death.
Long term overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function.
Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement. The primary entry route for welding fumes and gases is by inhalation. Bronchitis and some

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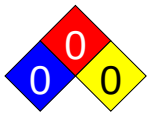
lung fibrosis habe been reported. Repeated exposure to fluorides may cause excessive calcification of the bone and calcification of ligaments of the ribs, pelvis and spinal column. May cause skin rash.
Overexposure to hexavalent chromium and nickel present in welding fume can present the risk of lung cancer, asthma and damage to the nose and skin.
Arc rays can injure eyes and burn skin. Electric shock can kill. Before use, read and understand the manufacturer's instructions, MSDS's and your employer's safety practices. Keep your head out of the fumes. Use enough ventilation, exhaust at the arc, or both, to keep fumes and gases from your breathing zone and the general area. Wear correct eye, ear and body protection. Do not touch live electrical parts. See American National Standard Z49.1, and OSHA Safety and Health Standards.
Carcinogenicity
Nickel: The International Agency for Research on Cancer indicates nickel refining and "certain nickel compounds" were cancer-causing, but could not state with certainly which forms of nickel may be carcinogenic. The National Toxicology Program lists nickel powder, nickel subsulfide, nickel oxide, nickelcarbonate, nickel carbonyl and nickelocene as substances "that may reasonably anticipated to be carcinogens". Because of this, the OSHA Hazard Communication Standard requires that everyone who manufactures or imports these substances or mixtures or alloys containing these substances must warn of a cancer hazard on their MSDS's and labels. This warning is mandated by OSHA even though studies have not demonstrated cancer risks associated with the use of nickel. Intramuscular injection and implantation of nickel powder produced localized tumors in rats and mice. Inhalation studies using animals showed no evidence of carcinogenicity.
Chromium: The International Agency for Research on Cancer and the National Toxicology Program indicates there is sufficient evidence for carcinogenicity of Chromium compounds both in humans and experimental animals. IARC notes that "the compounds responsible for the carcinogenic effect in humans cannot be specified". Studies with chromium metal and trivalent forms of chromium compounds have shown inadequate evidence for carcinogenicity in both animals and humans.
Crystalline silica: The National Toxicology Program indicates there is sufficient evidence for the carcinogenicity or respirable crystalline silica in experimental animals. Increases in incidence of lung cancers have been found in inhalation studies in rats. An IARC working group reported there is limited evidence for the carcinogenicity of crystalline silica in humans.
Other precautions: Electric shock from arc welding equipment can kill. When welding arc or torch flame may be a source of ignition of combustible.

· **Information pertaining to particular dangers for man and environment:** *Not applicable.*
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 0
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

*Health = *0*
Fire = 0
Reactivity = 0

4 First aid measures

· **General information:** *No special measures required.*
· **After inhalation:** *Supply fresh air; consult doctor in case of complaints.*

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· **After skin contact:** If skin irritation continues, consult a doctor.
· **After eye contact:** Rinse opened eye for several minutes under running water.
· **After swallowing:** If symptoms persist consult doctor.

5 Fire fighting measures

· **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
· **Protective equipment:** No special measures required.

6 Accidental release measures

· **Person-related safety precautions:** Not required.
· **Measures for environmental protection:** Do not allow to enter sewers/ surface or ground water.
· **Measures for cleaning/collecting:** Pick up mechanically.
· **Additional information:** No dangerous substances are released.

7 Handling and storage

· **Handling:**
· **Information for safe handling:** Prevent formation of dust.
· **Information about protection against explosions and fires:** No special measures required.

· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** None.

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8 Exposure controls and personal protection

· **Additional information about design of technical systems:**
Ventilation: Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. Keep exposures as low as possible
Respiratory Protection: Use respirable fumes respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below the recommended exposure limit.

· **Components with limit values that require monitoring at the workplace:**	
7440-47-3 chromium	
PEL	1 mg/m³
REL	0.5 mg/m³
TLV	0.5 mg/m³
13463-67-7 titanium dioxide	
PEL	15* mg/m³ *Total dust
REL	Lowest feasible conc.; (LOQ 0.2 mg/m3)
TLV	10 mg/m³

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7440-02-0 nickel	
PEL	1 mg/m³
REL	0.015 mg/m³
TLV	1.5 I mg/m³
471-34-1 calcium carbonate	
PEL	15*; 5** mg/m³ *Total dust **Respirable fraction
REL	10*; 5** mg/m³ *Total dust **Respirable fraction
TLV	10 mg/m³ (e)
7439-98-7 molybdenum	
TLV	(10) mg/m³ as Mo; NIC-10 I; NIC-3 R
7439-96-5 manganese	
PEL	Short-term value: C 5 mg/m³ as Mn
REL	Short-term value: 3 mg/m³ Long-term value: 1 mg/m³ as Mn
TLV	0.2 mg/m³ as Mn

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Personal protective equipment:**
· **General protective and hygienic measures:** Wash hands before breaks and at the end of work.
· **Breathing equipment:**
Not necessary if room is well-ventilated.
Use suitable respiratory protective device in case of insufficient ventilation.
· **Protection of hands:** Heat protection gloves
· **Material of gloves** Leather gloves
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:**
Wear helmet or use face shield with filter lens. Provide protective screens and flash goggles, if necessary, to shield others. As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go the next lighter shade which gives sufficient view of the weld zone.
· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **General Information**

Form:	Solid
Color:	Grey
Odor:	Odorless

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· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	Not applicable.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Density:**	Not determined.
· **Solubility in / Miscibility with Water:**	Insoluble.

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10 Stability and reactivity

· **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
· **Dangerous reactions** No dangerous reactions known.
· **Dangerous products of decomposition:**
Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, and the process, procedures, and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, galvanising, or phosphate coatings on steels which would produce phosphine gas), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapours from cleaning and degreasing activities which may be decomposed by the arc into toxic gases such as phosgene).
When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in SECTION II. Fume and gas decomposition products, and not the ingredients in the electrode are important. The concentration of a given fume or gas component may decrease or increase by many times the original concentration in the electrode. Also, new compounds not in the electrodes may form. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in SECTION II, plus those from the base metal and coating, etc..., as noted above. Reasonably expected fume constituents of this product would include: Example for Carbon dioxide shielded flux-cored electrode (AWS 5.20 E70-T-1): Reasonably expected fume constituents of this product would include: primarily oxides of Iron; secondarily complex oxides of Manganese, Silicon, Titanium and Sodium. The present ACGIH TLV for Manganese, 0.2 mg/m3 will result in a significant reduction from the 5 mg/m3 general welding fume (NOC) level. Example for Stainless Steel covered electrodes (AWS 5.4): Reasonably expected fume constituents of this product would include: primarily fluorides and complex oxides of Iron and Silicon, secondarily complex oxides of Manganese, titanium, chromium, nickel, sodium and potassium.
The present 1995 OSHA PEL (Permissible Exposure Limit) for hexavalent Chromium (Cr +6) is 0.05 mg/m3 which will result in a significant reduction from the 5 mg/m3 general welding fume (NOC) level. The limit of 0.05 mg/m3 for hexavalent chromium from the decomposition products in these electrodes comes from the limit shown at the bottom of OSHA Table Z-2, which is for 0.1 mg of CrO3- which calculates to 0.05 mg of Cr+6/m3. It applies to soluble chromates of the types found in covered stainless electrode fumes. Reasonably expected gaseous constituents would include Carbon monoxide and Carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample from inside the welder's helmet if worn or in the worker's breathing

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zone. See ANSI/AWS F1.1 and ANSI/AWS F1.2-1992

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11 Toxicological information

· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**	
7440-02-0 nickel	
Intraperitoneal LD50	250 mg/kg (rat)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** No irritating effect.
· **Sensitization:** Sensitization possible through skin contact.
· **Additional toxicological information:**
Workers exposed to hexavalent chrome (Cr+6) are at an increased risk of developing lung cancer. It also possible that occupational exposure to (Cr+6) may result in asthma, and damage to the nasal epithelia and skin. To avoid any risk follow the requirements of the OSHA rule for hexavalent chromium published on February 28, 2006 in the U.S. Federal Register, pages:10099-10385 which established an 8-hour time-weighted average (TWA) exposure limit of 5 micrograms of hexavalent chrome per cubic meter of air (5 µg/m³). This is a considerable reduction from the previous PEL of 1 milligram per 10 cubic meters of air (1 mg/10 m³, or 100 µg/m³) reported as CrO3, which is equivalent to a limit of 52 µg/m³ as (Cr+6)). This rule also contains ancillary provisions for worker protection such as requirements for exposure determination, preferred exposure control methods, including a compliance alternative for a small sector for which the new PEL is infeasible, respiratory protection, protective clothing and equipment, hygiene areas and practices, medical surveillance, recordkeeping, and start-up dates that include four years for the implementation of engineering controls to meet the PEL.

12 Ecological information

· **General notes:**
Water hazard class 1 (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

13 Disposal considerations

· **Product:**
· **Recommendation:** Must be specially treated adhering to official regulations.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

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14 Transport information

· **DOT regulations:**
· **Hazard class:** -

· **Land transport ADR/RID (cross-border):**
· **ADR/RID class:** -

· **Maritime transport IMDG:**
· **IMDG Class:** -
· **Marine pollutant:** No

· **Air transport ICAO-TI and IATA-DGR:**
· **ICAO/IATA Class:** -

· **Transport/Additional information:** Not dangerous according to the above specifications.

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15 Regulations

· **Sara**

· **Section 355 (extremely hazardous substances):**

None of the ingredient is listed.

· **Section 313 (Specific toxic chemical listings):**

7440-47-3	chromium
7440-02-0	nickel
7439-96-5	manganese
7440-50-8	copper
7440-48-4	cobalt

· **TSCA (Toxic Substances Control Act):**

All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**

7440-47-3	chromium
7440-02-0	nickel
7440-48-4	cobalt

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**

None of the ingredients is listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**

7439-96-5	manganese	D
7440-50-8	copper	D

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· **IARC (International Agency for Research on Cancer)**		
7440-47-3	chromium	3
13463-67-7	titanium dioxide	3
7440-02-0	nickel	2B
7631-86-9	silicon dioxide, chemically prepared	3
7440-48-4	cobalt	2B

· **NTP (National Toxicology Program)**		
7440-02-0	nickel	R

· **TLV (Threshold Limit Value established by ACGIH)**		
7440-47-3	chromium	A4
13463-67-7	titanium dioxide	A4
7440-02-0	nickel	A5
7440-48-4	cobalt	A3

· **MAK (German Maximum Workplace Concentration)**		
7440-02-0	nickel	1
7440-48-4	cobalt	2

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**	
13463-67-7	titanium dioxide
7440-02-0	nickel

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

· **Product related hazard informations:**
The product is not subject to identification regulations according to directives on hazardous materials.

· **Hazard-determining components of labelling:**
nickel

· **National regulations:**

· **Water hazard class:** Water hazard class 1 (Self-assessment): slightly hazardous for water.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** QS department
· **Contact:**
Ms. Monica Isenhart
phone +1-281-499 1212
· ***** Data compared to the previous version altered.**