1 Identification

- **Product identifier**
  - **Trade name**: UTP A 73 G 3
  - **Application of the substance / the mixture**: Rods and Wires for Welding

- **Details of the supplier of the safety data sheet**
  - **Manufacturer/Supplier**: voestalpine Böhler Welding UTP Maintenance GmbH
  - Elsässer Straße 10
  - D-79189 Bad Krozingen
  - Tel. +49 7633 409 01
  - Fax +49 7633 409 227
  - welding.bk@voestalpine.com
  - **Information department**: Quality department
  - **Emergency telephone number**: +49 7633 409-151 (Mo - Do 8 - 17, Fr 8 - 13 Uhr)

2 Hazard(s) identification

- **Classification of the substance or mixture**
  - The product is not classified according to the Globally Harmonized System (GHS).

  - **Label elements**
    - **GHS label elements** Void
    - **Hazard pictograms** Void
    - **Signal word** Void
    - **Hazard statements** Void
    - **NFPA ratings (scale 0 - 4)**
      - Health = 0
      - Fire = 0
      - Reactivity = 0
    - **HMIS-ratings (scale 0 - 4)**
      - Health = 0
      - Fire = 0
      - Reactivity = 0

- **Other hazards**
  - **Results of PBT and vPvB assessment**
    - **PBT**: Not applicable.
    - **vPvB**: Not applicable.

3 Composition/information on ingredients

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

  - **Dangerous components**:
    - **CAS**: 7440-47-3  
      - **EINECS**: 231-157-5
      - **chromium**
      - **5-12.5%**
    - **CAS**: 7439-98-7
      - **EINECS**: 231-107-2
      - **molybdenum**
      - **2.5-5%**

(Contd. on page 2)
4 First-aid measures

· Description of first aid measures
· General information: No special measures required.
· After inhalation: Supply fresh air; consult doctor in case of complaints.
· After skin contact: Generally the product does not irritate the skin.
· After eye contact: Rinse opened eye for several minutes under running water.
· After swallowing: Seek medical treatment.
· Most important symptoms and effects, both acute and delayed: No further relevant information available.
· Indication of any immediate medical attention and special treatment needed: No further relevant information available.

5 Fire-fighting measures

· Extinguishing media
· Suitable extinguishing agents: Suitable to surrounding conditions.
· Special hazards arising from the substance or mixture: No further relevant information available.
· Advice for firefighters
· Protecting equipment: No special measures required.

6 Accidental release measures

· Personal precautions, protective equipment and emergency procedures
   Ensure adequate ventilation.
   Use respiratory protective device against the effects of fumes/dust/aerosol.
   Environmental precautions: Do not allow to enter sewers/surface or ground water.
· Methods and material for containment and cleaning up: Pick up mechanically.
· Reference to other sections
   See Section 7 for information on safe handling.
   See Section 8 for information on personal protection equipment.
   See Section 13 for disposal information.

7 Handling and storage

· Handling:
· Precautions for safe handling: Ensure that suitable extractors are available on processing machines.
· Information about protection against explosions and fires: No special measures required.
· Conditions for safe storage, including any incompatibilities
· 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.
· Specific end use(s): No further relevant information available.
8 Exposure controls/personal protection

- **Control parameters**

- **Components with limit values that require monitoring at the workplace:**

<table>
<thead>
<tr>
<th>Compound</th>
<th>PEL Long-term value: 1 mg/m³</th>
<th>REL Long-term value: 0.5 mg/m³ *metal+inorg.compds.as Cr;See Pocket Guide App. C</th>
<th>TLV Long-term value: 0.5 mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-47-3 chromium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7439-98-7 molybdenum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7439-96-5 manganese</td>
<td>Ceiling limit value: 5 mg/m³ as Mn</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

- **Exposure controls**

- **Personal protective equipment:**

  - **General protective and hygienic measures:**
    Wash hands before breaks and at the end of work.
    The usual precautionary measures for handling chemicals should be followed.

  - **Breathing equipment:** Filter P2

  - **Protection of hands:**
    Leather gloves
    The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
    Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
    Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
    Heat protection gloves (non-combustible)
    Rubber gloves
    Acid resistant gloves

  - **Penetration time of glove material**
    The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

  - **Eye protection:**
    Safety glasses
    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

(Contd. on page 4)
Safety Data Sheet
acc. to OSHA HCS

Printing date 07/26/2016
Reviewed on 07/21/2016

Trade name: UTP A 73 G 3

Wear hand, head, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum this includes welder’s gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, and well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

9 Physical and chemical properties

- Information on basic physical and chemical properties
- General Information
- Appearance:
  - Form: Solid
  - Color: According to product specification
- Odor:
  - Odor: Odorless
  - Odor threshold: Not determined.
- pH-value:
  - pH-value: Not applicable.
- Flash point:
  - Flash point: Not applicable.
- Flammability (solid, gaseous):
  - Flammability: Not determined.
- Decomposition temperature:
  - Decomposition temperature: Not determined.
- Auto igniting:
  - Auto igniting: Product is not selfigniting.
- Danger of explosion:
  - Danger of explosion: Product does not present an explosion hazard.
- Explosion limits:
  - Lower: Not determined.
  - Upper: Not determined.
- Relative density:
  - Relative density: Not determined.
- Vapor density:
  - Vapor density: Not applicable.
- Evaporation rate:
  - Evaporation rate: Not applicable.
- Water:
  - Water: Insoluble.
- Partition coefficient (n-octanol/water):
  - Partition coefficient: Not determined.
- Dynamic:
  - Dynamic: Not applicable.
- Kinematic:
  - Kinematic: Not applicable.
- Organic solvents:
  - Organic solvents: 0.0 %
- Other information:
  - Other information: No further relevant information available.

10 Stability and reactivity

- Reactivity: No further relevant information available.
- Chemical stability
- Thermal decomposition / conditions to be avoided:
  - Thermal decomposition: No decomposition if used and stored according to specifications.
- Possibility of hazardous reactions: No dangerous reactions known.
- Conditions to avoid: No further relevant information available.
- Incompatible materials: No further relevant information available.
- Hazardous decomposition products:
  - Hazardous decomposition products: Reasonably expected fume constituents of this product would include: Chromoxide.

The present OSHA PEL (Permissible Exposure Limit) - published in the U.S. Federal Register 71, pages: 10099-10385 - for hexavalent Chromium (Cr +6) is 0.005 mg/m3 which will result in a significant reduction from the 5 mg/m3 general welding fume (NOC) level. It applies to soluble chromates of the types found in covered stainless.
electrode fumes.
No dangerous decomposition products known.
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 zone. See ANSI/AWS F1.1 and ANSI/AWS F1.2-1992. In order to determine and evaluation of the existing problem areas, the standards EN ISO15011 –parts 1,4 can also be applied.

11 Toxicological information

- Information on toxicological effects
  - Additional toxicological information:
    The product is not subject to classification according to internally approved calculation methods for preparations.
    When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
    Workers exposed to hexavalent chrome (CrVI) are at an increased risk of developing lung cancer. It is also possible that occupational exposure to (CrVI) 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 Probably Chromium(VI)oxide, 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.

- Carcinogenic categories

  - IARC (International Agency for Research on Cancer)
    7440-47-3 chromium  3
  - NTP (National Toxicology Program)
    None of the ingredients is listed.
  - OSHA-Ca (Occupational Safety & Health Administration)
    None of the ingredients is listed.

12 Ecological information

- Toxicity
  - Aquatic toxicity: No further relevant information available.
  - Persistence and degradability: No further relevant information available.
  - Behavior in environmental systems:
    - Bioaccumulative potential: No further relevant information available.
    - Mobility in soil: No further relevant information available.
  - Additional ecological information:
    - General notes: Water hazard class 1 (Self-assessment): slightly hazardous for water
    - Results of PBT and vPvB assessment
      - PBT: Not applicable.
      - vPvB: Not applicable.
  - Other adverse effects: No further relevant information available.
13 Disposal considerations

- **Waste treatment methods**
  - **Recommendation:** Must be specially treated adhering to official regulations.
- **Uncleaned packagings:**
  - **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- **Environmental hazards:**
  - **Marine pollutant:** No
- **Special precautions for user**
  - **Not applicable.**
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**
  - **Not applicable.**
- **Transport/Additional information:**
  - **Not dangerous according to the above specifications.**
- **UN "Model Regulation":** -

15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
  - No further relevant information available.
- **Sara**
  - **Section 355 (extremely hazardous substances):**
    - 7440-47-3 chromium
  - **Section 313 (Specific toxic chemical listings):**
    - 7440-47-3 chromium
    - 7439-96-5 manganese
  - **TSCA (Toxic Substances Control Act):**
    - All ingredients are listed.
  - **Proposition 65**
    - **Chemicals known to cause cancer:**
      - None of the ingredients is listed.
    - **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)**
    - 7440-47-3 chromium D
    - 7439-96-5 manganese D
43.0.3.

· TLV (Threshold Limit Value established by ACGIH)
  7440-47-3 chromium A4
  7439-98-7 molybdenum A3

· NIOSH-Ca (National Institute for Occupational Safety and Health)
  None of the ingredients is listed.

· GHS label elements Void
  · Hazard pictograms Void
  · Signal word Void
  · Hazard statements Void

· Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

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.

· Additional information:
  Recommendations for exposure scenarios, measures for risk management and identification of working conditions under which metals, metal alloys and products made of metal can be safely worked can be found attached.
  Detailed information can be found on our webpage www.voestalpine.com (Environment, REACH at voestalpine).

(Contd. on page 8) US
Welding Exposure Scenario WES - BNOL

Recommendations for Exposure Scenarios, Risk Management Measures and to identify Operational Conditions under which metals, alloys and metallic articles may be safely welded

Welding/brazing produces fumes which can affect human health and the environment. Fumes are a varying mixture of airborne gases and fine particles which, if inhaled or swallowed, can constitute a health hazard. The degree of risk will depend on the composition of the fume, concentration of the fume and duration of exposure. The fume composition is dependent upon the material being worked, the process and consumables being used, coatings on the work such as paint, galvanizing or plating, air or fume diverters from cleaning and degreasing activities. A systematic approach to the assessment of exposure is necessary, taking into account the particular circumstances for the operator and auxiliary worker that can be exposed.

Considering the emission of fumes when welding, brazing or cutting of metals, it is recommended to (1) arrange risk management measures through applying general information and guidelines provided by the exposure scenario and (2) using the information provided by the Safety Data Sheet issued in accordance with REACH by the welding consumable manufacturer.

The employer shall ensure that the risk from welding fumes to the safety and health of workers is eliminated or reduced to a minimum. The following principle shall be applied:
1. Select the applicable process/material combinations with the lowest class, whenever possible.
2. Set welding process with the lowest emission parameters.
3. Select welding consumables in accordance with class number. In general, the use of PPE is taken into account after all other measures is applied.
4. Wear the relevant personal protective equipment in accordance with the duty cycle.

In addition, compliance with the National Regulations regarding the exposure to welding fumes of workers and related personnel shall be verified.

In the table "Risk Management Measures for individual process/material combinations" below, reference is made to the following standards for collective and personal protection measures:

- ISO 4965
- EN ISO 15012:1-2004
- EN ISO 15012:2-2008
- EN 149:2001
- EN 135:2000
- EN 12941:1996
- Directive 1999/9/EC
- TRGS 528

Also in the table "Risk Management Measures for individual process/material combinations", reference is made to footnotes.

The description of the following footnotes:
1 Class: approximate ranking to mitigate risk by selecting process/material combinations with the lowest value.
2 Identification of individual risk management measures shall be applied
3 General Ventilation (GV) Low. With additional Local Exhaust Ventilation (LEV) and extracted air to the outside, the GV or LEV capacity may be reduced to 1/5 of the original requirement.
4 General Ventilation (GV) Medium (doubled compared to Low)
5 Filtration half mask (FFP2)
6 Filtering half mask (FFP3), helmet with powered filters (THDPS), or helmet with external air supply (LDK2)
7 Reduced negative pressured area. A separate ventilated area where reduced negative pressure is maintained.
8 Local Exhaust Ventilation (LEV) High, extraction at source (includes table, hood, arm or torch extraction)
9 Local Exhaust Ventilation (LEV) Medium, extraction at source (includes table, hood, arm or torch extraction)
10 Recommended measures to comply with national maximum allowable limits. Extracted fumes, for all materials except unalloyed steel and aluminium, shall be filtered before release in the outside environment.
11 A confined space, despite its name, is not necessarily small. Examples of confined spaces include ship, wells, vats, utility vaults, tanks, etc.
12 Not applicable.
13 Not recommended

(Contd. of page 9)
Risk Management Measures for individual process / base material combinations

<table>
<thead>
<tr>
<th>Class</th>
<th>Process</th>
<th>Base Materials</th>
<th>Remarks</th>
<th>Ventilation / Extraction / Filtration&lt;sup&gt;a&lt;/sup&gt;</th>
<th>PPE&lt;sup&gt;b&lt;/sup&gt;</th>
<th>PPE&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-confined space&lt;sup&gt;a&lt;/sup&gt;</td>
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</tr>
<tr>
<td>I</td>
<td>G3AW</td>
<td>All</td>
<td>Except Aluminum</td>
<td>GV low&lt;sup&gt;a&lt;/sup&gt;</td>
<td>n.r.</td>
<td>n.r.</td>
</tr>
<tr>
<td>II</td>
<td>BMMAW</td>
<td>All</td>
<td>Except Bi, V, Mn, Ni-alloys and Stainless</td>
<td>Improved helmet&lt;sup&gt;b&lt;/sup&gt;</td>
<td>FFP2&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
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<tr>
<td></td>
<td>FCAM 126/137</td>
<td>All</td>
<td>Except stainless and Nb-alloys&lt;sup&gt;b&lt;/sup&gt;</td>
<td>GV low&lt;sup&gt;a&lt;/sup&gt;</td>
<td>LEV low&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
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<tr>
<td></td>
<td>GMMW 127/135</td>
<td>All</td>
<td>Except Cu, Sn, V-alloys</td>
<td>LEV high&lt;sup&gt;a&lt;/sup&gt;</td>
<td>LEV medium&lt;sup&gt;a&lt;/sup&gt;</td>
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<td></td>
<td>Powder Plasma Arc 152</td>
<td>All</td>
<td>Except Cu, V, Cr, Mn, Ni-alloys and Stainless&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>IV</td>
<td>All processes class I</td>
<td>Painted / primed / platted</td>
<td>No Pb containing primer</td>
<td>GV low&lt;sup&gt;a&lt;/sup&gt;</td>
<td>FFP3&lt;sup&gt;c&lt;/sup&gt;</td>
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<td>All processes class II</td>
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<td>No Pb containing primer</td>
<td>LEV low&lt;sup&gt;a&lt;/sup&gt;</td>
<td>LEV medium&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>BMMAW 127</td>
<td>Stainless, Nb-, Re- and V-alloys</td>
<td>n.a.</td>
<td>LEV high&lt;sup&gt;a&lt;/sup&gt;</td>
<td>ThSP&lt;sup&gt;b&lt;/sup&gt;, LDH&lt;sup&gt;c&lt;/sup&gt;</td>
<td>ThSP&lt;sup&gt;b&lt;/sup&gt;, LDH&lt;sup&gt;c&lt;/sup&gt;</td>
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<td></td>
<td>FCAM 126/137</td>
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<td>n.a.</td>
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<td>ThSP&lt;sup&gt;b&lt;/sup&gt;, LDH&lt;sup&gt;c&lt;/sup&gt;</td>
<td>ThSP&lt;sup&gt;b&lt;/sup&gt;, LDH&lt;sup&gt;c&lt;/sup&gt;</td>
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<td>Powder Plasma Arc 152</td>
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<td>VI</td>
<td>GMMW 127</td>
<td>Steel and Ni-alloys</td>
<td>n.a.</td>
<td>Reduced (negative) pressured area&lt;sup&gt;a&lt;/sup&gt;</td>
<td>ThSP&lt;sup&gt;b&lt;/sup&gt;, LDH&lt;sup&gt;c&lt;/sup&gt;</td>
<td>ThSP&lt;sup&gt;b&lt;/sup&gt;, LDH&lt;sup&gt;c&lt;/sup&gt;</td>
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<tr>
<td>VII</td>
<td>Self-shielded FCAW 114</td>
<td>Un-alloyed steel</td>
<td>Welded wire, not containing Pb</td>
<td>Reduced (negative) pressured area&lt;sup&gt;a&lt;/sup&gt;</td>
<td>LEV high&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
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<tr>
<td></td>
<td>Self-shielded FCAW 114</td>
<td>Un-alloyed steel</td>
<td>Welded wire containing Pb</td>
<td>Reduced (negative) pressured area&lt;sup&gt;a&lt;/sup&gt;</td>
<td>LEV high&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>Painted / primated</td>
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<td></td>
<td>Air cooling and Cutting</td>
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<td>Thermal Spray</td>
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<td>Gassing Brazing</td>
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<tr>
<td></td>
<td>Closed system or Confined space&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>I</td>
<td>Laser Welding</td>
<td>All</td>
<td>Closed system</td>
<td>GV medium&lt;sup&gt;a&lt;/sup&gt;</td>
<td>n.a.</td>
<td>n.a.</td>
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<tr>
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<td>LVH&lt;sup&gt;d&lt;/sup&gt;</td>
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</tr>
</tbody>
</table>

<sup>a</sup> Abbreviations and acronyms:
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
TRGS: Technische Regeln für Gefahrstoffe (Technical Rules for Dangerous Substances, BAuA, Germany)
Trade name: UTP A 73 G 3

PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit