

<b>Professional use of dental alloys containing cobalt</b>		
<b>Systematic title based on use descriptor</b>	SU22 (Professional use) PC7, AC7, ERC8c, ERC11a (appropriate PROCs are given in Section 2 below)	
<b>2. Operational conditions and risk management measures</b>		
<b>Task</b>	<b>Involved task</b>	<b>Involved PROCs</b>
<b>Handling of massive ingots</b>	Handling of massive ingots	21
<b>Melting and casting</b>	melting in induction furnace, mould filling in centrifugal casting machine	22, 23
<b>Hand fettling</b>	Operations with rotary burrs and abrasives	24
<b>2.1 Control of workers exposure</b>		
<b>Product characteristics</b>		
<b>Task</b>	<b>Use in preparation and content in preparation</b>	<b>Physical form of the product</b>
<b>Handling of massive ingots</b>	Yes (No restriction)	Massive
<b>Melting and casting</b>		Massive / Molten
<b>Hand fettling</b>		Massive
<b>Amounts used</b>		
No restriction.		
<b>Frequency and duration of use/exposure</b>		
No restriction.		
<b>Human factors not influenced by risk management</b>		
The shift breathing volume 10 m <sup>3</sup> /8 h (full shift).		
<b>Other given operational conditions affecting workers exposure</b>		
Room volume not restricted. Process temperature or pressure ambient or no restriction respectively for all workplace except: melting and casting – process temperature <1400°C. Indoor use.		
<b>Technical conditions and measures at process level (source) to prevent release</b>		
Melting and casting closed furnace and/or extracted furnace. Other workplace level of containment/segregation not required.		
<b>Technical conditions and measures to control dispersion from source towards the worker</b>		
Localised controls (LC) not required for handling of massive ingots. Melting and casting (integrated exhaust ventilation for non-closed furnaces, efficiency up to 80 %). Hand fettling (integrated tool/machine extraction, efficiency up to 80 %). Level of separation if required see frequency and duration of exposure section. Installation of ventilated (positive pressure) control rooms can also reduce exposure.		
<b>Organisational measures to prevent/limit releases, dispersion and exposure</b>		
Additional information See Section: 7, 8, 11 (SDS).		
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>		
Respiratory protective equipment (RPE) not required. Since cobalt has sensitising properties, the use of suitable chemical resistant gloves (EN 374) providing protection for the duration of activity (e.g. nitrile rubber (0.4 mm), chloroprene rubber (0.5 mm), butyl rubber (0.7 mm) is a prerequisite for all process steps in which direct contact to cobalt substances is possible. In cases where direct contact with cobalt cannot be avoided, a protective suit conforming to EN13982 should be worn. As a general requirement for the conducted processes: standard working clothes (long-sleeve overall) and safety shoes.		
<b>2.2 Control of environmental exposure</b>		
<b>Product characteristics</b>		
Cobalt can be in any form in an article.		
<b>Amounts used</b>		
Not applicable.		
<b>Frequency and duration of use/exposure</b>		
Continuous use/release: 365 days/year.		
<b>Environment factors not influenced by risk management</b>		
Flow rate of receiving surface should be sufficiently high to dilute the effluent concentration of the STP below the PNEC (Water/ Sedimentation).		

<b>Other given operational conditions affecting environmental exposure</b>				
Indoor or outdoor use of products containing cobalt is possible. There are no intended Co releases due to wide dispersive use and the non-intended releases are negligible and pose no threat to the environment.				
<b>Conditions and measures related to municipal sewage treatment plant</b>				
Presence of municipal sewage treatment plant.				
<b>Conditions and measures related to external treatment of waste for disposal</b>				
<p><b>Fraction of daily/annual use</b> expected in waste: 60% of all articles, 40% is recycled. (EC, 2010)</p> <p><b>Appropriate waste codes:</b> 20 01 34; 20 01 33; 20 01 40; 20 03 01; 20 03 07</p> <p><b>Suitable Disposal:</b> Waste from end-of-life articles can be disposed of as municipal waste, except when they are separately regulated, like electronic devices, batteries, vehicles, etc. Disposal of wastes is possible via incineration (Directive 2000/76/EC) or landfilling (BAT Reference Document 2006, Council Directive 1999/31/EC and Council Decision 19/12/2002).</p>				
<b>Conditions and measures related to external recovery of waste</b>				
Shredders pre-treating metal wastes maximum release factors to air of 0.0015 after RMM and no releases to water and soil.				
<b>3. Exposure estimation and reference to its source</b>				
<b>Occupational exposure</b>				
The risk characterisation ratio (RCR) is the quotient of the exposure estimate and the respective Derived No Effect Level (DNEL) and has to be below 1 to demonstrate a safe use. For inhalation exposure, the RCR is based on a DNEL for cobalt of 40 µg/m <sup>3</sup> .				
<b>Task</b>	<b>Method used for inhalation exposure assessment</b>	<b>Inhalation exposure estimate (RCR)</b>	<b>Method used for dermal exposure assessment</b>	<b>Dermal exposure estimate (RCR)</b>
<b>Handling of massive ingots</b>	published data	25 µg/m <sup>3</sup> (0.625)	Since cobalt has sensitising properties, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus, dermal exposure is not assessed in this exposure scenario.	
<b>Melting and casting</b>	published data	25 µg/m <sup>3</sup> (0.625)		
<b>Hand fettling</b>	published data	25 µg/m <sup>3</sup> (0.625)		
<b>Environmental emissions</b>				
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH. Thus, the downstream user is not obliged to i) carry out an own CSA and ii) to notify the use to the Agency, if he does not implement these measures.				
<b>4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES</b>				
<b>Occupational and Environmental exposure</b>				
The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. For human health, this has to be done by showing that they limit the inhalation exposure to a level below the DNEL (given that the processes and activities in question are covered by the PROCs listed above) as given below. If measured data are not available, the DU may make use of an appropriate scaling tool such as MEASE ( <a href="http://www.ebrc.de/mease.html">www.ebrc.de/mease.html</a> ) to estimate the associated exposure. Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH. Thus, the downstream user is not obliged to i) carry out an own CSA and ii) to notify the use to the Agency, if he does not implement these measures.				