



# ID Card

## Slags, doré furnace

Version 4 July 2023

Please note that discussions on the ID Cards are currently ongoing.  
Should you need further information / detail, please contact [info@epmf.be](mailto:info@epmf.be)  
The content of this ID Card may be adjusted as the Refinables Project develops.

### Notes:

- *This ID card is used to support the substance sameness discussions in SIEFs and to describe the substance/group to the best of the SIEF members' knowledge.*
- *It also aims at grouping communications relevant to the request of available data or information, the approval of the proposed Lead Registrant and the registration strategy with the SIEF.*
- *It is the responsibility of each individual registrant to identify their substance and to report company-specific identity in their Registration Dossier (section 1 of IUCLID).*

### **DISCLAIMER**

The proper identification and characterisation of a substance or intermediate is the responsibility of each registering legal entity.

All data and information contained in this document shall be treated by the receiving party (i) in full confidence with the adequate respect of any confidential and/or proprietary nature of such information and (ii) only in the framework of the purpose of agreeing on substance sameness, Lead Registrant and overall REACH Strategy for the concerned Substance under REACH (the 'Purpose').

The receiving party (and any representative) shall not be allowed to use or circulate any or all parts of this document for any other purpose than the Purpose, without the prior written consent of the European Precious Metals Federation (EPMF).

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## 1. Identification of the group

***Important note: The EPMF agreed to explore criteria and approaches which could be considered to split the group registered in 2010 in an objective manner. Based on process information, it was decided to split the group in 2:***

- 1) Slags, doré furnace***
- 2) Slags, production of precious metals containing materials other than doré***

***Separate ID cards were generated for these 2 groups but they will be registered together in April 2014 and separate registrations are foreseen once we have clarity on the procedure for registration. For the April 2014 registration the same identifiers (name, EC number, CAS number, description) will be used as for 2010 registration. Slags, doré furnace will be referred to as grade 1 in the joint dossier.***

**Table 1. Identification of the group**

	Proposed by EPMF Refiners Work Group	Original (in EC inventory)	2010 Registration
<b>Name</b>	Slags, doré furnace	Slags, doré furnace	Slags, precious metal refining
<b>EC number</b>	266-975-1	266-975-1	308-515-5
<b>CAS number</b>	67711-98-2	67711-98-2	98072-60-7
<b>Description</b>	<p>Slags produced as by-products in the production (smelting, reduction, converting, and refining processes) of Slags, doré furnace. They generally contain copper and lead and small amounts of silver, antimony, tellurium and other metals.</p> <p>Depending on the fluxing agent used, slags in this group may contain metal oxides, phosphates, silicates, sulphides/sulphates and/or fused salts in varying concentrations.</p>	<p>Slag produced as a by-product in the furnace smelting of metal wastes rich in gold and silver. Principal components are usually tellurium, selenium and copper with minor amounts of lead, antimony and other metals.</p>	<p>Heterogeneous solids (e.g.: lumps) resulting from pyrometallurgy processes applied on precious metals containing primary and secondary feeds, using several fluxing agents such as sodium borate or borax, sodium carbonate, sodium phosphate, silica, and aluminium silicate amongst others.</p> <p>Depending on the fluxing agent used, slags resulting from the refining of precious metals may contain ferrous and non-ferrous metal oxides, carbonates, phosphates, silicates, and/or fused salts in varying concentrations, with some quantities of precious metals.</p>

**N.B.:** The description proposed above will be further detailed by EPMF for Registration purposes.

## 2. Synonyms and other identifiers of the group

None

## 3. Substances (with core identifiers) also falling under this group (with justification)

Although slags resulting from other metals refining processes may be very similar to Slags, doré furnace, they are not listed here as they are covered by other consortia and must hence, not be registered using the same information or in the same Registration Dossier.

## 4. Usual composition of the substance

**Table 2. Usual composition**

Type	Name of the element	Symbol	Species present	Typical concentration (%)	Concentration range (%)
Precious metals	Silver	Ag	Metallic, oxides	2,9	0 – 7,1
	Gold	Au	Metallic?	0,4	0 - 3
	Platinum Group Metals	Ir, Pd, Pt, Rh, Ru		0,01	0 – 0,05
Other metals/ constituents	Aluminium	Al	Oxides?	0,3	0 - 2,9
	Arsenic	As	Oxides	1,1	0 - 3,9
	Boron	B	Borate, oxides	0,4	0 - 2,7
	Barium	Ba	Oxides, sulphate	3,6	0 - 16,4
	Bismuth	Bi	Oxides	0,9	0 - 2,7
	Calcium	Ca	Oxides	0,3	0 - 2,1
	Chromium	Cr	Oxides?	0,06	0 - 0,35
	Copper	Cu	Oxides, metallic	10	0,9 - 38
	Iron	Fe	Oxides	2,7	0 - 19
	Potassium	K		0,11	0 - 1
	Magnesium	Mg		0,01	0 - 0,1
	Manganese	Mn		0,002	0 - 0,02
	Sodium	Na	Oxides, carbonate, salts	3,7	0 - 14
	Nickel	Ni	Oxides	0,76	0 - 2,7
	Lead	Pb	Silicate, oxides	23	0 - 44
	Sulphur	S	Metal sulfides/sulphates	0,44	0 - 4
	Antimony	Sb	Oxides	2,6	0 - 10
	Selenium	Se		0,57	0 - 3,8
	Silicon	Si	Silicates	5,3	0 - 12
	Tin	Sn		1,9	0 - 8,7
	Strontium	Sr		0,04	0 - 0,4
	Tellurium	Te	Oxides, metallic, salts	2	0 - 10
	Zinc	Zn	Oxide, silicate?	1,5	0 – 5,1
<b>Total</b>				64,9	

**N.B.1:** Classification drivers are indicated in red

Metal species were determined based on information available to registrants and/or mineralogical analysis (by means of XRD analysis).

The composition given above represents the usual elemental/compound content available to the Members of the EPMF by 28 February 2014. This usual content represents the majority of the Slags, doré furnace that is placed on the EEA market.

Composition of Slags, doré furnace may contain a variety of constituents, comprising compounds present in the process such as metal oxides, together with added fluxing agents, which may include sodium borate or borax (Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub>), sodium carbonate (Na<sub>2</sub>CO<sub>3</sub>), and silica (SiO<sub>2</sub>) (sometimes as aluminium silicate (Al<sub>2</sub>O<sub>3</sub>)). Thus several constituents may be present, in the form of oxides, borates, silicates, aluminates and carbonates, sometimes with entrained metals.

In a UVCB substance, the number of constituents is relatively large and/or; the composition is, to a significant part, unknown and/or; the variability of composition is relatively large or poorly predictable. Hence, concentration ranges outside the ones given above do not exclude sameness and are usually referred to as unusual or exceptional situations. Each potential registrant is responsible for performing its own elemental analysis.

## 5. Information on appearance, physical state and properties of the substance

**Table 3. Appearance / physical state / properties of the substance**

<b>Physical state</b>	Solid
<b>Appearance</b>	Green-black
<b>Particle size*</b>	Coarse lump

\* Fine powder: particles in the size range 100 – 2.500 nm. Coarse powder: particles in the size range 2.500 nm – 1 mm. Massive object: particles in the size range > 1 mm.

## 6. Analytical data

Annex VI of REACH requires the registrant to describe the analytical methods and/or to provide the bibliographical references for the methods used for identification of the substance and, where appropriate, for the identification of impurities and additives. This information should be sufficient to allow the methods to be reproduced.

In addition to analytical data, all registrants should use expert judgment and process knowledge to characterize their substance.

**Table 4. Analytical methods for identification of the substance**

Parameter / Method	Recommended for substance identification and sameness check	Applicable	Not applicable or not recommended
<b>Elemental analysis</b>			
ICP (ICP-MS or ICP-OES)	X		
Atomic absorption spectroscopy (AAS)			
Glow discharge mass spectrometry (GDMS)			
<b>Molecular analysis</b>			
Infrared (IR) spectroscopy			
Raman spectroscopy			



<b>Mineralogical analysis</b>			
X-Ray Fluorescence (XRF)			
X-Ray Diffraction (XRD)	X		
<b>Morphology and particle sizing</b>			
Optical microscopy and electron microscopy (SEM, TEM, REM)* #	X		
Laser diffraction* #			
Particle size by other means (e.g. sieve analysis)#			
Surface area by N-BET* #			
<b>Other</b>			
Magnetite analyser		X	
S/C analyzer		X	
Separation technique: ion exchange chromatography		X	

\* Analytical techniques particularly (but not exclusively) relevant for nanomaterials.

# The choice of the technique for particle size depends on the size of the material as manufactured/imported/placed on the market/used.

## 7. Lead Registrant

Umicore PMR (Belgium) volunteers to be the Lead Registrant for this intermediate. The European Precious Metals Federation (EPMF) will provide support to the Lead Registrant as laid down in the EPMF Agreement.

## 8. Scope of the Registration Dossier

The uses included in this Registration Dossier are summarised in the table below and accompanied with the appropriate text.

**Table 5. Reported uses of the substance**

Description of use	Sector of Use (SU)	Process Category (PROC)	Environmental Release Category (ERC)
Manufacture of an intermediate	NA	<ul style="list-style-type: none"> <li>• PROC 1: Use in closed process, no likelihood of exposure</li> <li>• PROC 2: Use in closed, continuous process with occasional controlled exposure</li> <li>• PROC 3: Use in closed batch process (synthesis or formulation)</li> <li>• PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises</li> <li>• PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</li> <li>• PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</li> <li>• PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</li> <li>• PROC 15: Use as laboratory reagent</li> <li>• PROC 21: Low energy manipulation of substances bound in materials and/or articles</li> <li>• PROC 22: Potentially closed processing operations with minerals/metals at elevated temperature. Industrial setting</li> <li>• PROC 23: Open processing and transfer operations with minerals/metals at elevated temperature</li> <li>• PROC 24: High (mechanical) energy work-up of substances bound in materials and/or articles</li> <li>• PROC 26: Handling of solid inorganic substances at ambient temperature</li> <li>• PROC 27b: Production of metal powders (wet processes)</li> </ul>	<ul style="list-style-type: none"> <li>• ERC 1: Manufacture of substances</li> </ul>



<p>Use as an intermediate in metal manufacturing</p>	<ul style="list-style-type: none"><li>• SU 14: Manufacture of basic metals, including alloys</li></ul>	<ul style="list-style-type: none"><li>• PROC 1: Use in closed process, no likelihood of exposure</li><li>• PROC 2: Use in closed, continuous process with occasional controlled exposure</li><li>• PROC 3: Use in closed batch process (synthesis or formulation)</li><li>• PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises</li><li>• PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</li><li>• PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</li><li>• PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</li><li>• PROC 15: Use as laboratory reagent</li><li>• PROC 21: Low energy manipulation of substances bound in materials and/or articles</li><li>• PROC 22: Potentially closed processing operations with minerals/metals at elevated temperature. Industrial setting</li><li>• PROC 23: Open processing and transfer operations with minerals/metals at elevated temperature</li><li>• PROC 24: High (mechanical) energy work-up of substances bound in materials and/or articles</li><li>• PROC 26: Handling of solid inorganic substances at ambient temperature</li><li>• PROC 27b: Production of metal powders (wet processes)</li></ul>	<ul style="list-style-type: none"><li>• ERC 6a: Industrial use resulting in manufacture of another substance (use of intermediates)</li></ul>
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