# Refinables Project

Comments on proposed strategy to split PM slags, slimes & sludges, flue dust

## BACKGROUND

At its 13 December 2012 meeting, the PM Refinables WG agreed that identification, sameness check, and grouping of streams in the following UVCBs could reasonably be challenged by ECHA:

- Slags, PM refining;
- Slimes and sludges, PM refining;
- Flue dust PM refining.

For these Refinables, several sources/processes were originally grouped under the same Refinable, on the basis that they are usually captured, collected and/or treated without distinction and that even if they were considered separately (following a theoretical approach) their variability and hazard profile would not be significantly different. However, even considering the reality of the PM sector, ECHA may consider them to be over-grouped.

It was hence agreed to set-up a task force in charge of exploring possible criteria and approaches which could be considered to split the above entries in an objective manner, using:

- source and process information of slags, slimes & sludges and flue dust in scope (i.e. only including those from PM refining, not other NFM, and not including e.g. slags used as aggregate);
- the NFM industries BAT Reference document (BREF);
- available information from splitting exercise done previously.

Volunteers for this task force are Angela Alderman, Daniela Cholakova, Edwin Broeckaert, Mike Shepherd and Hege Stubberud.

The task force held a conference call on 13 March 2013 to discuss possible criteria to split these Refinables (outcome see doc 'Proposal to split PM Refinables 3-4-7_130318') and based on these criteria and the descriptions submitted by PM Refiners in Summer 2009 on production processes and sources, an initial sub-grouping was done by the PMC secretariat (outcome see docs 'Ref - 4.1 - Splitting-Slags_PROPOSAL_130621', 'Ref - 4.2 - Splitting-SlimesSludges_PROPOSAL_130621' and 'Ref - 4.3 - Splitting-FlueDust_PROPOSAL_130613'). This resulted in 2 proposed sub-groups for slags, 6 proposed sub-groups for slimes & sludges and 1/no proposed sub-groups for flue dust.

This document is a summary of comments received on the proposed sub-groups, for discussion by the task force at its meeting on 27 September 2013.

## 1. SLAGS, PM REFINING

The proposed sub-groups are:

1) Slags produced as by-products in the production (smelting, reduction, converting, and refining processes) of doré
2) Slags produced as a by-product in the smelting of PM bearing feeds to produce a PM containing alloy subject to further refining

**Comments received:**

- We agree with the splitting of the slags as set out in the document and as discussed at the recent Refinables meeting.
- The proposal for splitting 'slags' seems a reasonably compromise.
- We fully agree with the adopted splitting approach and criteria.
- For slags two sub-groups sound reasonable.

## 2. SLIMES & SLUDGES, PM REFINING

The proposed sub-groups are:

1) Slimes obtained as reaction by-product during pyro- or hydro- metallurgical concentration/upgrading of PM containing materials
2) Slimes obtained during the electrolytic refining of Ag
3) Slimes obtained during the electrolytic refining of Au
4) Slimes obtained during hydro-metallurgical/leaching processes of PM containing materials
5) Slimes obtained during treatment of production effluents of PM production processes
6) Other slimes and sludges generated as by-products during PM production processes

**Comments received:**

- No objections to the proposed sub-groups but we also consider at least the combining of the sub-groups 4 and 5 as conceivable.
- One member sent a re-drafted proposal for splitting the Slimes and Sludges. In this approach there are four main sub groups:
    1) Slimes obtained/produced during the electrolytic refining of Ag and Au. (merge of sub-group 2 & 3 above)
    2) Slimes obtained/produced from hydro- or pyro- metallurgical upgrading of PM containing materials including non-PM sources (i.e. removal of base metals or solvent, producing an upgraded/enriched residue).
    3) Slimes obtained/produced by precipitation of solutions containing PMs.
    4) Slimes obtained/produced from the hydro-metallurgical leaching of PMs from PM containing materials (i.e. dissolution of PMs leaving a lower grade residue).
    5) Other slimes and sludges generated as by-products during PM production processes (same as sub-group 6 above) -> 'catch-all' sub-group, based on the general description of the production processes; not convinced this is really necessary, particularly as the sub-group has 'by-product' in the title which does not fall within REACH (by-product is also used in some of the other descriptions, which should be removed).

  We have also removed three descriptions contained in the original table as they better fit into Cements group rather than Slimes and Sludges. They all refer to the reduction of PMs and I have highlighted the relevant text in yellow in the second attached sheet.


Ref -

Ref -

- I think we should try and reduce the number of sub-groups for at least 'slimes and sludges', by combining sub-groups 4 and 5 and calling it 'hydrometallurgy'. We could think about combining sub-groups 2 and 3 and calling it 'electrorefining', but we then have rich Ag and rich Au in the same group. Does that really matter?
- I can agree to combine sub-group 4 and 5 for the "slimes and sludges". Otherwise, I believe that it will not be opportune to combine sub-group 2 and 3 as the composition of both materials are very different.
- We fully agree with the adopted splitting approach and criteria.
- I thought that sub-group 5 was already covered in another dossier: Residues, PM refining cementation. It would seem reasonable to collect together the slimes obtained by electrolytic refining of Au and Ag (i.e. combine sub-group 2 & 3) if acceptable to the companies involved.
  One of the most important areas I have used this classification to cover are PGM chloride liquors (sub-group 4) – this is essentially strong chloride solutions containing PGMs (primary output from our refinery process at one site) which is then separated out into the individual precious metals. There may be small amounts of residue, but essentially this is a solution. Other members also use slimes and sludges to cover this type of material – is it worth having a category for solutions or a statement regarding the status of solutions e.g. water is not counted.
  Also think that it is important to retain the 'other' sub-group.

- 'Slime from wet dedusting system of the process gases from the Kaldo furnace. After leaching of Se with NaOH, the slime is reversed to Kaldo furnace' to be removed as not to be registered (by-product).

## 3. FLUE DUST, PM REFINING

The proposed sub-groups are:

1) Product resulting from the smelting, refining and/or use of Ag and its alloys obtained from primary and secondary sources and including recycled plant intermediates. Recovered from exhaust air by filtration via cloth bags, arising from hygiene extraction systems on processes in the Ag recovery flowsheet.

**Comments received:**

- We agree with the proposal to have only one group for Flue Dust.
- The proposal for splitting 'flue dust' seems a reasonably compromise.
- We fully agree with the adopted splitting approach and criteria.
- Happy for one dossier and no-sub groups.