



Horizon2020 Information Days on Public-Private Partnerships

Brokerage event
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***SAFER: secondary aluminium foundries energy recovery and
pollutant emission reduction***

SACAL ALLUMINIO SPA
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ORGANIZATION/COMPANY

Sacal S.p.a - Società Alluminio Carisio - is an Italian company specialized in the aluminum refining

Since 1975, Sacal addressed significant investments to innovation and research, in order to improve its transformation techniques from aluminum scrap and a full recovery of processing residues

Through innovative processing and melting cycles, Sacal refines aluminum scraps with the aim to recycling and reusing it. In particular, Sacal produces secondary smelting aluminum alloys and, thanks to its significant plant investments, it can treat scrap of any type and form, polluted by iron, other metals, plastics and fats, becoming from all over the world and from industrial waste, from collection of old material, by skimming aluminum operators

PROJECT IDEA

Call reference: SPIRE-04-2016: Industrial furnace design addressing energy

First main aim: reduction of pollutant emissions of the pre-existing aluminium recycling process, particularly focusing on dioxins abatement. To assess this goal, a post-combustion chamber is predicted to be designed and introduced into the process.

The design of the post-combustor will be realized by the use of external and/or in-house developed software: several simulations will be carried out and the results will be analysed, allowing to define the optimal operational conditions to minimize the dioxins formation. Particular attention will be paid on the post-combustor materials in order to minimize the necessary maintenance and the corrosion problems.

PROJECT IDEA

The achievement of the energetic efficiency enhancement, on the other hand, will be obtained with the exploitation of the enthalpy content of the high temperature exhaust gases after the post-combustion.

The behaviour of the whole heat recovery section varying the operating conditions will be analysed with commercial and/or in-house developed software.

The steam generator will be designed with the purpose of obtaining steam with specific thermodynamic conditions required by the main process.

For what concerns the electric energy production, an Organic Rankine Cycle will be sized and selected, basing on the results of the thermodynamic evaluations for the novel proposed cycle. A market survey will be carried out with the aim of individuate the better solution for the specific application scenario

EXPECTED IMPACT

The project will have several impacts:

1. Pollution prevention and emissions reduction from the foundry section of the considered aluminium recovery plant
 - a decrease of the total powders emissions by 50%
 - a reduction in carbon monoxide (CO) emissions by 50%
 - a reduction in nitrogen oxides (considered as NO₂ equivalent) emissions by 30%
 - a decrease of the Volatile Organic Compounds (VOCs) emissions by 50%
 - a reduction in dioxins emission by 40%

EXPECTED IMPACT

2. The heat recovery from the high temperature exhaust gases enables to almost completely switch off four natural gas boilers, currently operating seven days a week to produce the steam required by the crystallization process
3. Electric energy saving: the introduction into the process of the Organic Rankine Cycle is estimated to remarkably reduce the electricity purchase from the grid by self-consuming the produced electric energy internally.

EXISTING PROJECT CONSORTIUM



SACAL ALLUMINIO SPA



UNIVERSITY OF BOLOGNA –
Department of Industrial Engineering

We are looking for:

- Industrial partners
- End users
- Public bodies

CONTACT DETAILS

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