IbD - Case Study 5 Process Intensification applied at Solid Reagents

Project:
Intensified by Design® for the intensification of processes involving solids handling

The IbD Project has delivered the EU process industry with an affordable and comprehensive devices-and-processes design-platform endeavoured to facilitate process intensification (PI), which specially targets -but is not limited to- solid materials processing. Five PI industry case studies have been implemented in mining, ceramics, pharmaceutical, non-ferrous metals and chemical processes using the IbD approach and to validate the IbD methodologies, tools, PI modules, control and fouling remediation strategies and the ICT Platform itself for the industrial implementation of PI in processes involving solids. The Platform includes design modules for the commonest intensified reactors- Rotating fluidized beds, micro-structured reactor and spinning disk, among others, as well as a generic Module Builder -equipped with a set of both proprietary and third-parties design tools- for designs carried out on the basis of radically novel ideas. The IbD Platform output is basically a data set that comprises the intensified reactor design -ready to be built or assembled-, an optimised whole process design including the upstream/downstream intensified unit operations and their solids handling capability, as well as cleaning methods, etc. and the expected economic and environmental quantitative impacts.

Project website: http://ibd-project.eu/ This project has received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No **680565**

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Sector:

Chemicals

Summary:

The following case study is linked to industrial process intensification of flow systems. However, traditional (single-tube) plug-flow reactors have a critical downside, being the small residence time distributions for reactions requiring fast turbulent flows for good mixing. This limitation is particularly true for reactions involving solids, as plug flow reactors generally do not have the capacity to pump at speeds to keep solids suspended, leading to sedimentation and fouling at inlets/outlets.

Theme:
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IbD Project

Brief description of PI technology chosen:

The technology chosen is AMT *Coflore ATR* reactor (http://www.amtechuk.com/pilot-and-plant-scale-atr/

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