RECP Best Practice Catalogue

Changing the configuration of the polymerization reactor

Developed within the framework of MED TEST II

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

switchmed

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Best Practice - Changing the configuration of the polymerization reactor

SECTOR:	**Chemical and Pharmaceutical**
SUBSECTOR:	Manufacture of other chemical products
PRODUCTS	PVAs
CATEGORY	Process control or modification
APPLICABILITY	Process

COMPANY NAME	---
COMPANY SIZE	Small

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Description of the problem (Base scenario):	The company's polymerization process is carried out in a reactor where vinyl acetate monomer, demi water and other additives are added from the top of the reactor. Then the polymerization process takes place and the produced Poly Vinyl Acetate (PVAc) will be withdrawn from the bottom of the reactor. The reactor needs to be cleaned regularly on monthly basis but some build-up material is difficult to remove. This problem causes product losses and increases the cleaning time due to the unrecovered product adjacent to the reactor walls.

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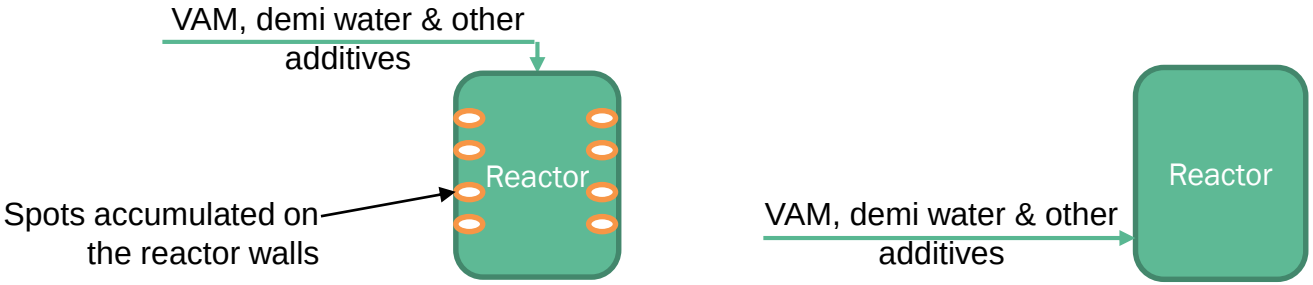
Description of the solution	Investigations from the company TEST team following the trainings on TEST approach of idenification the focus areas revealed that injection of the catalyst into the emulsion from the bottom instead of adding it from the top eliminated the build-up of PVAc on the reactor walls and led to cost savings in terms of time and material.



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Economic Benefits	The implementation of this measure will reduce the amount of the unreacted monomer and reduce cleaning time. It is expected that about 5% of VAM lost in the reactor will be saved. Amount saved of VAM is 1 ton/ year Material cost saving = 1,170 Euro/ year
Environmental Benefits	Reduce VAM emissions (flammable) and reduce the hazardous waste (1 ton/year) produced from the cleaning of the reactor walls.
Health and Safety impact	This measure increases worker's safety and provide better working environment for the workers.

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Capital investments & financial indicators	No cost is needed Payback period is immediate
Suppliers	No need for suppliers, In house – Company internal team.
Other aspects	Preventing unwanted polymerization will increase productivity & reduce coagulated solids in the product (this should be visible when inspecting the filters).
Implementation	This measure is implemented by the company and real savings are real (validated) saving figures.

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Replicability sectors	**The same concept can be replicated in:** Polymers industry. Any other industry that have reacted materials which possibly solidified on the reactor walls.
Aspects to investigate for replicability	Amount of raw materials and produced polymer. Availability of changing the injection direction of raw materials in the reactor.
Useful resources	