Recycling of wash water at P&G

Linclau Eddy (Procter & Gamble) linclau.eg@pg.com

Economically and Ecologically Efficient Water Management in the European Chemical Industry

TRADITIONAL : WASH WATER = WASTE - WASTE WATER

- add chemicals and/or energy
- convert COD into CO2 and sludge waste
- use incineration for difficult streams

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E4WATER : Wash water = product + water ≠ waste

- use tubular membranes to split in WATER and PRODUCT fraction
- recycle these 2 fractions separate
- when micro contamination concern : pasteurize to allow reuse/recycling

Sustainable:

100% recovery of water and raw materials
NO chemicals needed in the process
NO waste generated

Simple:

Fully automated; light-off operation
performance by design

Cost effective:

same/lower capital versus traditional
less space required
Opex neutral/ generating revenue

Tubular Nano Filtration Membranes

Volume >95%

<5%

Polishing technology (MBR or AOP)

Ohmic heating

Flash pasteurization

Discharge into sewer

Reuse in cooling tower or as process water

waste

External recycle

Internal recycle

Industrial application at P&G

First industrial unit , based on tubular Nano Filtration + MBR + Activated Carbon.
16 ton/day, designed as containerized system 'plug in and start-up'.
Build in Europe by SME's.
First unit running in P&G China since Feb 2015; more than 3000 ton of high concentrated wash water treated.

Stream	COD (mg/l)	Anionic surfactant (mg/l)
Equalization buffer tank	10000 - 50000	800
Nano Filtration permeate	1000 - 3000	30
MBR permeate	<100	<0.5
Final quality after polishing with ACF	<50	<0.5
Target to recycle into cooling tower	<50	<0.5

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Coordination:

DECHEMA e.V.
track@dechema.de
jungfer@dechema.de

www.e4water.eu