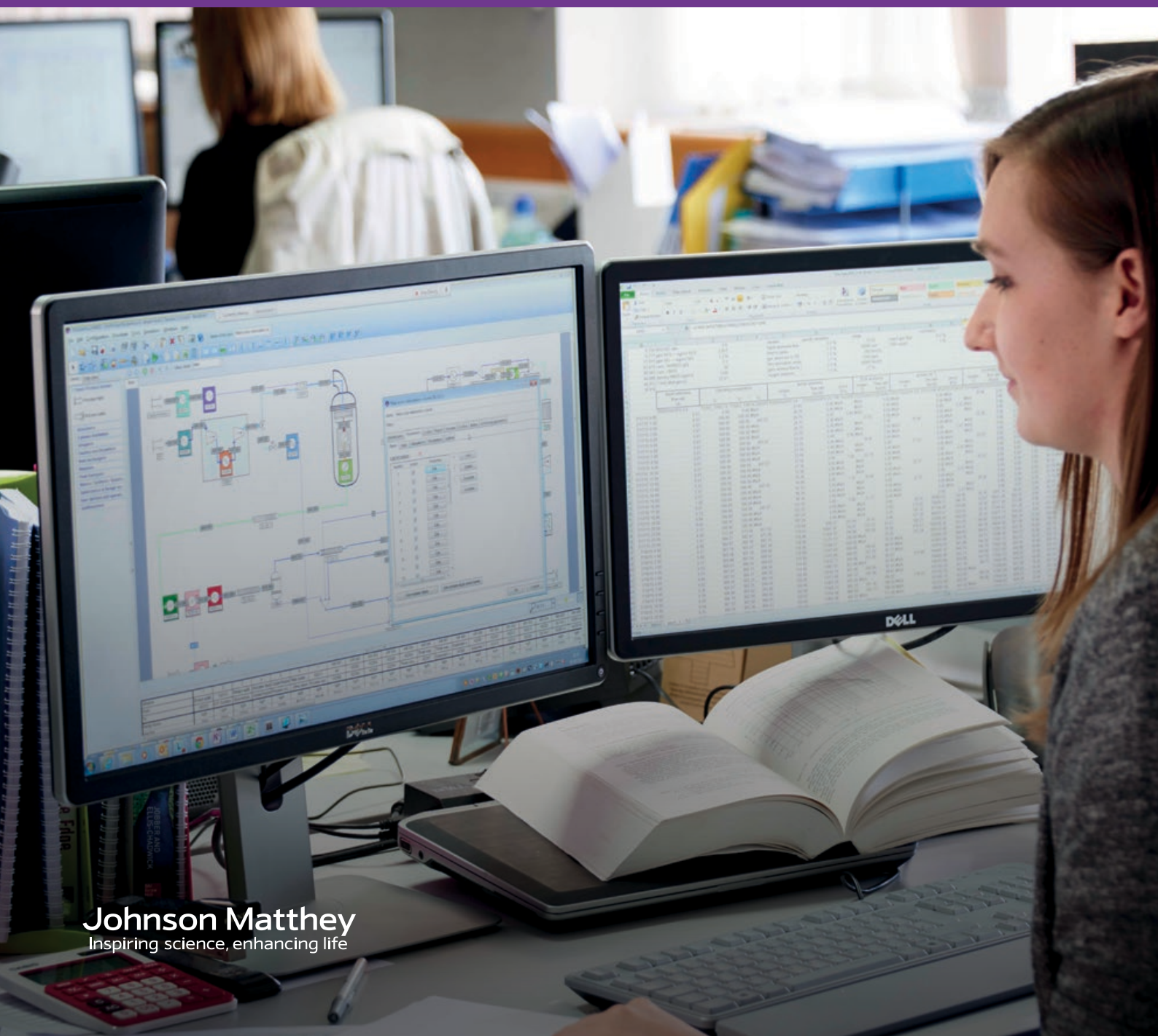
JM

Process modelling for nitric acid plants



Johnson Matthey
Inspiring science, enhancing life

Process modelling allows nitric producers to enhance performance of their plants

Johnson Matthey (JM) can assist operators with modelling nitric acid plants by applying our know-how and expertise to help improve or optimise plant operations.

Within our engineering teams there is a range of software available to provide fundamental understanding, detailed analysis of plant performance Including:

- Computational fluid dynamics (CFD),
- ProSim™ HNO_3
- JM proprietary models for ammonia oxidation

Use of modelling can help give a clear understanding of complex situations, giving optimisation potential to improve operations.

Computational fluid dynamics (CFD) is used to simulate fluid behaviour in complex parts of process equipment. It uses rigorous modelling to calculate velocities, temperatures and compositions of the process streams. These simulations are used to understand phenomena of mixing, combustion and fluid distribution and CFD is normally used to address areas such as gas distributors and catalyst support systems at the burner.

ProSimPlus HNO_3 is a unique process engineering tool, specifically designed to model nitric acid production plants and nitrous vapors absorption units. Accurate modelling of nitric acid plants is critical for performance optimisation the use of ProSimPlus HNO_3 allows JM engineers to analyse the process in detail in order to look for improvement opportunities especially related to the burner. Within the burner JM uses it's proprietary kinetic model to simulate the performance of the catalysts in the burner, determine the reaction profiles within the catalytic pack which that enables optimisation of the catalyst system to meet individual customer requirements.

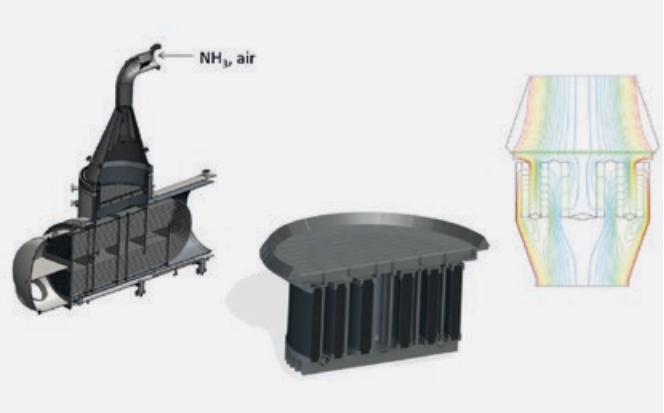


Figure 1: example of gauze and secondary N_2O catalyst flow simulation

In addition, JM uses its proprietary kinetic model to simulate the performance of the catalysts in the burner, determine the reaction profiles within the catalytic pack which then enables optimisation of the catalyst system to meet individual customer requirements.

We offer various options to achieve maximum performance through process modelling, including software licences, preliminary reports and comprehensive studies.

ProSimPlus NHO_3 is available via our partnership with ProSim.

ProSim

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