
The usefulness of modelling for improving energy efficiency

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Abstract

The CFD modelling in the industrial processes (glass production as well) is nowadays more than usual.

It is well known that the modelling could be used for getting better insight of what is happening inside the furnace, where normally very difficult inspection is possible due to the high temperatures.

Furthermore, the modelling could be very useful when planning furnace design changes as the simulations give the customers the possibilities to directly see the effects with no harm to the furnace or even the running production. Result of the simulation could even help the customers to find the sources of defects.

In these days there is one word, that is repeated again and again, and the word is decarbonation. There are multiple ways how to achieve this goal. And as always, there is still a huge pressure on a drop of pricing. One topic connects both these tasks – energy efficiency. The higher the efficiency, the lower emissions and the lower the costs for melting the glass.

Again, there are multiple ways to describe and evaluate the efficiency of any process. The simplest way is to produce the same amount of glass (or higher) of the same quality (or better) with lower energy input.

It is obvious that using "trial and error" approach is not a good way as it quickly becomes extremely expensive. And this is exactly the task for mathematical modelling. Many possibilities could be evaluated in short time and with reasonable costs.

Very likely, when any glass producer plans the furnace optimization, the CFD model is used prior the realization.

Furthermore, new concepts are currently being developed. This would be impossible without use of CFD modelling.

Glass Service (GS) has internally developed a software (Glass Furnace Model - GFM) that is aimed at the usage in glass melting industry. It is regularly updated to give the customers as many benefits from modelling as possible. Many customers use GMF on daily basis, other order just the modelling studies directly from GS. The positive feedback from the customers

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is the leading motivation for us to go on.

There will be shown some examples of using GFM to achieve customer's needs (such as lower carbon footprint, lower energy demand, etc.) in the presentation.

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