

Simulation and Mathematical Modelling of Float Glass Process

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Float glass process within tin-bath is very complicated and involves several modeling tasks of free surface thermal flow of glass:

- Glass flow in upper canal (spout) is influenced by position of the tweel.
- Glass flow along slanted lip.
- Falling glass is partially penetrating into the molten tin just below the lip, then flowing on the tin surface to the sides along wet-back and restrictors.
- Glass floating on the tin (glass ribbon forming) is controlled by restrictors, by heaters from upper lid, by process of tin cooling, by position of the top rolls located at glass ribbon sides and by pull force at the end of the tin bath (generated by the lehr).

During the cooperation project initiated by Glass Service, a.s., the mathematical modelling of the ribbon forming was originally solved by team of prof. Josef Málek at Mathematical Institute at the Department of Mathematical Modeling, Faculty of Mathematics and Physics, Charles University in Prague. This team has developed Cahn-Hilliard model of glass flow along the lip and 2.5 dim model of ribbon forming on the tin. The ribbon forming model was further specified in details by doc. Petr Sváček at the Czech Technical University in Prague.