Session	Energy Efficiency in Glass Production
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Chair	Tolga Uysal

Decarbonization Through AI Batch Monitoring for Electric and Gas Fired Furnaces Coupled with Model-Based Predictive Furnace Control

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Biography

Erik Muijsenberg is a Mechanical Engineering graduate from the University of Eindhoven, Class of 1990. In the eight years following his graduation, he was employed by TNO Glass group in Eindhoven, where he focused on furnace modeling and glass melt technology. In 1997, he assumed the role of TNO Glass Department leader.

In 1998, he took on the position of Managing Director at GLASS SERVICE B.V., marking the establishment of the first GLASS SERVICE subsidiary office in Maastricht, the Netherlands. After eleven years, he relocated to GLASS SERVICE headquarters in the Czech Republic, where he assumed the role of group Vice President. GLASS SERVICE boasts a global presence with over 110 engineers and offices in Czechia, Slovakia, Netherlands, Germany, UK, France, USA, China, and Japan. Notable subsidiaries include FlammaTec, recognized worldwide for combustion systems, and FIC UK, specializing in Electric melting solutions.

As of April 2024, Glass Service Group has become part of SEFPRO and Erik was appointed as the Commercial Director.

During the ICG Annual Conference in Korea in August 2024, Erik was elected as the new Vice President of the International Commission on Glass.

Erik has been a fervent advocate for Industry 4.0, promoting smarter model-based predictive furnace and forehearth control, as well as Carbon emission reductions in the Glass Industry for over two decades.

Recognition:

Otto Schott Award	1998	Växjö Sweden
German Dietzel Industry Award	2012	Magdeburg Germany
SGT UK Fellow	2014	Stoke en Trent UK
ICG Turner Award	2023	Hangzhou China
N.L. Varshneya Memorial Award	2023	Cambridge UK
Flogen von Klizting (Nobel Laureate)	2023	Panama City, Panama

Side Functions:

Past Chairman and Vice Chairmen ICG TC21 Furnace Design & Operations 2010-2024
The Phoenix Glass Person of the year Chairman, 2024
The ICG Vice President, 2024-2027

Abstract

Batch and cullet melting represent the initial stages of the glass melting process. The stability of this process, influenced by factors such as pull, cullet level, glass color, raw material variations, rheological behavior, and the batch charger, is crucial for ensuring optimal glass quality in gas-fired furnaces. The potential instability necessitates continuous 24-hour monitoring and potential corrective control to minimize quality issues. Additionally, the increasing electric boosting levels resulting from the decarbonization process have the capacity to alter glass convection loops, displacing batch downstream in the process.

In cold top melting furnaces, the thickness of the batch plays a pivotal role in insulating the hot glass melt and minimizing heat loss. However, variations in pull and cullet can significantly impact batch thickness. Until now, there has been a lack of systems capable of measuring the actual batch thickness or height and incorporating this parameter into automatic model-based predictive furnace control.

This paper will present the latest developments and results for both gas-fired and cold top electric melters.