

BURNERS, COMBUSTION AND HEAT TRANSFER

(672) - (*) - DEVELOPMENT OF A BURNER TESTING FACILITY

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At the Chair of Thermal Processing Technology at the Montanuniversitaet Leoben, an industrial burner testing facility is currently near completion. The test chamber has been integrated in the current infrastructure and uses the exhaust system from the flash reactor test facility. Due to the existing exhaust system, the output is limited to 1000 kW in natural gas-air operation. The current supply of oxygen limits the power to 1250 kW when operated with natural gas and oxygen. The gas control system allows any desired enrichment of the air with oxygen, up to pure oxygen operation. Additionally, the fuel can be mixed with alternative gases like hydrogen, using bundles of gas cylinders. To simulate thermal loads, 14 cooling elements could be inserted in the chamber from the top. For optical measurements in the ultraviolet and near infrared spectrum of the light, Air-cooled quartz glasses are used. The arrangement of the 23 measuring ports is designed in such a way that in the future measurements using various laser methods (Particle Image Velocimetry, Laser-Induced Fluorescence) will also be possible.

In the development of the burner test chamber computational fluid dynamics (CFD) methods were intensively used. To obtain the basic dimensions, several burner types with a power of 1000 kW using natural gas and air are modelled. CFD studies, for different arrangements of the cooling system were carried out as well.

Palavras-chave : burner testing facility, CFD analysis, alternative fuels