DATASHEET

HAMWORTHY COMBUSTION TECHNOLOGY CENTRE

Research and Development

Introduction

The Hamworthy Combustion Technology Centre, covering almost 6000 m^2 at the Group's Poole site, is recognised as one of the largest and most comprehensive burner testing installations in the world. The test rig complex includes 13 test furnaces capable of firing burners up to 100 MW. More than thirty engineers are involved with burner and combustion equipment testing and development. A range of complementary techniques are also used for burner development including CFD and physical modelling. Full-size flares can be tested at an off-site facility.

R&D

Burner development is carried out by a highly-skilled group of combustion engineers. The test furnaces play an integral role in the development of new burners and evolution of existing burners for new applications. All new burners are extensively test fired at the test facility before being introduced to market.

Customer Demonstration Testing

Production burners are test fired to prove emissions and combustion performance prior to delivery. This gives the customer confidence in burner performance and allows collection of valuable commissioning and set up data. Demonstration testing can also be used to give the customer's operations and start-up staff experience before commissioning. The test rigs are also used for investigation of combustion properties of unusual fuels and for burner customisation for special applications.

The test rig complex has a dedicated Customer Centre which visitors can use for meetings and refreshments while attending burner tests.

Training

The test facility is used to give 'hands-on' training to customer operations staff as well as for practical training of Hamworthy Combustion engineers in burner operation, optimisation and fault-finding. This is part of the services offered by the Hamworthy Combustion Institute.

Instrumentation and Equipment

The test furnaces are equipped with permanently installed analysers to monitor pollutants such as NOx and CO as well as O_2 concentration in exhaust gases. Emissions analysers are available for SOx, VOCs and other pollutants. Portable analysers are used for on-site investigation of burner performance and for emissions optimisation. The test furnaces are subject to a systematic process of upgrading with the latest instrumentation and provision of on-line data logging during burner testing.

Fuels and Gases

Storage tanks are available for heavy fuel oil (HFO), diesel oil and other liquid fuels. Natural gas is available at high pressure. There are also storage facilities and ring mains for lpg, compressed air, low pressure steam, oxygen and CO_2. Hydrogen and nitrogen and other special gases such as ethylene and pentane are supplied in cylinders as required for blending during burner testing.

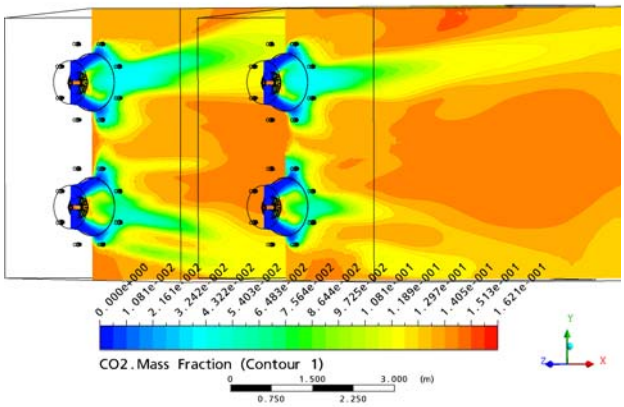
Burners can be supplied with pre-heated combustion air at up to 550 °C. Flue gas recirculation and water injection systems are available for NOx reduction.

CFD and Physical Modelling

Uniform air distribution is essential for optimum performance of burners. This is especially the case when burners have to operate at a low excess air level and meet stringent flame fit and emissions criteria.

In addition to CFD modelling, reduced scale dynamic air and water models are used to evaluate ducting systems and air distribution in common windboxes.

Computational Fluid Dynamics (CFD) is extensively used in burner development, evaluation of new flare designs and development of thermal oxidisers which cannot easily be tested. Full-time CFD engineers using CFX and Fluent software are based in our global network of offices.



Burner Ancillaries and Controls

The complex includes equipment and facilities for testing and development of electronic components and systems. This includes the Hamworthy Combustion range of flame scanners, pilot igniters and HE igniters developed by Chentronics. Test equipment includes a climate-controlled chamber for heat soak testing of electronic components.

Flare Testing

A flare pilot test rig is available at the Poole Combustion Technology Centre. Other full-scale flare testing is carried out at an off-site flare test facility.

Workshop and Site Installation

The Poole test facility has its own engineering workshop. This is where parts used in burner testing and development can be quickly manufactured and modified. A dedicated group of experienced fitters are responsible for burner installation on the test furnaces.

For further information on combustion equipment please contact the head office:

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