“Python”
Cast Copper Stave Coolers

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In 1995, looking as always for improvement a development team from Corus comprising of scientists, blast-furnacemen and foundrymen embarked on a project.

Their challenge was to relate to blast furnace cooling and was to develop a new stave concept which provides all the desirable characteristics of a traditional cast iron stave but with the well proven thermal tolerance, and consequent longevity benefits of copper. The key objective was to develop copper staves that could be readily retrofitted without the need for expensive modification to existing furnace shell and water systems.

The project team decides that new manufacturing technology was needed in order to create the means to achieve the project objectives.

The result was a series of breakthrough developments which allow internal waterways to be designed to give flexibility of cooling passage section and for these to be placed to optimise cooling efficiency and to gain full alignment with existing water connections. They also provide the means for the safe reduction of the stave thickness allowing a corresponding increase in furnace volume.

PATENTED CORE BASED TECHNOLOGY

The prototype stave was installed in Scunthorpe Queen Bess furnace in February 1996. After a successful 18 month trial after which the stave showed *no sign of degradation*, the first full row of 32 bosh staves was incorporated in the Scunthorpe Queen Victoria furnace during 1998. This was immediately followed by a decision to fit five rows (156 staves) of the PYTHON type in the Queen Anne furnace.

This time the installation includes the first use of horizontal coolers and the more complex Tuyere Breast-staves.

The new Cast stave offers great flexibility of design and shape. Complex geometry’s can be accommodated and the need for expensive machining of external profiles and internal waterways is eliminated.

The flexibility of the PYTHON concept has been further demonstrated in the design of staves for Llanwern No. 3 furnace which are shaped to fit around existing copper box coolers. Not only did the PYTHON enable the design options to fit exactly around these coolers but they have also provided greatly enhanced cooling efficiency by means of carefully profiled and placed waterways to exactly suit the needs of the furnace.

LLANWERN TRIAL STAVE

PYTHON Benefits:

- Increased furnace volume
- Proven technology with operational data
- Design to suit existing furnace shell and water configuration thereby simplifying installation and reducing costs
- Enhanced cooling efficiency giving extended stave and furnace life
- Full technical and operational back-up