

# AFT Fathom™ Increases Efficiency at Steel Plant: Coke Oven Gas Cooling Temperature Project

CASE STUDY

**Coke Oven Gas Cooling System**  
Mining & Metals Industry

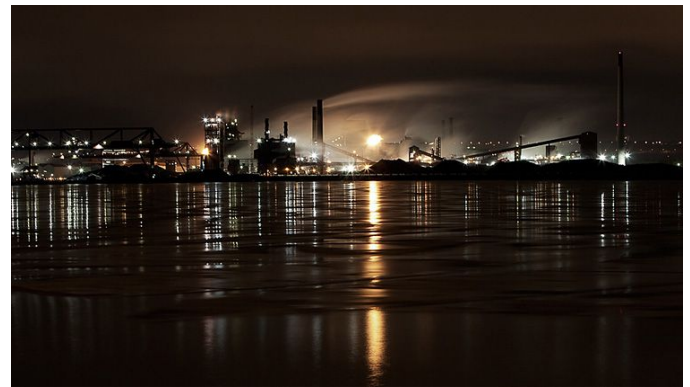


## **ArcelorMittal Dofasco Hamilton, Ontario, Canada Platinum Pipe Award Winner - Operational Benefits and Sustainability**

ArcelorMittal Dofasco (AMD) is in the construction phase of a \$6M capital project to improve their coke oven gas (COG) cooling system temperatures at the #2 By-Products plant in Hamilton, Ontario. Operational benefits of lower gas temperatures are increased efficiency of the COG cleaning/cooling process, improved by-product quality and reduced buildup that will extend equipment life and reduce maintenance time.

Justin Clappison, piping specialist at AMD, used AFT Fathom to design improvements and additions to the

(77 F). New flushing liquor pumps and piping are being installed as well as the PC's internals modified to help achieve this temperature.



Hamilton, Ontario steel production

**“Improved COG cooling temperatures will increase the amounts of condensable material, such as tar and naphthalene, dropping out of the gas during the initial stage of the cooling/cleaning process.”**

existing COG cleaning system. The model (see Figure 1) was used to validate new operational requirements of the system.

COG is generated in a series of coke ovens during the coal carbonization process. The large volume of COG produced is continuously withdrawn from the coke ovens and delivered to primary coolers (PC's) by a centrifugal blower. The COG undergoes the first stage of the cooling/cleaning process within the PC's. Flushing liquor is introduced to the PC's through a spray header arrangement. Cooling is achieved as the gas travels vertically upward through the PC's, counter to the downward fall of flushing liquor. The ideal exit temperature of the COG is about 25 degrees Celsius

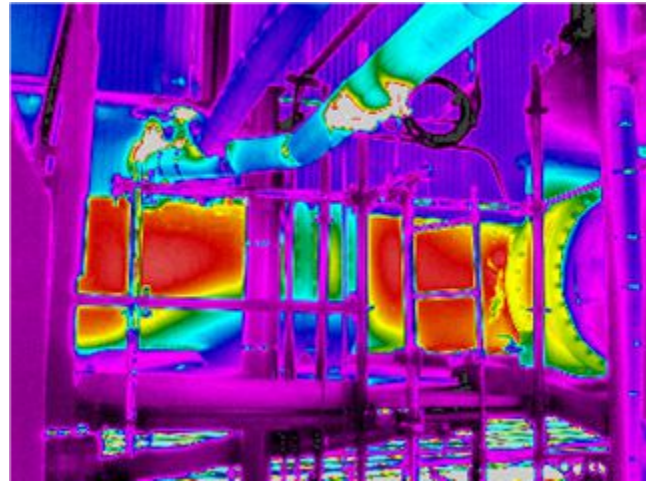
When asked about the benefits of AFT Fathom, Clappison said, “We were able to validate our piping layout, flow rates, control valve sizes, and pump/motor power requirements. Useful outputs were used in discussion with team members and vendors throughout the project. Proper equipment and valves have been purchased with confidence using the results of the software.”

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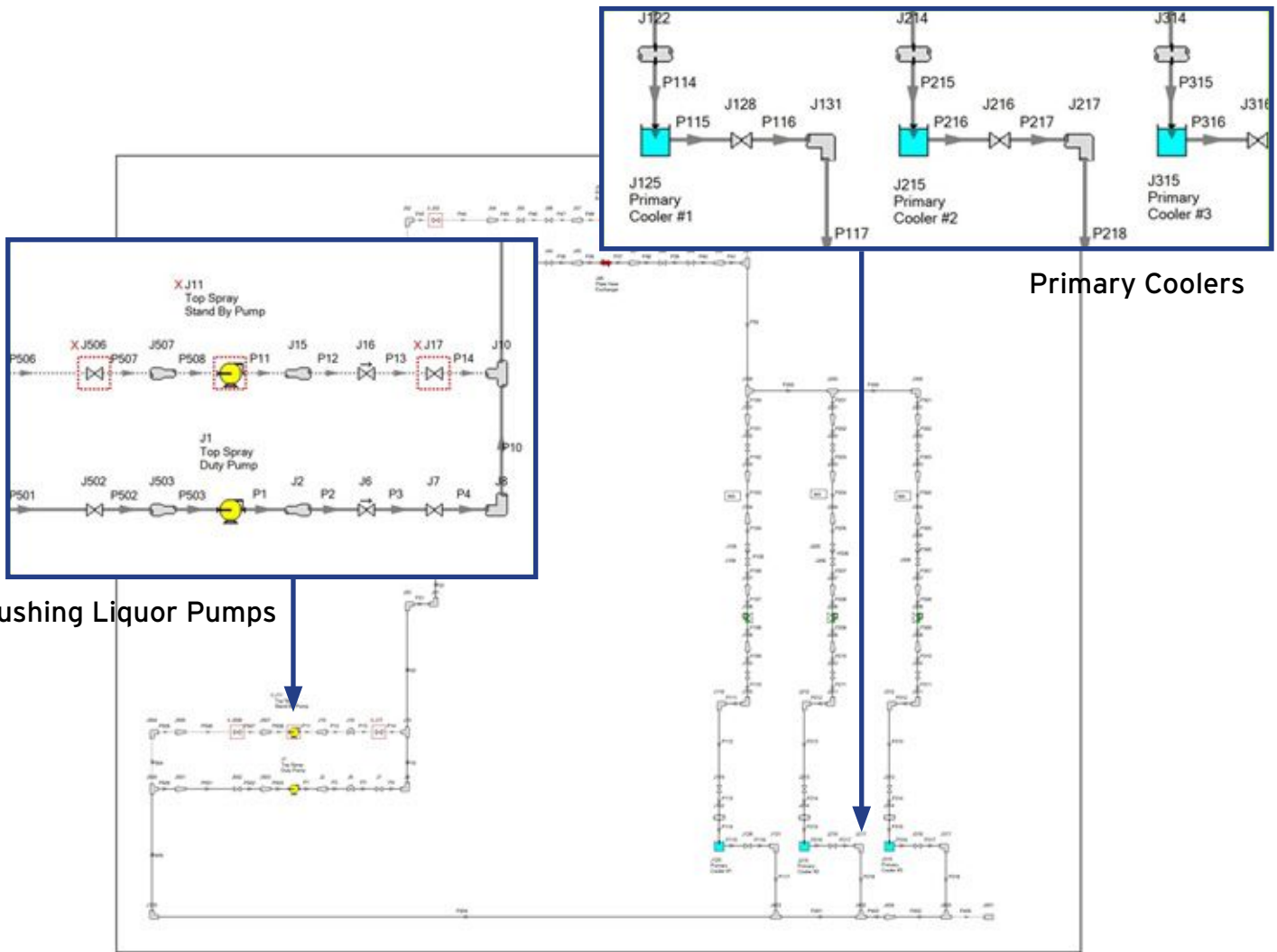
*Founded in 1912, ArcelorMittal Dofasco is Hamilton's largest private sector employer with more than 5,000 employees shipping 4.5 million net tons of high quality flat carbon steel annually. Around the world, the ArcelorMittal Group employs 240,000 employees in 60 countries and looks to flagship sites like ArcelorMittal Dofasco to develop new technology and products that are fundamentally transforming tomorrow.*



Existing coke oven gas piping



Blue show pipe buildup downstream of primary cooler



Primary Coolers

Flushing Liquor Pumps

Figure 1 - AFT Fathom Model: Cooling system at #2 By-Products Plant in Hamilton, Ontario