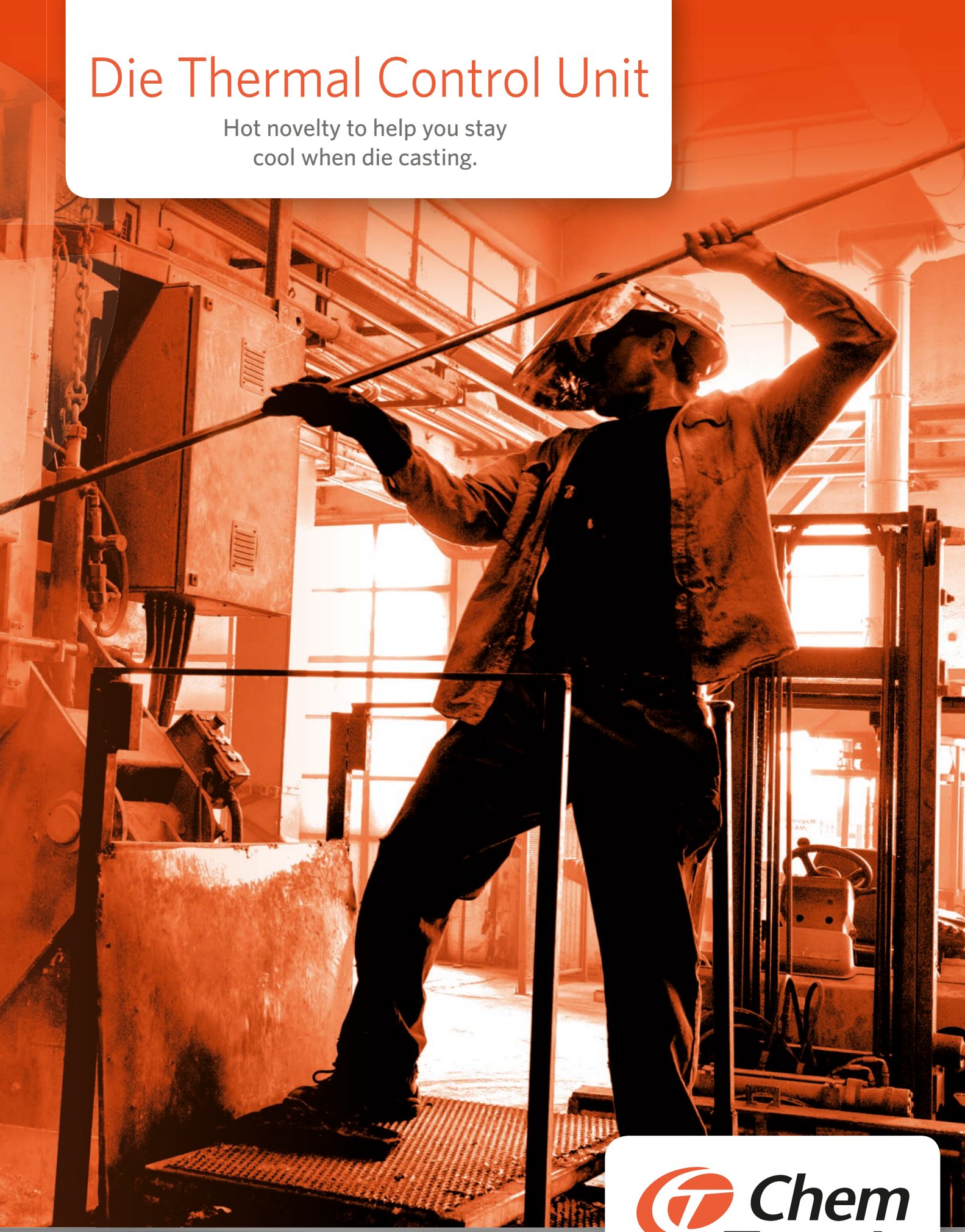
Die Thermal Control Unit

Hot novelty to help you stay
cool when die casting.



Precise real-time measurement of temperatures without disrupting a process with physical contact.

Chem Trend

Release Innovation™

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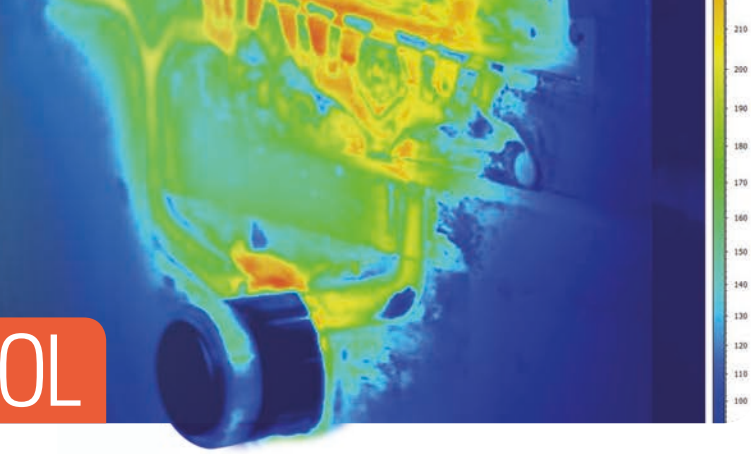
DIE THERMAL CONTROL



For more than 50 years Chem-Trend has offered a wide variety of solutions to meet the needs of its customers by helping to improve quality, reduce costs and boost productivity within their operations. In order to face the modern challenges of the high-pressure die cast (HPDC) industry and growing automotive OEM requirements, Chem-Trend partnered with industry to develop an innovative surface thermography system for the HPDC process.

LET THERMOGRAMS HELP YOU KEEP COOL IN THE HEAT OF DIE CASTING

Thermograms identify what human eyes cannot see – the thermal energy emitted by a body or an object. The main advantage this technology offers is the precise real-time measurement of temperatures without disrupting a process with physical contact to the surface to be measured.

Inprotec Irt is a leader in infrared technologies; the company specializes in thermography camera systems that detect radiation in the infrared range of the electromagnetic spectrum and produce images of that radiation.

The Die Thermal Control (DTC) unit is the advanced result of Chem-Trend's and Inprotec's cooperation to facilitate die casters' the control and monitoring of their die cast process.

In the HPDC industry, monitoring die temperatures plays a key role in several phases of the manufacturing process:

TEMPERATURE CONTROL MATTERS

Start-up phase: when the die must be gradually warmed up until prescribed operating conditions are reached.

Series manufacturing: when the die temperature must be controlled to maintain proper thermal balance through thermoregulation units and the spraying of die lubricants to achieve optimal quality through release, casting appearance and thermal management.

BETTER MONITOR AND REGULATE DURING OPERATIONS

The DTC unit is provided with an electric cabinet, a pneumatic system for shielding the infrared window and with 10-meter-long anti-crushing wires with industrial connectors to the housings. The DTC unit consists of a movable unit and one or two infrared cameras integrated into air-cooled aluminum housings. The cameras acquire a series of thermal images in real time, thus enabling immediate process feedback and control.
ROIs (Regions of Interest) or POIs (Points of Interest) can be set for monitoring specific details of the casting tool, temperature trends or simply for comparing previous to current production batches.
All data is stored and processed by a computer panel. Post analysis of thermal images can be easily conducted by downloading the data from the DTC via USB drive.

LET THERMOGRAMS HELP YOU KEEP COOL IN THE HEAT OF DIE CASTING

BENEFITS OF DTC USE

- Controlled, preset, start-up cycles for extended die life and scrap reduction
- Faster sampling of new dies, tools and castings to aid better knowledge of tooling
- Optimized spray and lubrication cycle
- Spray cycle customized to the release agent in use
- Local and punctual measurement of temperature without thermocouples
- Live view of temperature distribution of the fix and mobile die
- Control and monitoring of the HPDC manufacturing process:
  - „Identity card" map of the die
  - "Identity card" map of the casting
- Series thermographic records for archiving the manufacturing process
- Full data collection without disruption of serial production

INDIRECT BENEFITS

- Improved surface thermal temperature distribution resulting in lower die thermal shock
- Waste water reduction due to optimized spray cycle
- Correlation of casting parameters, i.e. casting defect and local die temperature
- Enhanced casting quality (cold flows, shrinkages, porosities, diesolderings, etc.)
- Increased productivity
- Improved overall equipment effectiveness of the HPDC cell
- Possible management of thermoregulation and cooling system
- Potential interface with spray equipment

KEY HARDWARE FEATURES OF DTC

- Reliable, robust and easy to transport
- IP 67 aluminum housings with Vortex technology
- Simple installation and removal on the die-casting machine by the end-user
- High-tech solution with integrated touch screen panel
- Series recording and saving of thermal images on hard disk
- Video recording and thermal image storage on hard disk
- Data transfer via USB interface
- Available in "mono" and "stereo" version to monitor fix, mobile or both die halves
- Infrared camera resolution 320 x 256 pixel
- Higher infrared camera resolution optional (640 x 512 pixel)
- Autofocus and motorized focus upon request
- Remote assistance service by Inprotec

SOFTWARE FEATURES OF THE DTC

- Tailor-made software exclusive to Chem-Trend, available in 5 languages (DE / GB / FR / ES / IT)
- Ability to draw up to 10 POIs
- Ability to draw up to 10 free ROIs with minimum, average and maximum temperature as reference values
- Indication of position of Hot Spot and Cold Spot in the ROI
- Ability to graph the ROIs trends of temperature minimum, average and maximum
- Ability to set on-screen or external signal threshold limit alarms.
- Representation of up to one month of temperature trend in video recording with live or archived data download capability.
- Camera settings such as emissivity, temperature scale and colors palette
- Recording of images on event and in manual mode (dedicated button)
- Ability to save file „collection" to:
  - recall the same areas of analysis in the same position, to manufacture repeated orders
  - conduct a post-analysis of the recorded images
- Specific customer software requirements available upon request (optional)
- Visualization of "event log" and "alarm log"
- Parameter settings protected by password to prevent unauthorized changes

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