

TTV

With the introduction of Marposs' Total Thermal Vision, Tecopress has improved numerous aspects of its die casting process and reached goals far beyond the scope of previous optimisations

Thanks to over 50 years of experience, Tecopress has established its position as a leading company in the production of light alloy components for major automotive manufacturers such as Audi, Ducati, BMW and Volkswagen.

Tecopress has always focused on research and the use of devices and technology to improve its die casting process. To pursue this goal and firmly maintain its insistence on innovation, the company has chosen TTV, the infrared vision technology developed by Marposs as a high level solution for improving surface temperature monitoring on die-cast moulds.

The end result has been to significantly improve cycle time cycle and achieve goals far beyond those reached by traditional Tecopress test systems in the past. TTV has also allowed major investment savings to be made by increasing production quality.



*The Tecopress staff in front of the Marposs TTV. From left to right:
Paolo Bergamini - Factory Director,
Marco Tassi - TPM and Continuous Improvement
Alex Amadelli - Plant Maintenance Manager
Massimiliano Raimondi - Production Manager
Luciana Pizzoferrato - TPM and Continuous Improvement
Fabrizio Cattani - TPM and Continuous Improvement*



A detail of the TTV thermocamera case

Keywords: efficiency, user-friendliness and greater die casting process awareness

Tecopress' decision was dictated by two requirements from the operating sphere of the company: the user-friendly design and efficiency of its tools and their capacity to respond rapidly to different production requirements.

As it does not require the operator to possess any special process skills, TTV has shown itself to be an excellent ally.

Its touch-screen interface displays of all the data required to test cycle characteristics while also allowing technicians to examine the various aspects that distinguish it.

Thermographic monitoring is synonymous with a rapid return on investment

Anyone operating in this sector is well aware that the tiniest flaw in an end product has a significant impact, especially if large production volumes are involved. In these cases, thermography becomes an essential tool for monitoring a number of die casting process variables, such as expected temperatures and their repeatability and eventual deviations, which are the key parameters constantly monitored by TTV.

Massimiliano Raimondi, the Production Manager, explains how important TTV process monitoring has been and the

benefits the company has enjoyed: “TTV has enabled Tecopress to closely study the effects that different variables produce on moulds and understand to what extent they damage components. Peeling, pitting, bonding and metallisation are the main defects that thermographic monitoring has enabled us to reduce and even eliminate. Using a press equipped with TTV helps us implement strategies aimed at increasing mould lifespan and measuring 100% of surface temperatures, immediately before and after the lubrication phases.”

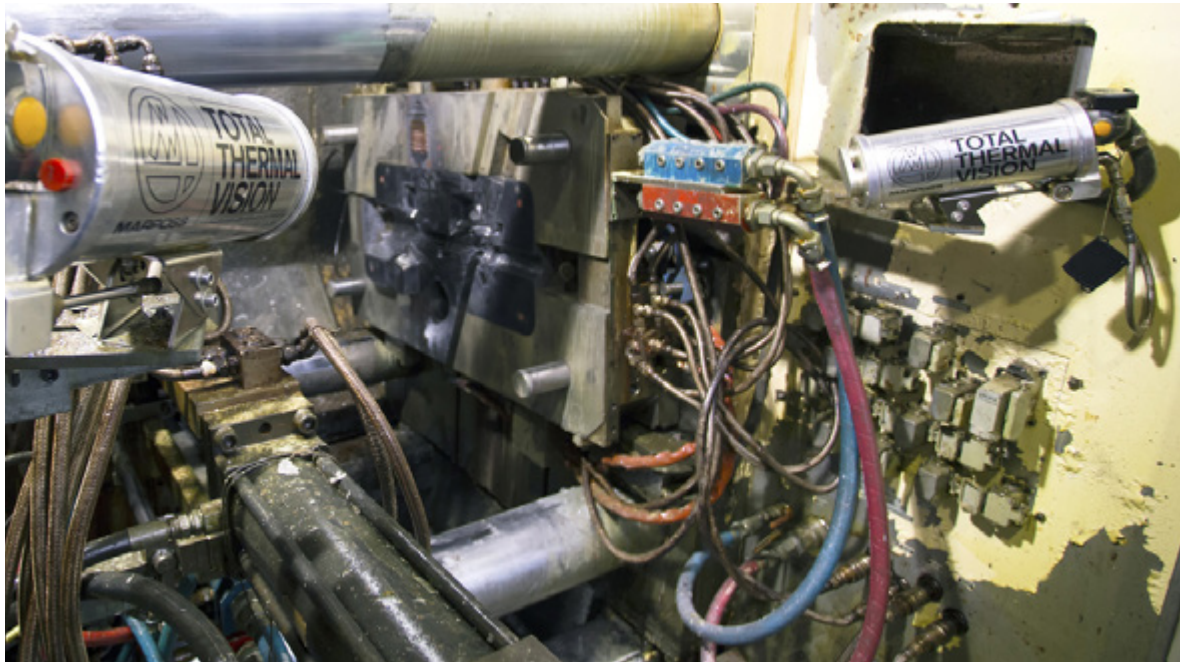
TTV has enabled Tecopress to reduce die cast flaws and increase moulds lifespan



A part of the Tecopress Production Plant

By capturing images in two key moments,” continues Raimondi, “we have been able to study any eventual defects in the die cast components. Before the lubrication cycle, images of any critical areas that may be out of range are recorded and the temperature set in every Region of Interest (ROI) are checked. Then, after lubrication, any areas where a temperature other than the expected ΔT are inspected. Any results that do not meet expectations created by simulated casting operations, prompt peripheral elements such as lubricators, thermoregulators and injection parameters, to be examined for inefficiencies, and the required corrective actions to be taken.”

A 5-6% optimisation in cycle time and a reduction of up to 20% in the use of mould release agents: a level of improvement that has enabled a rapid return on investment



The position of the thermocameras on the press

TTV has helped optimize different aspects of the die-cast cycle

In addition to eliminating defects, monitoring the surface temperatures of the mould has enabled the cooling and lubrication processes to be improved. How is this result measured? By reducing cycle times, reducing unexpected mechanical component breakages and lowering the degree of thermal stress on the mould steel, the lifespan of the system has been increased.

“Thermal monitoring has also allowed us to rationalise our use of water and mould release agents, limit the wear on mechanical components, and improve the global efficiency of die casting process,” explains Paolo Bergamini, the Plant Manager. “One important example is a 5-6% improvement in cycle time and a reduction of up to 20% in the use of mould release agents. This level of optimisation has been far higher than expected.”

The opportunity to monitor the temperature of the mould continuously during the heating phase has reduced cycle times and consequently increased machine productivity and diminished the number of rejected die casts during heating. The warm up and set up phases in the die-casting process are non-productive, so our aim is to reduce them as far as possible. According to Bergamini: “TTV has succeeded in reducing equipment set-up times as it allows us to identify on a case-to-case basis, the correct quantity of casts to produce before the press is considered ready for production.”

TTV allows lifespan of certain components to be calculated, which avoids unexpected breakages and expensive line downtimes

The end result: TTV changes your approach to production

Another aspect of TTV use that is particularly appreciated is the way it reduces both unexpected machine downtimes and mould replacements due to maintenance.

These elements have a negative impact on the productivity and efficiency of the machines, but thanks to thermographic monitoring the number of unexpected breakages and premature replacements has been drastically reduced. Keeping surface

temperatures within limits avoids overheating die casts that leads to metallisation which, in turn, generates cracks and splits in the mould. In particular, TTV has allowed the working life of certain components (like plugs and squeeze pins) to be calculated precisely. A level of monitoring and analysis that has improved and optimised die casting process to the point of achieving “zero defects”, which avoids expensive line downtimes.

A number of Tecopress customers are now even using these TTV thermographic images to demonstrate the superior quality of their production, while others have employed them to obtain approval from Quality Assurance institutions endorsed to certify correct production performance. Numerous customers are now also using thermographic batch images as part of their Production Part Approval Processes or to satisfy Customer Specific Requirements.

To conclude, Bergamini says that: “For Tecopress, TTV has proved to be an innovative, comprehensive and effective solution for increasing moulds lifespan, significantly reducing waste and optimising cycle times. The working relationship created between Tecopress and Marposs is extremely precious as it has succeeded in improving the entire production process while also looking towards the future.”



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