Industry 4.0 for Superplastic and Hot Forming manufacturing processes: effective developments and deployments in the AUROCK factory.

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Reach good industrial performances with superplastic forming process requests a fine mastering and optimization of process and press environment parameters. These parameters have a strong influence on the part quality, the cycle time, the forming tools costs, the press maintenance charges and the energy consumption.

Thanks to its longtime experience in Finite Elements (FE) models for digital forming processes and its good knowledge of forming press architecture and control, Aurock chooses to extend digital technology into its production workshop for factory's upgrade to smart manufacturing standards.

To reach this objective, Aurock develops and started to deploy in its workshop its own Industry 4.0 tool dedicated to HF/SPF parts production. This tool enables to optimize the most influent process and press environment parameters to reach a high level of productivity while contributing to a strong team involvement through skills development and pleasant working environment.

This Aurock's digital tool includes:

- a live Dashboard available on big screens at different workshop corners and on the company network for production supervision and live forming press monitoring,
- a Data Mining application offered to visualize and to analyze for optimization all the collected data from previous forming campaigns,
- a Digital twin of the presses giving the live thermal behavior and enabling to optimize the energy consumption and avoid quality problems
- a Predictive maintenance application enabling the supervision and data analysis of a dedicated sensors network to maximize the press availability rate.

This 4.0 transverse tool combined with already existing FE process modelling empowers Aurock to succeed in numerous new complex parts productions with mastering of industrialization, quality, maintenance and production costs.

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