THE SMART LINE

ARIES ALLIANCE
Shaping a better future

ARIES ALLIANCE INFORMATION LETTER

N°2 - DECEMBER 2019

Hot Forming & Superplastic Forming Presses

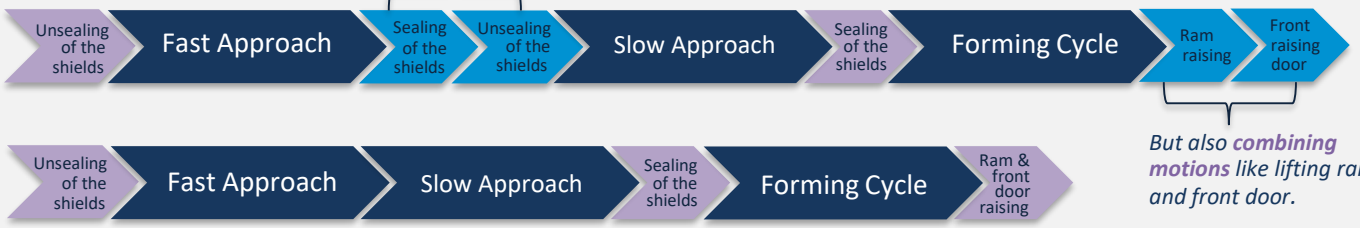
PUSHING THE LIMITS OF PRODUCTIVITY

Aircraft OEMs continually pushing cost reductions and ever-increasing competition between component suppliers led us to push the boundaries of **HF & SPF machine productivity.** Our angle on this is to **minimize unproductive times, thereby increasing OEE**. In doing so, we looked at three different areas. First, the **improvement of the press design.** Second, we looked at the **forming process itself.** Lastly, we worked on the **development of complementary equipment** that will perform nonproductive tasks traditionally executed in the press.

PRESS DESIGN IMPROVEMENT

1 DEAD TIME REDUCTION

*Reducing dead time means **removing** all **unproductive steps** in the cycle.*



*But also **combining motions** like lifting ram and front door.*

In the standard part-to-part HF cycle, the **total dead time** has been **reduced from 5 minutes to 1**

2 IMPROVED THERMAL EFFICIENCY

With over 30 years of experience in SPF and HF presses, Aries Alliance has developed **high efficiency heat shields**, that keep heat losses to a minimum while **reducing temperature recovery time** and **improving temperature homogeneity** in the press.

heat shields to reduce heat loss

3 TEMPERATURE REGULATION AT THE TOOL

Aries Alliance presses are also equipped with an advanced "**tool temperature regulation**" feature that reacts to the fluctuations of the die temperature by automatically adjusting the **platens set-points**. This allows **quicker temperature recovery** than conventional platen temperature regulation.

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PROCESS DEVELOPMENT

CYCLE TIME REDUCTION

We coupled the benefits of hot forming and superplastic forming to develop a **hybrid HF-SPF** cycle capable of forming complex parts, that cannot be formed in traditional HF. This results in **shorter cycle time** (typically half) and improved **thickness distribution**.

Hot Forming
High productivity
Even thickness dispersion

+

Superplastic Forming
Complex shape forming

dual HF/SPF process

ANCILLARY EQUIPMENT

IMPROVING PRESS UTILIZATION

SPF and HF presses are also used to heat parts and dies from ambient to forming temperature. These unproductive operations can keep a press out of production for several hours.
Aries Alliance has developed a **range of solutions** with different levels of **automation** to preheat and cool the die outside the press then load it in the press at or near forming temperature. It now takes **less than 10 minutes to change 5 to 10 tons dies heated to 750°C (1380°F)**.

fully automated turnkey work cell installation

The simplest installation starts with a furnace and an operator driven overhead crane while the most advanced includes several heating/cooling furnaces, buffer cocoons, entry tables and a fully automated handling system delivering hot dies to three presses.

The same principle may be used to preheat and cool massive parts out of the press and use the press only for part forming. This is required for heavy HF parts where the preheating time can be much longer than the forming time. In combination with a robotic loading of the part in the press, the automated work cell pictured above is able to produce 15,000 parts per year.

For more information, please visit : https://bit.ly/2OfJPh0