Improving Productivity
Mould Change: Small changes for the biggest reward

20 May 2020
12.00 - 12:45
Mould Change: Small changes for the biggest reward

Webinar | 20/05/2020 | Andy Goodyer
How long does your mould change take?

- Surprisingly a lot longer than most companies believe it does.  
  - It is common for mould changes to take over 50% longer than the company anticipates or plans.

- A full mould change typically has around 25-30 discrete actions. At each one of these steps it is usually possible for improvements to be made.

- Significant improvements in mould change times can be gained with small changes and investments.

- Where to look…..
The main areas to be considered are –
- Transfer & Loading
- Pre-heating
- Clamping
- Connecting

Each of these steps should be analyzed and monitored to understand how and where changes and improvements can be made.

Changes will have a positive impact on productivity and in addition normally result in a reduction in errors and improvements in safety.

How can improvements be made……
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Connecting the Mould

- A significant proportion of many mould changes is taken connecting all the services to the mould. This often involves multiple individual connections being made.

- Time is also regularly lost having to clean around the machine because fluid has been spilt during this process. While this affects change time it also has a number of health and safety issues.
Selecting the correct quick release couplings for a mould can often reduce tool change over from hours to just minutes. Significant benefits can be gained at very little expense.

For smaller or less complex tools simply moving to a valved connector can reduce or eliminate spillage.

On tools with more circuits or to further improve change times a move to multiple connection plate system is hugely beneficial.

- All circuits connected in 1 operation
- Foolproof keying system
- Only those circuits required are used
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Connecting the Mould

- Even on small moulds/machines the time savings that can be made are substantial. In this example mould change time was reduced by over 20%.

- The same principles shown here for water circuits can equally be applied to hydraulic and electrical/thermocouple connections.
Creating an area beside the machine to allow tools to be preheated prior to being installed can certainly save time by reducing heating time once installed on the machine.

The additional benefit of this is moulds are moved close to the machine prior to the next mould change so are ready to be installed immediately.

The installation of valved single and multi connections also means that the process is a simple.
Mould Transfer and Loading

- Transfer of moulds onto and away from the injection moulding machine can be a slow process. Often accounting for a large proportion of the total mould change time.

- Simple steps such as ensuring the next mould has been taken from storage and checked may seem obvious but is sometimes overlooked.

- Having a crane available for the mould change is also another simple step. Mould changes planned too close together and taking longer than expected can have a further knock on effect.

- Datum lines on the tool holders and crane positions can save time in positioning the mould. Balance weights on the lifting straps, to avoid tilting, is also a useful idea that can save time.
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Mould Transfer and Loading

- In the process of speeding up mould changes, mould transfer and loading can often be a neglected area, many even regarding it as a luxury. This is not always the case –

- Simple mould transfer and loading carts can be very economical, indeed with mould weights <1Ton they can be purely mechanical. Designed to service numerous machines and giving a return on investment of a few months in some cases.

- They allow moulds to be handled securely.
- Improving operator safety.
- Increase the availability of overhead cranes
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Mould Transfer and Loading

- For heavier moulds and larger machines then mould loading tables or even fully automated AGV’s should be considered
- While not suited to all moulders these solutions can offer significantly improved productivity while offering excellent ROI.

- When used in conjunction with multi connections and clamping these systems can offer shot to shot changes in under 10 minutes even with mould in excess of 50 ton.

- Systems such as these are now standardised.
Clamping is the next consideration when looking to improve a mould change and should be considered as the next step to improve mould change times.

There are 3 different technologies available –

- Mechanical
- Hydraulic
- Magnetic
Clamping systems can offer decreases in tool change time especially when mould changes are frequent and moulds vary in size/shape.

Selecting the most appropriate for each application requires detailed analysis.

Machine and mould size have a large bearing on this selection but cannot be looked at in isolation.

For example for machines under 300 Tonnes a mechanical system is the most cost effective, however if the quantity of moulds deployed on the machine is large or frequently changes then a magnetic system may be a better investment.

All clamping solutions offer improvements in safety reducing the need for the operator to be in the machine.
Conclusion

- Rigorous, step by step, evaluation process, mould changeover times can be reduced significantly.

- The selection of the correct technology and the correct processes are imperative to maximise return on investment.

- The aim should always be to choose the most suitable systems and processes, capable of operating safely and securely over many years, meeting the financial and productivity goals established at the outset.

- It is absolutely true that in many cases the maximum gain comes from the lowest investment.
Further Information

- Full Automated mould change display from tool preating to moulding in under 2 minutes - [https://www.youtube.com/watch?v=MsTiePp4jc](https://www.youtube.com/watch?v=MsTiePp4jc)


- White paper - Optimizing Overall Equipment Efficiency (OEE) in the Plastics Industry - [https://spot.staubli.com/api/v1/bin/zGaZoRk0MxlOAML24yJQOv](https://spot.staubli.com/api/v1/bin/zGaZoRk0MxlOAML24yJQOv)

- Full range of Staubli Solutions –
For further information or if you would like any help improving your mould change processes please contact –

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Stäubli Group at a glance

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- **1892 founded in Horgen, Switzerland**
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