

FOR IMMEDIATE RELEASE

Eliminating Trial and Error: New Cav-Bal®PRO Software Reduces Hot Runner Cavity Imbalance to Under 1%



Achieving consistent cavity-to-cavity balance in multi-cavity hot runner moulds remains one of the most persistent hurdles for process engineers working with complex injection mould tools. Moulding Optimisation's launch of Cav-Bal®PRO software introduces a data-driven solution to achieve precise hot runner cavity balance, eliminating the need for time-consuming, repetitive tuning cycles.

Left unaddressed, cavity imbalance leads to significant production inconsistencies, including varying part dimensions, high reject rates and uneven tool wear across multi-cavity tools. Of particular value to medical device manufacturers, the caps and closures market, or other sectors using high-cavity, precision mould tools, Cav-Bal®PRO software helps engineers rapidly address cavity imbalance, with an easy-to-use software application.

Launching this week, [Cav-Bal®PRO](#) offers a new, simple solution. Developed by Adam Clitherow, an experienced process engineer within the UK plastics sector, Cav-Bal® software

works by applying established scientific moulding principles and uses proprietary algorithms to calculate and adjust the tip temperatures of hot runners, to achieve sub 1% cavity balance after a series of a few moulding cycles, for tools with between 2 and 64 cavities.

The Engineering Challenge: Beyond Conventional Balancing

Traditional balancing methods often rely on time-intensive, iterative "trial and error" adjustments, relying on the instincts of the engineer, or the integration of expensive, complex in-cavity sensors. These approaches can be costly, technically burdensome, or require significant machine downtime to install, calibrate and maintain.

Cav-Bal®PRO disrupts this reliance by providing a simple, standalone software environment. It empowers engineers to diagnose and correct imbalance by systematically refining the heat profiles at the gate. By calculating the exact tip temperature adjustments required, within a few shots, the software allows for a level of precision and speed to reach cavity balance that traditional manual methods cannot match.

Proven Performance: A 90% Reduction in Imbalance

To demonstrate its efficacy in a live production environment, Cav-Bal®PRO was recently deployed on an 8-cavity hot runner mould experiencing significant filling instability. Prior to the implementation of the software, the system exhibited a cavity imbalance of 9.58%.

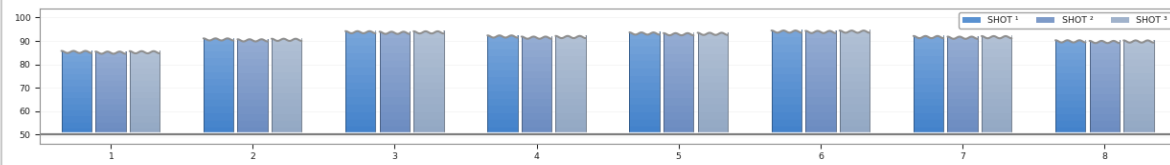
Following the application of the Cav-Bal®PRO adjustment model, the imbalance was reduced to just 0.61%. This represents a greater than 90% reduction in cavity-to-cavity differentiation.

By stabilising the process, manufacturers can drastically **reduce scrap rates, improve material efficiency, and achieve tighter manufacturing tolerances** that were previously difficult to maintain.

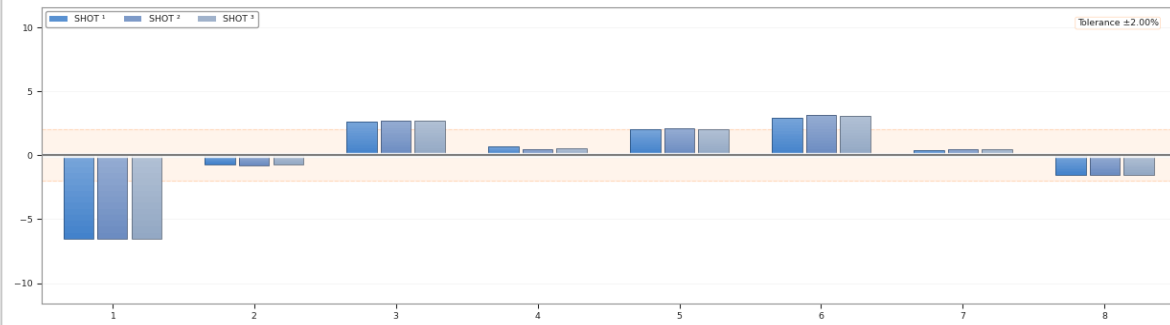
The screenshots below help visualise the cavity balance, before and after optimisation using the Cav-Bal®PRO software.

Results

% of Fill by Cavity



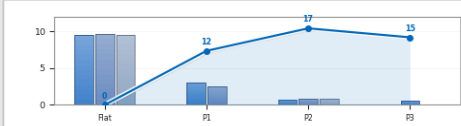
% Imbalance by Cavity



Shot Metrics

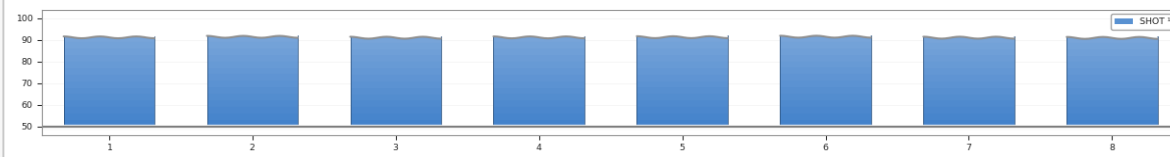
	SHOT 1	SHOT 2	SHOT 3	Σ %
Level of fill %	92.00	91.71	91.90	91.87
Imbalance %	9.50	9.65	9.58	9.58
Deviation tolerance ±2.00% Cpk 0.216 Ppk 0.226 Within tolerance 50.0% Max abs deviation 6.53%				

Progress

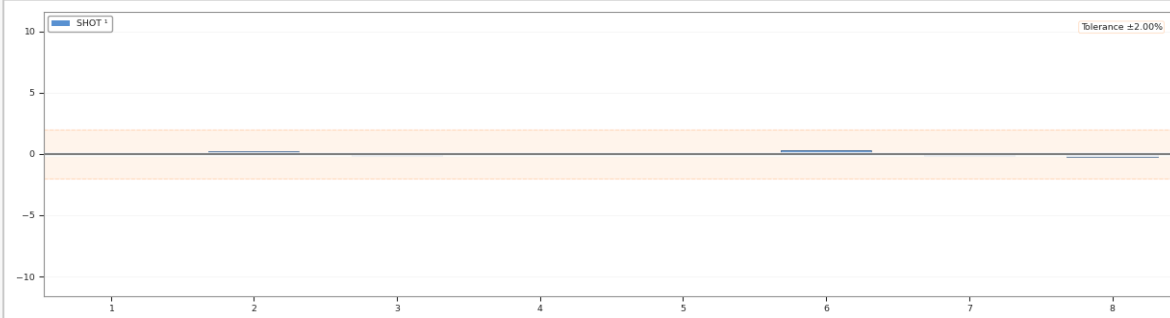


Results

% of Fill by Cavity



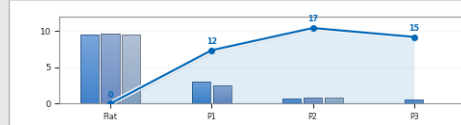
% Imbalance by Cavity



Shot Metrics

	SHOT 1	Σ %
Level of fill %	91.90	91.90
Imbalance %	0.61	0.61
Deviation tolerance ±2.00% Cpk 3.127 Ppk 3.127 Within tolerance 100.0% Max abs deviation 0.33%		

Progress



Industry Endorsement

"Cav-Bal®PRO has fundamentally changed the way I approach hot runner balancing," says Thomas Neale, Process Engineer. "It removes the guesswork and provides a scientific, repeatable methodology. The precision it brings to the shop floor is substantial, allowing us to hit tighter tolerances with far less intervention."

"For anyone involved in process development, validation or process optimisation, Cav-Bal is an invaluable tool. It has become an essential part of my workflow, and I genuinely wouldn't attempt to balance a mould without it."

Optimising Complex Moulding Processes

The software is designed for seamless integration into existing technical workflows, capable of managing the balancing requirements for tools with between 2 and 64 cavities. Beyond the core balancing functionality, Cav-Bal®PRO generates comprehensive, exportable reports, supporting the rigorous documentation requirements necessary in high-stakes manufacturing sectors such as automotive or medical moulding.

By replacing "gut-feel" adjustments with a proactive, data-led strategy, engineers can regain control over their moulding parameters, ensuring that the process remains robust regardless of batch complexity or mould age.

Try Cav-Bal®PRO for Free

Cav-Bal®PRO is available now to help teams advance their injection moulding capabilities and improve bottom-line performance through superior process stability.

To ensure engineers can evaluate the performance benefits directly within their own production environment, a **fully-featured, 30-day free trial** is available for download now via the company website.

For further technical specifications or to begin your free trial, visit the [Moulding Optimisation website](#).

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About Moulding Optimisation Ltd:

Moulding Optimisation Ltd is dedicated to providing advanced software solutions that solve the most common technical hurdles in the injection moulding industry.

Moulding Optimisation Ltd develops Cav-Bal®PRO - specialist software for hot runner cavity balancing and Scientific Injection Moulding studies. Cav-Bal®PRO gives injection moulding engineers a structured, data-driven way to correct cavity imbalance in multi-cavity hot runner tools. Using short-shot cavity weight data, the software calculates hot runner tip temperature adjustments, helping engineers reduce trial-and-error, improve cavity balance, and document the results clearly.

The software includes Cav-Bal® cavity balance correction, SIM Workbench™ study tools, capability analysis, DoE, graphs, reports, and setting sheet support. It is a standalone Windows application developed from practical moulding experience for mould qualification, validation support, troubleshooting, process optimisation, and production re-balancing.

Alongside the development and supply of practical software tools for moulding engineers, Moulding Optimisation Ltd also provides specialist injection moulding consultancy and process support. The company currently has immediate availability for new troubleshooting, process development, and tool optimisation projects.