

# PROJECT "MICRO SPRAYING" IN THE AS-CASTING FOUNDRY

AS-CASTING s.r.o. & ŠEBESTA

## Case Study - Project "Micro Spraying" in the AS-CASTING Foundry

### Introduction to the practical trials

The "micro spraying" project, the use of a new, revolutionary spraying technology, in the AS-CASTING foundry started in 2016 and was transferred to full-scale production mainly thanks to the Wollin performance and determination on the part of AS-CASTING and ŠEBESTA, who collaborated on the project.

The driving factor for the use of a new technology was the increasing order intake and thus the need to shorten the production cycle. It was agreed that ŠEBESTA would supply the complete technological equipment for the test, as well as provide an application technologist to commission the micro spray technology together with AS-CASTING personnel.

The test was first carried out on a Bühler 84D casting workstation with a Wollin PSM3 die spraying machine with SD13 standard spray nozzles and then on a new Colosio 2P 1000 L die casting machine and a Wollin ESM3 die spraying machine with Wollin DD4 dosing nozzles. Chem-Trend® SL 8801 (HERA™) was chosen as the release agent.

### Step-by-step development of practical tests and transfer to series production

#### Micro spraying on a quad mould; first tests; 2016

The first test was conducted with an existing quad mould, designed for standard spraying. This involved spraying 1.25 liters of release agent per cycle. The gross weight of the casting was 1.8 kg and the mould was at the end of its service life (approximately 85 000 shots). The cooling of the mould was not changed for the test. The first test reduced the cycle time from 58.1 seconds to 50.3 seconds. In addition to the increase in productivity, the press-in speed was reduced from 3.3 m/s to 2.6 m/s and the pressure in third phase was reduced from 480 to 300 bars. The mould surface temperatures were stabilized in the range of 190-350 °C.

The first application used an older micro-spray technique with a continuous micro spray. The consumption of Chem-Trend® SL-8801 concentrate per spray cycle was still 9 ml.

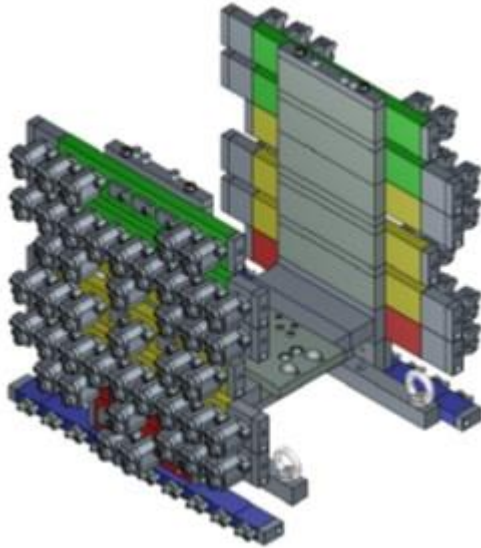
The result of the first test was thus a confirmation of the applicability and stability of micro spraying and a clear advantage for the production itself.

When monitoring long-term production, the process proved to be more stable than standard spraying. There was no more sticking of the release agent to the mould surface, the process was controlled more precisely and reproducibly, and the occasional internal porosity of the castings no longer occurred.

#### Micro spraying on the second quad mould; 2017

Based on practical experience and actual temperature values, a new mould with optimized, internal mould cooling was developed. At the same time, Wollin developed a newer technology for applying the release agent using dosing nozzles. The use of dosing nozzles is much more precise, more targeted, better controllable and thus ensures higher production stability. This has further stabilized the production process and reduced the consumption of the concentrate to 4 ml.

In this constellation, 193,000 shots were cast at AS-CASTING.



Spraying tool for the foundry AS-CASTING

### Micro spraying on the six-cavity mould; 2018

As AS-CASTING's customer increased the weekly offtake by 100%, productivity had to be increased by using a larger number of moulds. Based on references and experience with previous projects, the specialists from MECAS-ESI Ltd. were brought in to collaborate.

After minor optimizations, the production time stabilized at 46.1 seconds (the time is at the limit of the peripheral equipment's capability) with a release agent consumption of 6 ml, while the reject rate and production stability settled at more than acceptable levels.

To date, 480,000 casts have been produced with the mould. The mould is still in use and shows no major signs of wear.

Evaluation of the case study:

- at least 4-fold increase in mould service life
- 26 % increase in machine productivity
- 26% savings in machine and dosing furnace energy consumption per cast (for machines without frequency converters on the main motors)
- 18% lower piston speed in the second stage of the pressing process
- savings in the energy consumption of the tempering units (much lower set-up temperature, not measured exactly)
- 100% reduction in water consumption; original consumption of 1.25 liters per cycle (approx. 500 m<sup>3</sup> water per year)
- no process waste water generated by the spraying process
- reduction of air consumption over 70 % (estimate)
- noticeably reduced noise level
- higher production stability and reproducibility (specific data not disclosed) → less scrap
- cleanliness of the working environment - not quantifiable
- no problems with bacteria, fungi and lime
- no corrosion of moulds and clamping plates of the casting machine.

## Conclusion

The practical example of AS-CASTING has shown the clear and distinct advantages of micro spraying.

However, success will not come without a high level of commitment from all involved. It is important to select a team of convinced, well-qualified employees in the foundry who are proactive and inquisitive about the introduction of this technology.

Innovativeness, technological awareness and openness to cooperation are the most important aspects of a successful collaboration, from which the customer will ultimately benefit.

AS-CASTING has acquired important know-how in cooperation with ŠEBESTA, which they are now using independently in more and more projects, enabling it to take advantage of the enormous potential of micro spray technology, both from an ecological and economic point.

### Company Information:

AS-CASTING s. r. o.  
Noviny pod Ralskem 152  
CZ - 471 24 Mimoň  
<https://www.linkedin.com/company/as-casting/>

ŠEBESTA-slужby slévárnám s.r.o.  
Pražská 150, 642 00 Brno  
Česká republika / Czech Republic  
<https://www.linkedin.com/company/sebesta-sluzby-slevarnam-s-r-o/>

Wollin GmbH  
Kiesäckerstraße 23  
73547 Lorch/ Germany  
<https://www.linkedin.com/company/wollin-gmbh>

Original article published at:  
<https://www.sebestasro.cz/blogy/zkusenosti-s-technologie-mikroprostrik-ve-slevarne-as-casting-s-r-o>