Advanced Hot Runner Technologies

Synventive®
molding solutions
A business of BARNES GROUP INC

What is activeGate®

- Conventional Valve Gate Control
  - Valve pins can be opened and closed – based on time, screw position or other signals.
  - No possibility to influence pin's stroke, velocity or acceleration.
  - No feedback of current valve pin position or velocity

- *active*Gate® Flow Control
  - Technologies, which enable to gain control over the movements of the valve pin and to receive additional information, what is not possible with conventional valve gate control.

Innovative Technologies

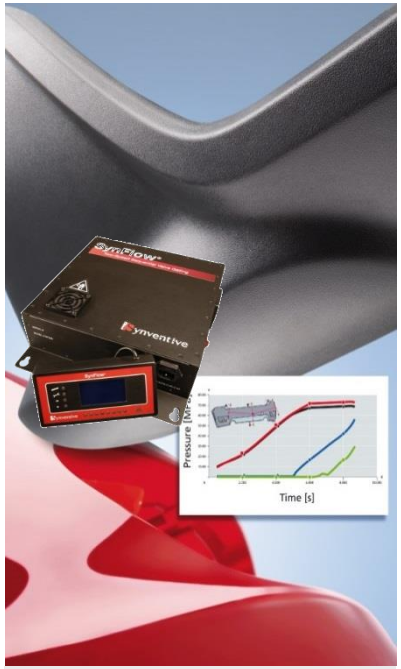
- ***active*Gate®**

Process control–technologies for perfect surface quality, dimensional stability and reproducibility

VMI

Pin monitoring

synfow®



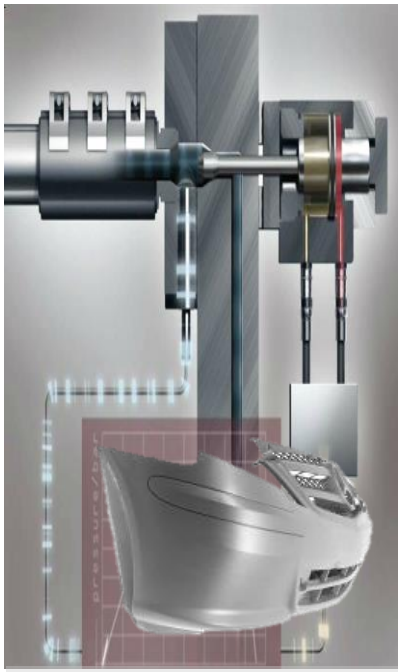
2-Speed-Control for cascade molding

*h*Gate® - hydraulic
*nu*Gate® - pneumatic
*e*Gate® - electric

Independent pin movement control

- Position
- Speed
- Acceleration
- Stroke

*Dynamic*Feed®



Individual melt pressure control at each gate

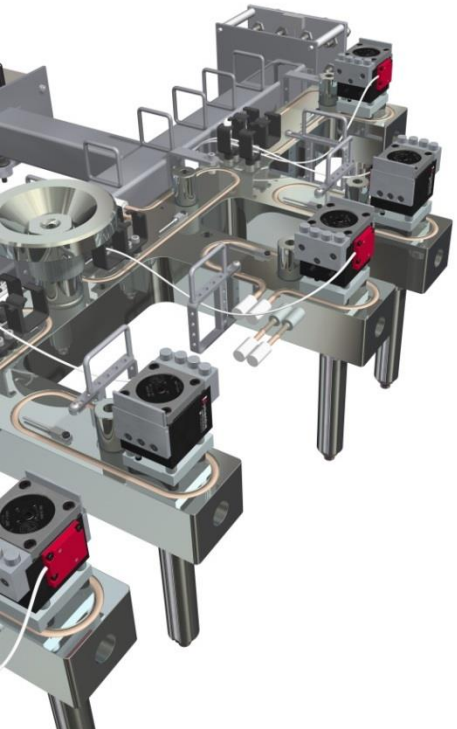
Upgradable *active*Gate® Technology

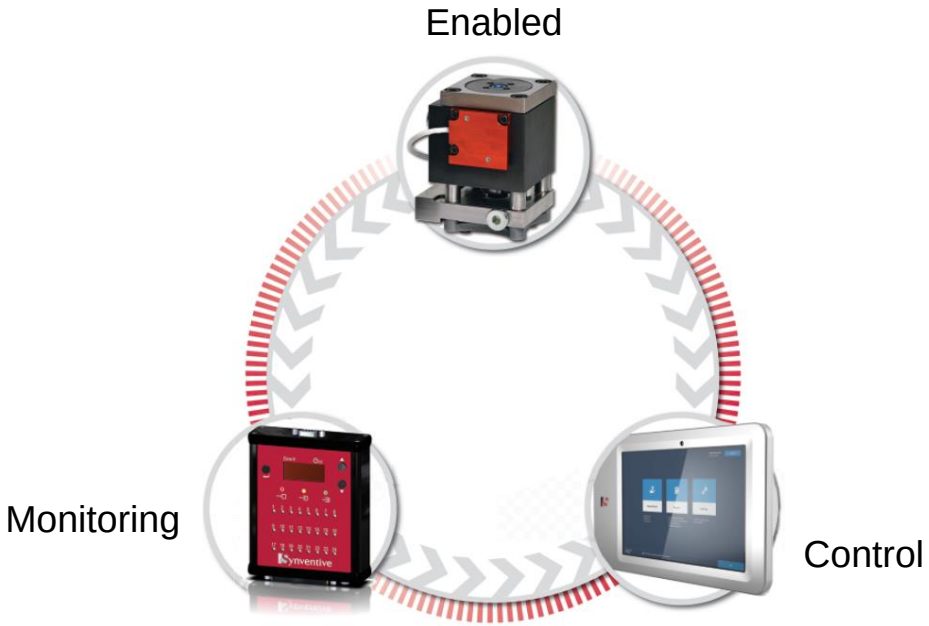
The premise of ***active*Gate** upgradable technology is that any hot runner system equipped with position sensors can be upgraded to higher levels of control if needed.

VMI – Monitor pin position and opening time remotely

synflow® – Controlled opening speed and stroke of the pin

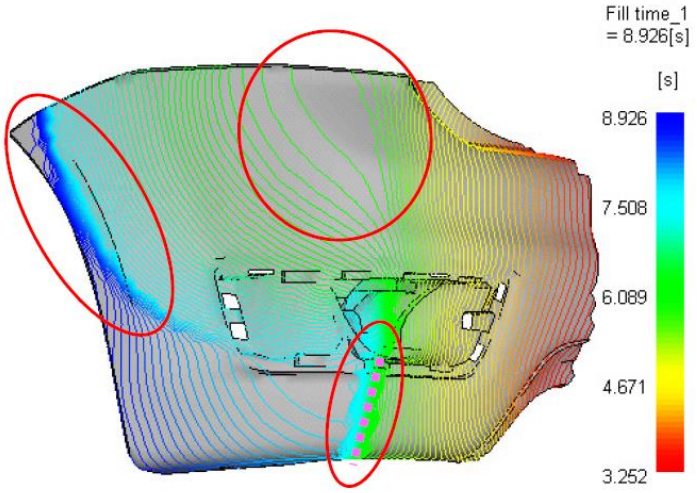
***h*Gate®** – Closed loop control of pin position



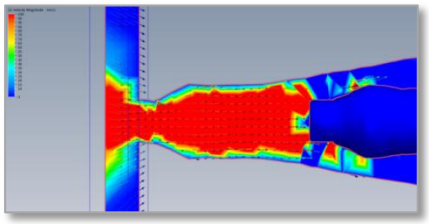


Traditional Valve Gates

Traditional Valve Gate Operation
Full speed open and close, no control

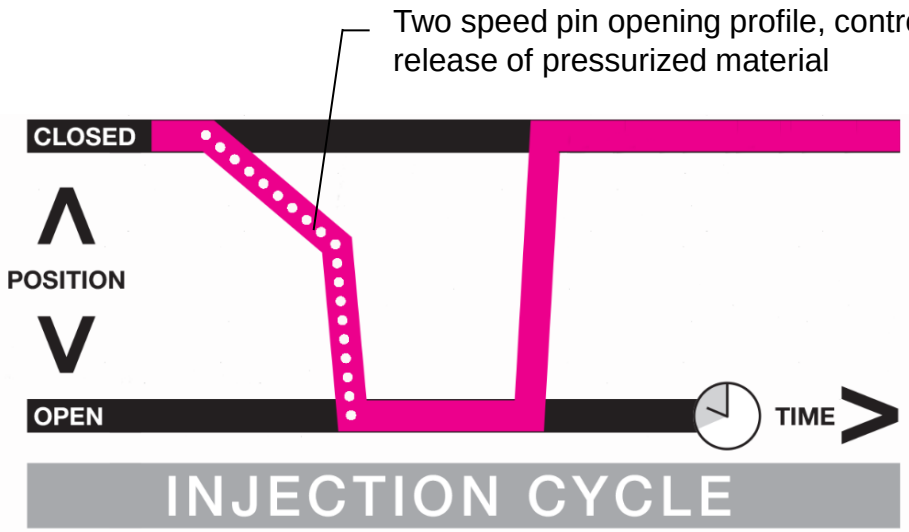


The inability to control the flow results in melt front stagnation and accelerations, which in turn may cause visible part surface defects.



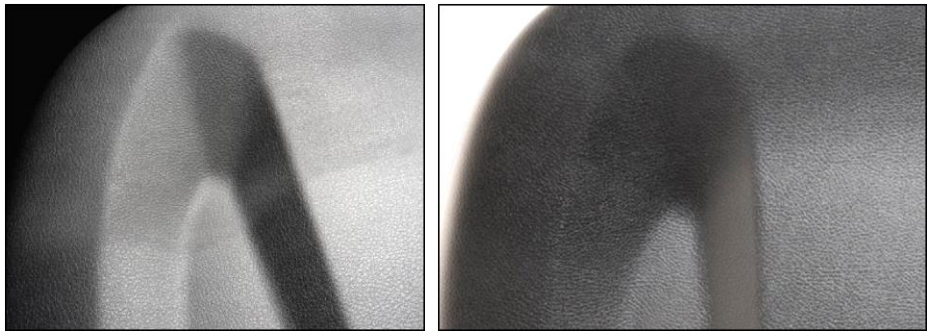
activeGate® Control Technology

By controlling the valve pins opening velocity, the sharp pressure changes are greatly reduced.



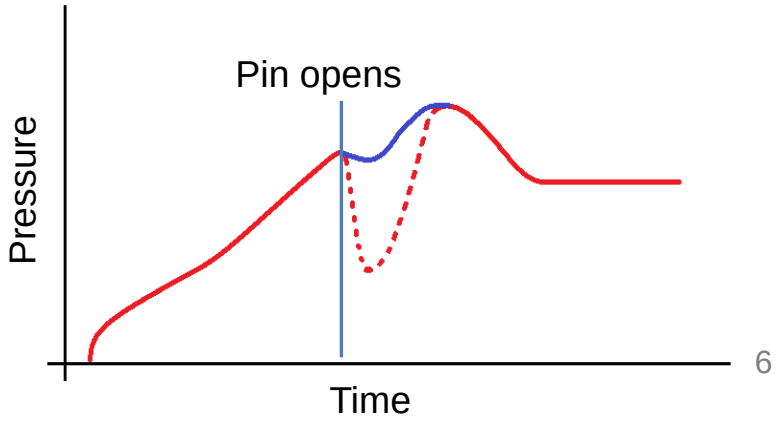
Pressure Line Reduction

Reduced initial pin opening velocity to eliminate sequencing defects. Pin returns to full speed once predefined stroke is reached.



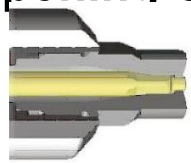
without synflow

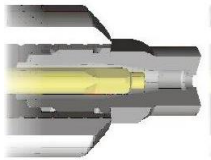
with synflow

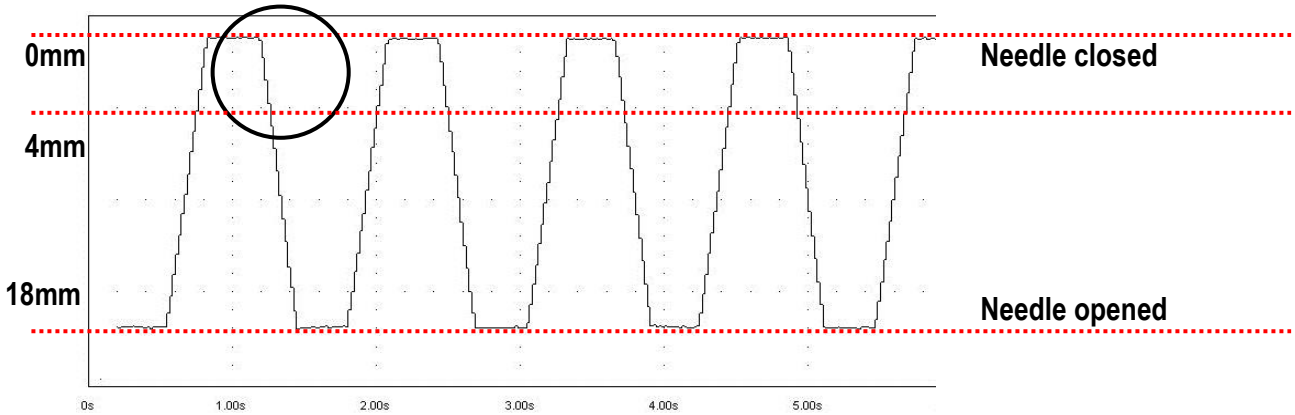


Controlling of opening speed

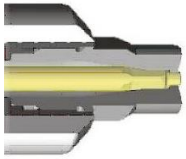
opening-closing conventional cascade

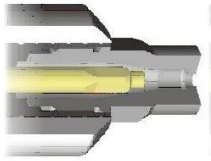


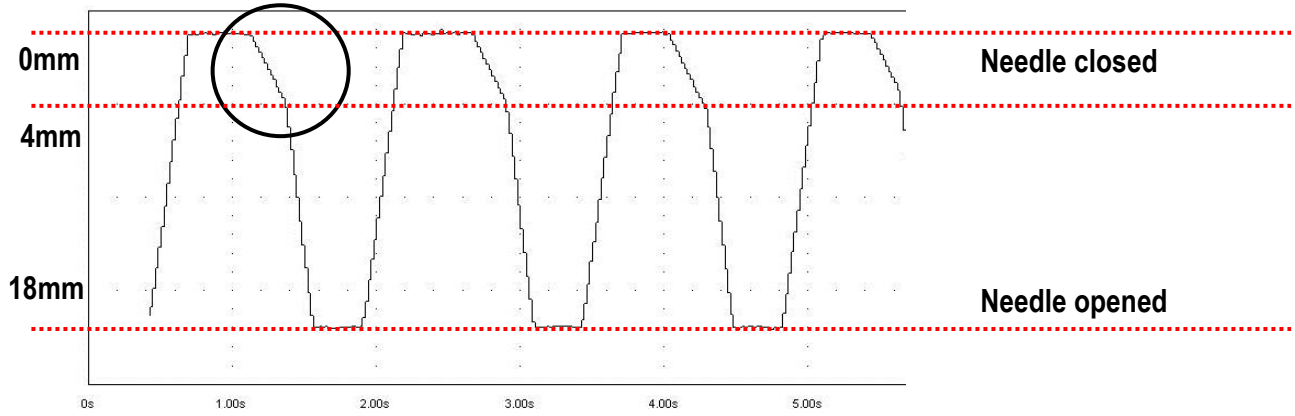




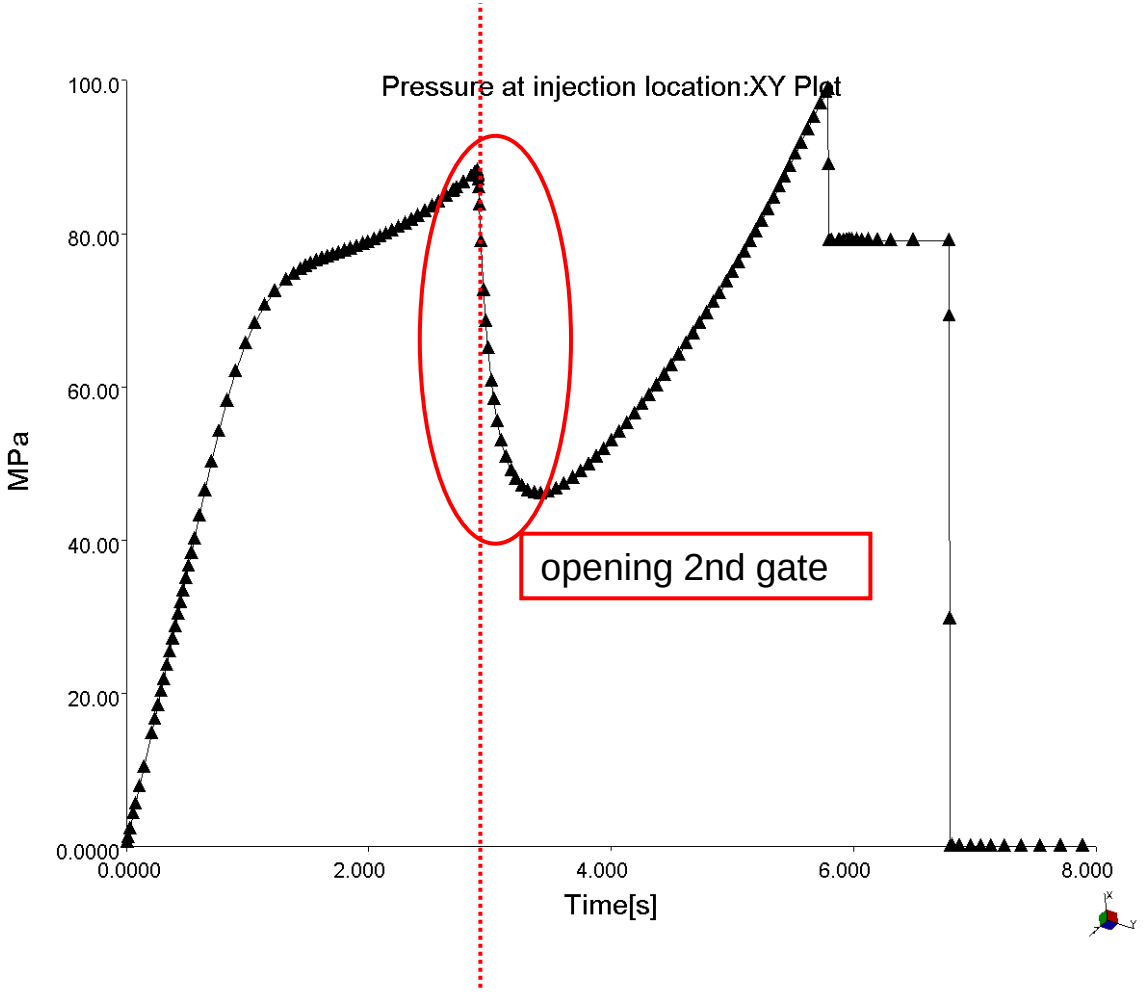
opening-closing with defined ramp







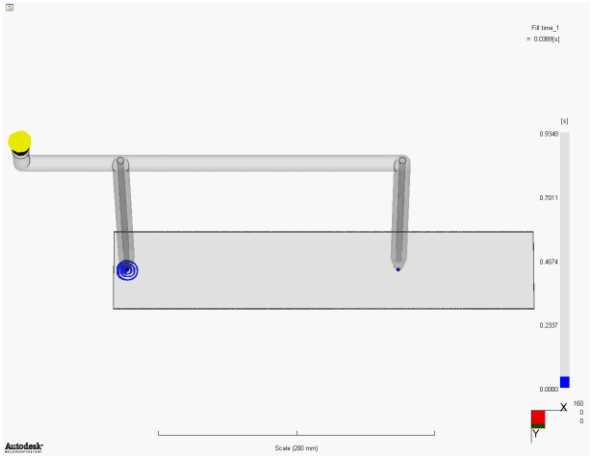
Cascade injection molding



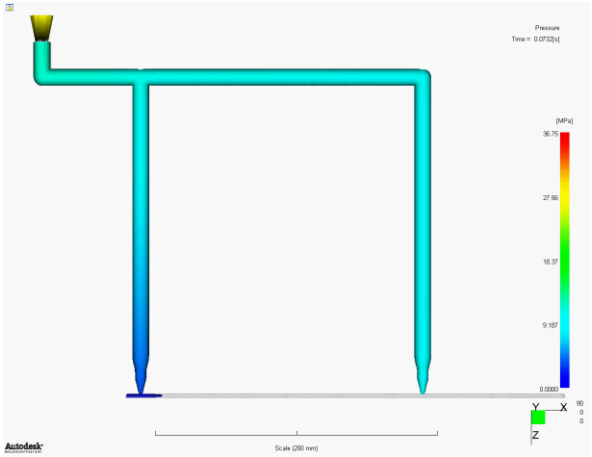
Machine pressure profile

Melt Expansion during Cascade Molding

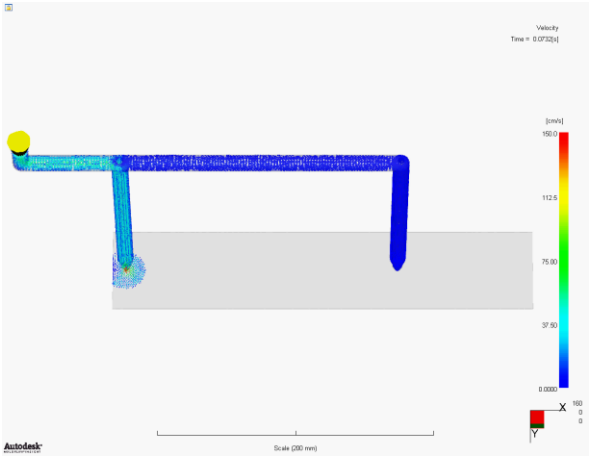
Isochrone Fill Time

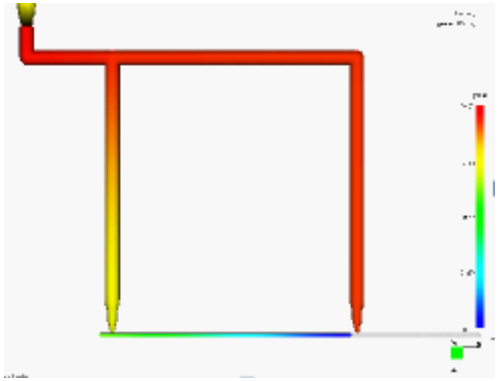


Pressure

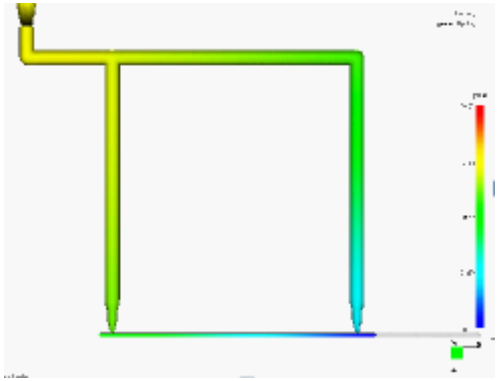


Velocity





Pressure before opening



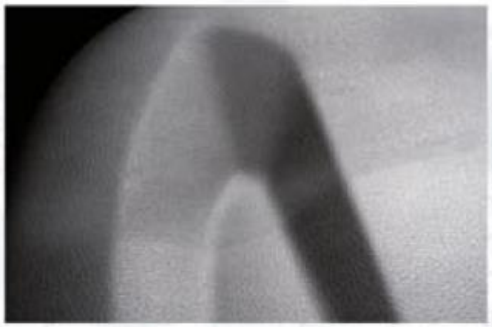
Pressure after opening

activeGate® Control Technology

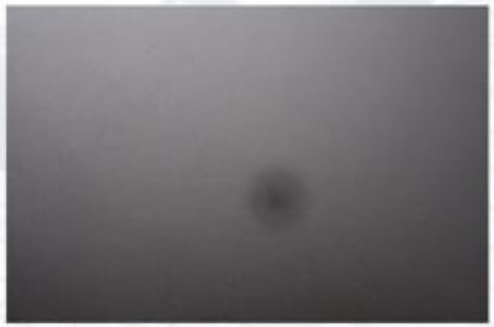
The first introduction of activeGate allowed you to define each valve pin's opening velocity for a specified length.
Many part defects caused by flow front variations are eliminated.

Key Benefits:

- Higher quality part surface finishes
- Higher production rates
- Decreased scrap
- Faster mold start-ups



Pressure Transition Marks



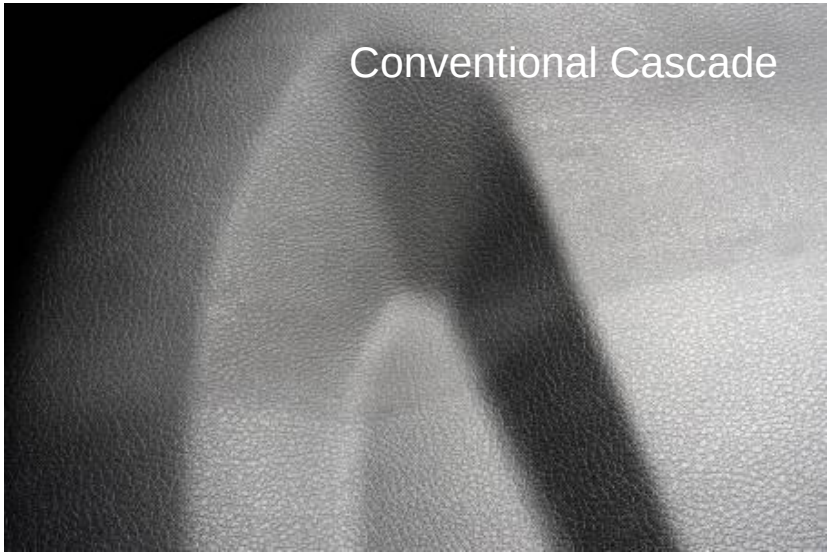
Hot Spot Marks

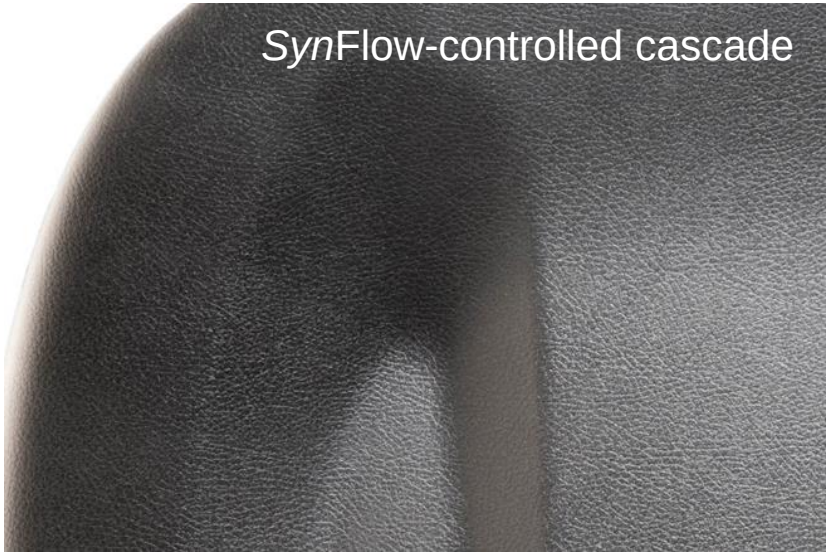
Reflection Marks

Case Study: Seat back cover

6-drop, 4 Nozzles with *synflow*®

Material: PP T15





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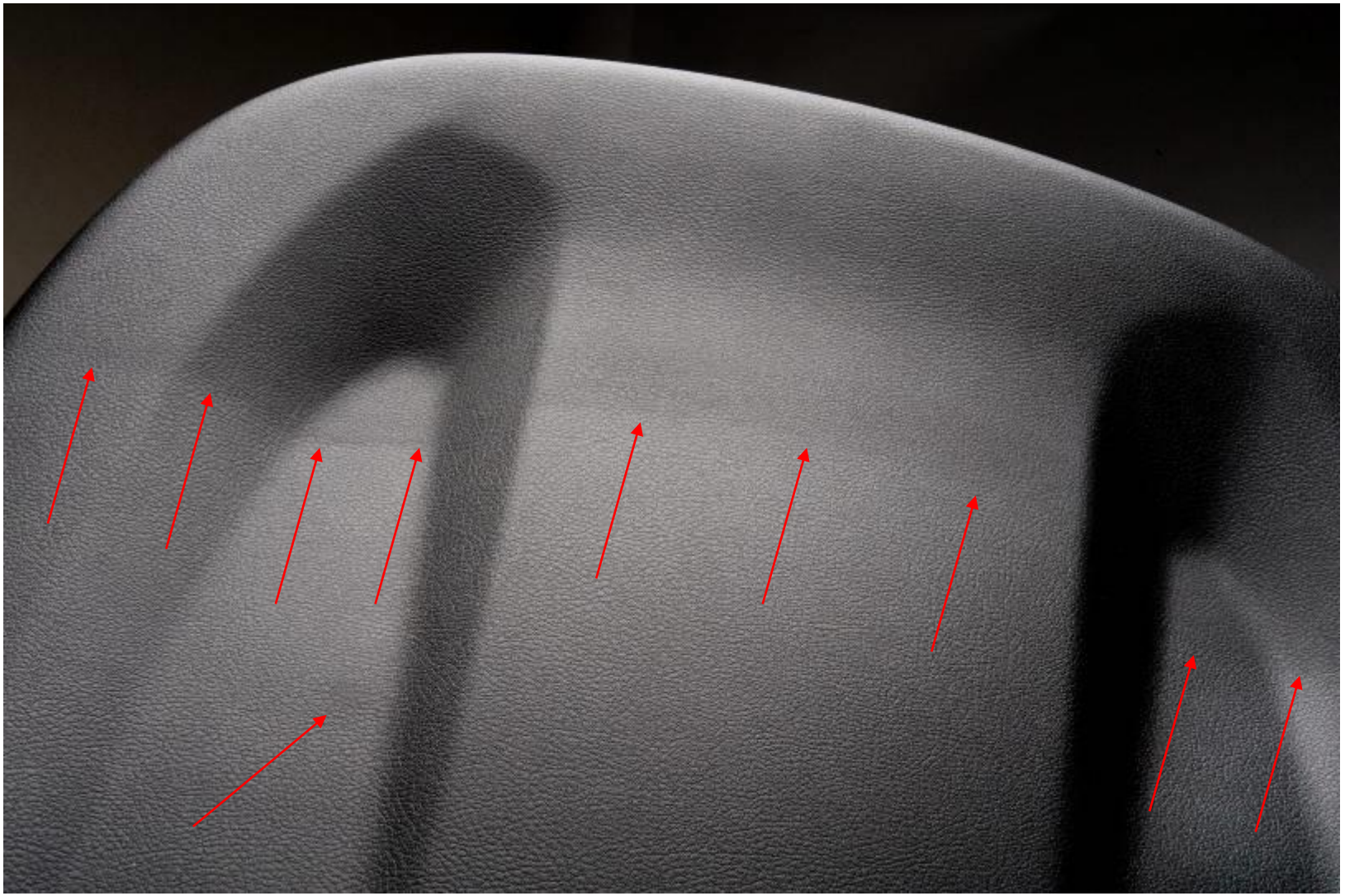

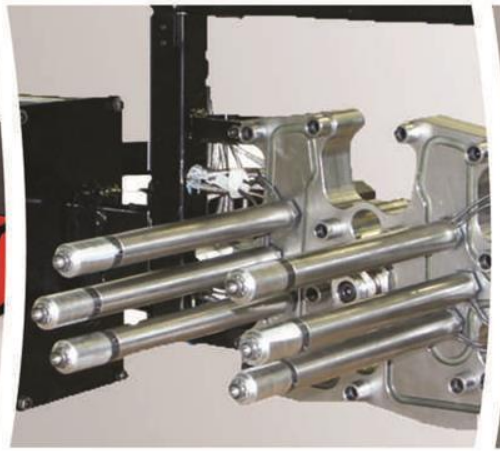

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