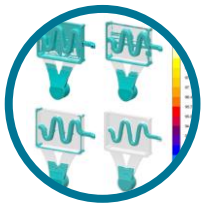
Construction guidelines for hollow ducts with MAGIT gasinjection

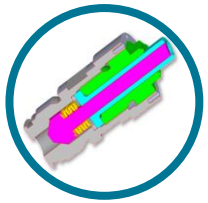
MAGIT Powermodules

Component design

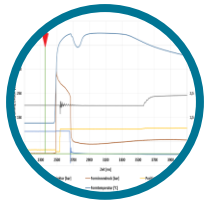


Simulation

Mould- concept



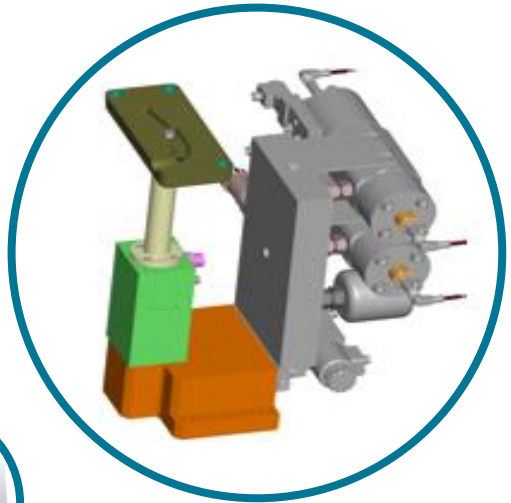
Injectors



Processoptimising

Component tests

Service & Training

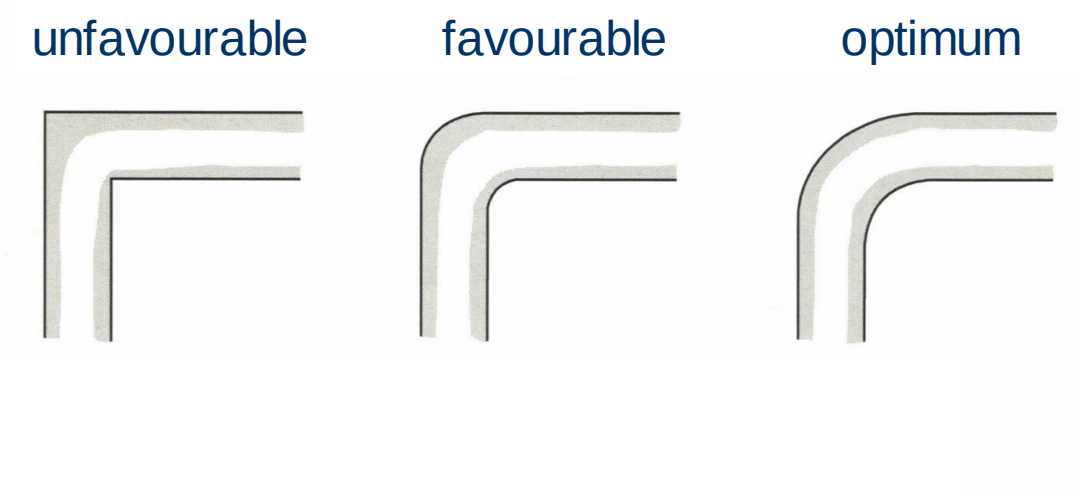


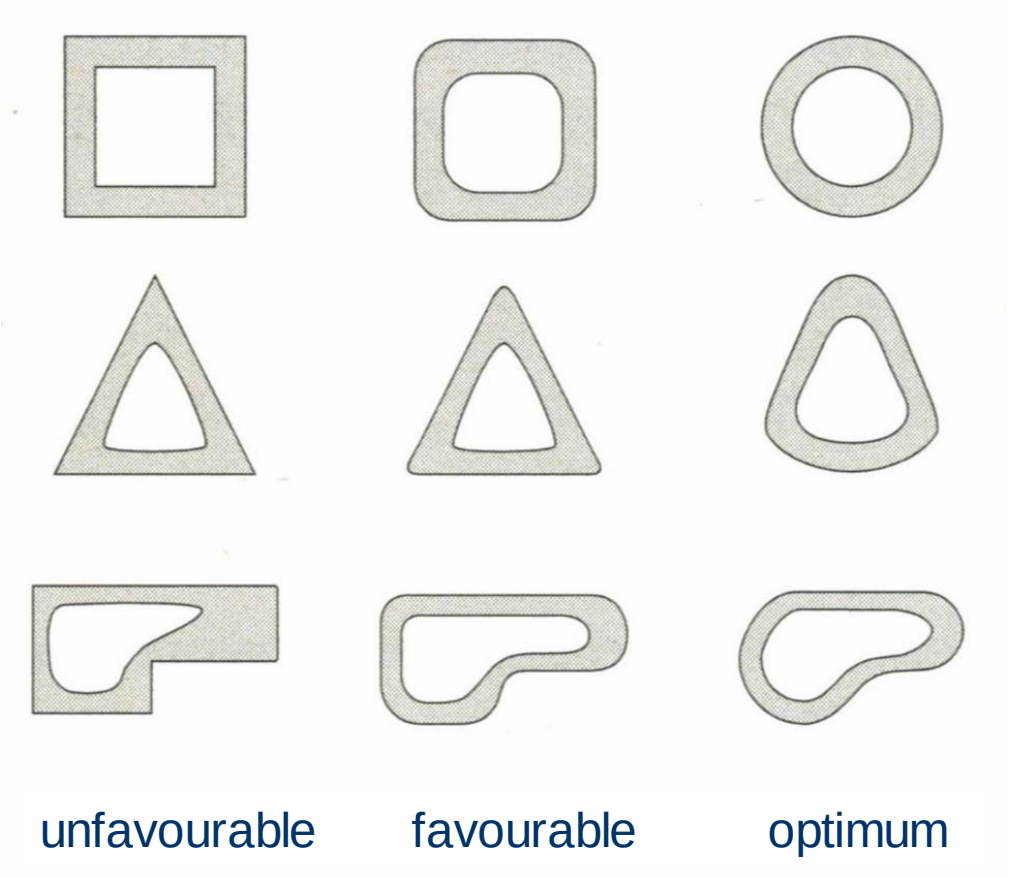
MAGIT Mouldmodules

Magnesium and Aluminium Gas-Injection-Technology

Channel designs and deflections

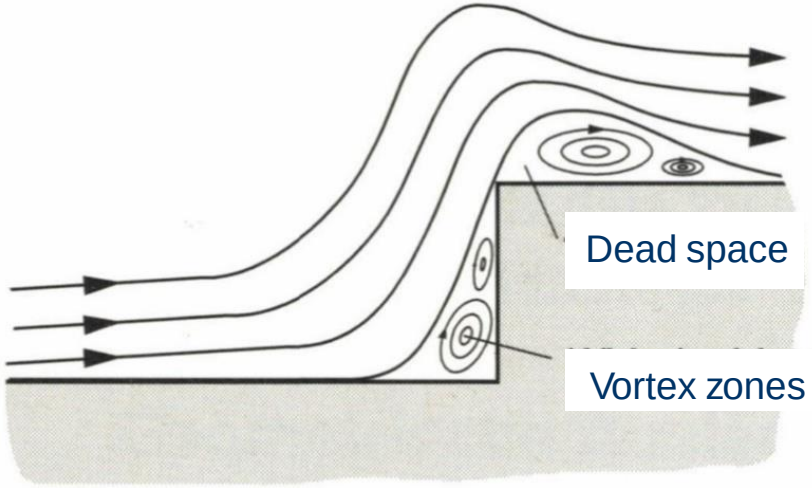
Round geometries favour a continuous, stable gas channel and reduce flow turbulence



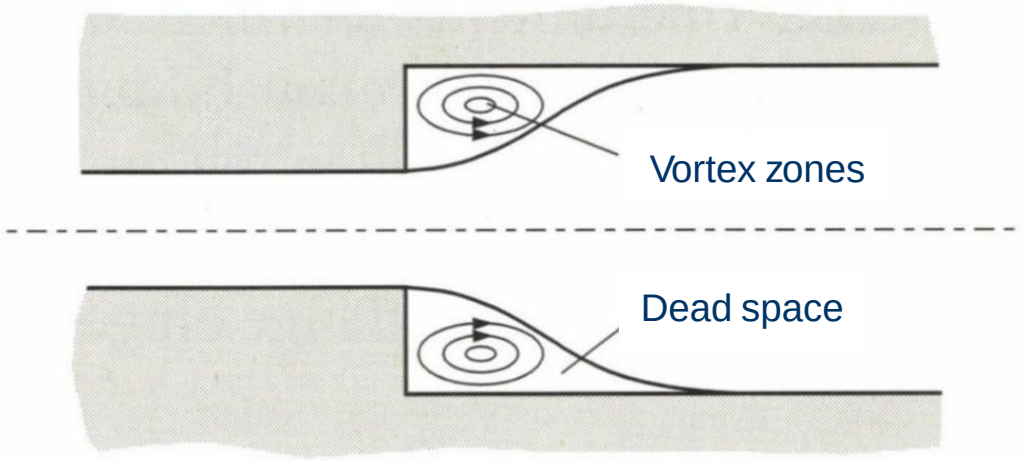


Cross-sectional changes

Severe widenings and narrowings in the channel course create turbulence that has a negative effect on the channel surface and its reproducibility.
All transitions must be rounded and designed to be as streamlined as possible.

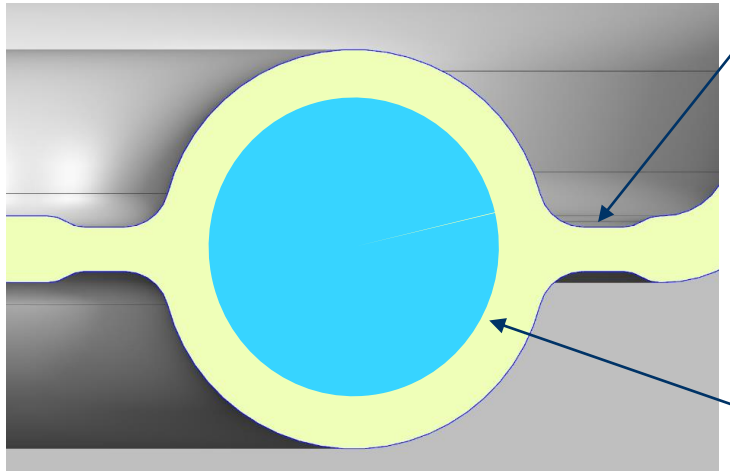


Detachment at corner flows



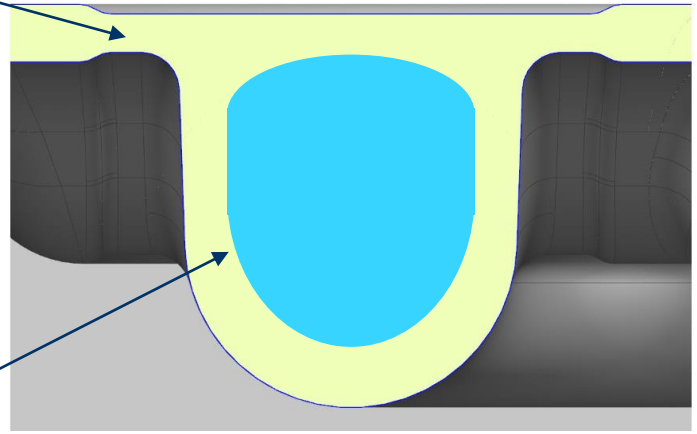
Unsteady expansion

Finger Effect & Gas Brakes



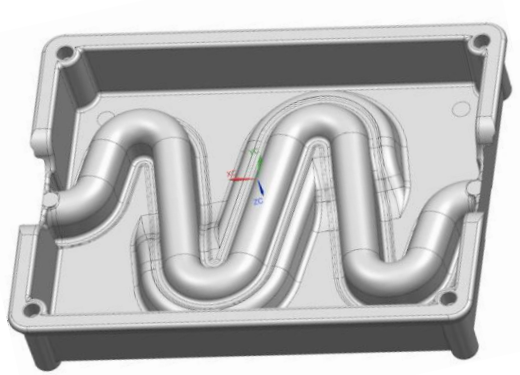
MAGIT gas brakes

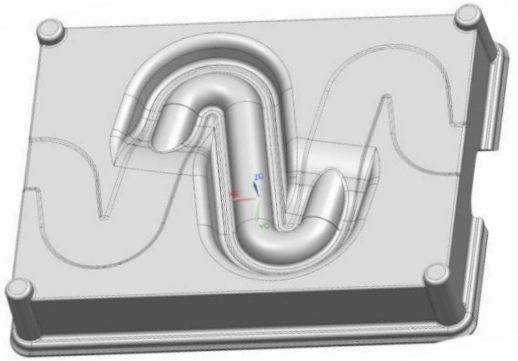
- Narrowing of the duct connection geometry
- Thickness depends on the desired duct wall thickness but maximum 2.5 mm
- Minimum width 5 mm



Theoretically expected channel geometry

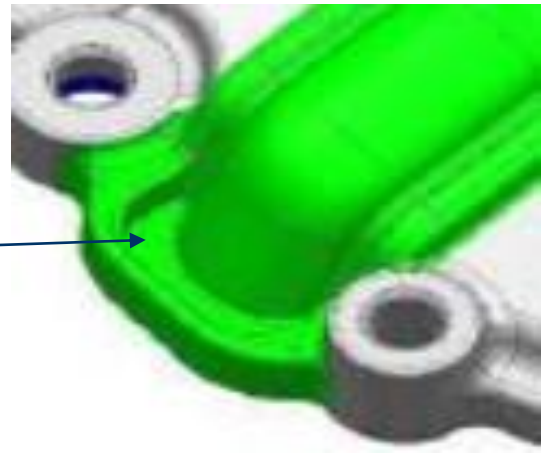
Gas brakes ensure safe solidification at the channel outer geometry and prevent the gas from fingering out into unwanted areas.

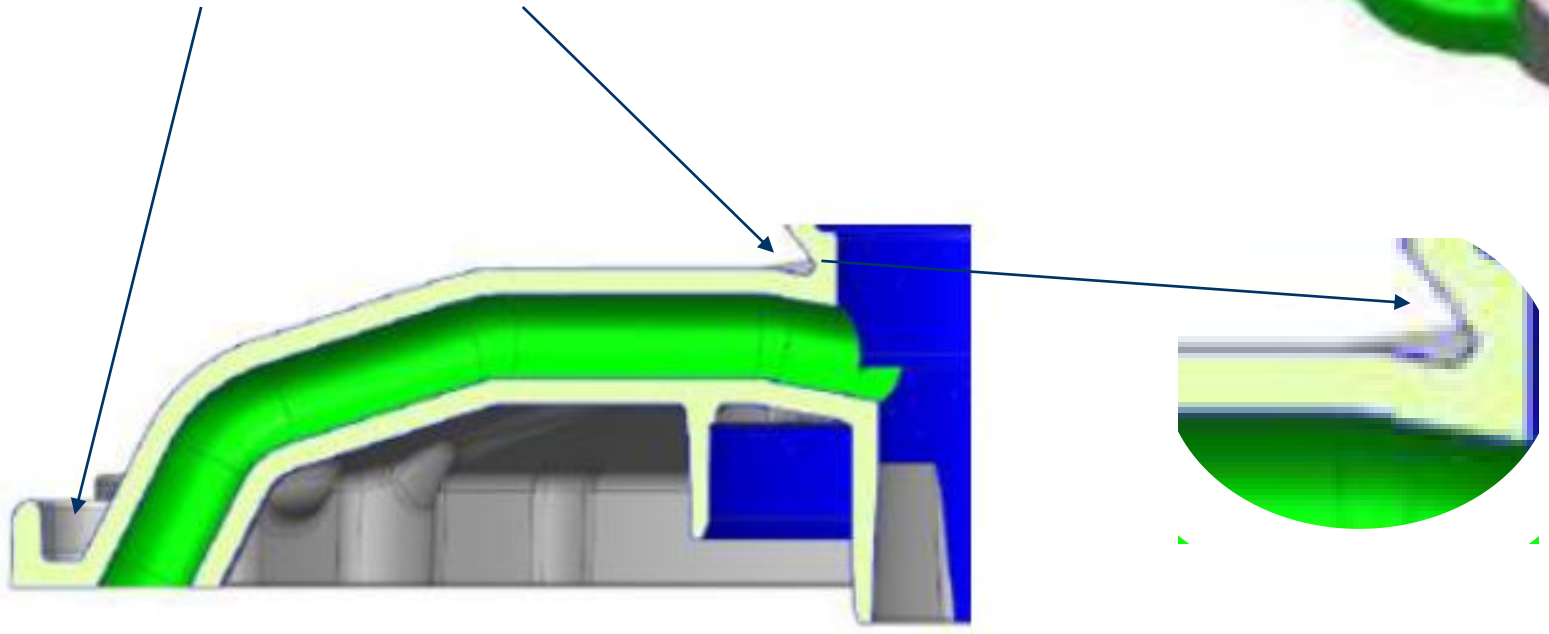




Flange and housing apertures

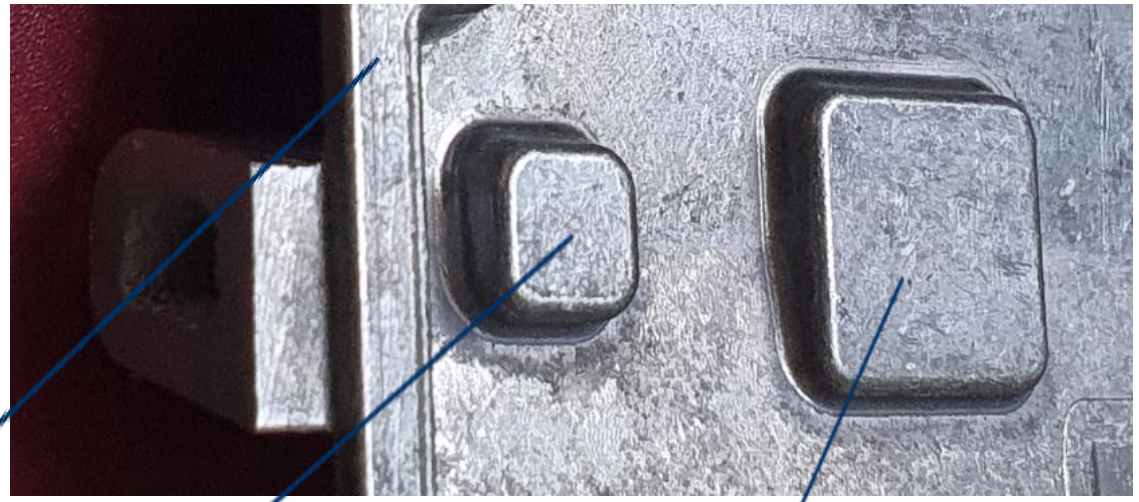
Wall thickness minimization is necessary for flange and housing apertures in order to prevent fingering out and clearing out in unwanted component areas.





Cross-sectional changes in wall thickness

Thick spots and wall thickness changes on the outside of the gas duct have a significant effect on the resulting duct geometry.

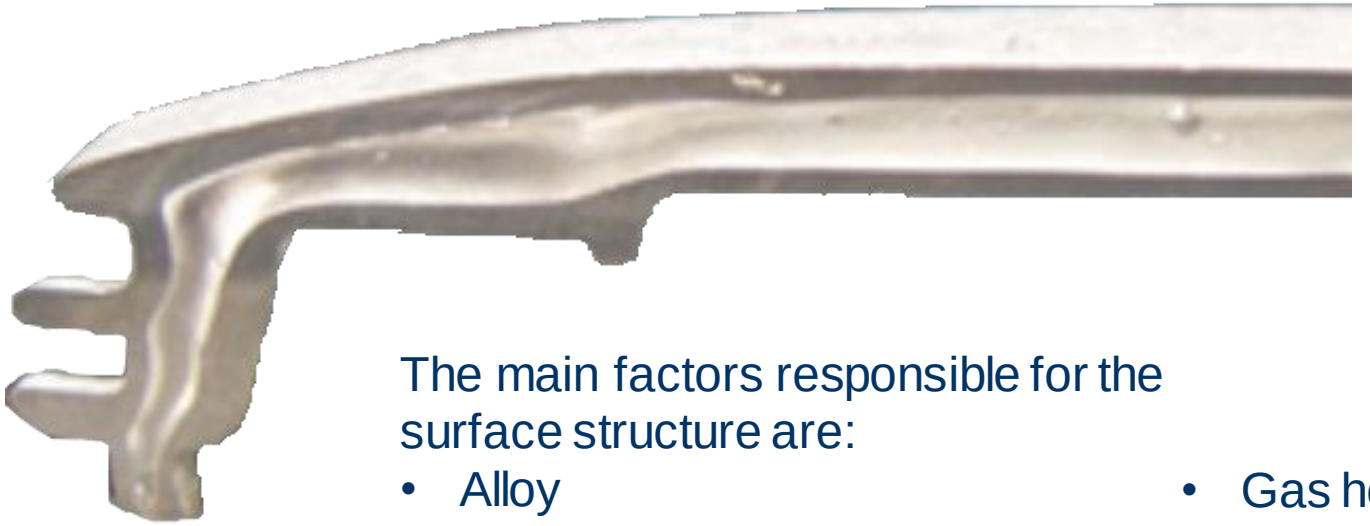


Disturbances of the gas injection process:

- Changing the internal channel geometry
- Creation of flow turbulence
- Change of the channel surface

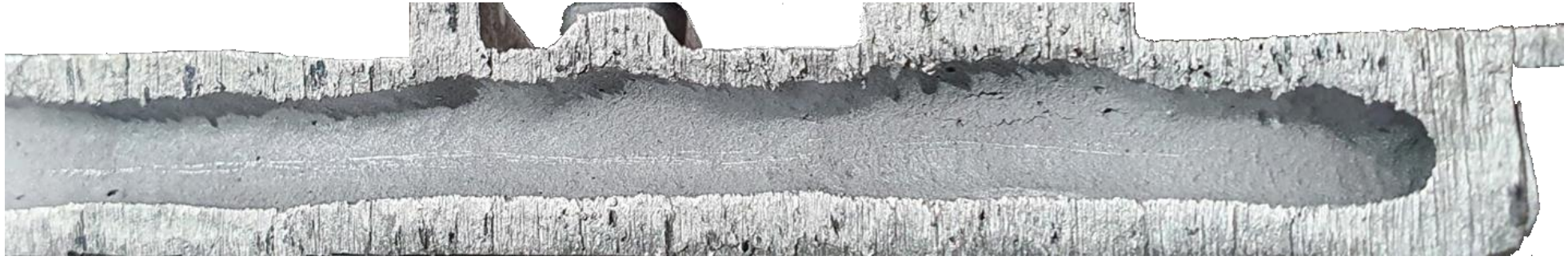
Kanaloberflächen

Generally valid statements on the surface in the gas channel cannot be made due to the large number of parameters influencing it. Some examples in the pictures:



The main factors responsible for the surface structure are:

- Alloy
- Injection pressure
- Blowout velocity
- Gas holding pressure
- Starting time of gas injection
- Duct geometry and duct run



Component-related mould concept

With our MAGIT tool concepts, you are on the safe side for successful tool design and commissioning right from the start.

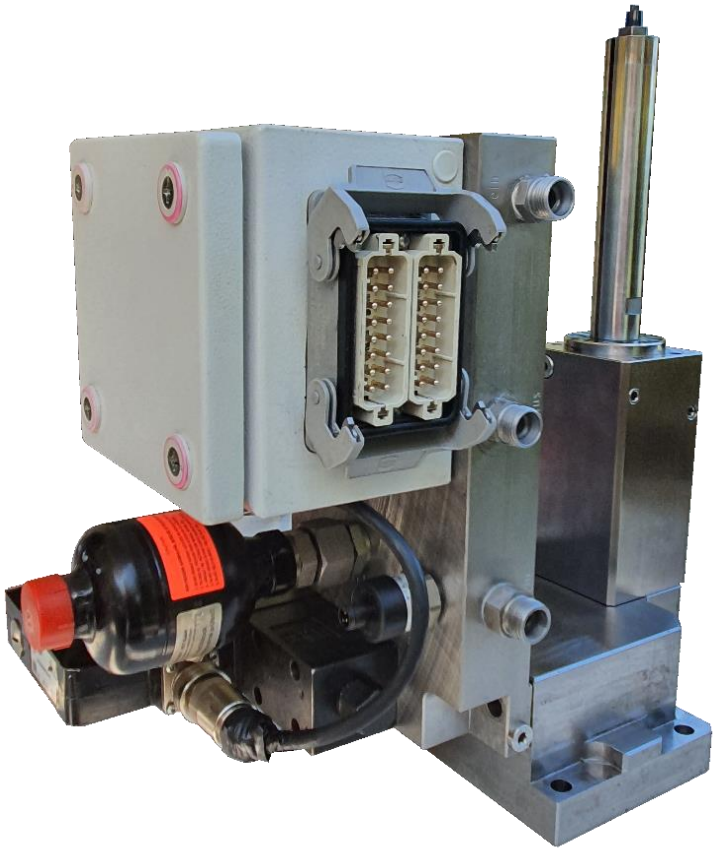
- Determining the optimal component position and direction in the mould.
- Finding the optimal injection point and dimensioning the inlet channel.
- Determination and dimensioning of the gate valve position and the overflow channel.
- Design of the side cavity.
- Checking the gating system in interaction with gas injection.

MAGIT Mould-Module

MAGIT SM Module
Sidecavity-Module with
Gate valve and
gate valve sleeve

The tool modules are fully assembled and tested functional units that are integrated directly into the die casting moulds.

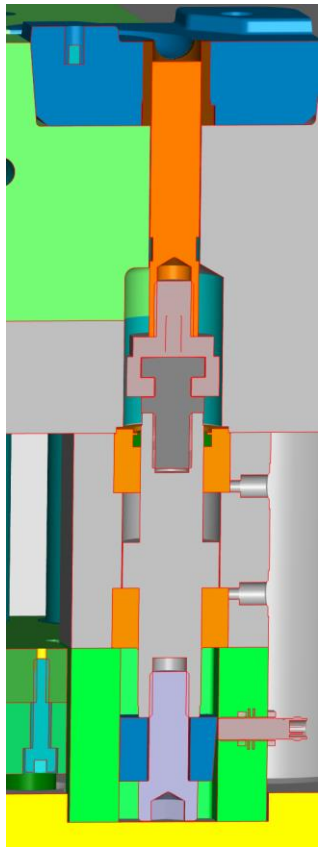
The injector and gate valve are controlled directly from the MAGIT Power Module PM500 via the MMI interface, so there is no dependence on the die-cast cell used.



MAGIT IM Module
Injection-Module with
Manifoldplate, hydraulic
proportional valve and MMI box

Modul Integration of IM&SM

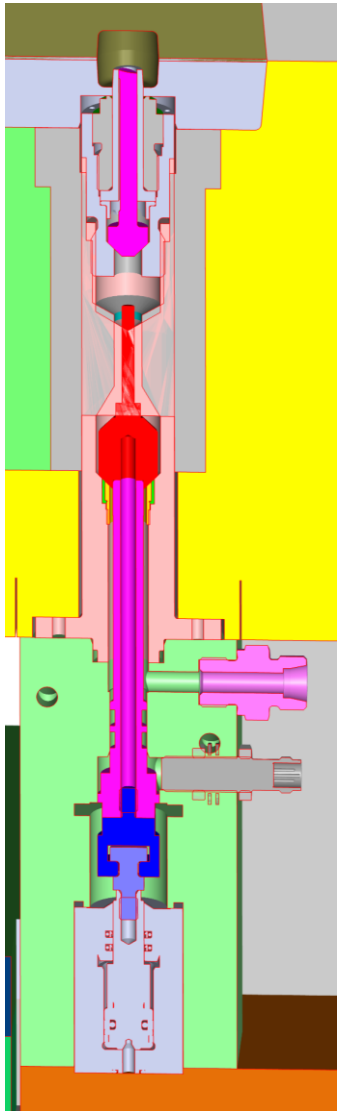
CAD-supported insertion of injection and sidecavity module into the mould



Determination of the dimensions, position and arrangement of the two tool modules in the tool.

All connections for
- Process gas
- Hydraulics
- Coolingfluid
- Sensors and position measurement

are centrally accessible from the outside of the mould via the connection and valve plate.



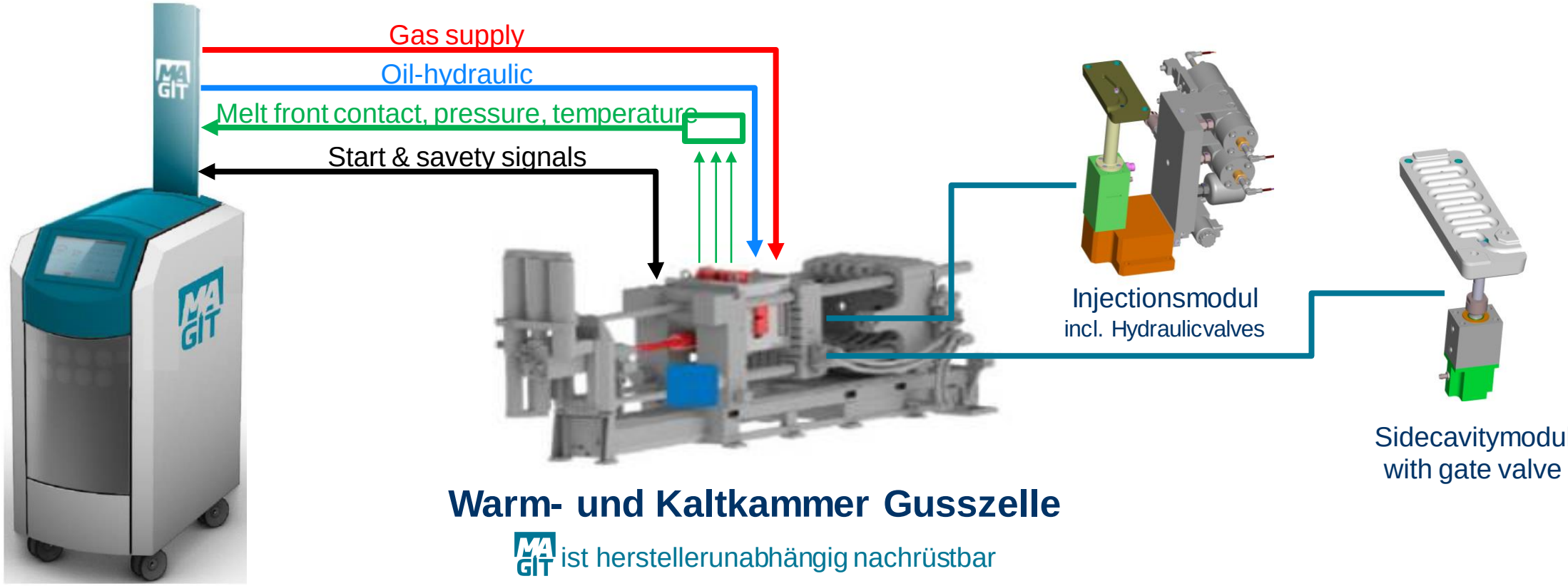
Design of the MAGIT system

Powermodul

Stand-alone control unit with integrated high pressure compressors

Die modules

Pursant to Die and component concept/design



Warm- und Kaltkammer Gusszelle

ist herstellerunabhängig nachrüstbar

Contact

we will gladly advise you

franz.krall@magit-hpdc.com

+49 173 8525112

www.magit-hpdc.com

TiK Technologie
in Kunststoff GmbH
Siemensstraße21
D-79331 Teningen

Franz Krall
Lärchenwaldstraße 18
A-4820 Bad Ischl
+43 660 6872111