Common casting defects

During the process of diecasting, there is always a chance where defects will occur. Minor defects can be adjusted easily but high reject rates could lead to significant changes at a high cost. Therefore it is essential for diecasters to have knowledge on the types of defects and be able to identify the exact root cause, hence eliminate further losses.

Defect analysis and solution

The common casting defects are as follows: ineffective mould filling, porosity, shrinkage, cold shuts, hard spots, die soldering and deformation with porosities and cold shuts being the most common.

The causes of casting defect can be summarized as blow:

- The shape and design of the casting
- Performance and parameters of the diecast machine
- Feed system design
- Operation of diecast machine
- Diecasting alloys

Cold shut

Cold shut is one type of surface defects and lines on the surface of the casting can be seen. These flow marks indicate metals are solidified at different stage.

Cause

Cold shut are caused when molten metal flow comes into contact with the cooler die surface and solidifies before complete filling of the mould. Another flow of metal fills in the mould and lies on top of the previous metal instead of remelting it which causes the crack. This most likely is due to inadequate mould temperature. Cold shut can easily be found at the region that is further away from the gate.

Cold shut can affect the mechanical strength of the casting as cracks would extend when the casting is under certain loading. The crack will act as the stress point and weaken the casting.
Solutions

- Reduce the amount of releasing agent used (mould will be less cooled down).
- Use mould layer that can reduce heat conduction.
- Shorten the diecast cycle.
- Reduce the flow of cooling water or replace the cooling channel with smaller pipes.
- Increase the liquid metal temperature.
- Add overflows at appropriate position to increase the mould temperature.

Cold shuts on the casting’s surface

Cold shut

Fig 4.2