



| Title / Titel:           | DocCode / Nr: | DocResp / Verantw: | Scope / Geltung: |
|--------------------------|---------------|--------------------|------------------|
| Plastics injection parts | ES019         | Q.PL.Z             | EGRP             |

| Revision: | Change / Änderung:                 | Author: | Checked: | Approved: | Effective / Gültig ab: |
|-----------|------------------------------------|---------|----------|-----------|------------------------|
| 01        | For now, only failure descriptions | DWU     | BHO      | DWU       | 12.03.2012             |
| 02        | Core tool breakage supplemented    | DWU     | BEM      | ROM       | 02.04.2012             |





## Scope / Umfang

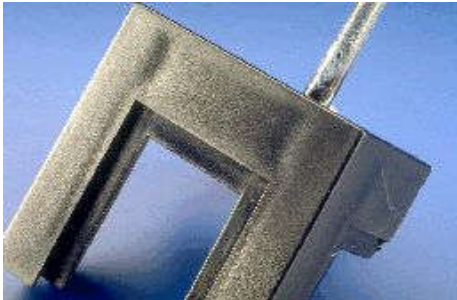



This ES defines the quality characteristics of plastic injection molded parts.

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# 1 VISIBLE FAILURE CHARACTERISTIC

| Bubbles and silver marks  | Good (ok)   | Bad (not ok)   |
|---|---|--|
| <p>Silver marks caused by gas bubbles in or just below the surface of the molding. These occur on the one hand by gases that are dissolved in the melt and relax at the flow front. By the source of the river, these bubbles put on the molding surface or are still covered by a thin plastic skin.</p> |    | <p>No bubbles and silver marks visible</p> <p>Visible or tactile bubbles and silver marks</p>  |
| Diesel Effect (burning mark)  | Goods (ok)  | Bad (not ok)   |
| <p>The existing air in tool cannot escape fast enough. When compressing the air, there is an increase of temperature which leads to the combustion (damage) of the plastic.</p>   |   | <p>No diesel effect visible</p> <p>Diesel effect visible</p>   |
| Flow line   | Good (ok)   | Bad (not ok)   |
| <p>When two plastic mass flows meet a weld is formed. Decisive for the visibility is the impact angle, the flow front temperature, the pressure build up and the vent.</p>  |  | <p>In the assessment is important to note that flow lines are primarily tool connected.</p> <p>Light visibility is permitted if the two mass flows have formed a connection with the flow line.</p> <p>Tactile flow line</p> <p>Mass flows are received not connect.</p> |
| Colour distortion / Gloss   | Good (ok)   | Bad (not ok)   |
| <p>The appearance of a surface is determined by the light reflection and absorption. A different surface texture of the plastic part (roughness) modified these factors.</p>  |  | <p>In the assessment is to distinguish between visible parts and other parts.</p> <p>Visible parts shall have a uniform gloss. Small differences are allowed.</p> <p>Visible parts whose surfaces have very noticeable differences in gloss.</p>                         |

| Shrinkage / Sink mark  | Good (ok)  | Bad (not ok)  |  |
|--|--|---|--|
| <p>In areas of mass concentrations arise during the cooling process a greater volume contraction of the melt. The reducing volume cannot be replaced by new melt.</p>  |   | <p>In the assessment is important to note that shrinkage and sink marks are primarily tool connected.</p> <p>Sink marks that go beyond the usual measure of the part (compared with release samples).</p> |  |
| Records effect   | Good (ok)  | Bad (not ok)  |  |
| <p>During the flow process the too rapid cooling behind the flow front is the activator of a partially viscous layer which stops by the low pressure in the flow front. The subsequent melt flows over this wall and is then pushed back to the mold wall, where it cools down more.</p> |                                        | <p>No records effect visible. Records effect visible.</p>   |  |
| Burr marks   | <p>The separating surfaces of the tool have a great distance from each other so that melting can occur in this slot.</p> |    | <p>In the assessment is important to note that burr marks are primarily tool connected.</p> <p>The evaluation of a burr is primarily relevant for release process of a new tool and must meet the requirements of the drawing.</p> |
| Injection links  | Good (ok)  | Bad (not ok)  |  |
| <p>Strong formation of molecules which breaks on cooling and the results is an altered surface impression or a small cone.</p>   |                                       | <p>In the assessment is important to note that injection links are primarily tool connected.</p> <p>Injection links is faulty if it is higher than the deepening.</p>                                     |  |
| <p>Light visibility injection links is permitted</p>   | <p>Light visibility injection links is permitted</p>   |   |  |
| Dirty and fat  | Good (ok)  | Bad (not ok)  |  |
| <p>Contamination by dust particles, fat, etc.</p>  | <p>Nothing visible with eye.</p>   | <p>Strong pollution.</p>  |  |
| Core tool breakage   | Good (ok)  | Bad (not ok)  |  |
| <p>By broken tool core voids are filled. This may be accompanied by other failure such as part not fully injected, sink marks, etc.</p>  | <p>Part according to the drawing.</p>  | <p>Part not according to the drawing.</p>   |  |