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Order Specification Coating material Bestellvorschrift Beschichtungsmaterial	 BOSCH
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1 Scope

This document serves as a supplementary specification for cast components. Its purpose is to provide a basis for a preliminary technical assessment and to define the requirements, application areas, and application methods related to the coating of cast components. These requirements and concepts will be further specified and finalized during subsequent technical discussions.

Project-specific information, such as sample phases, required delivery volumes, and other relevant project details, is specified in the Request for Quotation (RFQ).

2 Purpose of the coating

The purpose of the coating is to enhance the corrosion resistance of the highlighted sealing interfaces (see in chapter 4.). After completion of the customer's corrosion testing, the component shall meet the specified leakage test requirements.

The recommended coating: Sol Gel coating.

Information about Corrosion test: Corrosion test E01 – 130 cycles (3120 h)

Order	Test item	Time	Temperature	Conditions
1	Wet	2 h	40±2°C	Humidity: 95% RH or more
2	Salt spray	2 h	35±2°C	NaCl concentration: 5±1%
3	Dry	1 h	60±2°C	Humidity: 20 to 30% RH
4	Wet	6 h	50±2°C	Humidity: 95% RH or more
5	Dry	2 h	60±2°C	Humidity: 20 to 30% RH
6	Wet	6 h	50±2°C	Humidity: 95% RH or more
7	Dry	2 h	60±2°C	Humidity: 20 to 30% RH
8	Cold	3 h	-20±2°C	-

Figure-1_1 cycle of the corrosion test

Pass criteria:

- Corrosive creep below seal interfaces <100% of sealing width.
- No substrate metal corrosion: After testing, the coated aluminum alloy surface shall not show defects such as substrate corrosion, cracks, bubbles, or oxide film peeling.

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3 Product requirements of coating

3.1 Thermal requirements

T-resistant up to 220°C (short term), 120°C (long term, e.g. 1000h (to be discussed)).

3.2 Forbidden substances

Toxic ingredients are not allowed. Supplier must send IMDS to Bosch. If it is not possible, then specification must fulfill acc.to N 2580-1.

3.3 Chemical resistance

The coating material must be resistant to media acc.to ISO 16750-5. **Loctite 5970** compatibility is preferred.

3.4 Mechanical Properties

Adhesion: The coating must pass the cross-cut test (ISO 2409), achieving an adhesion rating of max. level 1.

Hardness and Strength: After testing, the hardness (such as Rockwell hardness) and tensile strength of the aluminum alloy substrate must meet the initial design requirements without significant degradation.

Scratch resistance: The coated surface must be scratched standing. Specification: tbd.

3.5 Surface preparation

Before applying the coating, the surface shall be properly cleaned and degreased, e.g. with isopropyl alcohol (IPA).

3.6 Application method

When brushing, ensure the coating film has a uniform thickness.

When spraying, control the flow rate and air pressure properly to reduce splashing and to ensure uniform thickness.

Curing time & method: tbd.

3.7 Coating thickness and roughness

Coating thickness shall be ~5µm (details can be discussed with supplier)

Surface roughness (Ra, Rz, ...) after coating. For initial surface conditions see chapter 4.

3.8 Identifiability

The supplier should recommend solutions for the identification of coated surface - tbd.

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4 Application areas

The coated surfaces are static sealing interfaces and shall not extend beyond the specified surface areas. The coating shall be applied only to the specified surfaces.

4.1 Application on System housing surfaces

The coating must be used on the surface with purple highlighted.

- Heat exchanger: machined flat surface (Rzmax 6.3)
- Pressure compensating element (PCE): machined conical surface (Rzmax 10)
- LV connector: machined flat surface (Rzmax 6.3)

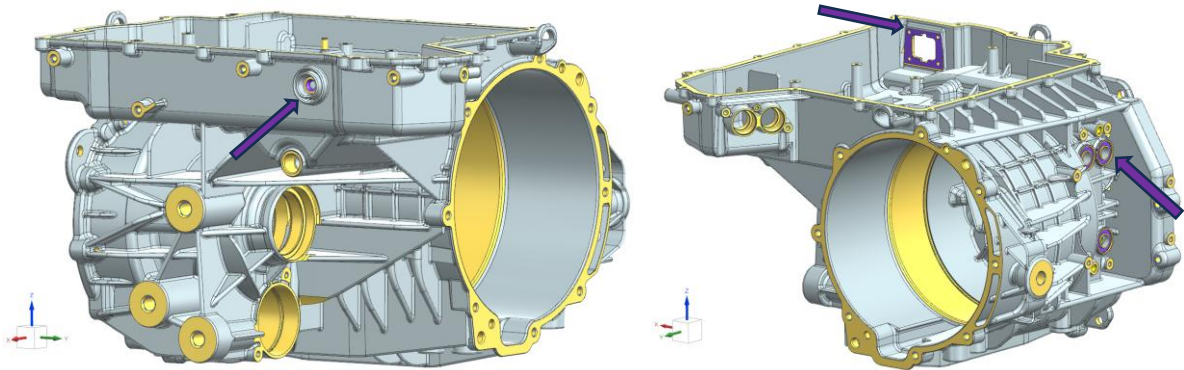


Figure-2. Overview of coated surface on System housing

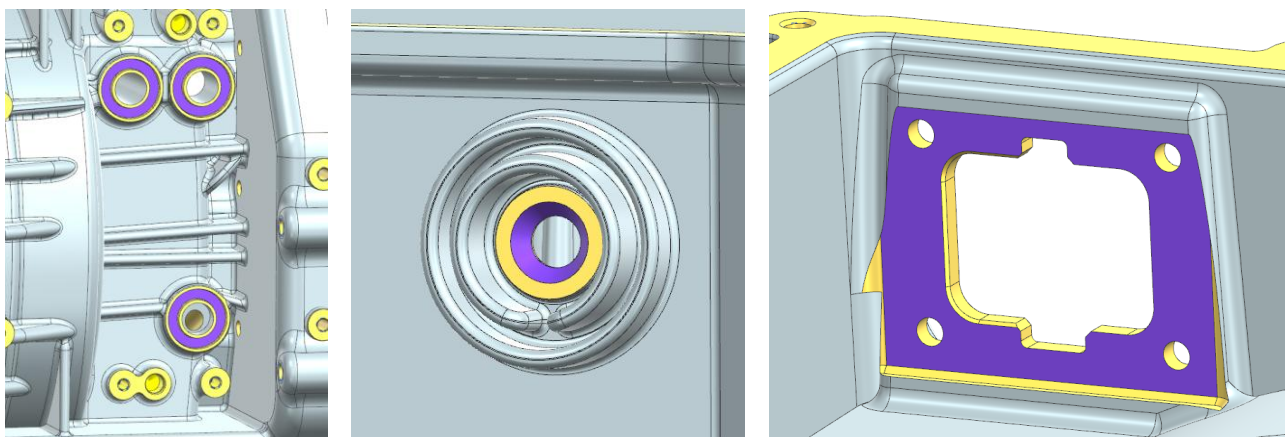


Figure-3 Coated surfaces for HEX-/PCE-/LV connector interfaces

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4.2 Application on B-bearing shield

The coating must be used on the surface with purple highlighted.

- Breather: Machined, flat surface (Ra 3.2 / Rzmax 6.3)

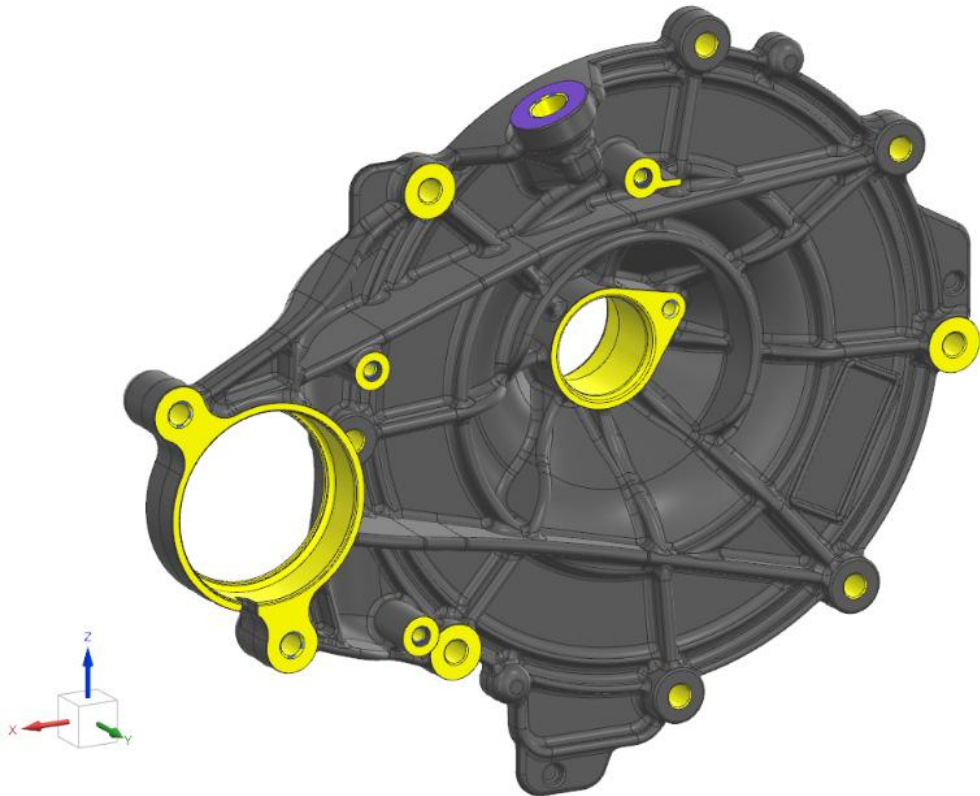


Figure-4_ Coated surfaces for Breather interface

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