Zentralverband
Oberflächentechnik e.V.

Fachverband Galvanisierte Kunststoffe

Guideline for testing plastic parts with real metal surfaces

Introduction

In today's practice, companies belonging to Fachverband Galvanisierte Kunststoffe e.V. (FGK) are increasingly confronted with different and sometimes widely varying OEM standards that are intended to ensure the quality of real metal surfaces. Although these tests often address the same basic requirements, they sometimes differ considerably in the details, such as the duration of tests or the number of test cycles. These developments lead to challenges for suppliers, especially when excessive requirements are not only difficult to meet, but are also not necessary to ensure the quality and reliability of real metal surfaces in the field.

Therefore, with this supplement, we would like to highlight industry testing standards and provide recommendations on how to deal with problematic test results. The aim is to create a transparent basis for cooperation and to ensure that testing requirements are designed to be practical, efficient and effective. In principle, the FGK would welcome if requirements were to be standardised again and suppliers were given the opportunity to become more involved through relevant working groups (VDA).

1. Industry-standard testing requirements

The tests for plastic parts with real metal surfaces can be roughly divided into:

- Testing the dimensional stability of the component under increased temperature influence and of layer adhesion (heat storage/temperature shock test)
- Testing the metal layer for corrosion (CASS/NSS test)
- Ageing simulation of component and coating (climate change test)

Tests	Description	Interieur	Exterieur	ABS	ABS/PC	PA
Temperature resistance	Heat storage	24 h	24 h	85 °C	100 °C	110 °C
Temperature shock	(1h, quenching 18° C)			90 °C	100 °C	100 °C
Corrosion tests DIN 9227	CASS-Test	24 h	48 h			
Corrosion tests DIN 9227	NSS-Test	240 h	480 h			
Climate change tests VDA 230-221	Cycles of 12 hours (90 °C/-35 °C/85 % humidity)	10	3			

2. Recommendations for clients

We recommend to start open discussions about the testing requirements early on in the planning phase. Together, realistic and field-relevant test criteria can be defined to ensure smooth project implementation. This avoids unnecessary delays and additional costs.

When defining tests, the requirements should be adapted to the later use of the product. Considerations such as typical operating conditions, load limits and safety reserves should be at the forefront in order to ensure practical and economically viable testing.

It is essential to strive for the standardisation of relevant test conditions in order to be able to achieve the highest quality economically.

3. Dealing with test failures

It is important to make a realistic assessment of the test requirements before the project begins. Working together, potential challenges can be identified at an early stage and risks can be better assessed. It should be taken into account that some tests, especially those with excessive requirements, cannot always be achieved and do not always have to be achieved in order to ensure functionality and reliability in the field.

If problems are identified in this regard during the course of the project, various optimisation loops are usually initiated. It is often found that communication regarding technical requirements and test results often only takes place between the electroplating companies and their customers. However, for a holistic assessment and an informed decision in the event of deviations, it is essential that the entire supply chain, including OEMs and responsible specialist departments, is involved in the decision-making process.

In some cases, the coating of a component can be adversely affected during the assembly process (e.g. mechanical stresses due to deformation or thermal damage due to welding), which in turn can lead to a negative test result, even though the coated component would in principle be suitable. Therefore, the specification and test planning should take into account whether a coating remains stable under real installation conditions or whether adjustments to the installation situation or assembly could become necessary. Close coordination between individual and assembly tests is crucial in order to define realistic evaluation criteria.

Some assembly tests focus on the function of the assembly and are sometimes subject to very strict requirements. Due to the nature of the system, the metal and plastic composite is not designed to withstand these extreme requirements without damage, but this does usually have no negative impact on functionality. It is therefore essential to distinguish between critical impairments and purely visual or secondary defects in order to enable practical decisions.

4. Conclusion

Successful cooperation is based on a common understanding of practical requirements and open communication. This supplementary sheet is intended to serve as a guide to highlight industry testing standards and make cooperation in the supply chain more efficient and more effective.

We thank you for your trust and partnership. Together, we can ensure that projects are not only technically successful, but also economically. If you have any questions or suggestions regarding the contents of this supplement, we at FGK are always happy to help (mail@zvo.org).