

PWIS-free – With a sense of proportion

Economical cleaning of components

The general requirement for PWIS-free (German: LABS-free) components partly results in considerably high costs without any effect on the product's quality, especially when cleaning elastomeric components. With the approach from APO GmbH based on the VDMA specification 24364, cleaning costs can be reduced without any risk of quality loss.



Image: Industrial car body painting (Source: Shutterstock - xieyuliang – 601727096)

In paint shops, clean components are essential. Not only must the surface to be lacquered, e.g. car body parts, be free from any contamination that may cause disturbances in lacquer wettings (the PWIS), but also even the smallest components within the painting system. Any contamination that impairs uniform paint application can cause major problems. Therefore, all components used in lacquer processing operating zones must be appropriately prepared. Any failure can lead to blemishes and so-called 'craters' and will lead to high troubleshooting expenses, which in some cases can even be combined with production downtimes.

Hence, automotive industry subcontractors, for instance, face the highest requirements regarding the PWIS cleanliness of their products. The delivered components must comply with the corresponding test specifications for cleanliness verification. In practice, there are often several test specifications from different customers for the same component, usually stating highest possible requirements independent of the component itself and its actual application.

Degree of required cleanliness

The actual demand for cleanliness depends on different factors. It hinges on the component itself and its materials, on its kind of application and the place of its use within a lacquer processing plant. It is essential to clarify these aspects to be able to realise economic cleaning processes while ensuring the compliance with the client's test specification.

Unfortunately, in practice, these test specifications often do not correspond with the real application. For instance, a test involves rinsing with solvents although the components are used in compressed air systems. Other specifications require heat exposure while in practice the component is used at room temperature.

The necessary degree of cleanliness should be evaluated in a realistic way. Why should components for final automotive assembly be equally clean as components used in spray guns? Antonio Pozo, the managing director of APO GmbH, describes the current situation: "The common practice of requiring the highest PWIS cleanliness levels for all components partly causes unnecessarily high costs for cleaning processes".

Support for Customised PWIS cleanliness requirements

On the initiative of various subcontractors, a working committee under the umbrella of the VDMA specialist "surface technology" department has addressed this topic. They have established the VDMA specification 24364, which describes requirements for the testing of paint wetting impairment substances to achieve appropriate PWIS/LABS-conformity. The approach of this specification is to classify lacquer processing production areas into different PWIS/LABS critical zones. Product groups are assigned to those zones and the defined testing classes and procedures meet the requirements of the appropriate zone.

An exact consideration of the service conditions and PWIS/LABS cleanliness requirements in accordance with this specification pays off, especially for elastomeric components. Beside the contaminants on the surface, such as release agents, that can be introduced to paint booths, some substances from the elastomeric material itself, e.g. softeners and processing aids, can leak out of the material over time and cause disturbances in lacquer wetting.

Therefore, cleaning processes for elastomeric components need to be particularly profound. The cleaning procedures are normally more elaborate, time-consuming and costly compared to those for metallic products. Usually, combinations of wet-chemical cleaning and plasma processes are applied for the cleaning of elastomeric components. This is the starting point for a closer look. The savings potential for the cleaning of metallic products is rather low. However, the costs for the cleaning of elastomeric components can be reduced by up to 30%.

Conclusion

The choice of adapted wet-chemical processes and different plasma technologies with regard to the requested PWIS/LABS cleanliness level allows for the shortening of cleaning time and

thus for the reduction of cleaning costs. Even with highest cleanliness requirements, potential savings can be achieved with suitable plasma technology, cleaning experience and the expertise for adaptation of the cleaning procedures. Numerous projects at APO GmbH show: Purchasers should not shy away from the proper definition of PWIS/LABS-conformity. Searching for alternative cleaning processes and reliable partners for the cleaning of components pays off and helps to cut costs.

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