

PART GEOMETRY AND PRETREATMENT MUST BE CORRECT

Monolayer Coatings for Commercial Vehicles

The desire to reduce the number of coating layers exists not only for the coating of cars but also in the commercial vehicle industry. A new monolayer coating now makes it possible to coat agricultural and construction machinery attractively with just one instead of the previous two layers and to protect them reliably against corrosion, provided that certain conditions are fulfilled.

— About twenty years ago, the first attempts were made to coat commercial vehicle bodies and trailers with a single layer of paint. Sufficiently good corrosion protection results were achieved in laboratory tests. In practice, however, the attempt to reduce the number of coating steps failed, as the special design of some components meant that there were surface areas that could not be reliably coated in a single step. The result was corrosion damage to the vehicles.

When one talks about reducing the number of coating layers in the car industry and therefore reducing the number of working steps, one generally means reducing from four to three layers. In the coating of commercial vehicles, such as agricultural or construction machines, the aim is to reduce the number of layers from the previous two to just one layer.

In practice, a number of points must be observed when monolayer coatings are used for the coating of commercial vehicles:

- Point 1: In the development of the coating systems, corrosion protection must be guaranteed even for thin coating thicknesses of the applied coating. In concrete terms, that means that good levelling prop-



erties must ensure that a closed coating film is formed even for film thicknesses of below 5 μm .

- Point 2: The design of the parts to be coated must allow the use of monolayer coatings. This requirement can easily be fulfilled in the coating of cover panels, counterweights and small parts.
- Point 3: The parts must be carefully cleaned and must be pretreated at least with iron phosphating.

If these requirements are fulfilled, the newly developed monolayer coatings, which are available either as solvent-based systems or as water-soluble coatings, can be used.

The Table lists some of the properties of current monolayer coatings.

Why is it that monolayer coatings can now once again be recommended for use in the automotive industry?

Firstly, the corrosion protection properties of the new coating systems have

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Properties	Solvent-based monolayer coating	Water-soluble monolayer coating
Required film thickness	80 µm	70 µm
Minimum film thickness	25 µm	25 µm
Substrate preparation	Blasting (SA2½) and iron phosphating	Blasting (SA2½) and iron phosphating
Maximum degree of gloss	> 90 GE 60° measuring angle	> 85 GE 60° measuring angle
Corrosion protection	Corrosivity category C3/C4 DIN EN ISO 12944	Corrosivity category C3/C4 DIN EN ISO 12944

The properties of solvent-based and water-soluble monolayer coatings

been improved to enable sufficient protection to be achieved even with thin layers. That means that a continuous coating film is produced and a certain corrosion protection is available even at those areas that are difficult to access during the application of the coating. However, where there is no coating at all, there is no corrosion protection.

Secondly, the fact that FreiLacke focuses on special coating problems in individual industrial sectors has resulted in more expertise and understanding for what customers demand of a coating. Knowledge about design-related corro-

sion protection, for example avoiding difficult to access components, avoiding sharp edges or eliminating the joining of different materials, makes it easier to assess together with the customer whether a monolayer coating can be used for a component or whether it is better, for reasons of corrosion protection, to use a conventional primer-surfacer and a top coat.

Furthermore, there is a greater understanding among users today, compared to even a few years ago, that the surfaces to be coated must be prepared for the coating; in other words, they must be

pretreated if good corrosion protection is to be achieved.

Conclusion

Improvements in the properties of coating systems with regard to the corrosion protection of thin coating layers and the lessons learned from experience with the first coating results have made the use of monolayer coatings in automotive finishing possible and practical once again. It is important that, before monolayer coatings are used, the part geometry and the pretreatment are precisely analysed and evaluated by the user and the coating manufacturer, and if required also by the manufacturer of the application equipment.

Once all questions have been satisfactorily answered and practical tests have been successfully completed, monolayer coatings can be used today for cost-effective finishing.

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