

U-C800
MANUFACTURING STANDARDS

Paint Processing of Passenger and Van Bodies

This standard describes the general process and control for the pre-treatment, priming, painting and corrosion protection of passenger and van bodies. It must be used in conjunction with the individual Model Paint Process Sheets to provide full processing details.

The procedures described in this standard are as follows:-

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PAINTING PROCESS

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1.0 **Materials**

- 1.1 Only non-production items which have been approved in accordance with procedure EU-II-d-1 may be used in conjunction with paint processing operations.
- 1.2 All production materials must be approved in accordance with Product Engineering Procedure EPD-A05, and have undergone suitable production line trials according to the Quality Procedure EU-VIIC-4.
- 1.3 All materials must have full C2 status from Toxicology and have been approved for use in their specific applications and locations by the responsible Plant Medical Officer.
- 1.4 Additives shall not be introduced into production materials without prior approval from Laboratory Materials & Fastener Engineering Quality and Manufacturing Engineering. All additives shall have full Materials & Fastener Engineering Quality and Toxicology approval. Form EU-1464 'Materials Compliance Sheet' should be used by suppliers to request Tox approval.
- 1.5 Information concerning the use of sealers, deadener pads and adhesives etc., is contained in the relevant model Trim and Sealer manuals and also the Model Paint Process Sheets.
- 1.6 The solvent thinning and filtering of paint materials ready for application is to be as recommended by Manufacturing Engineering or as required in the relevant materials specification.
- 1.7 All Paintshop materials shall be free of all crater inducing materials; eg: Silicones, when tested in accordance with U-MJX.
- 1.8 The use of compressed air for cleaning car bodies may give rise to high noise levels. The Occupational Health Department should be consulted to ensure compliance with Manufacturing Standard U-SX001-1 and U-SX001-2.

2.0 **Pre-Treatment and Phosphating**

2.1 **Preliminary Clean-up - BIW Area**

Bodies shall be free from all foreign matter. Where necessary, exterior surfaces should be solvent wiped to remove residual sealants, grease, oil, chalk and stamping marks etc.

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- 2.2 Treatment of Areas Discoloured by Heat - BIW Operations
Any discolouration caused by welding or brazing on the outer or critical customer visible interior surfaces shall be removed by sanding machine with a suitable grit size, eg: 100 grit, in order to achieve a bright metallic surface.
- 2.3 Preliminary Cleaning and Fitting of Slave Tooling
Where required clean exterior surfaces with an approved cleaning material, as detailed in the Model Paint Process Sheets, using clean lint free cloths.
- To allow satisfactory cleaning and Phosphating of enclosed areas all closures shall be retained in a partially open position by slave tools as depicted on the Model Paint Process Sheets.
- 2.4 Phosphating
Phosphating of bodies shall be carried out using an automatic spray, spray-dip or full dip system. All Phosphated Bodies must meet the performance requirements of specification WSK-M3P1-C.
- Phosphate coating weights and specification references are described in Paragraph 12.1.
- 2.5 Phosphate Draining & Dry Off
Carry-over of pre-treatment chemicals into the Electrocoat Tank must be avoided and suitable provisions incorporated to ensure Bodies are fully drained. Conductivity of the residual rinse water carried-over must not exceed 20 $\mu\text{S}/\text{cm}$. Bodies preferably should not be in a partially dried out condition immediately prior to entry into the Electrocoat Bath.
- 3.0 Electrocoating
- 3.1 Bodies shall be completely immersed in the Electrocoat bath with the roof top in the horizontal position and a minimum of 150mm below the surface level. The system shall be electrically charged to the condition necessary to meet the specified film thicknesses.
- All closures must be positioned with slave tooling, as per the Model Paint Process Sheets, to ensure adequate coverage by Electrocoat Primer.

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To meet film build requirements, and to accommodate the progressive introduction of pre-coated steels, the following immersion times are recommended:-

- a) Live (power on) entry systems - 2.5 minutes minimum immersion for any point on the body on entry to the same point on exit. It is recommended that the front leading edge of the roof is used for immersion time measurement.
- b) Dead (power off) entry systems - 2.5 minutes minimum immersion from the last point of body on entry to first point of body on exit. It is recommended that the rear edge of the roof is used on entry, and the front leading edge of roof on exit are used for immersion time measurement.

Minimum film thickness and specification references are described in Paragraph 12.2.

3.2 Tank Operating Parameters

These must be determined on the basis of meeting performance requirements of the specification and producing a smooth pore-free Electrocoat film. Tank control parameters should be within the limits agreed with the Material Supplier, Materials & Fastener Engineering Quality and Manufacturing Engineering.

3.3 Drain and Rinse

As the body leaves the Electrocoat tank, rinse off immediately with an over tank ultra-filtrate spray to remove any cream coat. This should be followed by a further five rinse cycles as follows:

- | | | |
|-------------------------|-------------------|--|
| • 2 nd Rinse | Full Dip | with re-circulated U/F |
| • 3 rd Rinse | Spray | with re-circulated U/F |
| • 4 th Rinse | Spray | with pure U/F |
| • 5 th Rinse | Spray or Full Dip | with demineralised water |
| • 6 th Rinse | Spray | with pure demineralised water with a maximum specific conductivity of 20 µs/cm |
| | | - Manf Standard: UPT-100-5 |

Rinse cycles may be supplemented by special nozzles to ensure adequate rinsing of critical areas, both externally and internally.

- * Above sequence must be used for systems where vans are processed. For other systems 2nd and 3rd rinses may be reversed.

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3.4 Ultrafiltration

The ultrafiltration unit should provide sufficient volumes of ultrafiltrate to operate a closed loop rinse system, ie: no top up material required. Impurities should be discharged to waste to ensure the operating parameters of the bath are maintained at the optimum level.

3.5 Blow-Off

All Bodies should be subjected to an automatic or manual blow-off operation concentrated to remove rinse water runs. Blow-off air must be free from dirt, oil and water droplets.

3.6 Baking

Baking cycles are detailed in Paragraphs 11.1, 11.2 and 11.9. The baking schedule is critical since undercuring or overcuring of the Electrocoat film will reduce its performance characteristics.

3.7 Sanding of Electrocoat Defects

Surface defects in the Electrocoat film, which may be visible in subsequent primer and enamel coats, must be removed by local sanding; relevant Model Paint Process Sheets are to be followed. As far as possible sanding should be avoided (or kept to a minimum); sand throughs to metal must be avoided. Sanding through areas of finished bodies must meet Durability Standard WSK-M2P136-A.

4.0 Sealing and Underbody Protection

4.1 Sealants, including caulking compound, plugs and adhesive tapes, shall be applied in line with relevant Model Paint Process Sheets and the Model Trim & Sealer Manuals. Excess sealer must be; removed from visible surfaces by wiping with clean lint free cloths or by spatula from cut edges; masked using either mechanical or disposable masks.

4.2 PVC underbody coating may be applied, either manually or automatically, to areas shown on individual Model Paint Process Sheets. Areas to be kept free of underbody coating must be; removed from visible surfaces by wiping with clean lint free cloths or by spatula from cut edges; masked using either mechanical or disposable masks.

Thickness of PVC underbody coating and specification references are described in Paragraphs 12.3.1/2/3/4.

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4.3 Body skid mounting areas that are not coated with underbody PVC must be protected with an approved repair material prior to the underbody wax application. This may be achieved by brushing or spraying. Film thickness and specification requirements are detailed in Paragraph 12.3.2.

4.4 Pre-gelling of the sealants and underbody coating is recommended to facilitate the removal of excess sealer and PVC underbody overspray and also to prevent contamination of automatic ostrich feather machines.

The baking cycle is described in Paragraph 11.3 and 11.9.

5.0 Primer Surfacer Application

5.1 Cleaning of Electrocoat Primed Bodies

Before entry into the Primer Spraybooth all exterior surfaces should be blown-off with dry oil-free deionised air in conjunction with either, an automatic ostrich feather dusting machine or manual tack wipe.

5.2 Application of Lower Body Stone Chip Protective

Stone chip protective primer should be applied automatically to the areas specified on relevant Model Paint Process Sheets and over coated wet on wet with a minimum of 20µ primer surfacer. Film thickness requirements are detailed in Paragraph 12.4.

5.3 Application of Primer Surfacer & Coloured Primer to Exterior Surfaces

Primer Surfacer, solvent based or water based, may be applied manually or automatically and by both electrostatic and non-electrostatic means. Automatic application should be performed in two coats each preferably applying 50% of the required film build. 1 minute flash-off is recommended between coats. Where colour keyed primer surfacer is specified this should also be applied in two separate coats. Any areas not fully covered by the automatic machines must be sprayed in by hand using the appropriate colour keyed surfacer.

Areas not completely Electrocoated, due to air entrapment, must be hand sprayed with Primer Surfacer (not colour dependant) to meet quality and performance requirements. Film thickness requirements are detailed in Paragraph 12.6.1/2.

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- 5.4 Application of Enamel Colours in Primer Booth
Apply enamel colours wet on wet to areas specified on relevant Model Paint Process Sheets. Film thickness requirements are detailed in Paragraph 12.7.
- 5.5.1 Baking of Solvent Based Primer Surfacer; Stone Chip Protective; and Wet on Wet Enamels
Allow a minimum of 3 minutes flash-off from the exit of the last spraying zone. Baking cycles are defined in Paragraphs 11.4.1 & 11.9.
- 5.5.2 Baking of Water Based Primer Surfacer
Allow a minimum of 6 minutes flash-off from the exit of the last spraying zone. Baking cycles are defined in Paragraphs 11.4.2 & 11.9.
- 5.6 Sanding of Primer Surfacer
Dry or moist sand defects locally on exterior and visible interior surfaces, in line with respective Model Paint Process Sheets.

Paper no coarser than 800 grit shall be used. Remove sanding residues with clean lint free cloths and demineralised water or by vacuum cleaning.
- 5.7 Repair of Sanded Through Areas of Primer Surfacer
In the case of locally sanded through areas the repair primer surfacer to specification SK-M6J9566-A (air drying), SK-M6J9565-A (baking/lamps) or WSK-M6J172-A1 (2 pack) may be employed.
- 6.0 Enamelling of Bodies
- 6.1 Cleaning of Primed Bodies
Before entry into the Enamel Spraybooth all exterior surfaces should be blown-off with dry oil-free deionised air in conjunction with either, an automatic ostrich feather dusting machine or manual tack wipe.

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6.2 Body Colour Painting

Solid colours, Basecoats and Clearcoat may be applied either manually or by automatic spray machines. Ideally, automatic systems should cover all exterior surfaces eliminating the need for manual spray "Fill In" operations. Enamel thicknesses are described in Paragraphs 12.8.1/2, 12.9, 12.10.1/2 and 12.11.

6.3.1 Metallic Basecoats - Solvent Based

Low or medium solid Basecoat should be applied in two coats. For optimum appearance and usage efficiency; 60% of the film weight should be applied on the first coat using electrostatic bells, the remaining 40% on the second coat by pneumatic or electrostatic spraying (however, this ratio should be optimised for individual colours). 1 minute flash-off between coats is recommended. Alternatively, Basecoat can be applied manually in two coats.

Before application of solvent based Clearcoat the following flash-off times are required:

- . for low solid Basecoats - 1 minute minimum
- . for medium solid Basecoats - 2 minutes minimum

The forced air drying may be heated or unheated depending on local plant space restrictions.

Film thickness requirements are detailed in Paragraph 12.9.

6.3.2 Metallic Basecoats - Water Based

Water based metallic Basecoat should be applied in two coats; either first and second both pneumatically or the first coat by electrostatic bells and the second pneumatically. For optimum usage and appearance; 60% of the film weight should be applied on the first coat and 40% on the second (however, this ratio should be optimised for individual colours). 1 minute flash-off between coats is recommended.

6.3.2.1 Before application of the water based Clearcoat, the water based Basecoat should be:

- . flashed-off for 1 minute minimum
- . Infra-red heated for 1.5 minutes to 100°C
- . 1 minute warm air drying at 100°C minimum
- . cooled to 40°C object temperature

6.3.2.2 Before application of the solvent based Clearcoat, the water based Basecoat should be:

- . flashed-off for 1 minute minimum
- . Infra-red heated for 1 minute to 80°C
- . 2 minutes warm air drying at 80°C
- . cooled to 30°C object temperature

Film thickness requirements are detailed in Paragraph 12.9.