

Description and Operation

General fundamentals of paint technology

Paint is a pigment-containing liquid which undergoes chemical and/or physical processes after it has been applied to a surface, so changing into a solid film covering.

Repair paint consists of binder, pigments, filler and solvent.

NOTE: Organic solvent is being replaced by solvent based on water.

Constituents of paint

- Binder
 - Mostly semi-fluid resins which bind together the other components of the paint when it dries.
 - Makes the paint durable.
 - Ensures good surface coverage.
- Pigments
 - Fine, colored powders, which give color to the paint.
 - Cover the components below (covering power).
- Additives
 - Additives give the paint special properties.
 - e.g. flow improver, softener, drying accelerator, thickener.
- Solvent
 - Thins the paint and allows it to flow more freely.
 - Evaporates during drying.

Painting process and corrosion protection.

In production, painting consists of individual steps which are optimally matched to each other.

Bodywork consists almost entirely of steel panels which have been pre-coated with zinc. The zinc layer is between 5-10 µm thick and acts as the first corrosion protection layer of the steel panel.

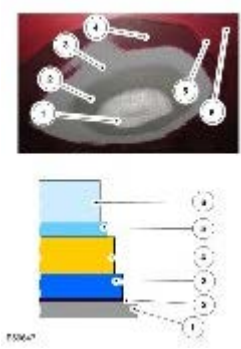
Production sequence:

- Clean and de-grease
 - In the first step, the bare bodywork is initially dipped in a cleaning bath and cleaned with a degreasing solution.
- Phosphatising
 - The cleaned bodywork is dipped in a bath containing various phosphate salt solutions. This creates a crystalline metal-phosphate layer which offers the optimal prepared surface and also corrosion protection.
- CDP base
 - The cathophoretic dip paint (CDP) base acts as a further corrosion protection layer.
 - In this process the bodywork is completely immersed in a bath consisting of a paint and electrolyte solution.
 - By application of an electric voltage, an electric field is created.
 - Positively charged paint particles settle on the negatively charged bodywork and form a protective layer up to 20 µm thick.
 - Next the bodywork is placed in a dryer, where the CDP base is hardened at 180°C.
- Sealing, stone-chip protection
 - Edges, seams and but joints are sealed with a sealing compound.
 - Vulnerable areas are coated with stone-chip protection.
- Filler
 - Filler protects the body panels from stone impacts. Furthermore, any unevenness of the metal surface is flattened out, in order to create the most homogenous and fault-free undersurface possible.
 - Once the filler is dry, it serves as the base on which paint is applied.
- Top coat
 - The top coat is applied as a single layer or two layers of paint.
 - When working with two layer paint, in the first job step the initial colored base paint is applied. In the second job step, a clear lacquer is applied, giving the base paint shine and hardness.

The structure of an original paint finish

During construction of the original paint, a total surface thickness of between 120 and 130 µm is achieved. The thicknesses of the layers may vary however, because they are greater for horizontal surfaces than vertical ones.

Paint layers



Item	Part Number	Description
1	-	Steel panel
2	-	Phosphate layer 2.9 g/m ² , corresponding to 2 µm.
3	-	Cathodic dip paint 30-35 µm
4	-	Filler 30-35 µm
5	-	Base paint 15-20 µm
6	-	Clear varnish 55 µm

Colored fillers applied in production

Filler which gives color is used in production. Its use makes the base paint and clear varnish unnecessary on certain vehicle interior surfaces (engine, doors).

Not every exterior paint has its own matching filler. It is more that the tones of the filler are color compatible, i.e. they have similar intensity to the top coat.

During repair painting the filler color tones must be used according to the manufacturer's instructions.