

# THE GELCOAT HANDLING GUIDE



## Dear Gelcoat User,

Gelcoat is an unsaturated polyester based coating which gives reinforced plastic products a glossy, protective and durable outer surface layer in a desired colour. Proper application of gelcoat is a key factor to achieve an attractive and top class product finish.



When we at Ashland initially designed the Gelcoat Handling Guide, we wanted, based on our long and wide experience, to provide you with the basic information needed for good gelcoat application and optimal use of our Maxguard and Enguard gelcoats.



Through pictures and comments, this guide describes important working practices in storage of raw materials, mould preparation, equipment maintenance, application and precautions. If however, problems occur when applying gelcoat we have compiled a trouble shooting section at the end of the guide to highlight possible causes for the problem.



We hope that this second edition of the Gelcoat Handling Guide will continue to be found useful for everyone working in the FRP industry.

Ashland, a pioneer in low styrene emission resins, is a supplier of high quality gelcoats worldwide. Our Enguard gelcoats have proven their reliability in production as well as in long time use of reinforced plastic products. We at Ashland have committed ourselves to continuous improvement of gelcoats and our latest invention is the LE Technology, giving final products superior properties with only half of the emissions during application. The premium Maxguard gelcoat range includes products based on the LE technology, of which a worldwide patent is pending.

As a globally leading gelcoat supplier Ashland has a strong presence in the reinforced plastics industry. In this position we want to provide you, our valued customer, with high quality products and professional technical support.

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## Receiving a new delivery

Check the order acknowledgement or shipping advice.

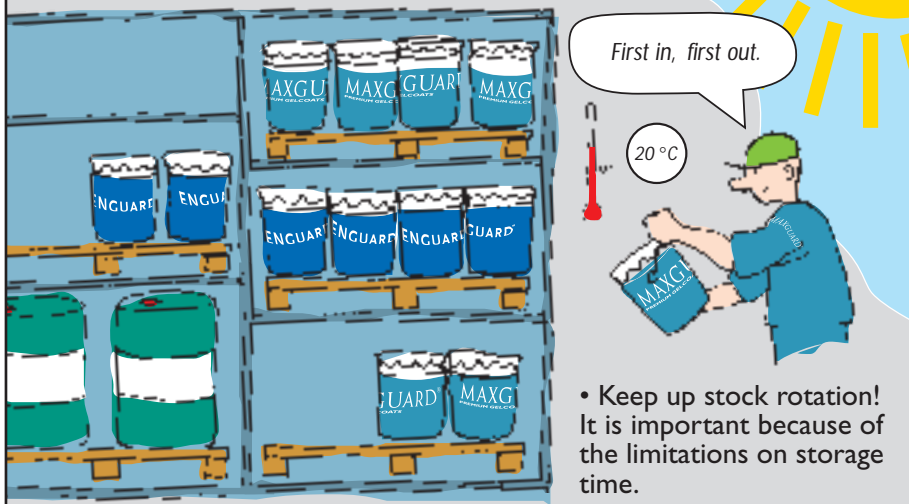
- Packing
- Quantity
- Product code: type, colour, spray/hand
- Batch number

**GELCOAT**  
GN 10470 S  
L 003158



## Storage

- In a separate storage room
- Out of direct sunlight
- In original metal cans and drums, lids and caps tightly closed
- Cans and drums on pallets in good order



# BEFORE STARTING



**Always** store catalyst separate from gelcoat and resin.

# 3

## Mould preparation

**A good production mould is a key factor to high quality products.**

- The mould must be cleaned and made dust free.
- Wax and polish the mould carefully
- In a new mould a release agent film must be used to ensure demoulding.
- Remove all dusty work from the area where the mould is prepared and kept for gelcoating.

Oh boy!  
This is real handwork...

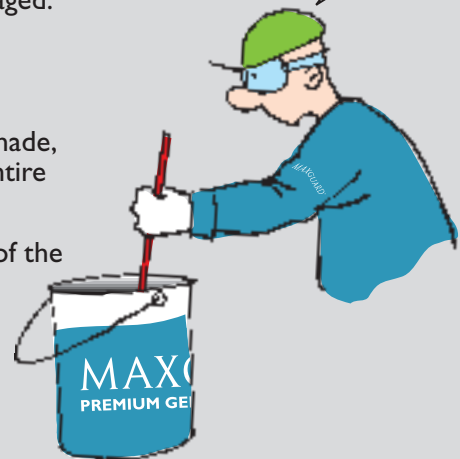
The product  
mirrors the mould.



## Material preparation

- Check that the cans picked up in the storage room are undamaged.
- Check the product code for the right colour and type.
- To achieve the exact colour shade, use the same batch for the entire product produced.
- Check that the temperature of the gelcoat is at optimal working temperature 18-25 °C.
- Stir the gelcoat in its original can.
- If gelcoat is removed from its original can use a clean pail.

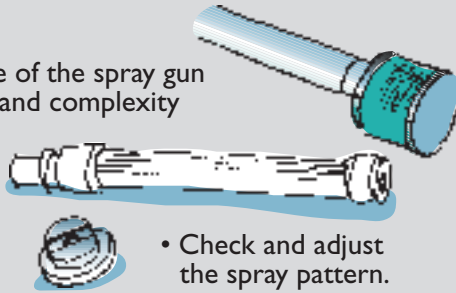
Now this gelcoat is  
ready for spraying



**Always**  
use high quality  
MEKP-catalyst  
for curing  
gelcoat.

## Check spray equipment

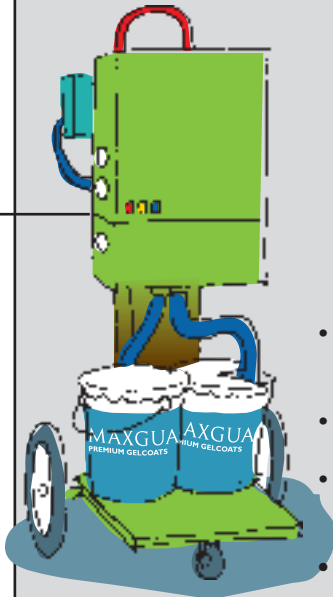
- Check and clean the filters.
- Select a suitable size and angle of the spray gun nozzle depending on the size and complexity of the mould.



- Check and adjust the spray pattern.

- Use the lowest possible pump pressure to force the gelcoat to the gun.
- Set the recommended MEKP-catalyst dosage 1.5-2.5%.
- If needed calibrate the catalyst dosage by measuring the geltime.

- **Check the instructions of the spray equipment manufacturer.**



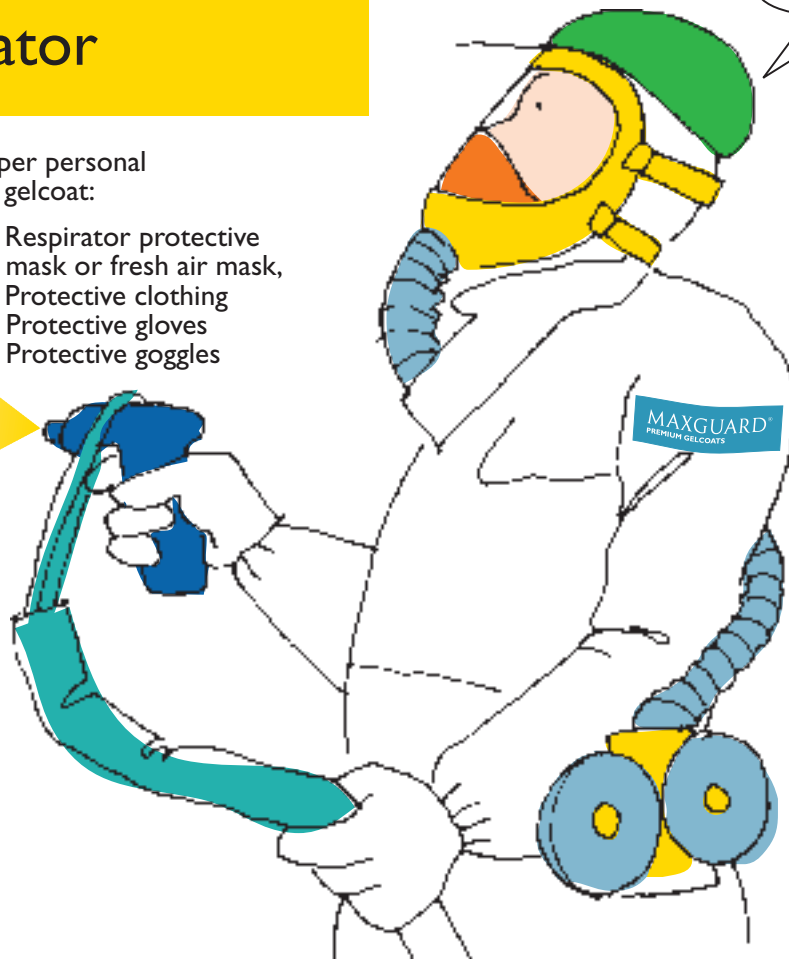
Always earth the spray equipment.

Nice to be a pro.

## Spray operator

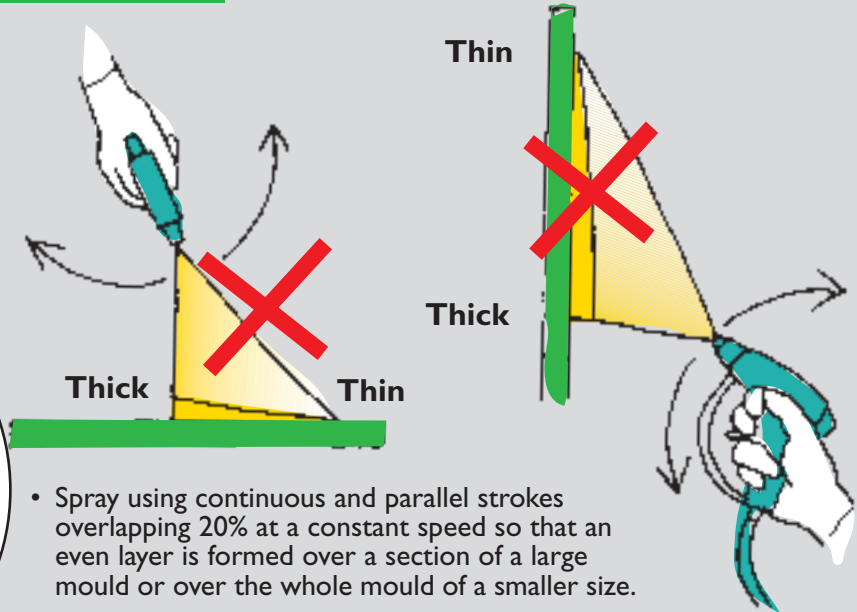
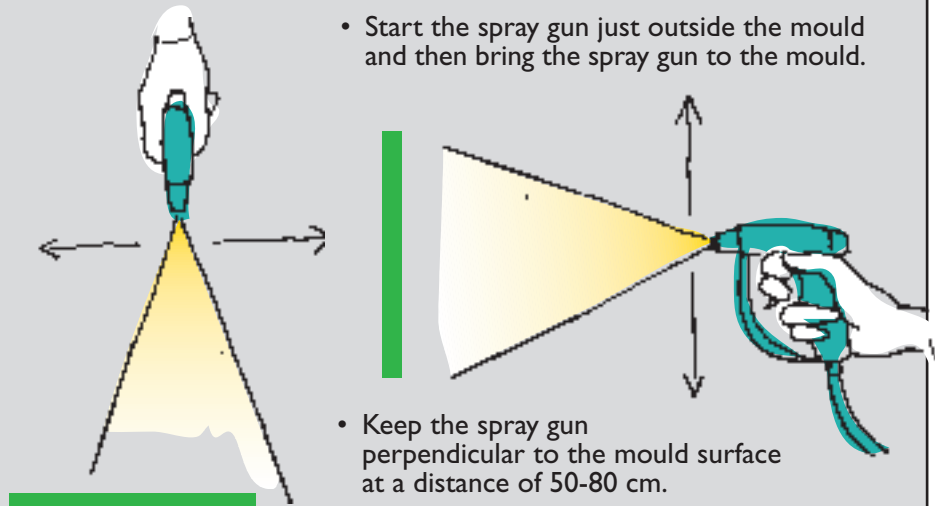
It is important to use proper personal protection when spraying gelcoat:

- Respirator protective mask or fresh air mask,
- Protective clothing
- Protective gloves
- Protective goggles

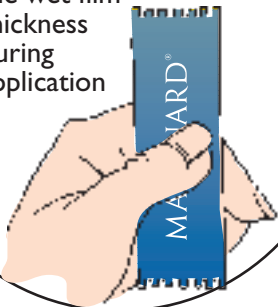


## Spray application

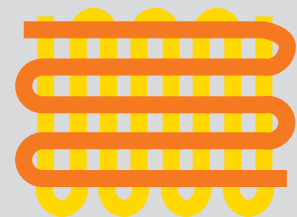
- Spraying should be done in a spray booth or in a separate area of the workshop.
- Set up the mould into an ergonomic position for spraying.



- Always check the wet film thickness during application

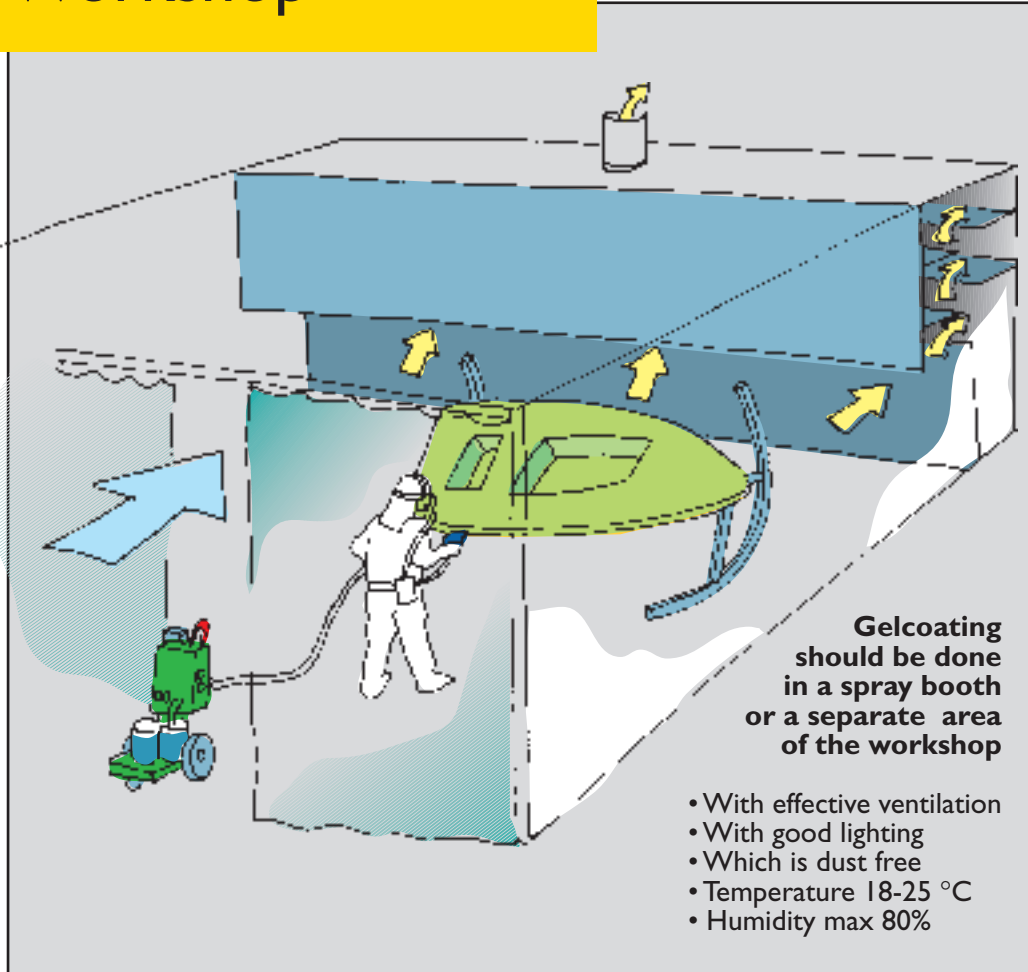


- Spray using continuous and parallel strokes overlapping 20% at a constant speed so that an even layer is formed over a section of a large mould or over the whole mould of a smaller size.
- Spray two to three passes to build up the total film thickness. Always spray a subsequent pass perpendicular to the preceding pass.
- Stop the spray gun outside the mould.
- For difficult parts of the mould where it is impossible to maintain the right spray gun position, brush can be used to smooth out the gelcoat layer.
- Check the wet film thickness which should be 0.5-0.8 mm (500-800  $\mu\text{m}$ ) depending on the end use of the reinforced plastic product.



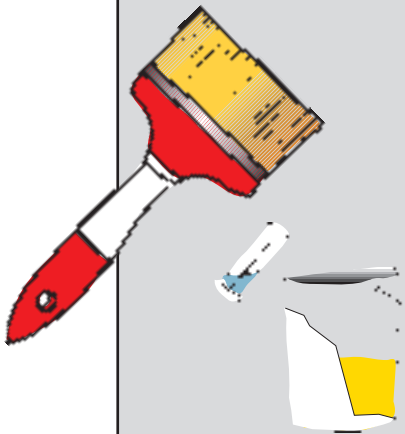
- First pass
- Second pass

## Workshop



## Check for brush application

- Always use clean high quality lacquer brushes with long and soft bristles.



- Stir gelcoat gently in its original can before use.
- Pour a needed amount of gelcoat into a clean pale.
- Add 1.5-2.5% of MEKP-catalyst into the gelcoat and mix thoroughly. Check data sheet.
- Apply immediately.

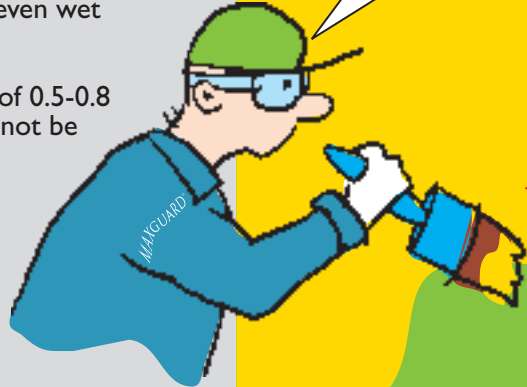


**Use proper clothing, protective gloves and goggles.**

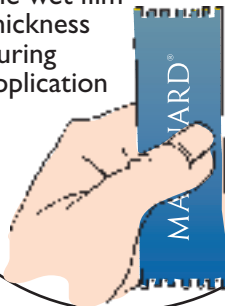
## Brush application

- Apply the gelcoat using continuous strokes to achieve an even wet film thickness.
- If a wet film thickness of 0.5-0.8 mm (500-800  $\mu\text{m}$ ) cannot be reached in one layer, a second layer can be applied on the fully cured first layer.

*This is much more demanding than painting*



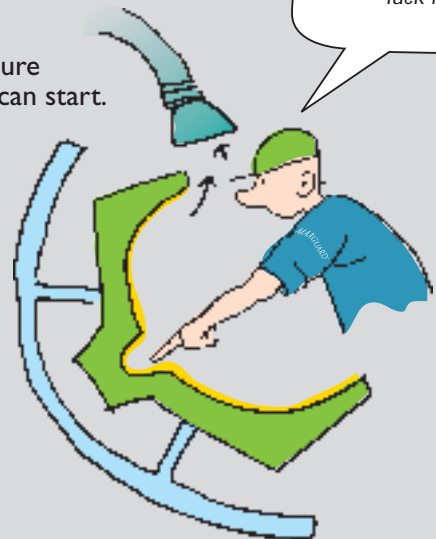
- Always check the wet film thickness during application



## Before starting lamination

- The gelcoat film requires about 2 hours at room temperature to cure until it is tack-free and lamination can start.
- Curing of gelcoat in deep pockets of the mould is prolonged and can be speeded up by ventilating or repositioning the mould.
- Check for even curing in all parts of the mould.
- Do not leave the gelcoat film to cure longer than overnight before starting lamination.

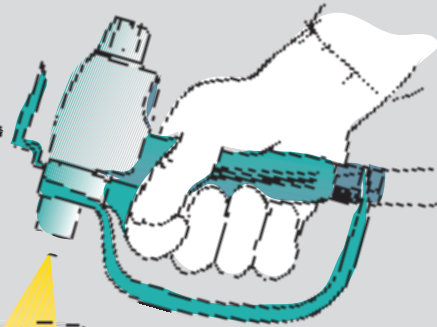
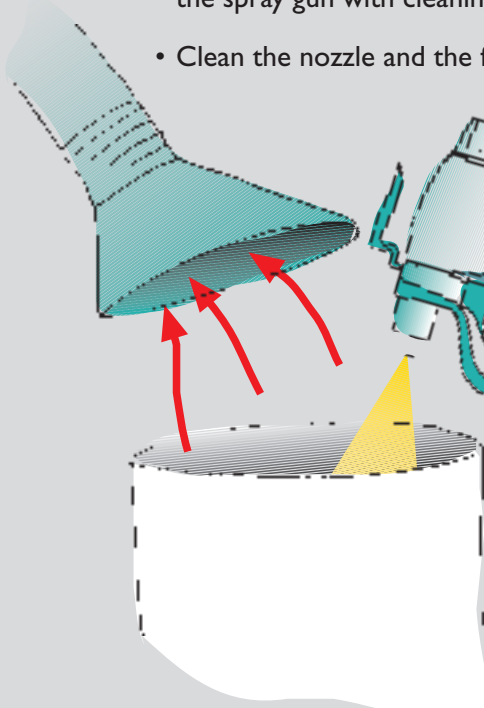
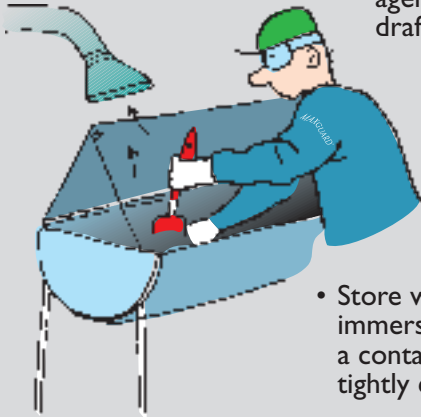
*Tack free?*





# Cleaning

- Wash the brushes with cleaning agent in a cleaning room or draft cupboard.
- Store washed brushes immersed in solvent in a container with the lid tightly closed.
- Remove the nozzle and flush the spray gun with cleaning agent.
- Clean the nozzle and the filters.
- Maintain the spray equipment according to the manufacturer's instructions.



## Gelcoat can

- Close the lid of the gelcoat can tightly and take the residual gelcoat into the storage room.

## Waste

- Clean the spray booth or the gelcoating area regularly.
- Take care of all the waste and dispose of it according to existing regulations.



## **DRAINING (SAGGING)**

- Cause:**
- Excessive gelcoat, gelcoat applied too thickly
  - Spray techniques
  - Wrong size / angle of nozzle
  - Too high spraying pressure
  - Mould release agent
  - Slow gelling



## **FISH-EYES**

- Cause:**
- Static electricity on mould surface
  - Wrong release agent
  - Dust and dirt on mould
  - Gelcoat film is too thin
  - Water, oil grease contamination



## **PRE-RELEASE**

- Cause:**
- Uneven or too thick gelcoat
  - Catalyst level too high
  - Gelcoat allowed to cure too long
  - Mould release agent
  - Uneven cure of gelcoat
  - Too resin rich laminate
  - Laminate curing too fast



## **WRINKLING (ALLIGATORING)**

- Cause:**
- Too thin or uneven gelcoat
  - Too low temperature
  - Cold gelcoat
  - Overspray
  - Too high or too low catalyst level
  - Too early overlamination



## **PINHOLES**

- Cause:**
- Too high catalyst level
  - Too high spraying pressure
  - Too vigorous catalyst mixing
  - Cold gelcoat
  - Improperly working spray unit
  - Improperly polished or dirty mould



## **RESIN / PIGMENT SEPARATION**

- Cause:**
- Too short spraying distance
  - Too high spraying pressure
  - Too big nozzle size
  - Wrong spraying technique (turbulence)
  - Too thick gelcoat (sagging)



## FIBRE PATTERN

- Cause:**
- Too thin gelcoat
  - Undercured gelcoat
  - Too early overlamination
  - Too heavy rolling of glassfibre
  - Too high resin exotherm
  - Too early demoulding

## CRACKING

- Cause:**
- Too thick gelcoat
  - Violent demoulding
  - Laminate construction too weak

## POOR ADHESION TO LAMINATE

- Cause:**
- Too late overlamination
  - Dust, moisture contamination
  - Mould release agent contamination
  - Improper overlamination

## SPOT BLISTERING

- Cause:**
- Catalyst droplets on gelcoat
  - Water, solvent contamination
  - Contaminated glassfibre (water, oil, dust)

## LOW GLOSS

- Cause:**
- Bad mould
  - Insufficient preparation of mould
  - Dust and dirt on mould surface
  - Pre-released gelcoat
  - Undercured gelcoat

## SPOT YELLOWING

- Cause:**
- Too thick gelcoat
  - Undercured gelcoat
  - Pre-released gelcoat
  - Too high resin exotherm
  - Inadequate mould cleaning or polish

# Technical Service

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Take the benefit from our technical service. Utilise our deep know-how and extensive experience by contacting our technical

service or local Ashland representative throughout the world. If you have anything to ask about gelcoats, production

methods, working conditions or about this gelcoat handling guide our expertise is at your disposal to assist you in reaching your targets.

