Intended use

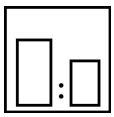
Mipa 2K-HS-Carbonic-Clearcoat is a high-quality acrylic clearcoat that has been developed especially for clear coating synthetic fibre substrates (e.g. glass composite materials or carbon fibre composite materials). Its high filling power as well as its insensitivity to blister allows a safe application even with high film thicknesses. After a drying of 15 minutes at 140 °F (60 °C) or alternatively 25 minutes at 105 °F (40 °C). When using the hardener Mipa 2K-HS-Hardener HS 25) plus cooling time it is possible to start already the sanding and polishing process. Due to the high UV protection provided by Mipa 2K-HS-Carbonic-Clearcoat, substrates with a tendency to yellowing (including carbon substrates) can be effectively protected against weather-related discolouration. It adheres to carbon and other composite materials and is ready for use after addition of Mipa 2K-HS hardener. In combination with Mipa P 67 S, which is very suitable as filler for glass or carbon fibre composites, and Mipa P 27, which is used as colourless filler for deeper pores and imperfections, the paint structure can be adapted to the surface-finish requirements.

Spreading rate: 405 - 490 sq.ft/gal by 1 mil. 10 - 12 m²/l 25 µm

General informations

Colour

colourless



Mixing ratio

Hardener	by weight (lacquer : hardener)	by volume (lacquer : hardener)
Mipa 2K-HS-Hardener	--	2 : 1

Hardener

for complete paintwork	for partial paintwork
HS 35 or HS 45 for large surf. or higher temp.	HS 10 for small surfaces HS 25 for large surfaces

Pot life

1 - 1,5 h at 70 °F (20 °C)

Thinner

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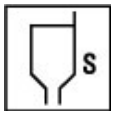

Spray viscosity

ready for use after addition of hardener

gravity spray gun	Airmix/Airless
17 - 19 s 4 mm DIN	--

Application mode

Application mode	Hardener	pressure (bar)	nozzle (mm)	spray passes	dilution (%)
HVLP (low pressure)	--	2 - 2,5	1,2 - 1,3	1 - 3	--
HVLP (low pressure)	--	2 - 2,2	1,2 - 1,3	1 - 3	--
HVLP / internal nozzle pressure	--	0,7	--	--	--

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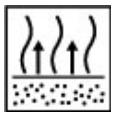

Flash-off time

3 - 5 min. between coats

10 - 30 min. prior to oven drying

Dry coat thickness

ca. 25 - 30 µm per coat

Drying time

object temperature	dust dry	set to touch	ready for assembly	sandable	recoatable
70 °F (20 °C)	15 - 20 min.	1 - 2 h	6 h	--	--
140 °F (60 °C)	--	15 min.	--	--	--

Note

Storage:

In tightly closed original containers at least 3 years shelf life.
Storage temperature range 50 - 86°F (10 - 30 °C)
Protect package from direct sunlight and heat.

VOC Information:

VOC as packaged:
less exempt solvents 441 g/l / 3.7 lb/gal
with exempt solvents 441 g/l / 3.7 lb/gal
VOC as applied 2:1 with Mipa 2K-HS Hardeners < 452 g/l / 3.77 lb/gl

Always check local VOC laws to ensure that the use of Mipa products is compliant in your area.

Processing conditions:

from 50 °F (10 °C) and up to 80 % relative air humidity.
Ensure an adequate supply and exhaust air ventilation.
Acrylic-based clearcoats do not cure perfectly at a temperature of below 50 °F

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General informations:

General notes on the subject of "colourless carbon coating":

The paint structure and the number of work steps in the colourless coating of carbon substrates depend basically on the following factors:

1. Substrate quality of the carbon layer: The coarser the carbon texture and the porosity is, the more layers of clear lacquer with intermediate sanding are necessary to ensure optimum levelling by means of clear coating, or a colourless filling of deeper pores and imperfections with Mipa P 27 is required.

If the filling power is required to be as high as possible to smooth the carbon texture, Mipa P 67 S should be used as a colourless filler layer.

Furthermore, it has to be taken into account that composite substrates have a system-related sagging behaviour which (depending on the substrate quality) can be more or less pronounced and which can have a negative effect on the appearance of the clearcoat afterwards.

2. Desired finish: The higher the requirements for the clearcoat, the higher the workload for coating. Depending on the carbon surface quality and for example in case of low requirements for the clearcoat surface, 3 coats of clearcoat including intermediate sanding may be sufficient. However, if a piano lacquer finish is desired, this may require 4 to 6 clearcoat layers including intermediate sanding. In addition, a final polishing step is required to ensure a flat and absolutely perfect clearcoat layer.

3. Since carbon substrates have a strongly varying surface quality due to the production process and since release agents are used for de-moulding, adhesion problems can generally occur. We therefore recommend doing a test coating with subsequent adhesion testing to ensure good adhesion. If you observe delamination, we recommend using the Mipa 1K Adhesion promoter.

In the following, various colourless carbon coating structures are presented, which, depending on the quality of the carbon texture or on the requirements on the final coating quality, consist of several painting steps:

Pre-treatment:

Carbon substrates must be clean, dry, free from dust, oil and grease and free from all adhesion inhibiting substances (e.g. release agents). Therefore clean thoroughly with Mipa Silikonentferner.

Dry sand the carbon surfaces with grit P 240 up to P 400. Care must be taken that the carbon surface is not sanded through to the fibre layer.

In case of heavy dust formation during sanding, use oil- and water-free compressed air to blow it away from the carbon substrates. Afterwards, clean thoroughly using Mipa Silikonentferner.

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Clear coating structure: Mipa 2K-HS-Carbonic-Clearcoat

A. filling coat with clearcoat Mipa 2K-HS-Carbonic-Clearcoat

1. apply uniformly and generously 2 to 3 coats
2. 10 - 30 min. flash-off at room temperature
3. 15 min. intermediate drying at 140 °F (60 °C) or 25 min. at 105 °F (40 °C) if Mipa 2K-HS-Hardener HS 25 is used + cooling + dry intermediate sanding with grit P 240 to P 400

Optionally, intermediate sanding can be omitted if the carbon base is very smooth or quality requirements do not require intermediate sanding.

Alternatively, drying at room temperature can be carried out instead of oven drying. In this case, overcoating is possible at the earliest after 1 hour at 20°C. If the first coating/ filling coat has dried for more than 10 - 12 hours, dry intermediate sanding with grit P 240 to P 400 is necessary.

B. clear top coating with Mipa 2K-HS-Carbonic-Clearcoat

1. apply uniformly and flowing 2 to 3 coats
2. 10 - 30 min. flash-off at room temperature
3. 15 min. intermediate drying at 140 °F (60 °C) or 25 min. at 105 °F (40 °C) if Mipa 2K-HS-Hardener HS 25 is used + cooling

Alternatively, drying at room temperature can be carried out instead of oven drying. In doing so, we recommend drying overnight.

Note regarding possible DFT:

Per spray pass, a dry film thickness of approx. 25 - 30 µm of clearocat can be applied, which will be reduced by sagging (especially when applied as filling coat) and by sanding. Hence, we can not recommend a specific dry film thickness to achieve an optimum clear coating. Instead, it is necessary, depending on the nature of the carbon substrates, to apply a number of clearcoat layers required to achieve the desired clearcoat finish. In order to ensure optimum UV protection, however, the colourless carbon coating must have a total dry film thickness of at least 3 - 4 mil (75 - 100 µm).

C. Polishing

Optionally, it is possible to include a final polishing step to achieve the best possible clearcoat finish. In this process, the final clearcoat layer can be polished in the following gradation after the specified drying and (dry or wet) sanding process:

1. pre-sanding: P 800 / P 1000
2. intermediate sanding: P 1500 / P 2000
3. final sanding: P 3000

Recommended gradation of polishing agents:

1. removal of sanding marks: MP Cutting Polish
2. polishing: MP ONE-STEP Polish
3. high gloss polish : MP Finish Polish

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Putty + clearcoat:

A. puttying : Mipa P 27

1. use Mipa P 27 to close pores and to even imperfections on the carbon surface
2. after drying for approx. 2 h at room temperature, dry intermediate sanding with grit P 220 to P 360, final sanding with P 400 to P 600

B. filling cleacoat layer: Mipa 2K-HS-Carbonic-Clearcoat

1. apply uniformly and generously 2 - 3 coats
2. 10 - 30 min. flash-off at room temperature
3. 15 min. intermediate drying at 140 °F (60 °C) or 25 min. at 105 °F (40 °C) when using the hardener Mipa 2K-HS-Hardener HS 25 + cooling + dry intermediate sanding with grit P 240 to P 400

Optionally, intermediate sanding can be omitted if the carbon base is very smooth or quality requirements do not require intermediate sanding.

Alternatively, drying at room temperature can be carried out instead of oven drying. In this case, overcoating is possible at the earliest after 1 hour at 70 °F (20°C). If the first coating/ filling coat has dried for more than 10 - 12 hours, dry intermediate sanding with grit P 240 to P 400 is necessary.

C. clear topcoat: Mipa 2K-HS-Carbonic-Clearcoat

1. apply uniformly 2 to 3 flowing coats
2. 10 - 30 min. flash-off at room temperature
3. 15 min. intermediate drying at 140 °F (60 °C) or 25 min. at 105 °F (40 °C) when using the hardener Mipa 2K-HS-Hardener HS 25 + cooling

Alternatively, drying at room temperature can be carried out instead of oven drying. In doing so, we recommend drying overnight.

D. Polishing

Optionally, it is possible to include a final polishing step to achieve the best possible clearcoat finish. In this process, the final clearcoat layer can be polished in the following gradation after the specified drying and (dry or wet) sanding process:

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Putty + filler + clearcoat:

A. puttying: Mipa P 27

1. use Mipa P 27 to close pores and to even imperfections on the carbon surface
2. after drying for approx. 2 h at room temperature, dry intermediate sanding with grit P 220 to P 360, final sanding with P 400 to P 600

B. filling: Mipa P 67 S

1. apply uniformly and generously 2 to 3 coats
2. 10 - 15 min. flash-off at room temperature
3. 30 min. intermediate drying at 140 °F (60 °C) + cooling + dry intermediate sanding with grit P 240 to P 400

Alternatively, drying at room temperature for 6 hours can be carried out instead of oven drying.

C. clear topcoat: Mipa 2K-HS-Carbonic-Clearcoat

1. apply uniformly 2 to 3 flowing coats
2. 10 - 30 min. flash-off at room temperature
3. 15 min. intermediate drying at 140 °F (60 °C) or 25 min. at 105 °F (40 °C) when using the hardener Mipa 2K-HS-Hardener HS 25 + cooling

Alternatively, drying at room temperature can be carried out instead of oven drying. In doing so, we recommend drying overnight.

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Optionally, it is possible to include a final polishing step to achieve the best possible clearcoat finish. In this process, the final clearcoat layer can be polished in the following gradation after the specified drying and (dry or wet) sanding process:

1. pre-sanding: P 800 / P 1000
2. intermediate sanding: P 1500 / P 2000
3. final sanding: P 3000

Recommended gradation of polishing agents:

1. removal of sanding marks: MP Cutting Polish
2. polishing: MP ONE-STEP Polish
3. high gloss polish : MP Finish Polish

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Filler + clearcoat:

A. filling layer: Mipa P 67 S

1. apply uniformly and generously 2 to 3 coats
2. 10 - 15 min. flash-off at room temperature
3. 30 min. intermediate drying at 140 °F (60 °C) + cooling + dry intermediate sanding with grit P 240 to P 400

Alternatively, drying at room temperature for 6 hours can be carried out instead of oven drying.

B. clear topcoat: Mipa 2K-HS-Carbonic-Clearcoat

1. apply uniformly 2 to 3 flowing coats
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3. 15 min. intermediate drying at 140 °F (60 °C) or 25 min. at 105 °F (40 °C) when using the hardener Mipa 2K-HS-Hardener HS 25 + cooling

Alternatively, drying at room temperature can be carried out instead of oven drying. In doing so, we recommend drying overnight.

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Safety aspect:
For professional use only. Not for sale to or use by the general public. Before opening the packages be sure you understand the warning Messages on the Labels and Safety Data Sheets of all components since the mixture will have the hazards of all of its parts.The manufacturer recommends the use of an air supplied Respirator when exposed to vapors or spray mist.

Medical Response:
Emergency Medical or Spill Control Information 011 49(0)700 24112112 (MIP)
US Emergency Phone Number (for transportation incidents only) 1-800-535-5053 (Infotrac)

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