

ASSOCIATION STANDARD

T/CSAE 72-2018

**Test and evaluation method for UV penetration resistance of
automotive coatings
(English Translation)**

Issued on: March 1, 2018

Implemented on: January 1, 1970

Issued by: China Society of Automotive Engineers

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Foreword

This specification was proposed by the Automotive Anticorrosion and Aging Branch of the China Automotive Engineering Society.

This specification is approved by the China Automotive Engineering Society.

This specification is under the jurisdiction of the China Automotive Engineering Society.

This specification was drafted. Anhui Jianghuai Automobile Group Co., Ltd., China First Automobile Co., Ltd., Beijing New Energy Automobile Co., Ltd., Zhejiang Zhongtai Automobile Manufacturing Co., Ltd., Shanghai Automotive Group Co., Ltd., PPG Coatings (Tianjin) Co., Ltd., BASF Shanghai Coatings Co., Ltd., Hunan Xiangjiang Guanxi Paint Co., Ltd., Baosteel Technology Center, Chongqing Changan Automobile Co., Ltd., FAW-Volkswagen Automotive Co., Ltd., Brilliance Auto Group Holdings Co., Ltd., Shanghai

Coatings Research Institute, Anjie Lun Technology (China) Co., Ltd., China Electric Apparatus Research Institute Co., Ltd., Ai Shide Coating Systems (Shanghai) Co., Ltd., US Q-Lab Company Shanghai Representative Office, Wujin Chenguang Metal Coatings, Hangzhou Kude Surface Treatment Technology Co., Ltd., Akzo Nobel (?? China) Investment Co., Ltd., China Testing and Testing Group.

1 Scope

This standard specifies the test and evaluation methods for the UV penetration resistance of single or composite coatings for automotive bodies.

This standard applies to the process validation and material development process of automotive body coating processes, and other coatings that require UV penetration.

The test and evaluation process of the layer's UV penetration resistance can also be referred to.

This standard is applicable to automotive companies to determine the best coating construction according to the determined UV coating penetration requirements of automotive coatings.

Thickness or coating structure, etc.

2 Normative references

The following standards are essential for the application of this document. All dated references, all subsequent modifications (not the inclusion of errata content or revisions does not apply to this specification, but parties to agreements based on this specification are encouraged to study the use of these documents.

The possibility of the latest version.

GB/T 1727 paint film general preparation method GB/T 3186 Paint, varnish and paint and varnish raw materials sampled GB/T 9278 Coating sample condition adjustment and test temperature and humidity GB/T 13452.2 Determination of film thickness of paints and varnishes JJG 178 UV, visible, near-infrared spectrophotometer verification procedures

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1 Solar ultraviolet radiation

Ultraviolet radiation ranges from 290 nm to 400 nm.

3.2 UV penetration

Electromagnetic radiation with an ultraviolet wavelength of 290 nm to 400 nm is measured using an ultraviolet-visible spectrophotometer with an integrating sphere attachment Transmittance in the range of 401 nm to 550 nm solar radiation.

3.3 Quartz Slides

Quartz slides are made of quartz glass and have good light transmission in the entire spectral range from ultraviolet to infrared.

Energy. The maximum light transmittance in the ultraviolet region can reach over 80%, and the light transmittance in the visible light region can reach over 93%. Test quartz glass the sheet thickness is required to be 1 mm to 3 mm.

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3.4 Integrating sphere

It is a hollow sphere, the inner surface is coated with a highly reflective diffuse reflection coating such as barium sulfate, with a photodetector, and the total opening area of the integrating sphere Does not exceed 10% of the internal surface area of the integrating sphere.

4 Test principle

The complex color light emitted by the ultraviolet-visible spectrophotometer source becomes monochromatic after being split by the monochromator, and the instrument scans the sample.

During the process, monochromatic light of different wavelengths is sequentially irradiated onto the sample, and the detector detects the intensity of the transmitted light to obtain a transmittance curve of the sample.

Since the coating film sample is not completely transparent and uniform, the light transmission through the sample has more scattering components, so ultraviolet-visible spectroscopic light is required.

The odometer is equipped with an integrating sphere attachment, and the light scattered from all angles is collected and detected.

At the time of testing, place the sample in the transmission port of the integrating sphere, and place the reflecting point of the integrating sphere on the whiteboard with high reflectivity.

The transmitted light is reflected back into the sphere.

5 Test equipment and equipment

5.1

Substrate attached to the test sample. quartz glass slide, polypropylene plate, Tedlar polyvinyl fluoride film

5.5 UV-visible spectrophotometer

The UV-visible spectrophotometer is shown in Figure 2. It must meet the JJG 178 UV, visible, near-infrared spectrophotometer verification procedure II Level requirements, the instrument needs to have an integrating sphere.

Figure 1 Integrating sphere

sample

Detector

Integrating sphere Whiteboard 3T/CSAE xx-2017

6.1.1 Coating film preparation

1) Coating preparation. sample preparation and dilution according to the conditions specified in the coating product specification, adjust the viscosity of the coating to the construction Viscosity, sampling with reference to GB/T 3186 paint, varnish and paint and varnish raw materials sampling;

2) Test plate preparation. paste the polypropylene plate or Tedlar polyvinyl fluoride film in the middle of the tinplate and the tinplate near one side Apply tape on the board (measuring film thickness);

Figure 2 UV-visible spectrophotometer

light source

Slit adjustment mechanism Monochromator spectroscopic system Sample compartment Detector

Figure 3 Schematic diagram of the peeling film forming method

tape

Film thickness calibration point Tinplate Polypropylene board Film peeling, coating film interception range 30 mm x 18 mm Choose a level that meets the requirements Line measurement film thickness, red circle Circle indicates film thickness detection point 4T/CSAE xx-2017

3) Prepare the paint film according to the general preparation method of GB/T 1727 paint