

Translated English of Chinese Standard: QC/T 484-1999

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GUIDING TECHNICAL DOCUMENT OF THE MINISTRY OF
MACHINERY INDUSTRY OF THE PEOPLE'S REPUBLIC OF
CHINA

QC/T 484-1999

Replacing JB/Z 111-74

Automobile -- Paint Coating

汽车 油漆涂层

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Note on transfer of standard number

According to the requirements of Standard Letter [1998] No. 216 of National Quality and Technology Supervision Bureau as well as the Reply No. 126 [1999] of State Bureau of Machine Building Industry, the original standard code JB/Z 111-86 is now converted to the industry standard code QC/T 484-1999. The content is temporarily unchanged. Please use the new standard code when quoting.

Automobile -- Paint Coating

This Standard applies to automobile paint coatings, not apply to paint coating for automobile electrical and instrument products.

1 Provisions on paint coating codes

According to the different use conditions of automobile parts and paint quality requirements, the paint coating is divided into 10 groups and several levels, according to the provisions of Table 1.

Table 1

Coating code	Group name	Level	Paint coating name	Note
TQ1	Vehicle body	A	High-quality decorative protective coating	
		B	General decorative protective coating	
TQ2	Car body	A	Advanced decorative coating	Suitable for luxury cars
		B	High-quality decorative protective coating	Suitable for intermediate car coating
TQ3	Car box	A	Corrosion-resistant, decorative coating	Suitable for iron car box
		B	Anticorrosive, decorative coating	Suitable for wooden wagons and iron wooden wagons
TQ4	Frame, wheel fender		High-quality anti-corrosion coating	
TQ5	Engine		Protective coating (quick drying)	
TQ6	Chassis			
TQ7	Blank, semi-finished stamping, spring	A	General anti-corrosion coating	
		B	Anti-corrosion coating	
TQ8	Special coating	A	Acid resistant coating	Suitable for battery box and its bracket
		B	Gasoline-resistant coating	Suitable for inner surface of gasoline tank
		C	Heat-resistant coating	Suitable for muffler
		D	Soundproof, heat-insulating, wear-resistant coating	exhaust pipe
TQ9	Water tank, steel plate, spring		Waterproof and antirust coating	
TQ10	Interior decoration			Suitable for interior parts of cars and passenger cars

2 Technical requirements

2.1 The main quality indicators of paint coatings are specified in Table 2 according to the group and level of paint coating codes.

Table 2

Coating code	Level	Coating characteristics	Main quality indicators of coating	Examples of uses	Note															
TQ1	A	It is a high-quality, decorative protective coating, with excellent weather resistance, water resistance, decoration and mechanical strength, suitable for wet tropical climate regions.	1. Paint film appearance: Flat and smooth. No particles are allowed on the appearance surface, but slight "orange peel" is allowed. Uniform light color without scratched face. Gloss: for the one with lights, not less than 90; for the one with plain light, not greater than 30. 2. Coating thickness: Primer layer: not less than 15 microns. Topcoat: not less than 40 microns. Total thickness: not less than 55 microns. 3. Mechanical strength: <table><tr><td></td><td>With plain light</td><td>With light</td></tr><tr><td>Impact</td><td>40 kg·cm</td><td>30 kg·cm</td></tr><tr><td>Elasticity</td><td>3mm</td><td>5mm</td></tr><tr><td>Hardness</td><td>≥0.4</td><td>≥0.5</td></tr><tr><td>Adhesion</td><td>Level 1</td><td>Level 1</td></tr></table> 4. Weather resistance: In Guangzhou and Hainan Island, the coating is still intact for two years of solarization or four years of use (that is, no foam, no powdering, no rust, no cracking), and the loss of light is not allowed to be greater than 30% or it is obviously discolored. 5. Corrosion resistance ④ Pass the salt spray test for 700 hours according to 4.1.11 a method. ② In the south of the Yangtze River, if it is used for five years (200,000 kilometers), there shall be no perforation corrosion or structural damage due to rust. 6. Water resistance: When immersed in 50°C water for 20 cycles, it is allowed to thicken, but it shall not foam. 7. Alkali resistance: It is not blushing according to 4.1.8 b method for 4 hours, but slight discoloration is allowed. 8. Acid resistance: It is not blushing within 24 hours. No spots but slight discoloration is allowed. 9. Gasoline resistance: When immersed in RQ-70 gasoline, there shall be no change in 4 hours. 10. Engine oil resistance:		With plain light	With light	Impact	40 kg·cm	30 kg·cm	Elasticity	3mm	5mm	Hardness	≥0.4	≥0.5	Adhesion	Level 1	Level 1	Cabs and covering parts for cargo trucks, coach compartments, off-road vehicles, jeep bodywork, and the above-mentioned assemblies that use small and medium-sized parts with the same weather resistance and decorative requirements.	1. The outer surface of the underbody and the inner surface of the fender shall be coated with soundproof, wear-resistant, and heat-insulating paint after primer (see TQ8-T), and the joint of the weld shall be coated with sealant. 2. Aluminum products use zinc yellow pure phenolic or epoxy primer. 3. The covered part of the inner surface of the car body may not be painted. 4. In order to improve the corrosion resistance of the car body, the interior cavity of the painted car body and the internal cavity of the unpainted structure shall be sprayed with anti-rust wax.
	With plain light	With light																		
Impact	40 kg·cm	30 kg·cm																		
Elasticity	3mm	5mm																		
Hardness	≥0.4	≥0.5																		
Adhesion	Level 1	Level 1																		

- a. Immerse the painted sample plate in $80 \pm 2^{\circ}\text{C}$ 2% Na_2CO_3 aqueous solution. After 10 minutes, check how the paint film is dissolved.
- b. Immerse the painted sample plate in an aqueous solution that contains 0.1 NNaOH at $55 \pm 1^{\circ}\text{C}$. After 4 hours, check the change of paint film.

4.1.9 Acid resistance: drop 0.1 NH_2SO_4 solution onto the sample plate. Observe the change of paint film after 24 hours at 20°C .

4.1.10 Water resistance: immerse the sample plate in a constant temperature water bath at $50 \pm 1^{\circ}\text{C}$. Observe the change of paint film. Heat at $50 \pm 1^{\circ}\text{C}$ for 8 hours then stop heating. Naturally cool in a heat-insulated device for 16 hours as a cycle.

4.1.11 Corrosion resistance: Use the three inspection methods to determine the corrosion resistance of paint film.

- a. Salt spray resistance test: conduct in a salt spray test box. The sample plate is required to use scotch tape or refined wax to seal the edges, sharp blade for the center part. Draw two cross-cutting cuts at an angle of 60° . And place it in the salt spray box at an angle of 30° to the vertical. It is required that the sample plates cannot be blocked and contacted with each other. When the temperature in the control box is $36 \pm 0.1 \sim 0.7^{\circ}\text{C}$, continuously spray. In NaCl solution with a saltwater concentration of $5 \pm 1\%$, in a salt spray box with PH value of 6.5~7.2, in an area with an amount of salt spray is 80cm^2 , at 1~2ml per hour (according to the average of at least 16 hours), continuously test and check once every 48 hours. After two checks, check once every 72 hours. Change the sample plate position after each check. Check according to product-specified standard and time. Observe the spread of corrosion under the paint film along the cutting line. (The indicators specified in this Standard are based on the one-sided corrosion spread not exceeding 2mm). Saltwater is not recycled.
- b. Salt solution resistance test: immerse the painted sample plate in a solution that contains 3% NaCl at a temperature of $25 \pm 1^{\circ}\text{C}$. Check the damage and corrosion of paint film every 24 hours.
- c. Assessment of actual service life: expressed in years (or mileage) due to corrosion perforation or structural damage due to corrosion.

4.1.12 Gasoline resistance: determine according to GB 1734-79 "Determination of resistance to petrol of films".

4.1.13 Engine oil resistance: determine according to chemical temporary 2017-57 "Determination of resistance to lubricating oil".

4.1.14 Weather resistance: assess the ability of paint film to resist natural damage.

- a. Atmospheric exposure test: determine according to GB 1767-79 "Method for

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