

JIS

JAPANESE INDUSTRIAL STANDARD

**Automobile parts —
General rules of electroplating**

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In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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Automobile parts — General
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1. Scope This Japanese Industrial Standard specifies general rules for electroplating ⁽¹⁾ (hereafter referred to as "plating") on automobile parts (hereafter referred to as "parts") mainly for the purpose of corrosion prevention, rust prevention and for decorative purpose.

Note ⁽¹⁾ Autocatalytic type electroless plating is not included.

Remarks: The following standards are cited in this Standard:

- JIS H 0400 Glossary of terms used in electroplating
- JIS H 0404 Graphical symbol for electroplated coating
- JIS H 8501 Methods of thickness test for metallic coatings
- JIS H 8502 Methods of corrosion resistance test for metallic coatings
- JIS H 8504 Methods of adhesion test for metallic coatings
- JIS H 8617 Electroplated coatings of nickel and chromium
- JIS H 8630 Electroplated coatings on plastics materials for decorative purposes
- JIS Z 8902 Xenon standard white light source

2. Definitions For the purpose of this Standard, the definitions given in JIS H 0400 apply together with the following definitions:

- (1) vehicle interior Place of usage of parts installed within the automobile body and not exposed directly or indirectly to the weather. Where indirectly or partially exposed to the weather, the place shall be deemed vehicle exterior.
- (2) vehicle exterior Place of usage of parts installed outside of automobile body and exposed directly or indirectly to the weather. Even when within vehicle interior, if indirectly or partially exposed to the weather, the place shall be deemed vehicle exterior.
- (3) significant area Important surface from application standpoint and shall be any one of the following cases:
 - (a) Surface that can be seen from normal direction in usage state.
 - (b) Surface subject easily to wear or damage.
 - (c) Surface subject to change in function by formation of corrosion or rust.
 - (d) Surface ordinarily touched by hand.

3. Classification and symbols of plating

3.1 Classification of plating and basis material Classification of platings used shall be classified along with the classification of basis material as indicated in Table 1.

Table 1. Classification of plating and basis material

Classification of plating	Classification of basis material	Symbol for plating (example) ⁽²⁾
Chromium plating	Iron	Ep-Fe/Ni, Cr [MFCr]
	Zinc and zinc alloy	Ep-Zn/Ni, Cr [MZCr]
	Copper and copper alloy	Ep-Cu/Ni, Cr [MBCr]
	Plastic	Ep-PL/Ni, Cr [MLCr]
Nickel plating	Iron	Ep-Fe/Ni [MFNi]
	Zinc and zinc alloy	Ep-Zn/Ni [MZNi]
	Copper and copper alloy	Ep-Cu/Ni [MBNi]
Copper plating	Iron	Ep-Fe/Cu [MFCu]
Zinc plating	Iron	Ep-Fe/Zn [MFZn]
	Zinc and zinc alloy	Ep-Zn/Zn [MZZn]
	Copper and copper alloy	Ep-Cu/Zn [MBZn]
Zinc-iron alloy plating	Iron	Ep-Fe/Zn-Fe [MFZn-Fe]
Zinc-nickel alloy plating	Iron	Ep-Fe/Zn-Ni [MFZn-Ni]
Tin-zinc alloy plating	Iron	Ep-Fe/Sn-Zn [MFSn-Zn]

Note ⁽²⁾ The symbols for plating shall be in accordance with JIS H 0404 but the symbols given in [] that have been used conventionally may be used for the time being.

Remarks: Classification of plating indicates the final plating.

3.2 Grade of using environment The using environment for plated parts shall be divided into four grades shown in Table 2.

Table 2. Grade of using environment

Grade	Using environment
Grade 4	Vehicle exterior exposed to severe using environment
Grade 3	Ordinary vehicle exterior
Grade 2	Vehicle interior exposed to severe using environment
Grade 1	Ordinary vehicle interior

3.3 Plating type According to the classification of plating, the plating types⁽³⁾ and the symbols for them shall be as shown in Table 3.

Table 3. Plating types and symbols for them

Classification of plating	Plating type ⁽³⁾	Symbol for plating type ⁽⁴⁾
Nickel plating	Gloss plating	b
	Dull-finish plating	s
	Mat-finish plating	m
	Duplex plating	d
	Triplex plating	t
Chromium plating	Normal plating	r
	Microporous plating	mp
	Microcracked plating	mc
	Black plating	bk

Notes ⁽³⁾ The plating of the same classification in which character, shape, method, etc. differ (JIS H 0404).

⁽⁴⁾ The symbols for plating type shall conform to JIS H 0404.

4. Reference for application

4.1 Chromium plating The reference for preferable application is shown in Table 4.

Table 4. Reference for application of chromium plating

Classification of basis material	Thickness of plating (minimum) μm		Symbol for plating ⁽²⁾	Using environment	Example of applied parts
	Nickel	Chromium			
Iron	10	0.15	Ep-Fe/Ni 10d, Cr 0.15 mp [MFCr 10]	Grade 1	Threads and washer
	15	0.15	Ep-Fe/Ni 15d, Cr 0.15 mp [MFCr 15]	Grade 2	Meter rim and horn frame
	20	0.15	Ep-Fe/Ni 20d, Cr 0.15 mp [MFCr 20]	Grade 3	Lamp rim and wheel cover
	25	0.15	Ep-Fe/Ni 25d, Cr 0.15 mp [MFCr 25]	Grade 4	Bumper, grille and side step

Table 4. (continued)

Classification of basis material	Thickness of plating (minimum) μm		Symbol for plating ⁽²⁾	Using environment	Example of applied parts
	Nickel	Chromium			
Zinc and zinc alloy	5	0.15	Ep-Zn/Ni 5, Cr 0.15 [MZCr 5]	Grade 1	Knobs and handle
	10	0.15	Ep-Zn/Ni 10d, Cr 0.15 mp [MZCr 10]	Grade 2	Moldings
	15	0.15	Ep-Zn/Ni 15d, Cr 0.15 mp [MZCr 15]	Grade 3	Ornament and quarter molding
	20	0.15	Ep-Zn/Ni 20d, Cr 0.15 mp [MZCr 20]	Grade 4	Door outside handle
Copper and copper alloy	5	0.15	Ep-Cu/Ni 5, Cr 0.15 [MBCr 5]	Grade 1	Cap ornament and decorative nut
	10	0.15	Ep-Cu/Ni 10d, Cr 0.15 mp [MBCr 10]	Grade 2	Ornament and key plate
Plastic	5	0.15	Ep-PL/Ni 5, Cr 0.15 [MLCr 5]	Grade 1	Knobs
	10	0.15	Ep-PL/Ni 10d, Cr 0.15 mp [MLCr 10]	Grade 2	Ornaments
	15	0.15	Ep-PL/Ni 15d, Cr 0.15 mp [MLCr 15]	Grade 3	Lamp rim
	20	0.15	Ep-PL/Ni 20d, Cr 0.15 mp [MLCr 20]	Grade 4	Grille and wheel cover

Remarks 1. In the case where the copper plating is necessary on substrate according to the classification of basis material, the thickness of copper plating shall be in accordance with the agreement between the parties concerned with delivery.

2. The duplex nickel shown as an example of thickness of nickel plating and the microporous plating as an example of chromium plating may be replaced by triplex nickel plating and microcracked plating respectively.

Besides, the change of the thickness of plating according to the plating methods shall be in accordance with the agreement between the parties concerned with delivery.

4.2 Nickel plating The reference for preferable application of nickel plating is shown in Table 5.

Table 5. Reference for application of nickel plating

Classification of basis material	Thickness of plating (minimum) μm	Symbol for plating ⁽²⁾	Using environment	Example of applied parts
Iron	5	Ep-Fe/Ni 5 [MFNi 5]	Grade 1	Threads, plug housing and key plate
Zinc and zinc alloy	5	Ep-Zn/Ni 5 [MZNi 5]	Grade 1	Key cylinder and tool box lock
	10	Ep-Zn/Ni 10 [MZNi 10]	Grade 2	
Copper and copper alloy	5	Ep-Cu/Ni 5 [MBNi 5]	Grade 1	Threads, washer and key plate
	10	Ep-Cu/Ni 10 [MBNi 10]	Grade 2	

Remarks: In the case where the copper plating is necessary on substrate according to the classification of basis material, the thickness of copper plating shall be in accordance with the agreement between the parties concerned with delivery.

4.3 Copper plating The reference for preferable application of copper plating is shown in Table 6.

Table 6. Reference for application of copper plating

Classification of basis material	Thickness of plating (minimum) μm	Symbol for plating ⁽²⁾	Using environment	Example of applied parts
Iron	3	Ep-Fe/Cu 3 [MFCu 3]	—	Inner surface of fuel pipe and inner surface of brake pipe
	10	Ep-Fe/Cu 10 [MFCu 10]	—	

4.4 Zinc plating The reference for preferable application of zinc plating is shown in Table 7.