Prepared (also subject responsible if other)		No.		
EMWMIAJ		105 86-MZY 510 15 Uen		
Approved	Checked	Date	Rev	Reference
EAB/FJB/GER [Martin Trygg]		2009-02-27	J	

Conversion coating

Application

This document shall be used at purchasing, manufacturing and control of properties.

Contact person EAB/FJB/GER Mikael Johansson.

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1 Background

This specification covers RoHS compliant chemical conversion coatings for metals. The specification describes different methods to be used in three types of environmental classes; severe outdoor, outdoor and indoor.

The RoHS complaint conversion coating has low mechanical endurance. The conversion coating shall be electrically conductive. The conversion coating does not affect the dimensions of the products or the tensile properties of the metals coated.

This document is in accordance with applicable parts of ISO 10 546 chromate chemical conversion standard.

2 Indication in product documentation

The conversion coating shall be indicated on product documentation as below:

MZY 510 15/nsxx RoHS compliant conversion coating

Where

n refers to class of corrosion resistance, see chapter 3.1

s refers to the appearance of the conversion coating, see chapter 3.2

xx refers to individual approved type of conversion coating

3 Classification

3.1 Corrosion resistance

There are different types of RoHS compliant conversion coatings and they are grouped into three classes depending on their corrosive resistance under organic coatings if applicable.

Class 1: refers to a conversion coating suited for severe outdoor environments.
High corrosion resistance under organic coatings.
Low surface resistance in humid environment i.e. electrically conductive.

Class 2: refers to a conversion coating suitable for mild outdoor environments.
Low corrosion resistance under organic coatings.
Low surface resistance in humid environment i.e. electrically conductive.

Class 3: refers to a conversion coating suitable for indoor environments. Low surface resistance in humid environment i.e. electrically conductive.

A conversion coating that is approved for class 1 is automatically approved for class 2 and 3. The same holds for conversion coatings in class 2; they are automatically approved for class 3.

3.2 Appearance

The different types of RoHS compliant conversion coatings are grouped into appearances; currently two groups.

Appearance 1: refers to a colourless conversion coating.

Appearance 2: refers to a goldish conversion coating.

4 Property requirements

The conversion coating shall be qualified according to 130 11-MZY 510 15

The conversion coating shall be fully compliant with the EU RoHS Directive (Directive 2002/95/EC of the European Parliament and of the Council of 27thJanuary 2003 on the restriction of use of certain hazardous substances in electrical and electronic equipment) effective from 2006-07-01.

The conversion coating shall completely and evenly cover the metal surface. Entirely or partly turbid layers or spots are not accepted.

The surface appearance shall be agreed upon between Ericsson and the supplier in order to get an even appearance of the product assortment.

5 Test methods for production

At quality inspections the following item shall be reviewed:

- Coating mass per unit area (g/m^2).
- Surface appearance if applicable.
- Surface energy if applicable.

5.1 Measurement of coating mass

The coating mass can be measured using X-ray method that detects the existence of surface coating and supplies information regarding the coating mass per unit area.

5.2 Qualitative testing for layer composition

To detect a surface treatment a special chemical reagent can be used. No information of coating mass will be available with this test. An individual reagent is needed for the different surface treatments. By treating the surface with the reagent a surface coloration is detected if a conversion coating is present.

Note that the test method is destructive.

6 Mechanical pre-treatment

Cast aluminium products shall be mechanically cleaned before the conversion coating is applied. The preferred mechanical cleaning method is blasting with a surface roughness with a Ra value from 3 µm to12 µm. An alternative is to use tumbling with a suitable abrasive media.

Mechanical pre-treatment is not applicable for hot dip steel coated with Aluzinc or zinc, or cast zinc products.

7 Handling

The conversion coated products shall be handled with care to prevent that the coated products are not damaged.

Approved conversion coatings Table 1 summarizes which conversion coatings that are approved according to requirements in 130 11-MZY 510 15.

Further new methods will continuously be added Table 1 as new conversion coatings are being accepted.

A conversion coating that is approved for corrosion resistance class 1 is automatically approved for class 2 and 3. The same holds for conversion coatings in class 2; they are automatically approved for class 3.

Example:

- MZY 510 15/3 gives that all conversion coatings in Table 1 can be used.
- MZY 510 15/31 gives that all colourless conversion coatings in Table 1 can be used.
- MZY 510 15/2 gives that all conversion coatings in Table 1 with corrosion resistance class 1 or class 2 can be used.
- MZY 510 15/21 gives that all colourless conversion coatings in Table 1 with corrosion resistance class 1 or class 2 can be used.
- MZY 510 15/1 gives that all conversion coatings in Table 1 with corrosion resistance class 1.

- MZY 510 15/1101 gives that only E-CLPS 4600 can be used.

Table 1. Classification of conversion coatings.

MZY 510 15/Suffix **See chapter 2**	**Conversion coating**	**Commercial name**	**Corrosion resistance** **See chapter 3.1**	**Appearance** **See chapter 3.2**	**Coating mass per unit area (g/m^2)**	**Applicable for stated materials**
Suffix 1101	Titanium/Cobalt	E-CLPS 4600	Class 1	Colourless	0.05-0.15	Aluminium Zinc coating Aluminium-zinc coating
Suffix 1103	Zirconium/Titanium	Gardobond X 4707	Class 1	Colourless	0.01-0.08	Aluminium Zinc coating Aluminium-zinc coating
Suffix 2101	Titanium	E-CLPS 2100	Class 2	Colourless	0.05-0.15	Aluminium
Suffix 2102	Titanium/Zirconium	Alodine 5200	Class 2	Colourless	0.05-0.15	Aluminium
Suffix 2103	Zirconium/(Titanium)	Alodine 4830/31	Class 2	Colourless	0.05-0.15	Aluminium
Suffix 2104	Titanium	Oxsilan AL 0500	Class 2	Colourless	0.01-0.08	Aluminium Zinc coating Aluminium-zinc coating
Suffix 2105	Zirconium/Titanium	Oxsilan 9812/1	Class 2	Colourless	0.01-0.08	Aluminium Zinc coating Aluminium-zinc coating
Suffix 2106	Zirconium/Titanium	E-CLPS 1900	Class 2	Colourless	0.01-0.08	Aluminium Zinc coating Aluminium-zinc coating
Suffix 2107	Zirconium/Titanium	E-CLPS 1980	Class 2	Colourless	0.01-0.08	Aluminium Zinc coating Aluminium-zinc coating

Suffix 2108	Titanium	Iridite NCP	Class 2	Colourless	0.05-0.15	Aluminium
Suffix 2202	Manganese	Candorpass 3400	Class 2	Goldish	0.10 [1])	Aluminium Zinc coating Aluminium-zinc coating
Suffix 2203	Manganese	Altisering	Class 2	Goldish	0.10 [1])	Aluminium
Suffix 2204	Manganese	Safeguard 3400	Class 2	Goldish	0.10 [1])	Aluminium Zinc coating Aluminium-zinc coating
Suffix 2205	Iron phosphate/ Molybdenum	Meta-pas P	Class 2	Goldish	0.10 [1])	Aluminium
Suffix 3101	Chromium (III)	N/A	Class 3	Colourless	0.05-0.20	Aluminium Zinc coating Aluminium-zinc coating

[1]) Approximate coating mass.

8 Reference

130 11-MZY 510 15	Procedure specification
ISO 10 546	Chemical conversion coatings
IEC 600 68-2-30 Db	Determination of moisture resistance at temperature variation 25-40 °C

9 Revision history

Rev B Aluminum-zinc coatings and zinc coatings has been added in table 2

Rev C Document has been completely revised

Rev D Suffix 2205 has been added

Rev E Suffix 1102 and 2102 has been added

Rev F Suffix 2103 has been added

Rev G Suffix 1103, 2104 and 2105 has been added

Rev H Suffix 2106 and 2107 has been added

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Zinc coating added to suffix 2104 and 2105

Rev J Chapter 6 Mechanical pre-treatment has been added to ensure the cleanness of the cast surface before the conversion coating process.

Suffix 1102 has been removed from class 1 and added in class 2. The main reason is process quality issues.