ThyssenKrupp Steel

Product datasheet for CrIII passivation

Product	Steel grades / base materials	Product datasheet
CrIII passivated hot-dip galvanized sheet **CrIII passivated Galfan® hot-dip coated sheet** **CrIII passivated Galvalume® hot-dip coated sheet** **CrIII passivated FAL hot-dip coated sheet**	Ordinary steels IF steels Higher strength IF steels Microalloyed steels Multiphase steels	007 March 2006

1. Production

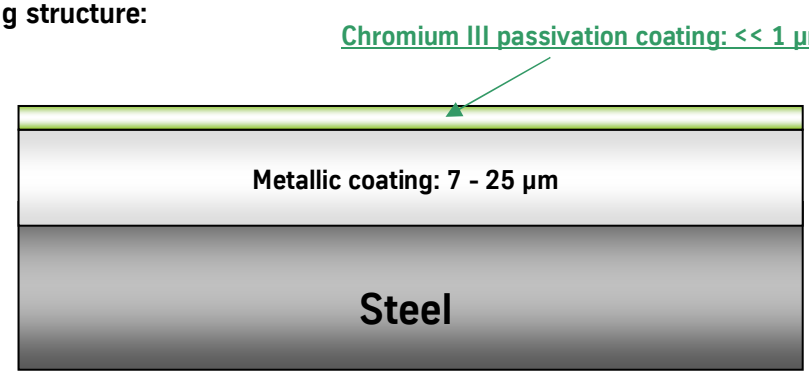
Effective October 01, 2005, TKS produces coated sheet with a trivalent chromium (CrIII) passivation coating, thus satisfying regulations prohibiting the use of compounds containing hexavalent chromium (CrVI)

- from July 01, 2006 (EU Directive 2002/95/EC) in the electrical industry (WEEE/RoHS)
- from July 01, 2007 (EU Directive 2000/53/EC) in the automotive industry (ELV)

Composition:

- coating containing CrIII
- contains fluoride and phosphate

Coating structure:



2. Temporary Corrosion protection

- Chemical passivation coating protects against humidity during transportation and storage
- Reduced risk of corrosion products (white rust)
- Metallic appearance is preserved
- The information in the SIZ brochure "Storage and transportation of hot-dip coated products" must be observed for chemically passivated coatings.
- Protection maintained for more than 6 weeks in the constant atmosphere test (DIN 50017)

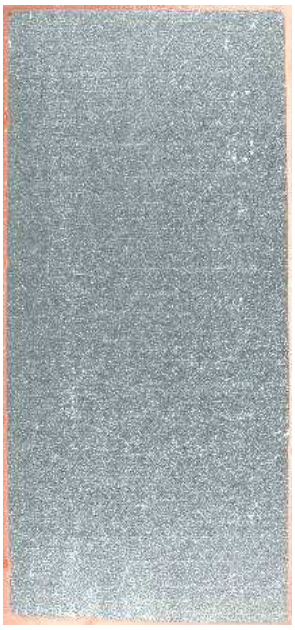
Constant atmosphere test (DIN 50017) for hot-dip galvanized sheet:

Test conditions: 100 % humidity; 40 °C constant temperature

504 h: < 1 % white rust	1008 h (= 6 weeks): 1 - 3 % white rust

Plant trials on individual specimens produced the following results (cannot be guaranteed for delivery):

Example of detail results for CrIII passivated hot-dip galvanized sheet "Z": constant atmosphere test (DIN 50017)

504 h	1008 h	1008 h
		
< 1 % white rust	1 - 3 % white rust	CrVI reference 1 - 3 % white rust

The white rust values are averaged from 3 specimens

3. Processability

3.1 Good service properties

Forming

- No disadvantages
- No abrasion in cupping test
- No change to coefficient of friction

3.2 Degreasing

- Suitable for degreasing
- Recommended conditions:

Ridoline 1250:

Bath:	Concentration:	1 %
	Temperature:	65 °C
	Spray pressure:	1 bar
Rinsing:	1. urban water 2. demineralized water	
Treatment time:	1 - 2 min	

3.3 Painting

- Suitable for painting
- TKS recommends checking on a case-to-case basis

Example of detail results for CrIII passivated hot-dip galvanized sheet "Z": paint adhesion

Results of cross hatch testing (acc. EN ISO 2409)

	Initial condition	Boiling test ***
Wet coating Cr(III) *	2 - 3	3
Wet coating Cr(VI) *	1 - 2	1 - 2
Powder coating Cr(III) **	1	1
Powder coating Cr(VI) **	1	1

* degreasing: Ridoline s.point.: 3.2
** without degreasing
*** 1h, 100 °C, demineralized water

Wet coating: BASF GD4
Powder coating: BASF PE 56

3.4 Suitability for adhesive bonding

- With both high-strength structural adhesives (e.g. Betamate 1496) and sealers (e.g. Betaguard PF250), Z with CrIII passivation displays good bonding properties similar to sheet with CrVI passivation
- TKS recommends checking on a case-to-case basis

3.5 Weldability

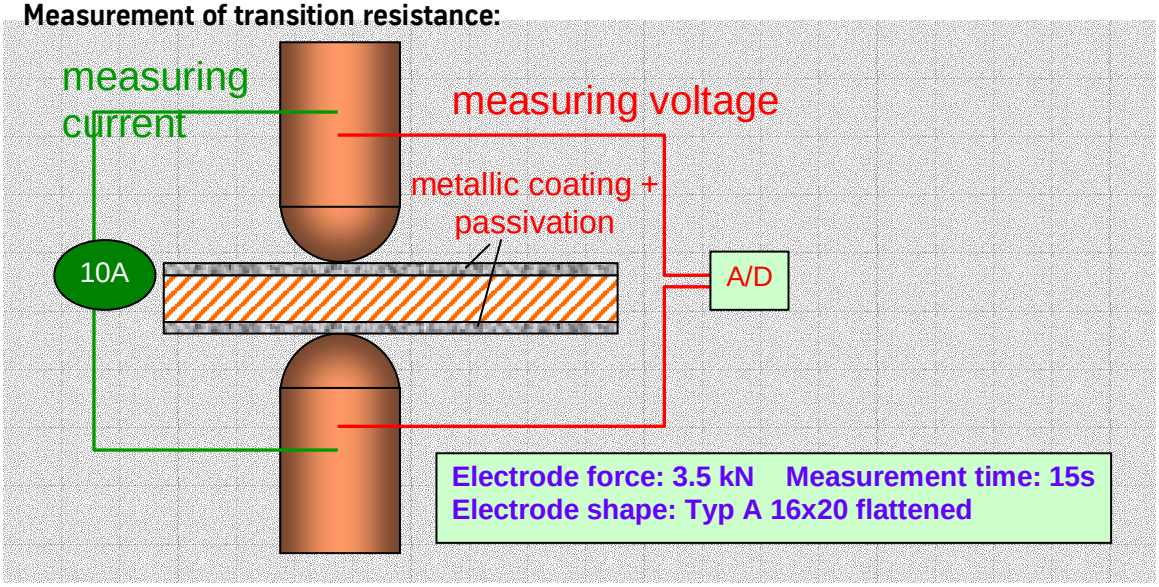
- Resistance spot welding: no identifiable disadvantages

Example of detail results for hot-dip aluminized sheet „AS": Transition resistance

Cr(III)	50 µOhm
Without passivation	50 µOhm

* AS-coating weight: 80 g/m²

Measurement of transition resistance:



4. Ordering requirements

The symbol for chemical CrIII passivation is “C”

e.g.: DX 51 D + **Z 275 N A C**

Z: hot-dip galvanized
275: 275 g metallic coating weight in g/m²
N: normal spangle
A: normal surface
C: chemically CrIII passivated

5. Delivery forms and sizes

Metallic coat	C *	CO **
Z	•	•
ZA	•	•
AZ	•	•
AS	•	•

* C: chemically CrIII passivated
** CO: chemically CrIII passivated and oiled

	Width		Thickness	
	Coil	**Cut lengths**	**Coil**	**Cut lengths**
Z	800 - 2000 mm	800 - 1800 mm	0.50 - 3.00 mm	0.50 - 3.00 mm
ZA	750 - 1525 mm	750 - 1525 mm	0.50 - 3.00 mm	0.50 - 3.00 mm
AZ	750 - 1525 mm	750 - 1525 mm	0.50 - 3.00 mm	0.50 - 3.00 mm
AS	600 - 1350 mm	600 - 1350 mm	0.50 - 3.00 mm	0.50 - 3.00 mm

Other widths and lengths by arrangement.

From October 2005, Galvannealed “ZF“ is no longer produced with chemical passivation.

6. Comments

All information given is based on in-house laboratory tests. Variances are possible in individual cases due to differing parameters. We recommend checking on a case-to-case basis. We would be pleased to place our experience at your disposal.

For further information, please contact our technical customer service department.

Technical customer service

Tel.: +49 203 52 41166

7. Publisher's addresses

DIN, EN ISO standards	Beuth Verlag GmbH, Postfach, D-10772 Berlin, Germany
SIZ brochure "Storage and transportation of hot-dip coated products"	Stahl-Informations-Zentrum, Postfach 10 48 42, 40039 Düsseldorf, Germany E-Mail: siz@stahl-info.de Internet: siz@stahl-info.de