

European Enamel Authority: (EEA) 7.20

4th Edition 2013

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7.20: QUALITY REQUIREMENTS FOR PORCELAIN AND VITREOUS ENAMELLED INDUSTRIAL TANKS

7.20.1 Application area

This norm is applicable for enameled panels for industrial tanks (not chemical vessels). The steel quality must be suitable for enameling and is to be agreed upon between the enameller and the steel manufacturer / supplier.

7.20.2 Test methods Item

Name: Comparable standards

- **3.5:** visual assessments EEA 8.7
- **3.9.3:** determination of the hardness referring to Mohs EN 101
- **4.3:** measurement of the thickness of the enamel coating EN ISO 2178, EN ISO 2360, EN ISO 1463
- **4.4:** determination of the resistance to chemical corrosion by citric acid or other acids at room temperature EN ISO 28706-1/9
- **4.5:** determination of the resistance to chemical corrosion by boiling citric acids EN ISO 28706-2/10, EN ISO 28706-2/5
- **4.6:** determination of the resistance to chemical corrosion by boiling water and/or water vapor EN ISO 28706-2/13, EN ISO 28706-2/5
- **4.7:** determination of the resistance to chemical corrosion by boiling detergent solution EN ISO 28706-3/9, EN ISO 28706-2/5
- **4.9:** determination of the resistance to impact ISO 4532
- **4.10:** determination of the adherence of the enamel to the substrate EN 10209 Annex C
- **4.12:** determination of the porosity by the high voltage test (destructive) ISO 2746, EN 14430
- **4.25:** determination of the resistance to chemical corrosion by hot sodium hydroxide solution EN ISO 28706-4/9
- **4.28:** determination of the quality of steel for enameling EN 10209 for cold rolled steel and EN 10025 or EN 10111 for hot rolled steel or EN 10149 for HSLA steels and EN 10222-1 for steel forgings for pressure applications
- **4.39:** determination of the adherence of enamel to steel of more than 3 mm thickness EEA Specification 8.6.3

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7.20.3 Quality requirements

Test method	Requirement	Remarks	Frequency
3.5 visual assessment	internal 0 defects external max. 5 defects/m ² (*)		in production 100 %
3.9.3 hardness	hardness mohs \geq 5	on test sheets	when taking into production a sig.diff. enamel recipe, but at least 1 x a year
4.3 thickness enamel coating	0.34 \pm 0.16 mm		S4 AQL 2.5
4.4 cold citric acid cold sulphuric acid cold hydrochloric acid	min. class A min. class A min. class A	EN ISO 28706-1 solution 10 % test duration 15 minutes	in production 1 x per month in production 1 x per month in production 1 x per month
4.5 boiling citric acid	weight loss: max. 5 g/ m ² per 2.5 hours	on test sheets conform to EN ISO 28764, test duration 2,5 hours, EN ISO 28706-2	when taking into production a sig.diff. enamel recipe, but at least 1 x a year
4.6 boiling water	weight loss: max. 10 g/m ² per 48 hrs vapour phase weight loss: max. 5 g/m ² per 48 hrs liquid phase	on test sheets conform to EN ISO 28764, test duration 48 hours, EN ISO 28706-2	when taking into production a sig.diff. enamel recipe, but at least 1 x a year
4.7 detergent solutions	weight loss: max. 5 g/m ² per 24 hours	EN ISO 28706-3	when taking into production a sig.diff. enamel recipe, but at least 1 x a year
4.9 impact resistance	max cracking: at 20 N no damage > 2 mm ϕ after 24 hours	ISO 4532	when taking into production a sig.diff. enamel recipe, but at least 1 x a year
4.10 adherence or 4.39	min. 2 min. "good"	on test sheets conform to EN ISO 28764 on test sheets conform to EN ISO 28764	in production 1 x a month in production 1 x a month
4.12 porosity	internal 0 defects	EN 14430	in production 100 %
4.25 sodium hydroxide 80° C	max. 8 g/m ² per 24 hours	test duration 24 hours EN ISO 28706-4	when taking into production a sig.diff. enamel recipe, but at least 1 x a year
4.28 steel quality	double-sided enamellable steel quality or suitable construction steel for applied processing		

(*) Defects at the outside: 5 defects of max. 1 mm diameter (on a test surface of 1 m²);
Max. 5 defects are allowed to be repaired, f.e. by means of a sealing kit.