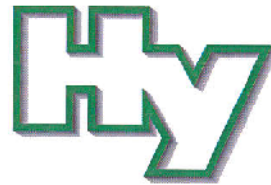


Hygiene-Institut des Ruhrgebiets

Institut für Umwelthygiene und Toxikologie

Direktor: Prof. Dr.rer.nat. Lothar Dunemann

Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V.



HYGIENEINSTITUT · Postfach 10 12 55 · 45812 Gelsenkirchen 1 GERMANY

Hamoun Nyzeh Co. (HANYCO)
Mr Ali Vaziri
No. 28, 3rd St.
Shaghayegh Blvd., Kashani Ave.
1483877631 TEHRAN
IRAN

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Internet www.hyg.de

Contact person: Roland Weiß (Dipl.-Biologe)

Gelsenkirchen, 08.12.2017

MEMO

Cold water test (23°C) according to the DVGW Code of Practice W 347 and warm water test (60°C) based on DVGW Code of Practice W 347

Product: Cement Mortar Lining of Ductile Iron Pipes


Order of 14.11.2017

Dear Mr Vaziri,

please find attached the test certificates and the test reports for the above mentioned product.

The invoice is also annexed to this letter. Thank you for your order.

With kind regards


Dr.rer.nat. Andreas Koch
Head of the Dept. for water
hygienic material testing

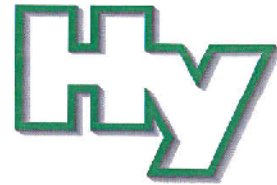
Attachments

Hygiene-Institut des Ruhrgebiets

Institut für Umwelthygiene und Toxikologie

Direktor: Prof. Dr. rer. nat. L. Dunemann

Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V.



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E-Mail r.weiss@hyg.de
Internet www.hyg.de

Reference-No.: K-292553-17-WR
Contact person: Roland Weiß (Dipl.-Biologe)

Gelsenkirchen, 08.12.2017

TEST CERTIFICATE

according to the DVGW Code of Practice W 347, May 2006
"Hygienic requirements for cement-bound
materials for drinking water supply"

Product: Cement Mortar Lining of Ductile Iron Pipes

Specimen: prisms (grey/white)

Test result:

The test specimen meet the requirements of the DVGW Code of Practice W 347, May 2006 according to the test report-no.: K-292553-17-WR dated 08.12.2017 for the following scopes:


Scope	Products / Components	Assessment
I	mortar lining of cast iron pipes and steel pipes	passed
II	concrete pipes \geq DN 300, reservoirs, cementitious coatings of reservoirs	passed
III	cement for tiles, joint filler, coating of fittings (e.g. for welding joints)	passed
IV	concrete components in protective areas of drinking water plants I, II, III	passed

as far as the material is qualified technically.

This test certificate is valid beginning with the date of issue and is ending by **08.12.2022** as far as there are no changes in the formula. After this time it can be extended for further 5 years if demanded.

If the product contains organic ingredients, the microbiological behavior must meet the requirements of DVGW worksheet W 270.

The Director of the Hygiene-Institute
on behalf of


Dr. rer. nat. Andreas Koch
Head of the Dept. for water
hygienic material testing



The assessment was based on the assumption that the used starting substances and monomers used to manufacture the product may completely known and no other substances are present in the product. The validity of this document expires in case of modifications in the composition of the product or the processing conditions. The results and evaluations refer to the groups of test items. This document may not be published without our written permission only complete and unchanged or duplicated.

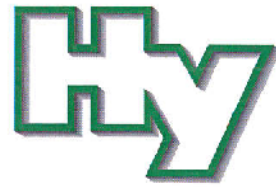
Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V., Vereinsregister: VR 519 Amtsgericht Gelsenkirchen, USt-ID: DE125D18356
Vorstand: Prof. Dr. Werner Schlake (Vors.), Prof. Dr. Jürgen Kretschmann, Dr. Emanuel Grün, Dr. Dirk Waider, Prof. Dr. Lothar Dunemann (geschäftsf. Vorstand)

Hygiene-Institut des Ruhrgebiets

Institut für Umwelthygiene und Toxikologie

Direktor: Prof. Dr. rer. nat. L. Dunemann

Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V.



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Reference-No.: K-292553-17-WR
Contact person: Roland Weiß (Dipl.-Biologe)

Gelsenkirchen, 08.12.2017

TEST REPORT according to the DVGW Code of Practice W 347, May 2006 "Hygienic requirements for cement-bound materials for drinking water supply"

Order of: 14.11.2017

Field of application:
I mortar lining of cast iron pipes and steel pipes
II concrete pipes \geq DN 300, reservoirs, cementitious coatings of reservoirs
III cement for tiles, joint filler, coating of fittings (e.g. for welding joints)
IV concrete components in protective areas of drinking water plants I, II, III

Product: Cement Mortar Lining of Ductile Iron Pipes

Production place: Hamoun Nyzeh Co. (HANYCO), No. 28, 3rd St., Shaghayegh Blvd., Kashani Ave.,
1483877631 Tehran Iran

Test specimen: prisms, grey/white (40 mm x 40 mm x 160 mm)

Specimen production: produced by the applicant: 29.10.2017
Start of precondition: 14.11.2017 (w/c-value: 0,294)

Sampler: delivered sample

Date of receipt: 14.11.2017

Start of migration test: 21.11.2017

End of test: 07.12.2017

The Director of the Hygiene-Institute
on behalf of


Dr. rer. nat. Andreas Koch
Head of the Dept. for water
hygienic material testing

This test report consists of 2 pages.

The assessment was based on the assumption that the used starting substances and monomers used to manufacture the product may completely known and no other substances are present in the product. The validity of this document expires in case of modifications in the composition of the product or the processing conditions. The results and evaluations refer to the groups of test items. This document may not be published without our written permission only complete and unchanged or duplicated.



Deutsche
Akkreditierungsstelle
D-PL-13042-02-00

test results (cold water 23°C)

Product: Cement Mortar Lining of Ductile Iron Pipes

Test specimen: prisms, grey/white (40 mm x 40 mm x 160 mm)

Formulation: submitted and checked (No. 8322), without any additives. The heavy metal contents, including arsenic, of the cement meet the purity criteria
DVGW Code of Practice W 347, May 2006.

SV-ratio migration test: 1728 cm³ / 2200 ml = 1 / 1,27 (test water: reference water according annex B W 347)

SV-ratio odour/flavour test: 864 cm³ / 2860 ml = 1 / 3,31 (test water: reference water according annex B W 347)

Parameter	Method	Test cycle / Result			Requirements for "scope I-products"
		1 4. Day	2 7. Day	3 10. Day	
Colour	Hy-KTW-14.05, 18.11.08	colorless	colorless	colorless	n.s.e..
Turbidity	Hy-KTW-14.05, 18.11.08	clear	clear	clear	n.s.e..
Tendency to foam formation	Hy-KTW-14.05, 18.11.08	none	none	none	n.s.e..
Threshold odour number (23°C)	DIN EN 1622:2006-10	3 *)	2 *)	1	< 2
Total organic carbon (TOC) mg/m ³ x d	DIN EN 1484:1997-08	2,6	1,2	< 0,5	≤ 2,5

*) tentative determination of Threshold odour number

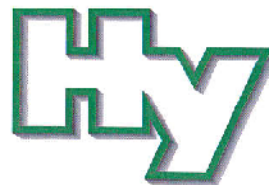
n.s.e. = not significant effected

Hygiene-Institut des Ruhrgebiets

Institut für Umwelthygiene und Toxikologie

Direktor: Prof. Dr. rer. nat. L. Dunemann

Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V.



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Internet www.hyg.de

Reference-No.: K.292554-17-WR
Contact person: Roland Weiß (Dipl.-Biologe)

Gelsenkirchen, 08.12.2017

TEST CERTIFICATE

based on to the DVGW Code of Practice W 347, May 2006
"Hygienic requirements for cement-bound
materials for drinking water supply"
Warm Water Test (60°C)

Product: Cement Mortar Lining of Ductile Iron Pipes

Specimen: prisms (grey/white)

Test result:

The test specimen meet the requirements of the DVGW Code of Practice W 347, May 2006 according to the test report-no.: K-292554-17-WR dated 08.12.2017 for the following scopes:

Scope	Products / Components	Assessment
I	mortar lining of cast iron pipes and steel pipes	passed
II	concrete pipes \geq DN 300, reservoirs, cementitious coatings of reservoirs	passed
III	cement for tiles, joint filler, coating of fittings (e.g. for welding joints)	passed
IV	concrete components in protective areas of drinking water plants I, II, III	passed

as far as the material is qualified technically.

This test certificate is valid beginning with the date of issue and is ending by 08.12.2022 as far as there are no changes in the formula. After this time it can be extended for further 5 years if demanded.

If the product contains organic ingredients, the microbiological behavior must meet the requirements of DVGW worksheet W 270.

The Director of the Hygiene-Institute
on behalf of

Dr. rer. nat. Andreas Koch
Head of the Dept. for water
hygienic material testing



The assessment was based on the assumption that the used starting substances and monomers used to manufacture the product may completely known and in other substances are present in the product. The validity of this document expires in case of modifications in the composition of the product or the processing conditions. The results and evaluations refer to the groups of test items. This document may not be published without our written permission only complete and unchanged or duplicated.

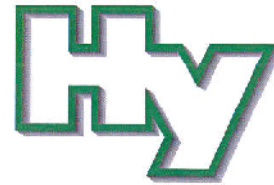
Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V., Vereinsregister: VR 519 Amtsgericht Gelsenkirchen, USt-ID: DE125018356
Vorstand: Prof. Dr. Werner Schlake (Vors.), Prof. Dr. Jürgen Kretschmann, Dr. Emanuel Grün, Dr. Dirk Waider, Prof. Dr. Lothar Dunemann (geschäftsf. Vorstand)

Hygiene-Institut des Ruhrgebiets

Institut für Umwelthygiene und Toxikologie

Direktor: Prof. Dr. rer. nat. L. Dunemann

Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V.



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Internet www.hyg.de

Reference No.: K-292554-17-WR
Contact person: Roland Weiß (Dipl.-Biologe)

Gelsenkirchen, 08.12.2017

TEST REPORT based on the DVGW Code of Practice W 347, May 2006 "Hygienic requirements for cement-bound materials for drinking water supply" Warm Water Test (60°C)

Order of: 14.11.2017

Field of application:
I mortar lining of cast iron pipes and steel pipes
II concrete pipes \geq DN 300, reservoirs, cementitious coatings of reservoirs
III cement for tiles, joint filler, coating of fittings (e.g. for welding joints)
IV concrete components in protective areas of drinking water plants I, II, III

Product: Cement Mortar Lining of Ductile Iron Pipes

Production place: Hamoun Nyzeh Co. (HANYCO), No. 28, 3rd St., Shaghayegh Blvd., Kashani Ave.,
1483877631 Tehran, Iran

Test specimen: prisms, grey/white (40 mm x 40 mm x 160 mm)

Specimen production: produced by the applicant: 29.10.2017
Start of precondition: 14.11.2017 (w/c-value: 0,294)


Sampler: delivered sample

Date of receipt: 14.11.2017

Start of migration test: 21.11.2017

End of test: 07.12.2017

The Director of the Hygiene-Institute
on behalf of


Dr. rer. nat. Andreas Koch
Head of the Dept. for water
hygienic material testing

This test report consists of 2 pages.

The assessment was based on the assumption that the used starting substances and monomers used to manufacture the product may completely known and no other substances are present in the product. The validity of this document expires in case of modifications in the composition of the product or the processing conditions. The results and evaluations refer to the groups of test items. This document may not be published without our written permission only complete and unchanged or duplicated.



test results (warm water 60°C)

Product: Cement Mortar Lining of Ductile Iron Pipes
Test specimen: prisms, grey/white (40 mm x 40 mm x 160 mm)
Formulation: submitted and checked (No. 8322), without any additives

SV-ratio migration test: 864 cm² / 1100 ml = 1 / 1.27 (test water: reference water according annex B W 347)
SV-ratio odour/flavour test: 288 cm² / 1150 ml = 1 / 3.99 (test water: reference water according annex B W 347)

Parameter	Method	Test cycle / Result			Requirements for "scope I-products"
		1 1. Day	2 2. Day	3 3. Day	
Colour	Hy-KTW-14.05, 18.11.08	colorless	colorless	colorless	n.s.e..
Turbidity	Hy-KTW-14.05, 18.11.08	clear	clear	clear	n.s.e..
Tendency to foam formation	Hy-KTW-14.05, 18.11.08	none	none	none	n.s.e..
Threshold odour number (23°C)	DIN EN 1622:2006-10	3 *)	2 *)	1	< 2
Total organic carbon (TOC) mg/m ² x d	DIN EN 1484:1997-08	9,0	5,4	1,3	≤ 2,5
arsenic mg/m ² x d	DIN EN-ISO 17294-2:2017-01	< 0,005	< 0,005	< 0,005	≤ 0,05
lead mg/m ² x d	DIN EN-ISO 17294-2:2017-01	< 0,005	< 0,005	< 0,005	≤ 0,1
cadmium mg/m ² x d	DIN EN-ISO 17294-2:2017-01	< 0,0005	< 0,0005	< 0,0005	≤ 0,05
chromium mg/m ² x d	DIN EN-ISO 17294-2:2017-01	< 0,005	< 0,005	< 0,005	≤ 0,3
nickel mg/m ² x d	DIN EN-ISO 17294-2:2017-01	< 0,005	< 0,005	< 0,005	≤ 0,2

*) tentative determination of Threshold odour number

n.s.e. = not significant effected