

Test Report

KOLLMORGEN EUROPE GMBH:
COMPATIBILITY TEST OF SEVERAL
MATERIALS AGAINST TYPICAL
CLEANERS AND DISINFECTANTS FOR
EXTERNAL SURFACES

Created by Thomas Wershofen
Application Support Program Leader
Application Specialist EMEA; Food and Beverage
Phone +49 (0)2173 5991 710
Thomas.wershofen@ecolab.com

SUMMARY

All tests confirmed the stability of the selected materials against the tested media.

None of the materials showed relevant incompatibility issues.

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PURPOSE

To check the material compatibility of different equipment parts from Kollmorgen Europe GmbH; Ratingen, Germany.

BACKGROUND

Materials and Equipment from Kollmorgen is used widely in the Food and Beverage Industry. Surfaces in the Food and Beverage Industry are usually frequent treated with different kind of cleaning and/or disinfection agents in order to ensure the hygiene level are requested in this industry.

To ensure the hygiene level as requested it is important that all materials used in this area are resistant against the products produces but also against typically used cleaning and disinfection media.

The following tests have been done with a selection of typical cleaning- and/or disinfection-agents which are typical examples for a broader range of specific products.

METHOD AND MATERIALS

The tests have been performed roughly following conditions of the DIN 90505 which is usually designed for metal surfaces but also allow a good test of plastic materials and elastomers as well.

The samples have been soaked completely into the solutions under test without additional mechanical stress.

Chemical products under test:

P3-topactive DES:	slight acidic foaming disinfectant based on peracetic acid, hydrogen peroxide and surfactants
P3-topax 12	neutral cleaning agent based on surfactants
P3-topax 56	acidic cleaning agent based on phosphoric acid and surfactants
P3-topax 66	alkaline cleaning and disinfection agent based on caustic, bleach and surfactants
P3-topax 990	neutral disinfection agent based on alkylamineacetates

Test conditions:

- 21°C
- 28 days (for EPDM E1117 only 14 days)

3% concentration (in demineralised water) for P3-topactive DES and P3-topax 990
5% concentration (in demineralised water) for P3-topax 12, P3-topax 56 and P3-topax 66

The applications solutions of P3-topactive DES and P3-topax 66 have been changed twice per week, because of the instability of the ingredients in application solution.

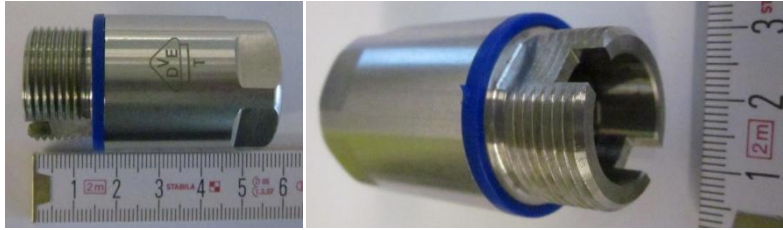
A test period for 28/14 days (= 672/336 h) correlates with 2016/1008 cleaning steps with a contact time of 20 minutes each or 5,5/2,75 years with one treatment per day.
Due to the possible relaxation after each treatment in practice the chemical attack would be even lower.

Examination methods:

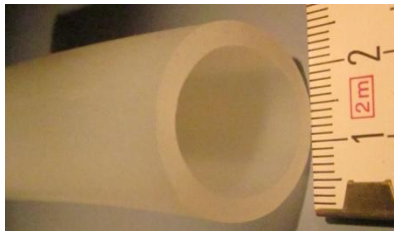
- weight (before and after test); a change of more than 1% is significant, at more than 5% the material is not compatible
- sensory examination (haptic, smell, sticking effect, color change, flexibility)
- surface structure (under digital microscope)
- Hardness (Shore A)

Materials under test:

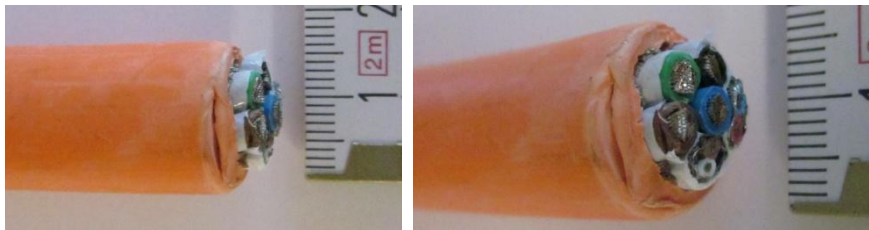
Kabelverschraubung HD-HD2410.000 (Rittal)



Hose: Tygon 3350 (Saint-Gobain)



Cable: "AWM E54661 125C 600V CSA AWM LL54185 I/II A/B 125C 600V FT1 RoHS Compliant"



to avoid potential chemical reactions with the chemicals only the red covering of the cable has been tested

Sealing (black): Material unknown



Sealing (blue): FDA compliant EPDM (Marco Compound E1117)



RESULTS

Kabelverschraubung HD-HD2410.000 (Rittal)

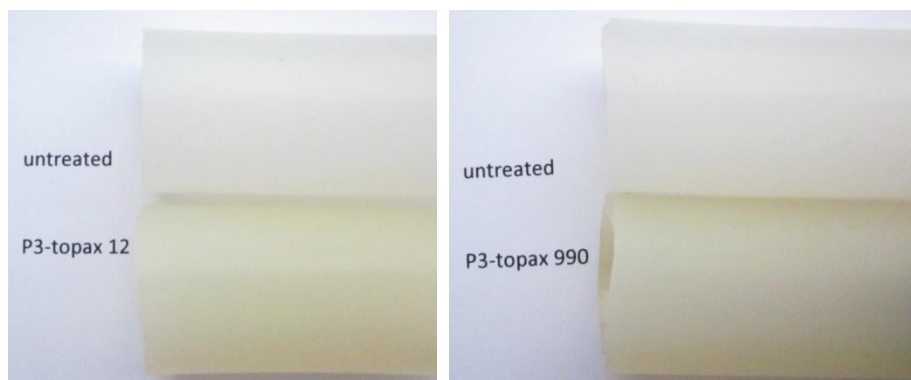
	Kabelverschraubung					
	untreated [g]	28 days [g]	Δg [g]	Δg [%]	Shore A (blue sealing)	sensory effects
3% Topactive DES	102,1764	102,1976	0,0212	0,02	59	unchanged
5% Topax 12	101,8694	101,9163	0,0469	0,05	60	unchanged
5% Topax 56	102,6574	102,7699	0,1125	0,11	58	unchanged
5% Topax 66	102,4673	102,4090	-0,0583	-0,06	63	unchanged
3% Topax 990	102,4323	102,8027	0,3704	0,36	65	unchanged
0-level (untreated)					58	

The Shore A of the P3-topax 990 treated sample is with an increase level of 8 slightly above the typical range of +/- 5. Nevertheless the material showed no significant changes.

Hose: Tygon 3350 (Saint-Gobain)

	Tygon 3350					
	untreated [g]	28 days [g]	Δg [g]	Δg [%]	Shore A	sensory effects
3% Topactive DES	14,1513	14,1789	0,0276	0,20	54	unchanged
5% Topax 12	14,5729	14,6103	0,0374	0,26	56	yellowish discoloration
5% Topax 56	13,3366	13,3597	0,0231	0,17	53	unchanged
5% Topax 66	14,4464	14,4081	-0,0383	-0,27	54	unchanged
3% Topax 990	12,8938	12,9739	0,0801	0,62	58	yellowish discoloration
0-level (untreated)					53	

The color changes are significant but don't give any hint on material incompatibility which would reduce the lifetime of the material.



**Cable: “AWM E54661 125C 600V CSA AWM LL54185 I/II A/B 125C 600V FT1
 RoHS Compliant”**

	cable					
	untreated [g]	28 days [g]	Δg [g]	Δg [%]	Shore A	sensory effects
3% Topactive DES	7,0420	7,0678	0,0258	0,37	97	unchanged
5% Topax 12	6,2962	6,3050	0,0088	0,14	98	unchanged
5% Topax 56	6,0776	6,0857	0,0081	0,13	98	unchanged
5% Topax 66	6,0538	6,0334	-0,0204	-0,34	97	unchanged
3% Topax 990	5,3536	5,3686	0,0150	0,28	97	unchanged
0-level (untreated)					97	

Sealing (black): Material unknown

	O-ring (black)					
	untreated [g]	28 days [g]	Δg [g]	Δg [%]	Shore A	sensory effects
3% Topactive DES	0,3843	0,3928	0,0085	2,21	69	unchanged
5% Topax 12	0,3803	0,3782	-0,0021	-0,55	71	unchanged
5% Topax 56	0,3853	0,3839	-0,0014	-0,36	71	unchanged
5% Topax 66	0,3807	0,379	-0,0017	-0,45	71	unchanged
3% Topax 990	0,3816	0,3806	-0,001	-0,26	72	unchanged
0-level (untreated)					71	

The ring treated in P3-topactive DES showed some significant increase of mass (swelling), but still below the level of incompatibility.

Sealing (blue): FDA compliant EPDM (Marco Compound E1117)

	O-ring (blue) FDA compliant EPDM					
	untreated [g]	28 days [g]	Δg [g]	Δg [%]	Shore A	sensory effects
3% Topactive DES	0,5284	0,5290	0,0006	0,11	71	unchanged
5% Topax 12	0,5215	0,5218	0,0003	0,06	71	unchanged
5% Topax 56	0,5250	0,5256	0,0006	0,11	72	greenish discoloration
5% Topax 66	0,5284	0,5329	0,0045	0,85	71	unchanged
3% Topax 990	0,5258	0,5277	0,0019	0,36	71	unchanged
0-level (untreated)					71	



CONCLUSION:

All tests confirmed the stability of the selected materials against the tested media. None of the materials showed relevant incompatibility issues.

Nevertheless in some cases visual changes are possible but which are not relevant for use of the materials.

The swelling (mass increase) of the black O-ring sealing in P3-topactive DES is significant but still below the typical incompatibility level (5%).