

EXPLANATION PAPER R&D MANAGEMENT		EP PWG NSSS002	
SUBSTITUTE SOFTENERS		date	28/02/2017
First results of the long-term evaluation of a NeutraCalc unit		revision	
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		Dirck Demeyer, R&D Engineer	
translation :			

First evaluation under lab conditions

By the first evaluation test, the NeutraCalc medium was checked on the scaling effect under lab conditions. Hereby, a 10L water boiler, set at 60°C, was fed with testing water, which was refreshed every 24h and of which the scale formation on the boiler resistance was checked by weight increase (analytical measured at 0,1 g accuracy). The total water consumption was 500L for each testing water, reassuring the ability of measuring the weight difference if scale formation would occur.

The results of these tests were :	after 500L of totally softened water	no measurable scale
	after + 500L NeutraCalc water	no measurable scale
	after + 500 L hard city water	1 g weight increase

First long-term evaluation

The same test boiler and NeutraCalc unit was installed in a household environment with normal hot water consumption. The results are :

after 7 month of use	hard water scale was removed
after + 4 month	no measurable scale

A daily used boiler can showed a small layer of lime precipitation which was easy to wipe off.

Overview of the test results

1. There was no measurable scale on the boiler resistance after passage of softened water or NeutraCalc water under the same circumstances.
2. There was a clear measurable scale on the boiler resistance after a short passage of hard water.
3. There is no measurable scale on the boiler resistance after about 1 year of use of NeutraCalc.
4. The initial lime scale at start of the in situ test is removed from the boiler resistance after a passage of NeutraCalc water during 7 month.
5. The crystallization of the carbonate is not scaling but forms a deposit on the boiler wall and especially on the boiler bottom.
6. Only the scale on the resistance is responsible for energy loss and premature failure.
7. Lime deposits may come out and appear in the hot water, settling down on shining surfaces.
8. When this occurs, these deposits are easy to wipe off, if done regularly .

Conclusion

NeutraCalc is not removing the hardness from the water, but converts it into a manageable & not scaling form, without the need of salt or power supply. NeutraCalc is so to be considered as an absolute green solution.

The precipitation of lime after NeutraCalc is completely different from the common hard water scale : crystallization does not take place at the moment of settlement but before, so is the precipitation not fixed to the surface. Therefore, it does not interfere with heat transmission and is easy to remove.

Existing lime crystallization in contact with NeutraCalc treated water, seems to disappear by physical influence of the floating crystal cores.

NeutraCalc is no replacement for classic water softeners. Water softening is still a complete prevention of lime precipitation and necessary in particular situations. A softener will also be more preferred in cases where there is the most interest in shining surfaces, without or very little cleaning.

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Pictures

1. After passage of 500 L NeutraCalc water



2. After next 500L of hard city water = 1 g weight increase



3. After 1 year of domestic use = no extra weight increase on the element (weighted mass) and small crumbling deposit on the bottom of the vessel



4. Impact on precipitation : easy to wipe off

