Neutrakon® Neutraliser

For the neutralisation of acid condensates from condensing boilers to prevent corrosive destruction of sewer piping

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Inhalt:

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NEUTRAKON® - Produktpalette

Gas - Neutraliser

Oil - Neutraliser

Refill Packages

Condensate pump

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Why it makes sense to neutralize acid condensates below 25 kW

Basics

Condensing boilers generate large quantities of acid condensates: up to 3.5 l acid per hour or up to 7000 l per year with a heating output of 25 kW.

Condensates from condensing oil and gas boilers are primarily strong acids with values below ph 4 to 1.8. More than 60% of the gas condenser condensates are **strong acids** because they have pH values between 2.8 and 3.8.

Consequences of discharging acids

This causes heavy damage to the domestic and public canalisation system due to acid condensing boiler condensates.
Long-term tests by the Research Laboratory NRW [(1)] show **the pipe corrosion rates amount to 1.2mm to 3.0 mm per year** (page 4) even with an extremely small boiler of **14 kW.** This is shown on the photo of the Materials Testing Laboratory on page 6.
Renewal and repair of corroded sewer piping result in high costs that can be avoided by neutralizing these corrosive acids!

Neutralisation in new buildings

In newly build houses, the internal sewer system is made of non-corrosive plastic pipes. The condensate inlet into the public canalization system, however, is always above the max. waste water level in the pipe to avoid backflow into the building. **Dilution with other waste water at the point of condensate entering, is therefore not possible.**
The strong acid condensate corrodes the tubewall at a rate of 1,2 to 3 mm per year!
The test running over more than one year, issued by the Materials Testing Laboratory NRW (top and page 5) shows these damages.

Condensates in old buildings

Some 80% of all heating systems employing condensing boilers are installed in old buildings. Pipe fitters and plumbers can hardly be expected to check the connecting pipes from the old building to the public canalization system to ensure that the sewage pipes are suitable for aggressive condensates.

Insufficient dilution with other waste waters

The acid boiler condensates can not be neutralized by the household wastewater.
Tests made by the Technical University of Munich[(2)] show that 95% of the acid condensates flow undiluted into the unprotected sewer pipes, causing up to 3mm acid corrosion per year.

No neutralisation through alkaline deposits

The heads of research departments of globally leading detergent manufacturers unanimously confirmed in an industry panel meeting on 12 December 1996 that
"… *the use of modern detergents* ***can not guarantee that acid condensates from condensing boilers can be neutralised reliably*** *in order to protect the public network pipes*".[(3)] Alkaline deposits are prevented by modern detergents (tensides, zeolites) and regular flushing with highly effective (surface de-tensioning) detergents and cleansers.

Conclusion

Reliable protection against incalculable damages is available.
Even for boilers below 25 kW, Neutrakon® neutralisation is an easy, low cost, and safe solution!

[(1)] Longterm test: Research Laboratory North Rhine-Westphalia (Materialprüfungsamt Nordrhein Westfalen), No. 210656592, dated 17 Jan 1995; see Photo Page 5 and Table Page 4
[(2)] Study: Test Laboratory for Water Quality and Waste Management (Prüfamt für Wassergüte und Abfallwirtschaft) of the Technical University Munich, dated July 1997
[(3)] Dr. Peter Olschewsky – Industrial Association Detergents, registered association (Industrieverband Waschmittel e.V.), Frankfurt, "Neutralising acid condensates from condensing boilers to protect the public network of concrete pipes", 7 Feb. 1997

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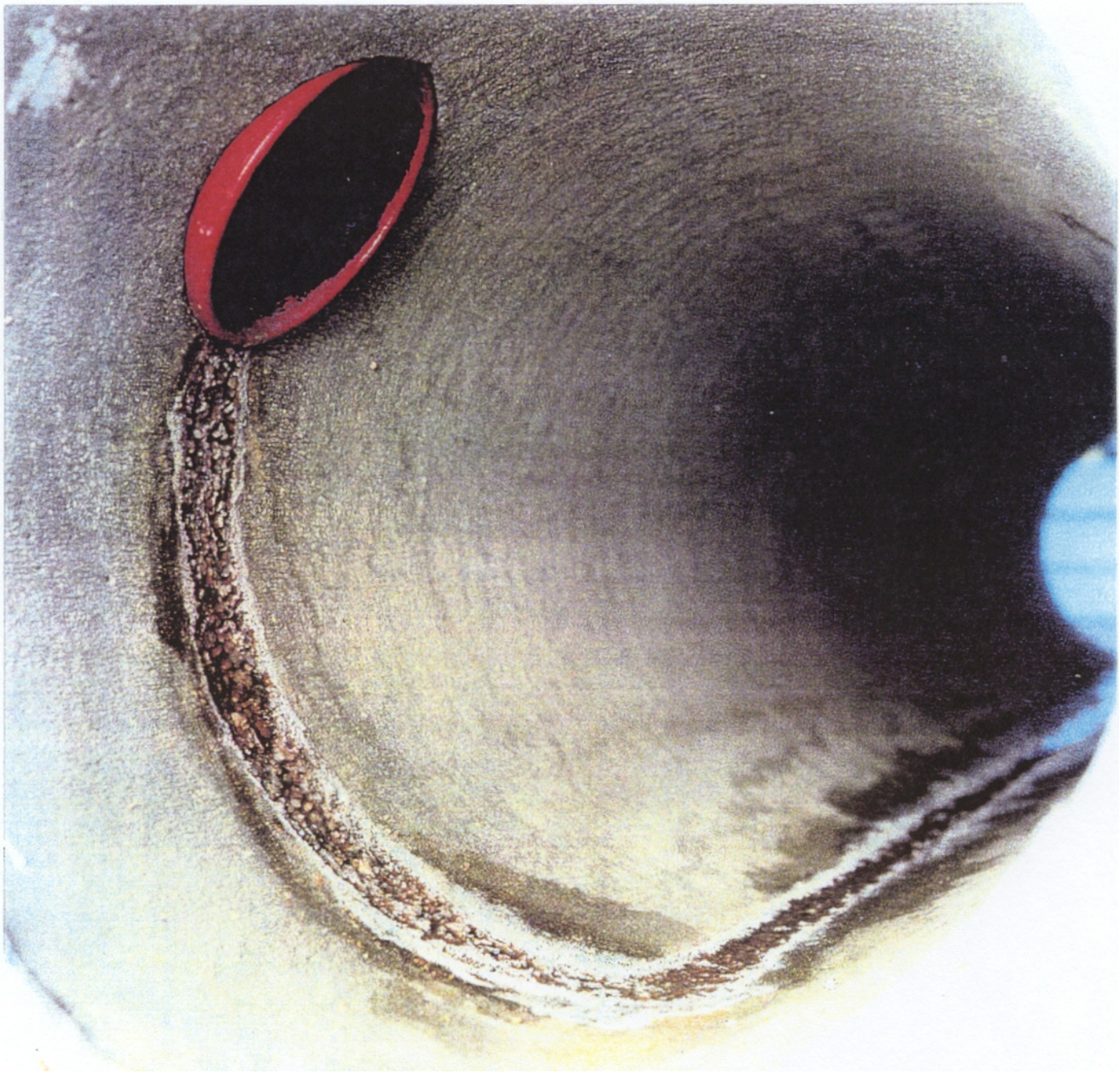

Photo No. 5: Concrete corrosion due to synthetic condensate of pH value of 3 after 540 days testing (concrete made of gravel)

Annotation of Mommertz GmbH: Condensate water volume corresponds to a condensing boiler of 14 kW

Pipe No.	pH value	aggregate	Sewer pipe corrosion in mm: upper third	middle third	lower third	average value	max. value	max. concrete loss to be expected in mm/year	concrete loss of 50% of wall thickness after ... years
Pipes only with condensate load									
1	3,0	Gravel	2,5	2,1	1,8	2,1	2,5		
2	3,0	Limestone	5,9	7,0	3,0	5,3	7,0	2,8	15
3	3,0	Gravel	2,2	2,9	2,6	2,6	2,9		
4	3,0	Gravel	2,6	3,0	2,8	2,8	3,0	1,2	27
5	4,0	Gravel	0,4	0,5	0,5	0,5	0,5	0,2	162
6	4,0	Limestone	0,5	0,5	0,5	0,5	0,5		
7	4,0	Gravel	0,6	0,7	0,5	0,6	0,7	0,3	142
8	4,0	Gravel	0,5	0,5	0,3	0,4	0,5		
Pipes with condensate load and flushed drinking water									
9	3,0	Gravel	1,4	2,3	2,9	2,2	2,9		
10	3,0	Gravel	2,9	3,0	2,7	2,9	3,0	1,2	27
11	3,0	Gravel	2,7	2,9	2,9	2,8	2,9		
12	4,0	Gravel	0,8	0,8	0,5	0,7	0,8	0,3	108
13	4,0	Gravel	0,5	0,5	0,4	0,5	0,5		
14	4,0	Gravel	0,4	0,5	0,3	0,4	0,5		

Calculation basis for the concrete loss/year:

$$\frac{0{,}08\ \text{l/kWh}^{1)} * 26800\ \text{kWh/a}^{2)} * 360\text{d} * \text{max. concrete loss in mm}}{10\ \text{l/d} * 360\text{d} * 540\text{d}}$$

[1] condens. water volume [2] natural gas requirement [3] discharged vol. of synth. Condensate [4] Test duration at MPA NRW

Calculation basis for loss of 50% wall thickness after ... years:

$$\frac{\text{Wall thickness of pipe in mm}^{5)}}{\text{Max. concrete loss mm/a}}$$

[5] Wall thickness of used pipes at location of max. concrete loss:

Pipe with gravel aggregate: 65 mm; Pipe with limestone aggregate: 85 mm

See also photo on page 5

Annotation of Mommertz GmbH:

Condensate water volume corresponds to a condensing boiler of **14 kW**.

Test Laboratory
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TECHNISCHE UNIVERSITÄT MÜNCHEN

Study and Analysis of Discharge Volumes, Discharge Times and Deposits of Household Waste Waters In Connection with Neutralising Acid Condensate From Heating Systems Utilising Condensing Boilers

For
Mommertz Wasser- und Wärmetechnik GmbH
Daimlerstraße 8
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July 1997

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5. Summary

Acid condensates from small heating systems using condensing boilers can be neutralised only to a very small extent by household waste waters. Studies in a 3-person household have determined that only 4.2% of the generated condensates are neutralised. Neutralisation takes place only when waster water is being flushed. The extent of the neutralisation is determined by the duration of the flow of the waste water. Multi-family houses probably have a more positive effect due to varying water usage patterns. In single- and 2-person households the situation is significantly less favourable.

Deposits found in the interior installation are unable to neutralise acid condensates due to their chemical composition as well as quantity.

The treatment of the acid condensates using a neutralisation apparatus installed into the condensate drains is absolutely necessary because a sufficient neutralisation by household waste waters with a common canalisation drain alone is not taking place.

Garching, 28 July 1997

Dr.rer.nat. Konrad Leonhard
(Head of the Test Laboratory)

Neutrakon® - List of references

- ATAG Verwarming B.V., Lichtenvoorde, Netherlands
- Bösch KG, Lustenau, Austria
- Bosch Thermotechnik GmbH, Wetzlar, Germany
- Brötje August GmbH & Co., Rastede, Germany
- Buderus Austria GmbH, Wels, Austria
- Buderus Ferroknepper, Esch/Alzette, Luxembourg
- Buderus Heiztechnik AG, Pratteln, Switzerland
- Buderus Heiztechnik GmbH, Prag, Czech Republic
- Buderus Italia S.r.l., Assago (Milano), Italy
- Cordes & Graefe KG; Germany
- Cosmogas S.r.l., Meldola, Italy
- DeDietrich Thermique SA, Mertzwiller, France
- DeDietrich Remeha GmbH, Emsdetten, Germany
- EL-MET GmbH, Stolpen, Germany
- ESOT d.o.o., Celje, Slovenia
- Ferro Wärmetechnik GmbH, Schwabach, Germany
- Friederich Detering GmbH, Emden, Germany
- GEA – Happel GmbH & Co. KG, Gaspoltshofen, Austria
- Giersch Enertech GmbH, Hemer, Germany
- Hovalwerke s.r.o., Istebné, Slovakia
- HRB Handel für Haustechnik, Münster, Germany
- Immergas SpA, Brescello, Italy
- Machines Nordiques SA, Aulnay sous bois, France
- MKM Nova d.o.o., Ljubljana, Slovenia
- OEG Öl- und Gasfeuerungsanlagen, Hessisch Oldendorf, Germany
- Oertli - Rohleder Wärmetechnik GmbH, Möglingen, Germany
- Paradigma -- Ritter Energie- und Umwelttechnik GmbH & Co. KG, Karlsbad, Germany
- Pfeiffer und May, Germany
- Potterton Commercial, Warwick, UK
- Richter und Frenzel, Germany
- Sächsische Haustechnik, Germany
- Schulte / KLT Lufttechnik GmbH, Hanau - Wolfgang, Germany
- Sieger Heizsysteme GmbH, Siegen, Germany
- Vaillant GmbH, Remscheid, Germany
- Viessmann Werke GmbH & Co., Allendorf (Eder), Germany
- Weinmann und Schanz, Balingen, Germany
- Weishaupt GmbH, Schwendi, Germany
- Wolf Austria, Linz, Austria
- Wolf GmbH, Mainburg, Germany

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