

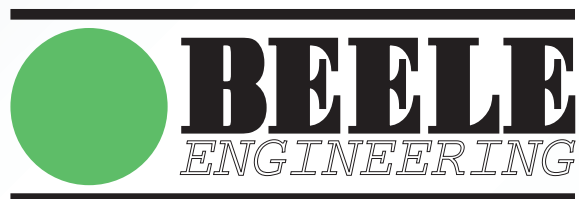
TEST REPORT 022/15

NO FIRNO

NO FIRNO



**INVESTIGATION ABOUT THE RODENT
RESISTANCE OF NOFIRNO® TO PREVENT
DAMAGE TO ELECTRICAL INSTALLATIONS**



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brochure code	: installation NOFIRNO pipe

Test Report 022/15: Comparison of rodent behaviour with different sealings

Site: Workshop at HC-ELECTRIC, Vienna, Austria

Testing sample: 4 items 75mm Polokal piping

Pipe 1: sealed with NOFIRNO® fire-resistant sealant, filler 18/12 and stainless steel grille of mesh width less than 6mm on the inside

Pipe 2: sealed with rock wool sheet 150kg/m³, 60mm thick

Pipe 3: sealed with NOFIRNO® fire-resistant sealant, filler 18/12

Pipe 4: sealed with expanding foam 60mm thick

Three female mice (Mus Musculus)

Aim of the trial:

After a try-out installation in February 2013, mice could be kept away from two running projects at the ÖBB (Austrian National Rail Company) in Prinzersdorf/Austria, where the rodents had caused considerable damage before the start of the project.

With a view to testing the trend, we have now in addition carried out our own internal mouse project with Isi, Lisi and Lotti to demonstrate the effectiveness of our rodent protection with NOFIRNO®.



Test Report 022/15: Comparison of rodent behaviour with different sealings

Method:

A mouse cage was acquired with litter, feed, treats and the mice. Four test pipes of length 250mm were made. A COLLAR sealing flange was glued on one side and fixed to the mouse cage. In the event that the mice succeeded in gnawing through a sealing medium, an EPDM blank plug was installed as escape prevention.

The cages were cleaned once a week. Cleaning the pipe and the upper platform was done daily in order to make any change more easily visible.

The documentation occurred in the Mouse Diary:

An assessment of the subjects was done every day at 08.00.

	Pipe 1	Pipe 2	Pipe 3	Pipe 4
	NOFIRNO®	Mineral wool	NOFIRNO®	Expanding foam
Day 1	-	-	-	-
Day 2	-	gnawed at	urine	faecal traces
Day 3	-	gnawed at	urine	gnawed at
Day 4	-	gnawed at	-	5% gnawed away
Day 5	-	gnawed at	-	10% gnawed away
Day 6	-	gnawed away	-	15% gnawed away
Day 7	-	5% gnawed away	traces of gnawing	15% gnawed away
Day 8	-	5% gnawed away	-	20% gnawed away
Day 9	-	5% gnawed away	-	25% gnawed away
Day 10	-	5% gnawed away	-	35% gnawed away
Day 11	-	5% gnawed away	-	50% gnawed away
Day 12	-	10% gnawed away	-	60% gnawed away
Day 13	-	10% gnawed away	-	70% gnawed away
Day 14	-	15% gnawed away	-	70% gnawed away

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	Pipe 1	Pipe 2	Pipe 3	Pipe 4
	NOFIRNO®	Mineral wool	NOFIRNO®	Expanding foam
Day 15	-	15% gnawed away	-	70% gnawed away
Day 16	-	20% gnawed away	End of trial	End of trial
Day 17	-	20% gnawed away		
Day 18	-	25% gnawed away		
Day 19	-	30% gnawed		
Day 20	-	35% gnawed away		
Day 21	-	35% gnawed away		
Day 22	-	40% gnawed away		
Day 23	-	40% gnawed away		
Day 24	-	50% gnawed away		
	End of trial	End of trial		

Test Report 022/15: Comparison of rodent behaviour with different sealings

Pipe 1 before the test



Pipe 1 after the test

No bite marks detectable.
During the course of the test
only faeces and urine were found in
the pipe.



Test Report 022/15: Comparison of rodent behaviour with different sealings

Pipe 2 before the test



Pipe 2 after the test

The mice had gnawed away more than half the 60mm thick rock wool sheet in the 24 days. Faeces and urine were found in the pipe every day. The pipe with the rock wool seal was regarded as an attractive place to be.



Test Report 022/15: Comparison of rodent behaviour with different sealings

Pipe 3 before the test



Pipe 3 after the test

After seven days, the mice had gnawed at the sides of two fillers and then no longer for the remaining period.



Test Report 022/15: Comparison of rodent behaviour with different sealings

Pipe 4 before the test



Pipe 4 after the test

With the test pipe using expanding foam, the mice had almost gnawed their way through after 14 days. The wall thickness remaining at the thinnest point was less than 10mm.



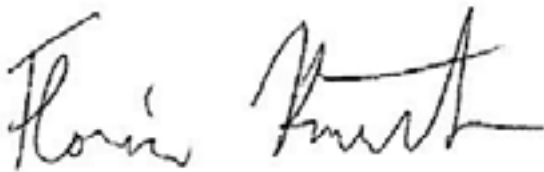
Test Report 022/15: Comparison of rodent behaviour with different sealings

Outcome:

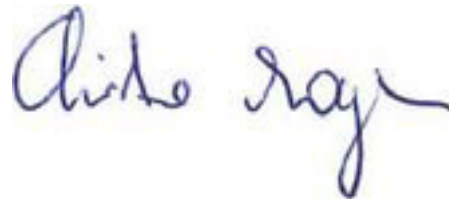
The test showed that over the entire period of 24 days, the pipe with the NOFIRNO® sealant together with filler and stainless steel grille remained undamaged. The mice also lost interest in the NOFIRNO® test sample without grille after tasting it. By contrast, the test samples sealed with rock wool sheeting and the expanding foam were inspected, chewed on and gnawed away to more than half by the rodents. It would only have been a question of time for the mice to eat their way through the expanding foam or the mineral wool.

(Please address any questions to technik@hcelectric.com)

HC-ELECTRIC GMBH



Florian Kräuter



Christa Mayer

Vienna, 08/01/2015

NOFIRNO® - Rodent Protection

The way to keep rodents at bay...

Rodents that find their way into electrical equipment repeatedly cause major damage and outages resulting from short circuits. Apart from faulty, gnawed on and burnt-through cables and switches, these animals cause total system shut-downs, endangering safety, particular in the rail transport sector. These shut-downs may lead to severe disruption of rail traffic, right up to having to use buses to replace trains. Attempts to keep rodents out using polyurethane foam, mineral wool panels, whistles, etc. have been largely unsuccessful.

Following several successful pilot trials, our NOFIRNO® Rodent Protection is now being used extensively by the ÖBB (Austrian National Rail Company). All the electrical operating rooms on the newly constructed route from Vienna to Sankt Pölten have been equipped with the NOFIRNO® Rodent Protection System, and further damage from rodents to the 50 Hz power distribution plants has been permanently prevented by this means.

NOFIRNO® Rodent Protection consists of fire-resistant sealant and fillers adapted to the local conditions that are installed with flange frames, plate metal covers or boards. You will find the precise work steps in the instructions for installation. There are tender documents and product specifications for application in electrical distribution units, floor ducts and cable troughs.

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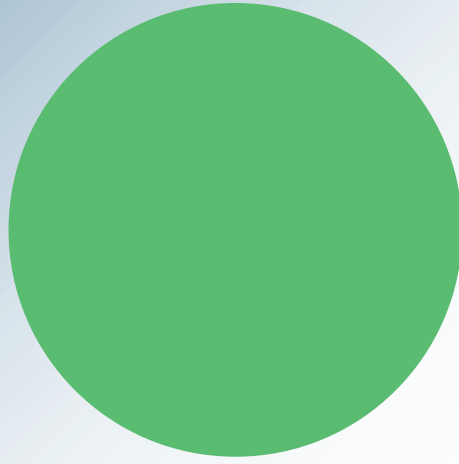
Order processing:

Tel: 01-606 87 88-61
Fax: 01-606 87 88-20
office@hc-electric.com

Technical advice:

Tel: 01-606 87 88-60
technik@hc-electric.com

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BEELE Engineering bv
Beunkdijk 11 - 7122 NZ AALTEN - THE NETHERLANDS
Tel. +31 543 461629 - Fax +31 543 461786 - E-mail: info@beele.com
**Websites: <http://www.beele.com> (and/or www.actifoam.com, www.firsto.com, www.nofirno.com,
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