

Gummiwerk KRAIBURG Elastik GmbH & Co. KG

## Rubber floor mats for animal houses

Manufacturing process certification,  
PAH test



**CONTINUOUS  
MONITORING**  
RUBBER FLOOR MATS  
FOR ANIMAL HOUSES  
✓ PAH harmless  
✓ Manufacturing  
process certification  
DLG Certificate 6890



## Overview

The DLG quality marks and seals stand for independent tests and certifications of products, systems and processes (such as manufacturing processes) that are based on requirements that are drawn from the field. The test criteria are laid down by independent test commissions that are made up by volunteer experts. These criteria describe the methods of testing the essential and value determining features of products or processes. The specifications that define a specific quality of a product or process are drawn from the field and are in line with the latest scientific findings. The quality mark is awarded to a product or process after the test has revealed that it complies with the high DLG standards. Depending on the type of test and product group, the mark is either awarded under the RAL quality assurance scheme or as DLG quality mark under the DLG quality standards scheme. The DLG tests provide consumers with valuable purchase information and at the same time ensure that the quality of the tested product is maintained at a consistently high level. By submitting their products to a DLG test, manufacturers agree to accept an ongoing and independent quality monitoring programme for the products, systems and processes tested. This programme is subsequently carried out by qualified samplers and auditors who on an ongoing basis take unannounced samples at the manufacturer's or dealer's premises for subsequent analysis or carry out audit processes.



This DLG quality mark test involved an assessment and evaluation of the quality assurance programme as implemented in the manufacturing process of floor mats for animal houses and also involved measuring PAH migration to Tenax in all rubber blends. The test was based on the 'Project report on PAH migration from rubber floor mats' as provided by Fraunhofer-Institut für Verfahrenstechnik und Verpackung IVV, Freising, Germany, dated 8 August 2018.

The manufacturing process was certified to the ISO 9001 : 2015 standard. This standard defines the introduction and enforcement of a quality management system within an organisation. It affects all organisational processes that have an impact on customer demands and legal requirements. The audit of the Tittmoning production site covered all processes that are relevant for achieving a consistently high quality of the product. It focused on the entire manufacturing chain – from procurement of the raw materials to the moment the finished product is prepared for delivery. At the same time, the DLG testers took random samples of the manufactured products and tested these for compliance with defined PAH limits (Conformity of Production). After the certification is awarded to the product qualities and processes defined, an monitoring programme is installed at the Tittmoning production site which involves DLG experts assessing the products and processes for PAH limit compliance on an ongoing basis.

## Assessment – Brief Summary

Table 1:  
Summary of test results

Parameter tested	Test result	DLG requirement
<b>Quality assurance in the manufacturing of floor mats for animal houses</b>	The overall impression of the company as gained by the auditors was very good. The company is very quality-conscious and has implemented the quality management system in every aspect. The staff interviewed are knowledgeable and show a high commitment to their individual areas of work.	<b>Quality management system in place, applied and adhered</b>
<b>PAH migration to Tenax</b>	All rubber blends comply with 15+1 EU SCF-PAH and 8 EU REACH-PAH standards	$\leq 10 \mu\text{g}/\text{dm}^2$ (15+1 EU SCF-PAH) $\leq 5 \mu\text{g}/\text{dm}^2$ (8 EU REACH-PAH)

## The Product

### Manufacturer and Applicant

Gummiwerk KRAIBURG Elastik GmbH & Co. KG, Göllstraße 8, 84529 Tittmoning, Germany

Products:

Rubber floor mats for animal houses

Contact:

Telephone +49 (0)8683 701-0, Telefax +49 (0)8683 701-126,

info@KRAIBURG-elastik.de, www.KRAIBURG-elastik.de,

www.kraiburg-belmondo.de

### Description and Technical Data

Gummiwerk KRAIBURG Elastik GmbH & Co. KG manufactures rubber mats for cattle, pigs and horses. The mats are used to floor aisles and cubicles. The mats are manufactured from various rubber blends.

All blends were tested for compliance with the quality assurance standards for manufacturing processes and PAH migration (Polycyclic Aromatic Hydrocarbons).

## The Method

### Assessing the quality assurance measures

The assessment for certifying the production processes at the Tittmoning production site was carried out to ISO 9001:2015. The manufacturing process was assessed by evaluating the following criteria:

- Quality systems
- Responsibilities, authorisations and communication
- Human resources
- Procurement of the raw materials
- Marking and traceability
- Preservation of product
- Control of monitoring and measuring equipment
- Control of defective products
- Corrective action

### PAH migration to Tenax

PAH migration testing was carried out by taking samples from all rubber blends that are produced at the production site.

The testing was carried out to the EN 62841-13b standard.

### Parameters

- Simulating a modified Polyphenylene Oxide (MPPO, Tenax)
- Contact time: 10 days
- Temperature: 40 °C
- Contact surface: 0.5 dm<sup>2</sup>
- Quantity: 2 g Tenax

The tests involved cutting a 0.5 dm<sup>2</sup> patch from the sample and applying 2 g of Tenax powder on it (one-sided contact layer). The weight of each patch was obtained by weighing it on analysis scales.

At the end of the contact time, the migrating contact was terminated by removing the Tenax powder from the samples. Then the Tenax was extracted at 40 °C during 24 hours with n-Hexane by adding an isotope-marked PAH standard blend (internal standard) and the n-Hexane extracts were cleaned before the GS-MS measurement was taken using SPE.

The test was carried out by applying duplicate measurements.



### Evaluating the quality assurance measures

A quality management system is in place and is applied. The criteria tested comply with the requirements. The overall impression of the company as gained by the auditors was very good. The company is very quality-conscious and has implemented the quality management system in every aspect. The staff interviewed are knowledgeable and show a high commitment to their individual areas of work.

Specific quality standards have been defined and implemented. These ensure that the properties of the products are consistently maintained and no impure raw materials can enter the production process. It was also shown that the manufacturing process ensures no PAH contamination can take place.



Figure 2 and 3:  
Inspecting the raw materials stock

### PAH migration to Tenax

All rubber blends produced at the site were tested.

PAH migration to Tenax was found to be less than what is legally permitted. This applies to all Kraiburg rubber blends tested.

Benchmarks:

10 µg/dm<sup>2</sup> for 15+1 EU SCF-PAH  
and

5 µg/dm<sup>2</sup> for 8 EU REACH-PAH



Figure 4:  
Selecting samples for testing at the stockroom

## Summary

The manufacturing processes of all rubber mats for animal houses made by Gummiwerk KRAIBURG Elastik GmbH & Co. KG at the company's Tittmoning production site were inspected and assessed.

Also, PAH migration from all manufactured rubber blends to Tenax powder was tested.

All criteria tested complied with the requirements.

## More information

### Test implementation

DLG TestService GmbH, Gross-Umstadt location

The tests are conducted on behalf of DLG e.V.

### DLG test scope

Quality mark test 'Project report on PAH migration from rubber floor mats' provided by Fraunhofer-Institut für Verfahrenstechnik und Verpackung IVV, Freising, Germany

Checklist used for the assessment in accordance with ISO 9002:2015

### Department

Betriebsmittel

### Head of Department

Dr. Michael Eise

### Test engineer(s)

Dr. Harald Reubold\*

### Spezialuntersuchungen

Fraunhofer-Institut Verfahrenstechnik und Verpackung,  
Giggenhauser Straße 35,  
D-85354 Freising

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\* Author

## DLG – the open network and professional voice

Founded in 1885 by the German engineer Max Eyth, DLG (Deutsche Landwirtschafts-Gesellschaft – German Agricultural Society) is an expert organisation in the fields of agriculture, agribusiness and the food sector. Its mission is to promote progress through the transfer of knowledge, quality standards and technology. As such, DLG is an open network and acts as the professional voice of the agricultural, agribusiness and food sectors.

As one of the leading organisations in the agricultural and food market, DLG organises international trade fairs and events in the specialist areas of crop production, animal husbandry, machinery and equipment for farming and forestry work as well as energy supply and food technology. DLG's quality tests for food, agricultural equipment and farm inputs are highly acclaimed around the world.

For more than 130 years, our mission has also been to promote dialogue between academia, farmers and the general public across disciplines and national

borders. As an open and independent organisation, our network of experts collaborate with farmers, academics, consultants, policymakers and specialists in administration in the development of future-proof solutions for the challenges facing the agriculture and the food industry.

### Leaders in the testing of agricultural equipment and input products

The DLG Test Center Technology and Farm Inputs and its test methods, test profiles and quality seals hold a leading position in testing and certifying equipment and inputs for the agricultural industry. Our test methods and test profiles are developed by an independent and impartial commission to simulate in-field applications of the products. All tests are carried out using state-of-the-art techniques at our ultra-modern facilities applying also international standards. The actual testing agency is the DLG TestService GmbH which holds multiple accreditations to perform these tests.

Internal test code DLG: 2018-131

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**DLG TestService GmbH**  
**Groß-Umstadt location**

Max-Eyth-Weg 1 • 64823 Groß-Umstadt • Germany  
Phone: +49 69 24788-600 • Fax: +49 69 24788-690  
Tech@DLG.org • www.DLG.org

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