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TAPVEI® is the world's leading producer of aspen products for animal welfare.

Since 1982, TAPVEI has been producing the highest **quality bedding, nesting material and environmental enrichments** for laboratory animals. TAPVEI is a **quality-driven company**, providing controlled laboratory environments for your animal research. In our production process we use naturally grown **Nordic aspen** (*Populus tremula*) and **renewable energy**.

Raw material

All TAPVEI® products are made from aspen (*Populus tremula*) – a natural hardwood from the pristine Nordic environment. Out of the multitude of studies carried out with various species and animal breeds, hardwood materials are typically found to produce the least undesirable side effects on experimental results.

Research and development

TAPVEI runs an in-house research program on product quality and physical properties, as well as an out-sourced product development research program with independent centres of laboratory animal research in Estonia and Finland. Our research is grounded in well established customer relations in order to directly serve our customers' needs.

Quality assessments

Finished products are regularly tested for microbiological, chemical and environmental contaminants in independent laboratories. All TAPVEI® products are compliant with GV-Solas requirements for animal feed.

Environmental responsibility

The whole production process of TAPVEI® products follows high ecological standards. It starts with using untreated raw material from the intact Nordic wilderness under a Forest Stewardship Council® certified (FSC®) chain of custody and is followed by use of bioenergy for heating the production plant. Our products are biodegradable. Quality is ensured by applying the ISO 9001:2008 and ISO 14001:2004 standards.

Aspen in animal research

There are various reasons why the highest quality laboratories prefer aspen products to other raw materials (softwood, corncob, cellulose).

Most specifically, the discoveries of softwood bedding cytotoxicity and its effects on the metabolism of pharmacological agents under research have prompted research labs to switch to aspen bedding.

Additionally, mice and rats alike generally prefer aspen chips over softwood sawdust and corncob bedding. From amongst various types of hardwood, aspen is preferred due to its lower dust count. Aspen bedding shows high absorptive properties, and hardwood in general guarantees the lowest ammonia concentrations in rodent cages. Even when purposely contaminated with fungi, aspen chip bedding does not encourage the growth of fungi in the rodent cage environment (see Additional reading sections for references).

Products

TAPVEI offers a full range of products to serve laboratory animal needs for bedding, nesting material and environmental enrichments.

Bedding is a compulsory element according to current laboratory animal welfare regulations and one of the main materials to which animals are continuously exposed. Its main practical purpose is to absorb moisture and ammonia from animal urine and faeces. It should also be pleasant and harmless for animals and support **species-specific behaviours** like nesting. High production standards help to avoid indirect maintenance and research costs of bedding-induced variability in research results. Hence, research-grade laboratory animal bedding is highly suggested.

TAPVEI® aspen bedding

Our innovative technology ensures that TAPVEI® bedding material has no sharp edges. This significantly reduces dust levels, which in turn has a major impact on dust-related costs and the operational problems associated with excessive dust. The moisture content and absorption capacity of TAPVEI® aspen bedding is achieved by an automatic drying process with 100-120 °C clean air and heated by environmental-friendly bioenergy. It also ensures that the bedding is microbiologically clean and fulfils corresponding requirements of the GLP standard.

- Raw material – aspen (*Populus tremula*)
- Moisture content around 10%
- Relative density 180-200 kg/m³
- Absorbing capacity 260%
- Dust content (particles < 0.25mm), less than 0.1%
- Binding of ammonium 26mg/L
- Ideal for use within automated bedding dispensers
- Recommended for IVC isolators and automated systems
- Autoclavable
- Biodegradable
- Full batch analysis
- Dried using only 100% renewable bioenergy
- Safe for animal and human respiratory tracts



Bedding 5x5x1 mm



Bedding 2x2x1 mm

TAPVEI® bedding is available in different packaging options: paper, vacuum and fiber.

Quality Certificates

With the obvious effects that TAPVEI's production of natural bedding, nesting and enrichment products have on the environment, ecological thinking and activities are inevitable in our business. In order to minimise environmental impact, constant attention is paid to decreasing and avoiding possible ecological harm. As a part of this process, we follow the responsible forest management practises of FSC, an international organisation that guarantees the origin of raw material. The management system of TAPVEI Estonia OÜ has been approved by ISO 9001:2008 and ISO 14001:2004 standards.



Certificates of Analysis

The microbiological and chemical composition of TAPVEI® products is screened quarterly in independent laboratories and compared to the limits set by GV-Solas guidelines for animal feed. Our products are screened for over 200 different compounds. TAPVEI's requirements for raw material, facilities, production and storage have guaranteed an outstanding quality standard for many years in a row.

Source: **Guidelines for the quality-secured production of laboratory animal feed.**

Society for Laboratory Animal Science, Committee for the Nutrition of Laboratory Animals, August 2001.

Microbiological critical values

		Critical value
Aerobic total germ count	§64 LFGB 06.00-18*	$<1 \times 10^5$
Yeasts/Moulds	§64 LFGB 01.00-37*	$<1 \times 10^3$
Enterobacteriaceae	§64 LFGB 05.00-5*	100
E.coli		10
Coagulase-positive staphylococci	§64 LFGB 00.00-55*	10
Salmonella	§64 LFGB 00.00-20*	–

*official method

cfu: colony forming unit

Critical values of contaminants

Chlorinated hydrocarbons	mg/kg	Phosphoric acid ester	mg/kg
HCB	0,01	Malathione	1,0
o, β, d-HCH	0,02	Fenitrothione	1,0
g-HCH (Lindane)	0,10	Pirimiphos (-methyl)	1,0
Heptachlorine and -epoxide	0,01	Chlorpyrifos (-methyl)	1,0
o, g-Chlordane	0,02	Other phosphoric acid esters	0,5
Aldrin and Dieldrin	0,01		
Endrine	0,01		
DDE + DDD + DDT	0,05		
o, s Endosulfane and -sulfate	0,10		
		Poly-chlorinated biphenyls (PCB)	0,05

Heavy metals	
Arsenic	1,0
Lead	1,5
Cadmium	0,4
Mercury	0,1
Fluorine	150

Nitrosamines	
Nitrosodiethylamine (NDEA)	0,01
Nitrosodimethylamine (NDMA)	0,01

Dry weight 88%

Mykotoxins	
Alfatoxin B1	0,010
Alfatoxin B2	0,005
Alfatoxin G1	0,005
Alfatoxin G2	0,005

Fusarien toxins	
Deoxynivalenole	0,500
Ochratoxin	0,100
Zearalenone	0,100

TAPVEI® bedding certificate of analysis

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75408 Harjumaa
ESTLAND

Date 27.01.2017

Customer no. 10076953

REPORT 1995276 - 194263

Order 1995276
Sample no. 194263
Sample acceptance 17.01.2017
Date of sampling 10.01.2017
Sample code Aspen chips (Populus tremula) - Batch 100117E
Packaging plastic bag

Unit Result Declaration Substance Method

Pesticides Multi-Residue-Methods (complete list see appendix)

In the range of performed analysis no pesticides were detected above limit of quantification.

Physico-chemical parameters

Nitrate	mg/kg	<25		OM	DIN EN ISO 10304-1 (D 20)
Nitrite	mg/kg	<1,0		OM	DIN EN ISO 14673-3

Trace-elements / Heavy metals

Boron	mg/kg	3,57		OM	DIN EN 15621 (mod.)
Fluorine, detected as Fluoride	mg/kg	<40		OM	EN 16279
Copper (Cu)	mg/kg	<5,00 ^{m)}		OM	DIN EN 15621
Zinc (Zn)	mg/kg	6,71		OM	DIN EN 15621
Selenium (Se)	mg/kg	<0,10		OM	DIN EN 15763 (mod.)
Cadmium (Cd)	mg/kg	0,10		OM	DIN EN 15763
Lead (Pb)	mg/kg	<0,10		OM	DIN EN 15763
Mercury (Hg)	mg/kg	<0,02		OM	DIN EN 16277 (mod.)
Arsenic (As)	mg/kg	<0,10		OM	DIN EN 15763 / VDLUFA VII, 2.2.2.5

Mycotoxins

Aflatoxine B1	µg/kg	<1,0 ^{m)}		OM	in-house method LC/MS/MS
Aflatoxine B2	µg/kg	<0,5		OM	in-house method LC/MS/MS
Aflatoxine G1	µg/kg	<1,0 ^{m)}		OM	in-house method LC/MS/MS
Aflatoxine G2	µg/kg	<1,0 ^{m)}		OM	in-house method LC/MS/MS

Non-dioxinlike PCB (ndl-PCB)

Sum ndl-PCB (upper-bound)	µg/kg	4,8 ^(x5)		OM	calculated
PCB 28	mg/kg	<0,0008		OM	DIN EN 12393-2 (mod.) / DIN EN 12393-3 (mod.)
PCB 52	mg/kg	<0,0008		OM	DIN EN 12393-2 (mod.) / DIN EN 12393-3 (mod.)
PCB 101	mg/kg	<0,0008		OM	DIN EN 12393-2 (mod.) / DIN EN 12393-3 (mod.)
PCB 138	mg/kg	<0,0008		OM	DIN EN 12393-2 (mod.) / DIN EN 12393-3 (mod.)
PCB 153	mg/kg	<0,0008		OM	DIN EN 12393-2 (mod.) / DIN EN 12393-3 (mod.)
PCB 180	mg/kg	<0,0008		OM	DIN EN 12393-2 (mod.) / DIN EN 12393-3 (mod.)

Microbiological examinations

Escherichia coli	cfu/g	<10 (LOD)		OM	ISO 16649-1
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Geschäftsführer
Dr. Paul Wimmer



Deutsche
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LUFA-ITL GmbH

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Date 27.01.2017

Customer no. 10076953

REPORT 1995276 - 194263

	Unit	Result Declaration	Substance	Method
Clostridium spp., sulfite-reducing, MPN	in 1g	<2	OM	conform VDLUFA VI, 7.18.4 (mod.)
Enterococcus spp.	cfu/g	<100 (LOD)	OM	DIN EN ISO 7899-2 (mod.) n)
Total viable count	cfu/g	<100 (LOD)	OM	conform VDLUFA III, 28.1.2
Coliform bacteria	cfu/g	<10 (LOD)	OM	ISO 4832
Moulds	cfu/g	<100 (LOD)	OM	conform VDLUFA III, 28.1.2
Yeasts	cfu/g	<100 (LOD)	OM	conform VDLUFA III, 28.1.2
Salmonella spp. in 25g		not detected	OM	ISO 6579

xx5) For each single result below the LOQ, the LOQ was used for the calculation.

m) Due to the disturbing influence of the sample matrix, the limit of detection resp. limit of quantitation was increased.

Explanation: "<" or "n.q." represent the fact that the concentration of the analyte is below the limit of quantification (LOQ).

The sign "<"...."(LOD)" or n.d. in column result means, the substance concerned can not be detected within the limit of detection.

Explanation: OM = on original matter; DM = on dry matter base

n) Not accredited

LUFA - ITL Frau Dr. Verena Gonzalez Lopez, Tel. 0431/1228-316
Customer Relations Management feed

Start of testing: 17.01.2017

End of testing: 26.01.2017

The analytical results are only valid for the delivered sample material. A plausibility check is hardly possible for samples of unknown origin.
Duplication of this document or of parts of it requires the authorization from laboratory.

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