UKAS TESTING
0076

TECHNICAL REPORT			
Description of samples received:	*1 chamois sample*	**BLC Job ref:**	*AA067 2468 final*
Unique customer reference:	*853A*	**Page:**	*1 of 5*

ADDITIONAL INFORMATION			
Contact name:	Robert Margossian	**Date work received:**	22/06/07
Customer Order No:	None supplied	**Date out:**	09/07/07
Supplying:	Not given	**Specification:**	BS6715:1991 (except for formaldehyde)

TESTING OF CHAMOIS LEATHER

Test	Method	Requirement	Results	Pass/Fail
pH	BS 1309:1974 method 9	5.0 to 10.5	*pH = 6.97*	***Pass***
Grease content (14% fat free)	BS 1309:1974 method 4	Max 15%	*5.7%*	***Pass***
Ash content (14% fat free)	BS1309:1974 method 6	Max 24%	*3.6%*	***Pass***
Total oils, fat and ash	BS1309:1974 method 4 and 6	Max 35%	*9.3%*	***Pass***
weight per unit area (based on 30cm^2)	MBS6715:1991 7.2	1st class leather - Min 0.030 g/cm^2 2nd class leather – Min 0.0225g/cm^2	*0.040g/cm^2*	***Pass***
Water absorption	BS6715:1991 appendix B	Min 375%	*853A – 645.4* *853B – 610.3*	***Pass***
Formaldehyde	BLC 7A.9 based on CEN ISO TS 17226:2003 (HPLC analysis)	BLC requirement – Max 200mg/kg	*16.6 mg/kg*	***Pass***

Technical Notes

- Formaldehyde - The sample was finely ground, accurately weighed, extracted and subjected to analysis as described in the method. Analysis was carried out according to the HPLC analysis of CEN ISO TS 17226:2003, which involves reaction of the formaldehyde with 2,4-dinitrophenylhydrazine to produce a coloured derivative. This was then analysed using High Performance Liquid Chromatography (HPLC). Identification and quantification were done by using retention time data from accurately known standards.

Conclusions

The chamois sample has complied with the BS6715:1991 requirements.

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Robert Margossian Dermatech International Ltd Unit 5 Hampstead Gate 1A Frognal London, NW3 6AL		Head of Section	Testing Manager

BLC Leather Technology Limited, Leather Trade House, Kings Park Road, Moulton Park, Northampton, NN3 6JD, UK
Tel +44 (0) 1604 679999 Fax +44 (0) 1604 679998 Email: info@blcleathertech.com Registered No 3514845 (England)
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Composting test

Introduction

Composting is defined as the breaking down of organic matter by microbes in a moist, warm, aerated environment. The microbes take oxygen from the air and food from the organic material. Carbon is the principle source of energy and nitrogen is used to promote cell synthesis. Part of the energy released by the organisms is in the form of heat. As a result of these activities, the compost heap passes through warming up, attaining a gradual peak in temperature, cooling and maturing phases.

Experimental part

The biodegradability of chamois leather was studied using a compost environment. Different batches of experiments were carried out to achieve the optimum conditions and understand the environmental and mechanism of the process. These batches were carried out under the following conditions:

- 1/ Biological process only
- 2/ Biological process using an accelerator and heating at 60°C with a thermostat for 7 days
- 3/ Biological process heating at 60°C with a thermostat for 7 days

The process that takes place in the composter is (follows this reaction):

$$\text{Organic mater} + O_2 + \text{bacteria} \text{ ---------- } \text{new bacteria} + \text{compost} + CO_2 + H_2O + NH_3$$

The main parameters considered when charging and controlling the composter were:

- Temperature: evolution during composting 18-60°C
- Moisture: 50-60%
- C/N ratio: 20-30/1
- pH: variation during process 5-8
- Size of the organic matter

The composter used for the trials can be seen in Figure 1.

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Figure 1: Composter used for the experiments

Batch 1
3 replicate samples (40mm x 50mm) were conditioned for 48 hours at 20°C and 65% RH before placing them in the composter.

Batch 2 and 3
3 replicate samples (40mm x 50mm) and other 2 replicates (40mm x 150mm) respectively were conditioned under the same conditions.

The dimensions of each sample were measured and the substance in 3 places along the length of the pieces. They were weighed and tagged with numbered plastic tags for identification purposes and the shrinkage temperature was measured using DSC (Differential scanning calorimetry) for all of the samples. This shrinkage temperature was used as a method to determine thermal stability and see when detannin occurred.

Temperature, moisture level and pH were monitored (measured) and recorded regularly during the process.

Results and discussion

The reaction process was triggered by micro-organisms and took place in three stages (thermophilic, mesophilic and stabilising) at different temperatures over a total period of at least 5 months for the natural biological process. With the use of accelerator (based on enzymes plus bacteries) the time was reduced.

Batch 1 Biological process only.
The original samples can be seen in Figure 2. Figures 3 and 4 show the result of biodegradation after 2 months and the further biodegradation after 3 months.

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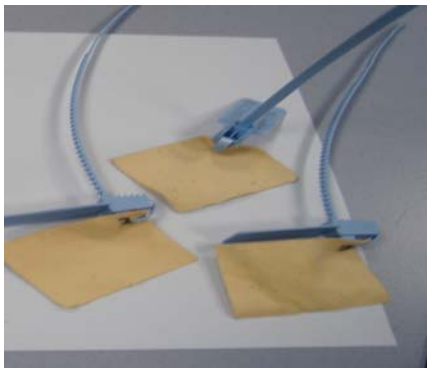

Figure 2: Original samples for the first batch

Figure 3: Sample from first batch after 2 months

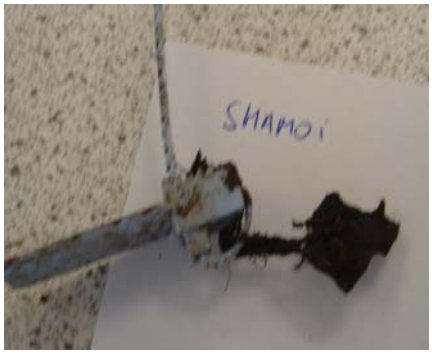

Figure 4: Sample from first batch after 3 months

Batch 2 and 3, these batches were carried out by introducing of heat control and addition of an accelerator.
The original samples can be seen in Figure 5. It can be seen from the results of Figure 6 that with both accelerator and heat control the speed of biodegradation is increased, showing similar degradation to that in Figure 4 but this time after 1.5 months.

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Figure 5: Original samples for batch 2

Figure 6: Samples from batch 2 (using accelerator) and batch 3 (without using accelerator) after 1.5 months

Conclusions

The chamois sample is biodegradable under natural biological conditions but the speed of degradation can be influenced by use of special accelerator. By controlling the conditions, biodegradability of this chamois leather should take place within 6 months.

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