NZWTA

FACT SHEET

CHEMICAL TREATMENTS IN SCOURED WOOL – THE ALKALI SOLUBILITY TEST

Background

Scouring wool can often involve a number of chemical treatments in order to standardise its colour or provide additional properties to improve its intended product-use. Some of these chemicals may cause damage to the wool, the likes of which is not necessarily obvious to the eye.

Tests for damage are based around the principle that wool shows an increased solubility in alkaline solutions when attacked by oxidising or reducing agents, acids, or exposure to heat or light. Most testing on scoured wool is conducted to quantify the damage caused by hydrogen peroxide bleaching, a chemical regularly used to produce a whiter visual appearance for the wool.

The Alkali Solubility Standard

This test is conducted according to test method IWTO DTM-4. It involves the treatment of a dry wool sample in sodium hydroxide under controlled conditions of time, temperature and volume. The alkali solubility is calculated as the loss of the mass of the treated specimen expressed as a percentage of its oven dry mass.

The results reported are:

(a) The pH of the aqueous extract

(b) The individual alkali solubility for each specimen and the mean result for the sample

The test is most useful when an untreated control sample is available and when the nature of the treatment of the sample under test is known. When the sample has been treated by two agencies having opposite effects on the solubility, the interpretation of the results even when an untreated control sample is available, is difficult and may be misleading. The test does not provide an absolute measure of damage, instead is useful as an indicator of relative levels of damage.

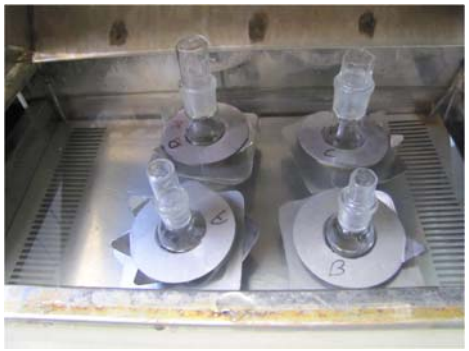

Fig 1: Samples sitting in a water bath during test preparation

Application of the Standard

The alkali solubility of crossbred wool that has not been chemically modified to any significant extent usually lies within the range of 11 – 14%. Evidence suggests that fine wool (e.g. Merino wool) may normally exhibit higher solubility (up to 18%) due to the greater surface area exposed to the treatment.

Fig 2: Sample after sitting in a water bath

Wools subjected to moderate levels of peroxide during the scouring process can produce alkali solubility levels exceeding 20%. Heavily bleached wools can produce results over 30%.

For more information on Alkali Solubility testing, contact NZWTA on +64 6 835 1086 or email: testing@nzwta.co.nz