

SGS Wool Testing Services

Info-bulletin

Condition tests

What is wool "condition"?

Quite simply, wool's "condition" is the amount of moisture in a given mass. Condition tests were one of the earliest laboratory tests carried out for certification of wool consignments. The reason for this is straightforward. It was once said that the wool merchants of Bradford got rich by selling huge amounts of water.

At "normal" atmospheric conditions of humidity, wool contains between 11% and 16% water expressed as a proportion of the oven-dry weight. This is known as the **regain**. Alternatively, if we dry a weight of wool, we drive off a percentage of water, and this figure is known as the **moisture content**.

The chart shows the relationship between regain, moisture content and atmospheric humidity. It can be seen that the relationship is complicated by the fact that wool holds different quantities of water depending on whether the water is being adsorbed or desorbed. The difference between the two curves expresses the energy involved in binding the water to the wool.

How is "condition" determined?

The condition of a wool sample is determined by condition testing. This is a fancy term for establishing the moisture content by carefully controlled drying. Depending on the throughput of the laboratory this may be achieved by drying a known weight of wool to constant mass in a specially-designed "conditioning oven"; or by using a forced hot air drier.

Capacitance instruments are also available for quality control laboratories. These work by measuring the effect of the water in the test volume on the electrical characteristics of that volume. Since they do not measure the moisture content directly, and have to be calibrated for the way in which the wool is presented.

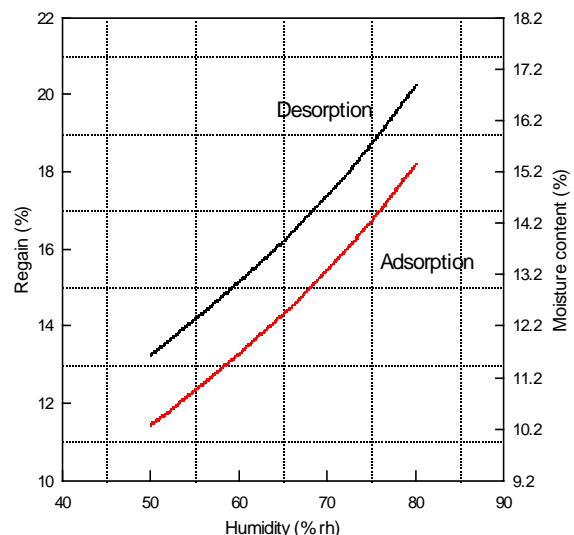
IWTO used to maintain a register of "conditioning houses" around the world. These were laboratories that had been regularly audited by independent technical assessors and deemed competent to follow the reference method.

At the Harrogate (May 1995) meeting of IWTO, it was agreed that conditioning should be incorporated in the new, more stringent, IWTO laboratory licensing scheme, which is based on ISO 17025 laboratory accreditation. Test houses in New Zealand have been accredited against ISO 17025 for all their wool certification since 1990.

Conditioned invoice mass

Condition testing is used to determine the conditioned invoice mass of a consignment. The consignment is weighed and cored in compliance with the IWTO regulations, and the core sample dried to determine the regain (or moisture content) at the time of sampling.

The consignment net weight is the weight of wool after allowing for the weight of packaging or "tare". The tare varies depending on the type of packaging and its size. The net



Regain, moisture content and atmospheric humidity

weight of the consignment plus the regain allows the actual weight of dry material to be calculated. This weight is then multiplied by 1.16 or 1.17 to allow for a regain of 16% or 17% (depending on the contract specification).

This calculated weight is the **conditioned invoice mass**, which is a standardised mass. It is important to recognise that it can vary significantly from the net mass of the consignment depending on the moisture content at the time of weighing.

Commercial implications

Nearly 90% of the wool produced in New Zealand is scoured here. Generally scours dry the wool to less than the standardised regain in order to guard against the possibility of damage from localised damp spots.

As an example, a 16 tonne contract may have a net mass of 15,950 kg at the time of core sampling, with a regain of 15.8%. However, the certified invoice mass at 17% would be 16,115 kg, and this is what the purchaser will be invoiced.

In some countries the natural humidity is very low, and wool stored under these conditions will slowly lose weight as the moisture evaporates. The weight of individual bales 3 months after they were weighed and tested in New Zealand may therefore be significantly lower than shown on the weight note, although the amount of wool fibre is the same.

It can be seen that the price per kilo of wool either has to vary depending on the moisture content, or must be fixed based on the conditioned invoice mass. As the actual moisture content will vary to some degree from bale to bale in a consignment, it is desirable to have a measure of the moisture content for each sales transaction.