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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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Leather and fur - Limit of harmful matter

皮革和毛皮 有害物质限量

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1 Scope

This standard specifies the limits for the harmful substances in leather and fur, together with the test methods, the inspection rules and the marking.

It applies to leather and to fur, and to the leather and fur parts of articles made from them for everyday use.

Note on the edition: this is the 2006 edition. The requirements below are those it establishes; a later revision of GB 20400 extends the list of controlled substances considerably, and a specification that needs the current state of the law should check which edition applies to it.

4 Requirements

The substances controlled are the azo dyes that release carcinogenic aromatic amines under reducing conditions, free formaldehyde, and hexavalent chromium.

The three arrive by three different routes, which is why they are controlled together. The amines come from the dyeing; the formaldehyde from the tanning and the finishing resins; and the hexavalent chromium from the chrome tanning itself, where trivalent chromium is oxidised to the hexavalent form under heat, light or the wrong pH.

The limits are applied to the accessible parts of an article, that is, to what touches the wearer or the user. A leather lining and an outer sole are not in the same position, and the standard distinguishes by contact rather than by material.

Hexavalent chromium is made, not added

About four fifths of the world's leather is chrome tanned, using basic chromium sulphate in the trivalent state. Trivalent chromium is essentially harmless in this use and is what makes

the leather what it is: soft, heat resistant and durable.

Hexavalent chromium is a different substance entirely - a sensitiser and a carcinogen - and nobody puts it into leather. It forms afterwards, in the finished article, when trivalent chromium is oxidised: by heat during drying, by light, by ageing of the fatliquors, and above all when the pH of the leather has drifted upwards.

That is what makes it a requirement rather than a formulation rule. A tannery can use no hexavalent chromium at all and still ship leather that contains it, and the same hide can test clean at despatch and positive after a summer in a warehouse.

It also explains why the test is on the finished article. What matters is the state the leather is in when somebody wears it, and that state is produced by the whole history of the material rather than by anything a tanner declares.

What is controlled and why

Tanning is a chemical process, and not all of its reagents leave with the effluent. What the standard controls are the substances that reach the wearer through prolonged contact with the skin.

The free formaldehyde comes from the resin finishes and from certain retanning agents and is a skin sensitiser, so it is limited numerically. The aromatic amines that can be released by the reduction of decomposable azo colourants are prohibited outright rather than limited, as they are in the textile regulation this standard sits alongside.

How the limits are applied

As with textiles, the limits are graded by the use of the article, so that goods for infants and goods in direct contact with the skin are held to tighter figures than goods that are not.

Clause 5 refers each determination to the corresponding leather test method, clause 6 sets the inspection rules, and clause 7 sets what the marking must declare so that a purchaser can tell which category the article was made to.

Why the azo dye limit is written as a release

The requirement is not that the leather contains no azo dyes. Most dyes used on leather are azo dyes and the great majority of them are harmless; the requirement is that the dye does not release certain aromatic amines under reducing conditions.

The reducing conditions are the point. Human skin and gut carry bacteria that cleave the azo bond, and a dye that is inert in a bottle can be split in contact with sweat or after ingestion into two amine fragments. It is the fragments that are carcinogenic, not the dye.

This is why the test is a reductive cleavage followed by a chromatographic determination,

and why a supplier cannot answer it with a declaration of what was used. A dye house that has switched to compliant dyes still has to demonstrate it on the leather, because the same amine can arrive from a pigment in a finish or from a previous batch on the same drum.

Accessible parts, and where the limits bite hardest

The standard applies to the accessible leather and fur components of an article, which sounds like a technicality and is the clause that decides what a manufacturer has to test.

A shoe upper, a watch strap, a glove lining and a bag handle are in prolonged contact with skin, often damp with sweat, and they carry the strictest attention. A sole, a stiffener or an internal reinforcement is inside the construction and reaches nobody.

The distinction also explains the emphasis on formaldehyde. It is used in the tanning and in the finishing resins, it is volatile, and it migrates out of the leather over time - which means the part of an article that releases it into the air a wearer breathes is not necessarily the part that touches them.