Bisphenols in Leather

Conference: 13th AICLST, Kolkata, 6–8 March 2026

Paper reference: K/TI-114/O

Printed pages: 139–140

Source: *Leather 2050: Challenges & Opportunities*, ILTA (2026)

Bisphenols in Leather Volkar Rabe*, Biju Francis, Catherine Gabagnou, Jens Fennen

Key Note Address

Ref. No. K/TI-114/O

TFL Ledertechnik GmbH

Abstract

Bisphenols are under scientific and regulatory scrutiny due to their endocrine activity and potential environmental and health risks. In leather production, certain bisphenols can occur as ingredients or byproducts in leather chemicals and may transfer into finished leather. Although the planned EU restriction in 2023 was withdrawn, bisphenols remain relevant for ongoing assessments and regulatory discussions. In addition to EU regulations, international regulatory frameworks such as California Proposition 65 further contribute to the global relevance of this topic.

This presentation provides an overview of bisphenols relevant to leather and leather chemicals, and potential pathways in leather processing. The current regulatory situation is outlined, including the withdrawn restriction, ongoing evaluations, and expected next steps. It is emphasized that EU regulations apply regardless of the country of production, affecting imported leather, and that brand-specific restricted substance lists also need to be considered.

Analytical methods for measuring bisphenol levels and their transfer into leather are highlighted. It will be shown that based on experimental data obtained from practical test setups, these levels can also be calculated. Finally, strategies to reduce bisphenols in leather are discussed, supporting compliance with current and potential future regulatory requirements.

Keywords : Bisphenols, Regulation, Leather chemicals, Leather, Analytical methods

Corresponding author E-mail : volkar.rabe@tfl.com

1. Introduction

Leather production relies on polymer-based auxiliaries to achieve softness, filling, and color stability. At the same time, bisphenols, especially Bisphenol S (BPS) and Bisphenol F (BPF), have come under scrutiny due to their potential as endocrine disruptors. These substances can migrate into leather via synthetic retanning agents and are subject to both regulatory restrictions and brand requirements.

2. What Are Bisphenols and Why Are They Concern?

Bisphenols consist of two aromatic rings connected by hydroxyl groups, providing high chemical stability and reactivity. For leather production, BPS and BPF are relevant, while the industrially important BPA plays no role.

The spatial arrangement of bisphenols resembles steroid hormones such as estrogens, enabling binding to estrogen receptors. This structural similarity allows them to interfere with hormonal signaling, potentially affecting reproduction, development, and metabolism. In leather production, this is relevant because bisphenols can migrate into the final product via polymer-based syntans.

3. Regulation

No unified global regulation exists. In the EU, regulation is enforced through REACH Regulation with a groupbased approach for bisphenols. Particularly concerning substances are classified as Substances of Very High Concern (SVHC), which has direct implications for production, import, and use.

Current MRSL lists already reflect limits from the 2023 EU restriction proposal that was withdrawn. Manufacturers must review raw materials and formulations to meet these requirements.

4. Leather Chemicals Affected and Bisphenol Content

Bisphenols mainly enter leather via synthetic retanning agents (syntans). Key groups where bisphenol content is relevant include Phenolic and Sulfonic based syntans. Phenolic syntans may contain BPS and BPF up to 10,000 ppm, while sulfonic based syntans contain only BPS but up to 25,000 ppm. The amount remaining in leather

strongly depends on the formulation, including washing steps, additional chemicals, and pH during retanning.

Rule of thumb: Using approximately 10% of a syntan in a formulation results in roughly one-tenth of the bisphenol content of the syntan in the leather. For precise calculations, the entire formulation must be considered.

To produce leather with bisphenol content below the detection limit, syntans with very low bisphenol levels must be used. HPLC is commonly used for quantification after appropriate extraction from syntans or leather samples. These analyses are essential to verify compliance with regulatory and brand requirements.

5. Summary

BPS and BPF pose challenges in leather production due to their hormone-like effects and potential migration via syntans. EU REACH regulations, SVHC classification, and brand MRSL lists provide guidance for current limits, which may change in the future due to new regulatory developments.

Bisphenol levels in leather depend on syntan type and formulation. By selecting appropriate syntans, adjusting process parameters, and conducting analytical controls, manufacturers can produce leather that meets current regulatory and brand limits while maintaining quality and functionality.