Buckman™
Chemistry, connected.

Remove formaldehyde worries and keep the quality in.

Switch to Butan™ "F series" advanced chemistries from Buckman.

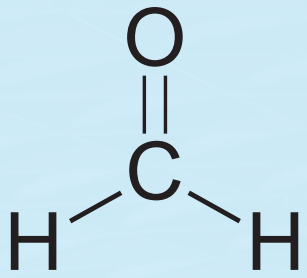
Some products used in the leather industry, especially tanning and retanning agents, contain formaldehyde which can leave finished leather products with detectable levels of free-formaldehyde—a residual, unbound compound that is restricted in leather. Formaldehyde can irritate the eyes, mucous membranes and skin and can cause allergic reactions. Many authorities classify formaldehyde as a carcinogen. The demand today is for leathers without free-formaldehyde.

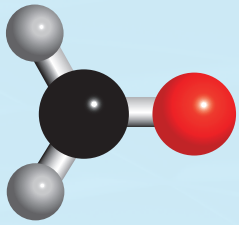
While there are ways of minimizing some of the free-formaldehyde present in leathermaking, Buckman has a better idea. Don't put it there in the first place. Butan "F series" keeps the free-formaldehyde out and the quality in.

Butan™ "F series" removes formaldehyde worries and keeps the quality in.

Why is free-formaldehyde so important?

Formaldehyde occurs naturally in the environment where it is present in very low concentrations, but this highly reactive chemical compound is also widely used as a common building block by the chemical industry to synthesize more complex materials. It has the formula HCHO and is the simplest aldehyde.



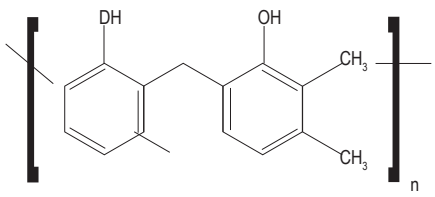
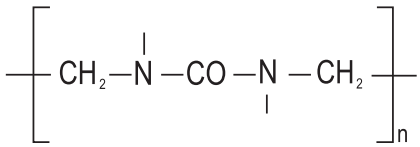
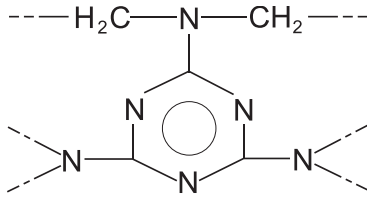


At even low concentrations, free-formaldehyde can be irritating to the eyes and mucous membranes. Skin irritation or allergic reaction might occur if higher amounts of free-formaldehyde come in contact with the skin. Formaldehyde is also variously classified as a "probable" and by some authorities as a "known" human carcinogen.

Sources of free-formaldehyde in leather

The most common source of free-formaldehyde found in leathers comes from tanning or retanning agents. Formaldehyde is typically used in the manufacture of syntans and resins where it joins together smaller molecules in condensation or polymerization reactions to form larger molecular structures. These synthesized compounds are useful for making various types of leathers.

Examples of products that may contain formaldehyde include:

Phenol formaldehyde condensation syntans	Melamine and dicyandiamide resins	Urea-formaldehyde condensation products
		

Improper production methods involving formaldehyde can leave unreacted or incompletely bound (not cross-linked) formaldehyde in the final materials. For example, if excess formaldehyde is used during the production of a condensation syntan, this could leave residual, unreacted free-formaldehyde in the end product. Unreacted free-formaldehyde present in such materials becomes the primary source of formaldehyde detected in the leather crust or final leather article. Fully reacted and cross-linked HCHO is not detected by standard analytical methods and is not considered a health or safety concern.

Formaldehyde is reactive; it binds with proteins and has been used as a tanning agent in the past. Loosely bound or free-formaldehyde present in syntans may bind with the collagen, but often by a weaker bond which may break down during the extraction phase of analytical testing. This results in detectable free-formaldehyde in the leather.

Analytical methods to measure free-formaldehyde

Different analytical methods are used to measure and report HCHO levels in leather or leather chemicals. Most of these methods rely on an extraction phase to remove the HCHO from the leather or chemical substrate and this is followed by various detection techniques. The conditions under which the HCHO is extracted ranges from mild, which only measures some of the free-formaldehyde present, to harsher techniques which will remove all the free-formaldehyde and some of the bound but not cross-linked HCHO.

Analytical methods specifically developed for the leather industry are shown in Table 1. Other methods may also be stipulated. These typically originate from the textile industry (e.g., ISO 14184-2, Japan Law 112) or are required by automobile manufacturers (e.g., VW, Toyota, Audi), but irrespective of their origin, one is required to meet the customer specifications.

Leather Industry Methods for HCHO		
Methods	Description	Equivalents
IUC 19-1	Determination of formaldehyde content in leather. Part 1: Quantification by HPLC. Determined by soaking in water.	ISO Standard: ISO 17226-1:2008 European Norm: EN ISO 17226-1 (Replaces DIN 53315)
IUC 19-2	Determination of formaldehyde content in leather. Part 2: Quantification by colorimetric analysis. Determined by soaking in water.	ISO Standard: ISO 17226-2:2008 European Norm: EN ISO 17226-2 (Replaces DIN 53315)
IUC 26	Determination of free-formaldehyde content in leather processing chemicals.	ISO Standard: ISO FDIS 27587:2009 European Norm: EN ISO 27587

Ways to reduce free-formaldehyde in leather

Control of process conditions and use of effective scavengers can help reduce formaldehyde levels, but these methods do not always give reliable or consistent results and can result in failures when more aggressive analytical methods are used. Selection of the right chemicals is the easiest and best way to meet customer requirements for no detectable HCHO in leathers.

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There's a Butan™ "F series" solution that removes HCHO worries while maintaining leather quality.

Solutions from Buckman for formaldehyde-free leathers

Buckman's "F series" product line offers tanners a complete solution to enable the manufacture of leathers that meet the strictest formaldehyde requirements as well as current REACH regulations.

Butan 1906F. This syntan is based on dicyandiamide (DCD). Butan 1906F is specially manufactured to retain natural filling and tightness properties, but it does not contain the high level of formaldehyde normally associated with this type of syntan. Tests of the product and leather made using Butan 1906F result in no detectable formaldehyde. Comparison trials with other low formaldehyde DCD based products show inferior leather quality when compared to the full and tight leathers produced with Butan 1906F.

Butan 1907F. This syntan is based on melamine. Melamine is reacted with formaldehyde to produce resins with good filling effect. Unique technology has been used to produce Butan 1907F which retains the selective filling and softness characteristics but without the conventional levels of residual formaldehyde. Butan 1907F and leathers produced with this resin show no formaldehyde when using standard analytical test methods.

Butan 1908F. This product is a protein filler with efficient and selective filling of looser parts of the hide. Fillers do not always pass formaldehyde testing, but Butan 1908F can be safely used to complete the range as it is not produced using formaldehyde.

Butan 1913NF. This is a replacement syntan which gives good body and fullness with mellow handle to the resultant leather. Residual formaldehyde levels are often high in these types of syntans, but Butan 1913NF easily passes standard analytical tests for both the chemical product and leather articles.

Butan 7802. This is an amphoteric syntan which gives mellowness, fullness and roundness while maintaining grain fineness and smoothness. The product and leathers will pass formaldehyde testing. Butan 7802 can be used in a wide pH range, from the low pH in chrome tanning to higher pH's in retanning stages.

Butan 7843. Butan 7843 is a pre-tanning syntan product without formaldehyde. The high dispersing property of this syntan helps in processing various types of leathers, such as when high dosage retanning or low chrome tanning or high vegetable tanning is necessary. Butan 7843 helps in dispersion and uniform penetration of syntans and vegetable tannins thus making the leather's grain smoother. Due to better penetration of syntans and vegetable tannins, the risk of grain crack, uneven dyeing, coarse break and looseness is reduced with Butan 7843.

Butan 7844. Butan 7844 is a new addition to the current range of syntans from Buckman. Butan 7844 has excellent light and heat fastness properties and can be used in retanning all types of leathers. The use of Butan 7844 confers excellent fullness and tightness to the leather and improves the round handle. Butan 7844 can be used in the production of all types of leathers from various substrates like cow, goat, sheep, buffalo and pig.

Butan 7845. Butan 7845 is a specialty syntan employed for the production of white and pastel colored leathers from all types of substrates. Butan 7845 helps produce excellent white leathers which have a high degree of lightfastness and also a high degree of heat fastness. Butan 7845 also provides excellent tightness, fullness and body to the final leather.

Learn more. Please contact your Buckman representative to assist you in reducing formaldehyde worries while ensuring you produce quality leathers. We are a simple phone call away.

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