



borchers
A MILLIKEN BRAND

Accelerating Alkyds:

How MEKO-free and cobalt-free solutions help reduce labeling while improving coating performance

Milliken

In the modern coatings industry, sustainability has become a critical focus.

This shift is driven by growing toxicity concerns and regulatory pressures. As regulations become more stringent worldwide, innovation and the adoption of more technologies that don't result in toxic labeling will continue to grow within the coatings industry. The transition to more sustainable practices not only helps you meet regulatory requirements but also aligns with consumer demand for more sustainable products.

The addition of cobalt-free driers and Methyl Ethyl Ketoxime (MEKO)-free anti-skins in alkyd coatings not

only aims to improve labeling but also to enhance durability and performance.

In this article, we will delve into the importance of transitioning to MEKO-free and cobalt-free alkyd formulations, examining their benefits for coating manufacturers and product developers committed to sustainability.

The Role of Additives

Additives play a pivotal role in the performance and sustainability of coatings.

In particular, **moving away from traditional MEKO anti-skinning agents and cobalt-based driers to replace them with options that are lower in toxicity is crucial.**

MEKO presents risks due to its classification as a carcinogen. Cobalt is scrutinized for its potential health hazards in coating applications as well as sourcing issues.

MEKO-FREE ANTI-SKINS



Concerns around MEKO

Alkyd-based paints provide good durability and performance. MEKO is traditionally used as an anti-skinning agent in these formulations to prevent in-can skinning, which can waste up to 20% of a paint and result in defects upon application. However, MEKO has been under scrutiny due to its identified health risks for workers and consumers. Its release from products over an extended period of time (days/weeks) can pose more potential risks for consumers upon application. These concerns have prompted stricter regulations globally.

MEKO has been classified as a Category 1B Carcinogen by the European Union, requiring labeling in formulations with 0.1% or more MEKO content; MEKO is often used as an anti-skin at addition levels greater than 0.1%.

Many formulators are now faced with the choice to add carcinogenic GHS labeling to their current products or to remove MEKO completely.

MEKO has been issued a Code of Practice in Canada and has been added to its List of Toxic Substances. Authorities determined that potential MEKO exposure

from applications like alkyd coatings may be associated with causing cancer or impacting organs and nose tissues. Utilizing MEKO in indoor alkyd paints now requires safety labeling throughout Canada.

Such regulations are causing formulators to begin replacing MEKO in their alkyd formulations. However, reformulation is not as simple as taking MEKO out of the product.

To prevent in-can skinning, another anti-skinning agent will need to be evaluated to match the performance of MEKO for anti-skinning properties, dry times, and more.

Advantages of MEKO-Free Anti-Skins for Alkyd Systems

Adopting MEKO-free anti-skins in alkyd-based formulations not only supports regulatory compliance but can also help to meet consumer demands for more sustainable solutions. Additionally, MEKO-free anti-skins are available that can maintain, or even improve, the performance of coatings in terms of in-can skin prevention, drying times, and film integrity.

In response to the regulatory and health concerns associated with MEKO, the coatings industry is actively exploring and adopting alternatives.

Among these, 2-Pentanone oxime emerges as one substitute, offering similar anti-skinning properties with reduced risks. However, in April 2022, Germany proposed to include the substance 2-Pentanone Oxime, also known as N-Pentan-2-ylidenehydroxylamine, in the European Chemicals Agency's (ECHA) Community Rolling Action Plan (CoRAP). This plan prioritizes substances for evaluation over a three-year period. Following the outcome of the Substance Evaluation process, 2-Pentanone Oxime is expected to receive a harmonized classification including the Carcinogen Category 2 hazard. Further restrictions under REACH Annex XV are expected for this substance as a result of the reclassification.

Other viable options include amino compounds dissolved in fatty acid esters and solvents, which exhibit minimal impact on drying times and maintain the integrity of alkyd-based coatings.



Borchers offers Ascinin® MEKO-free and oxime-free anti-skins that can meet stringent regulations while delivering good performance.

COBALT-FREE DRIERS

Concerns around Cobalt

About 5% of global cobalt use is in paint and coating applications. Cobalt driers are commonly used to decrease dry times in alkyd-based coatings. However, cobalt-free drying additives are being developed to address environmental and health concerns associated with cobalt, which is classified as a potential carcinogen.

Cobalt and its compounds, including cobalt siccatives, have faced carcinogenic, sensitization, and reproductive toxicity concerns and reclassifications in various regions around the world. The primary concerns around cobalt are focused on cobalt exposure and applications that have a higher risk of exposure to workers or that release into the environment. There are some industries where cobalt applications are considered low risk, such as products categorized as articles (i.e., tires, alloys, and rechargeable batteries).

However, risk is higher in paint and coating applications, and exposure mitigation efforts are less effective in this industry.

These exposure concerns have led to some recently proposed actions in regions around the world. In Europe, cobalt metal received a harmonized classification including Carcinogen 1B through the 14th Adaptation to Technical Progress in the EU's Classification, Labeling, and Packaging (CLP) Regulation. The European Commission is also proposing Occupational Exposure Limits (OEL) that would impact cobalt and cobalt compounds. The continued risk assessment on cobalt and its compounds by European Authorities may see more reclassification with new stringent paint and coating label requirements.

In the United States, the Environmental Protection Agency (EPA) is conducting an assessment of cobalt and cobalt compounds through their Integrated Risk Information System (IRIS). While this takes time to complete, it may lead to cobalt restrictions in this region.



Sourcing is another issue with cobalt. A significant issue with cobalt sourcing stems from its geographic concentration. Many of the world's cobalt reserves are found in the Democratic Republic of Congo (DRC). Over the years, various forums have raised concerns about artisanal cobalt mining in the DRC, citing allegations of child labor, unsafe working conditions, and conflicts within certain mining regions.

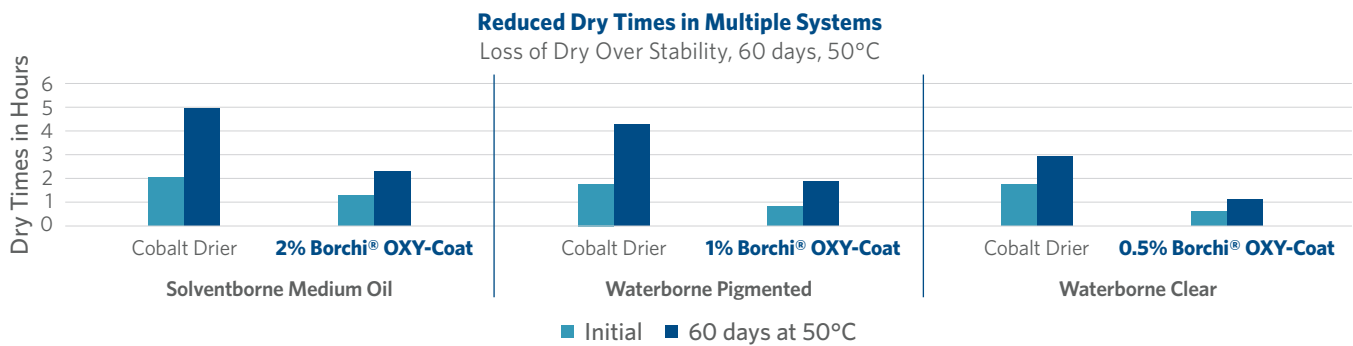
In response to these concerns, there has been a surge in global legislative initiatives aimed at regulating the sourcing of cobalt from the DRC. One notable example is the European Union's Directorate of Trade, which has proposed legislation to categorize cobalt from the DRC as a regulated conflict mineral.

Advantages of Cobalt-Free High-Performance Catalysts (HPCs)

The search for effective alternatives to cobalt in alkyd-based coatings has led to the development of Borchi® high-performance catalysts (HPCs) that can replace traditional cobalt-based solutions. These alternatives utilize patented iron and manganese technologies and are designed to function in solvent and waterborne systems while being free from carcinogens, mutagens, and reprotoxic substances.

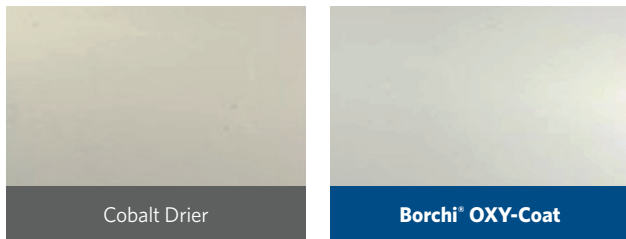
HPCs can not only match the performance of cobalt but can also surpass it, offering faster drying times, reduced yellowing, improved gloss retention, enhanced corrosion resistance, and good wet adhesion. These cobalt-free solutions are widely registered and can be compliant with regulations such as REACH, ensuring they meet stringent standards. By adopting these innovative driers, manufacturers can reduce the risks associated with cobalt use in coatings.

Borchi® HPCs are available for solventborne, waterborne, and high solids alkyd systems.



Brighter Whites and Non-Yellowing Over Dark Aging

1 week dark aged with ammonia

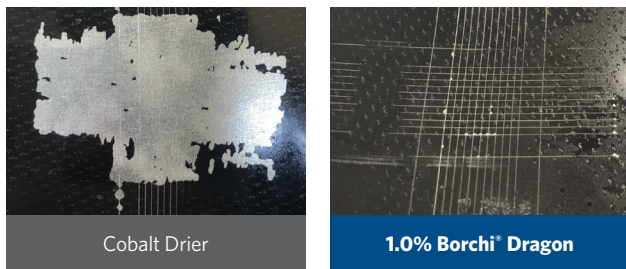


Wrinkling Prevention

applied at 20 MIL thick



Excellent Wet Adhesion



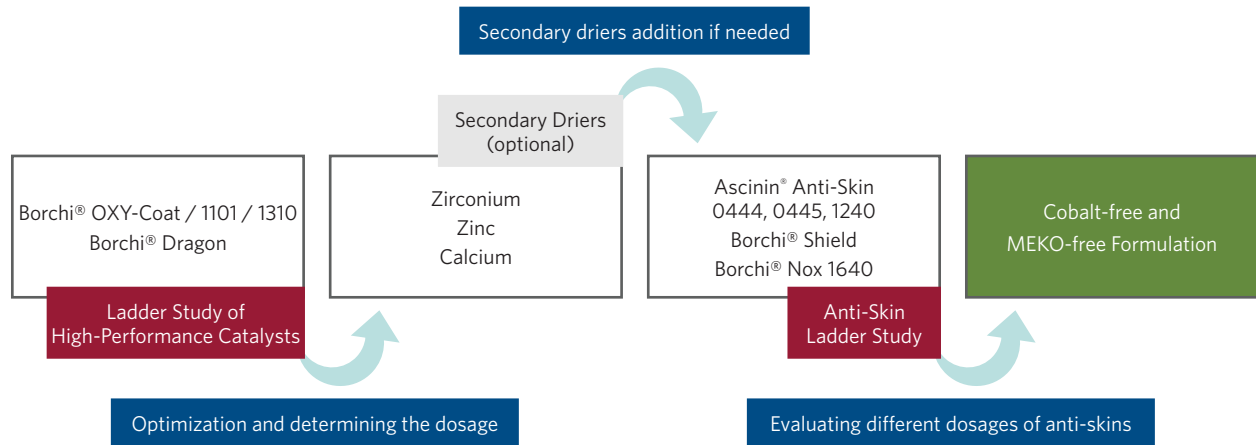
Significantly Improved Corrosion Resistance

after 180 hrs Q-FOG



HPCs include our **Borchi® OXY-Coat product line as well as Borchi® Dragon solutions.**

As MEKO regulations have already taken effect, our team recommends replacing both MEKO and cobalt at the same time to avoid alkyd reformulation once more in the future.

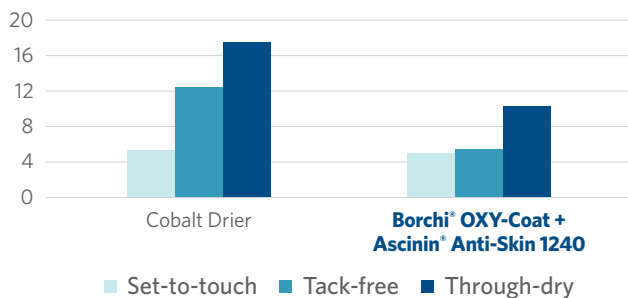


Below is an example of a cobalt-free and MEKO-free formulation with a Borchi® OXY-Coat high-performance catalyst and an Ascinin® anti-skinning agent. The formulation is a solventborne high gloss white trim paint for decorative use.

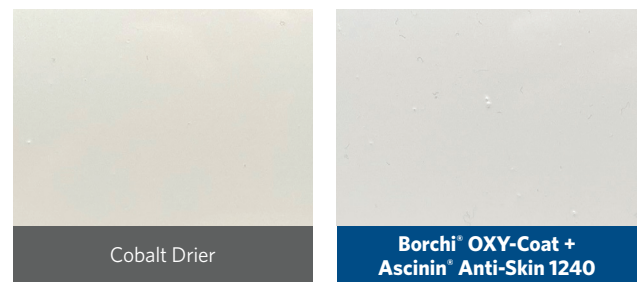
Benefits include improved dry times and lower yellowing:

Ingredients	Cobalt-Free & MEKO-Free Formulation	
	Control	Borchi® OXY-Coat
Long Oil White Paint	100.00	100.00
15% Co/Zr Carboxylate	0.46	← Eliminated Zr
10% Ca Carboxylate	0.46	0.92
Borchi® OXY-Coat		0.23
MEKO	0.31	
Ascinin® Anti-Skin 1240		0.50
Total	101.23	101.65

Faster Drying Times
in hours



Better Color
Dark Aged Color (2 months)



A close-up photograph of a hand holding a paintbrush, applying white paint to a surface. The brush has a wooden handle and a metal ferrule with '3" 1500' embossed on it. The background is a clear blue sky.

NO NEED TO SACRIFICE PERFORMANCE WHEN IMPROVING LABELING IN COATINGS

There are a number of additives available on the market to help meet regulatory and customer sustainability demands while providing good performance.

Borchers experts are here to help you with our wide variety of coating additives.

Visit [borchers.com/contact](https://www.borchers.com/contact) to see how we can help improve your coatings.

borchers
A MILLIKEN BRAND

PLEASE NOTE: As each customer's use of our product may be different, information we provide, including without limitation, recommendations, test results, samples, care/labeling/processing instructions or marketing advice, is provided in good faith but without warranty and without accepting any responsibility/liability. Each customer must test and be responsible for its own specific use, further processing, labeling, marketing, etc. All sales are exclusively subject to our standard terms of sale posted at www.milliken.com/terms (all additional/different terms are rejected) unless explicitly agreed otherwise in a signed writing.

11.08.2024

Milliken