

Integrated solution for **conversion of AlOx films**



VACUUM METALLIZING

BOBST AlOx Conversion

Packaging trends & consumer requirements



Numerous consumer market research studies have shown a new trend for convenience food coupled with the desire to see the content of the package being purchased. This has pushed converters and brand owners to actively seek viable alternative packaging solutions to increase consumer appeal and maintain product freshness.

When it comes to high barrier and transparency, **AIOx** coated films are a clear alternative due to their humidity independence, cost savings, transparency, microwaveability and high barrier properties which extends product shelf life. **AIOx** barrier coated films are found in an increasing number of food packaging applications ranging from health conscious products such as healthy snack bars to confectionary, liquid pouches and microwaveable foods.

Recyclability and sustainability are key trends with a move towards packaging

which is more environmentally friendly. Food products that are well protected by their packaging leads to products which are kept fresher for longer, this has a positive effect by reducing the amount of food waste.

There is also a trend in the market for packaging simplification, film down gauging and a move away from PVDC & EVOH coated or extruded structures. In addition Aluminium foil prices are increasing and there is mounting pressure in the packaging industry to become more environmentally friendly by reducing carbon footprint & CO² emissions.

The future of laminate applications is virtually limitless; by combining different materials and their positive features using state-of-the-art technology and specialist knowledge; the BOBST Integrated Solution for **AIOx** Conversion is a perfect example of such an application for its simplicity of use and fast route to market.

AIOx Conversion

- > Trends and requirements
- > Packaging market
- > At a glance
- > Process know-how
- > Barrier performance
- > Laminate structure
- > Services
 - > General services
 - > BOBST Connect

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Creating value

BOBST innovations
are driven by customer
and brand owner needs.

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Sustainability

Growing demand in the market for recyclable, reusable and compostable packaging solutions, to work towards a circular economy.

Barrier solutions

Growing requirement for packaging with high barrier to oxygen and water to extend shelf life. Unique combinations of vacuum and wet coatings for faster time-to-market.

Expanding reach of added value coating

Barrier enhancement and high precision coating for high quality, high appeal products with extended shelf life to be used in a variety of industries including labels, medical, hygiene, cosmetics and industrial.

Partnerships to deliver new innovative solutions

Working together to develop, test, refine and certify new products and solutions. Process experts and converters fulfill the desired end product and meet evolving market needs.

Cost reduction

AluBond® as an enabling technology to higher performance, dyne level, adhesion and barrier at a lower cost.

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Integrated AlOx conversion solution

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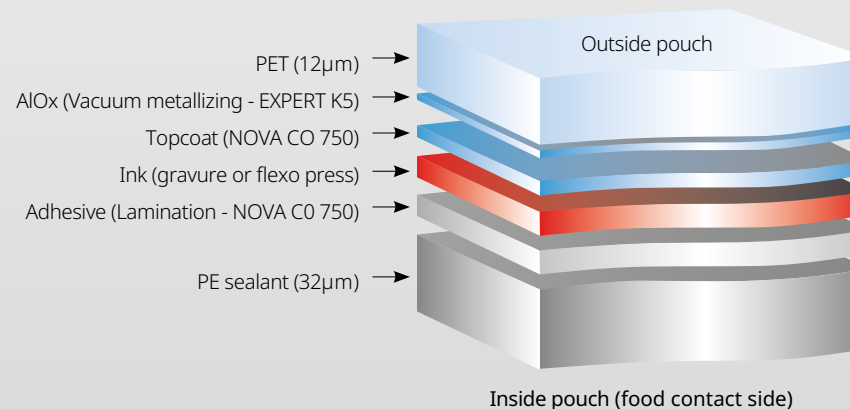
The BOBST simple and efficient **AlOx** vacuum deposition process for single layer application onto clear films has been well-established in the market for many years. The result is high barrier properties with a thin inorganic oxide layer that provides excellent coating uniformity and transparency.

In addition, the BOBST Integrated Solution for the conversion of **AlOx** transparent barrier films incorporates the application of an off-line topcoat to protect and enhance barrier functionality during conventional conversion processes such as printing and lamination.

The process knowledge transfer, top coat formulation and conversion know-how from one single supplier results in a faster time-to-market from day one. The two-step process is extremely cost-effective and provides a wider window of operation with the vacuum coating process followed by a topcoat applied in atmosphere.

Unlike other in-vacuum topcoat solutions, the BOBST solution works at maximum operating speeds and results in maximum productivity without compromising performance.

Pouch structure example



Food safety allowing metal detection

Low-cost, **easy to operate**

Simple and **effective barrier protection**

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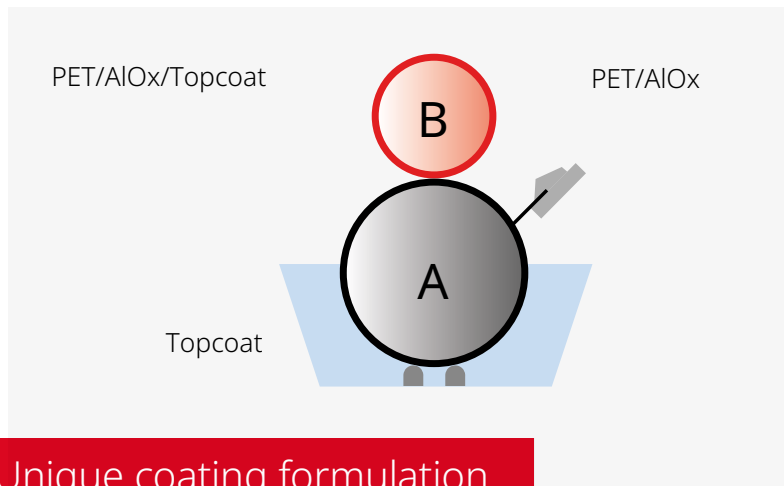
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High barrier topcoated **AlOx** film made easy

AlOx Conversion

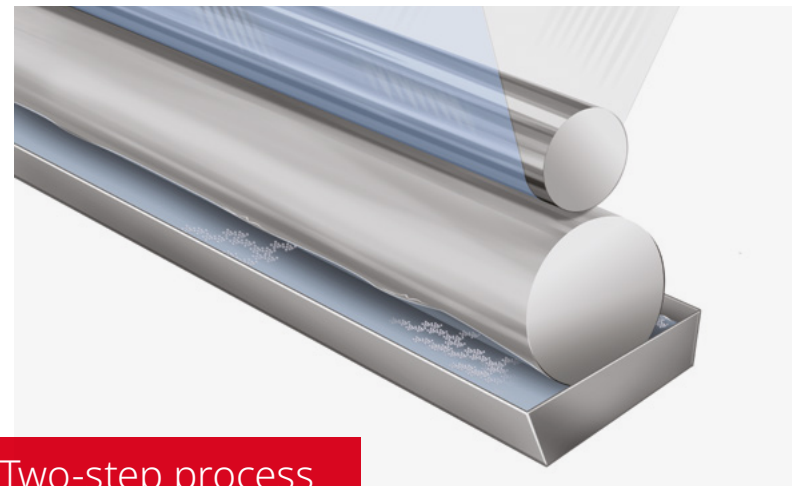
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Unique coating formulation

An organic topcoat layer is applied to encapsulate the thin ceramic type **AlOx** barrier coating and provide increased flexibility to prevent initiation of micro-cracks and other defects during standard conversion/handling processes resulting in excellent product protection with high barrier properties.

These are optimised tailor-made coating formulations that are specifically designed to work in conjunction with the unique **BOBST AlOx** process and provide protection to the film barrier properties during all stages of the conversion process and also give a barrier improvement in both oxygen transmission rate (OTR) and water vapour transmission (WVTR).



Two-step process

This is a two-step process without compromise that requires relatively low capital investment, allows for a wide operating window and has a low running cost. Two processes running at max capacity without compromising speed, barrier performance, quality or cost.

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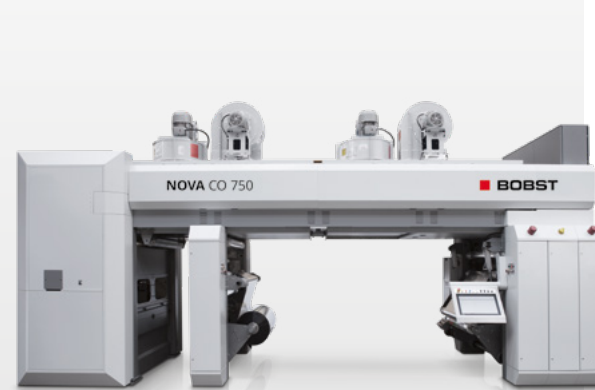
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The AIOx coated PET films are first produced on a BOBST vacuum metallization platform (either an EXPERT K5 or VISION K5) the film is then topcoated on an AIOx optimized BOBST Coating line (e.g. NOVA CO 750). Once coated, the film is then either gravure printed or flexo printed and is finally laminated on the NOVA CO 750.

AIOx vacuum metallizer



Coating line



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ROBUST AIOx CLEAR BARRIER FILM

The **BOBST AIOx** Integrated Conversion Solution enables film producers and converters to produce high barrier transparent films for flexible packaging (single layer topcoated or complete laminate structures) with a robust structure and superior properties that can withstand the aggressive mechanical stresses during some typical conversion processes with minimal loss on barrier permeation performance.

It is a game-changer in the packaging industry due to its simplicity of use and operation resulting in outstanding barrier performance and flex crack resistance, yet totally transparent in a low cost process.

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Superior barrier performance

The **BOBST AIOx** topcoated, printed and laminated integrated film structure has been extensively evaluated for durability and barrier permeation performance including the Gelbo Flex test before going to market.

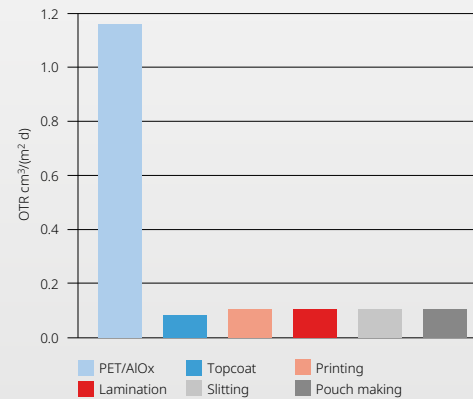
This test is used to simulate the strain the packaging material may be exposed to during further downstream processes after lamination such as folding and forming into packaging and when handled during transport, storage and in the retail environment.

The Gelbo Flex test procedure has been designed to determine structural durability. After a pre-determined number of flexing cycles, subsequent barrier measurements will show if it can withstand this type of repetitive flexural strain.

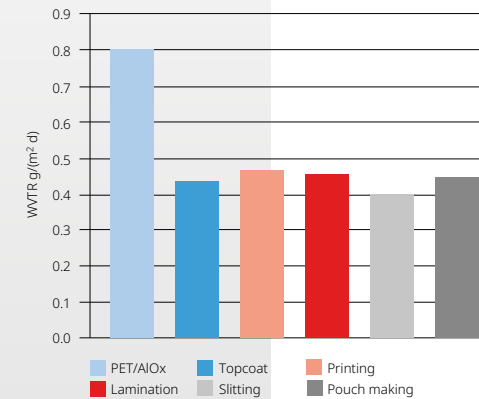
The graphs show the OTR and WVTR values of the barrier topcoated film through conversion and after 20 Gelbo Flex cycles.

BARRIER TOPCOAT

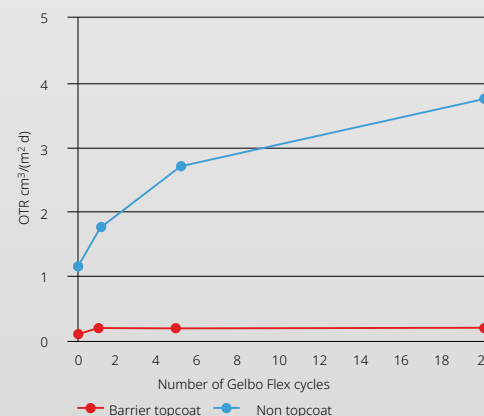
OTR improvement by factor > 10



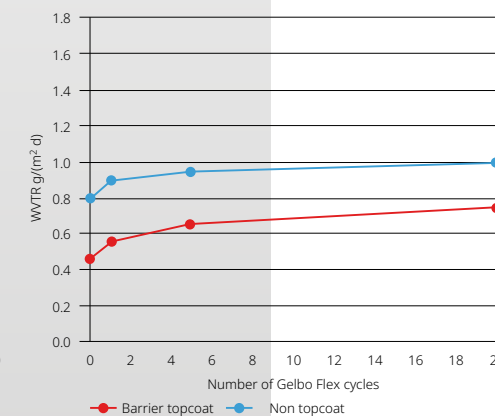
WVTR improvement by factor ≈ 2



OTR performance after Gelbo Flex (laminate)



WVTR performance after Gelbo Flex (laminate)



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The BOBST Integrated Solution results in downgauging of the film or has the potential to reduce the number of layers in the laminate structure resulting in packaging simplification with a duplex laminate rather than the traditional triplex structure which translates in a reduction of conversion steps and lower production cost.

Weight reduction

The duplex laminate structure also offers environmental benefits due to a reduced material use and packaging weight. It leads to a package which is more environmentally friendly and sustainable due to its higher yielding and chlorine-free chemistry. This also results in a reduced carbon footprint.

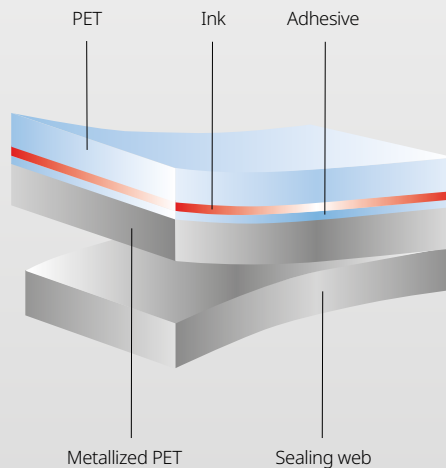
RECYCLABILITY

This technology is the first step towards packaging designed for recyclability; it aims to divert packaging waste from landfill or incineration and aid the creation of a circular economy for plastic packaging.

The **BOBST AIOx** Conversion process is a great example of how innovation and process technology together can meet the needs of converters, brand owners, retailers and consumers.

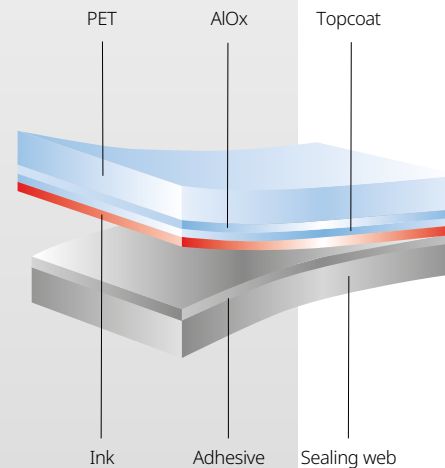
TRIPLEX (Typical Structures)

PET/Al foil/Sealing web
 PET(Printed)/Adhesive/MetPET/
 Sealing web



DUPLEX (BOBST Innovative Approach)

PET/AIOx/Topcoat/Print/Adhesive/
 Sealing web
 Less material (AIOx: 8-10nm vs
 PVdC:1-2µm), light weight



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Maintaining excellence

Expert services for all your equipment.
Improve your processes, boost your productivity and enhance your expertise with a complete range of services from BOBST.



Maintain your Investment

- Scheduled maintenance with BOBST certified technicians
- Preventative intervention, maximizing machine uptime
- Optimum performance over the equipment lifetime

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Approved parts and logistics

- BOBST Original and Certified parts, and consumables
- Quality assurance, and extended maintenance intervals
- Worldwide distribution, and full availability where and when you need it

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Machine upgrades

- Additional features, configured for your machine
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Digital age manufacturing happening with BOBST Connect

BOBST Connect is an end-to-end, user-centric digital platform that enhances and increases your packaging productivity. It's designed to help you make the most of the data your machine generates, improving efficiency across your value chain.

As well as exceptional data insights, BOBST Connect helps to orchestrate and improve your whole production process, from your PDF to the finished product and quality report. It brings data and digital services together in one fully connected platform, with machine insights and expertise built in.

All of this is available to you as part of BOBST Connect Essential, the first subscription level that you receive when you purchase a new BOBST machine.



Performance analysis

- Production insights, including interaction of OEE components
- Identify and eliminate performance gaps

Accurate reporting

- Meaningful insights on OEE and downtime
- Accurately measure target speed and quality losses
- Trend analysis over time

Progress indicator

- Highlights extensive production deviations
- Empowers timely interventions

Remote assistance

- Priority access to technical specialists
- Video with Augmented Reality expert support based on real-time data
- Available 24/7 (optional)

Shift management

- Optimize planning time
- Deliver overall resource efficiency

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