

High Barrier metallized films

VACUUM METALLIZING

BOBST DarkNight®



Loss of barrier performance

Defects on metallized films lead to a drastic deterioration of barrier properties and poor visuals known in the industry as "Starry Night". Reduced water vapour and oxygen barrier in turn translate in to a reduction in shelf life of food products.

Figure 1 illustrates how water vapour and oxygen can permeate easily through the film when a high number of defects are present.

Defects can be grouped into two categories; those which are source related and those which are winding related. The different types of defects which can occur can be seen in Figure 2.

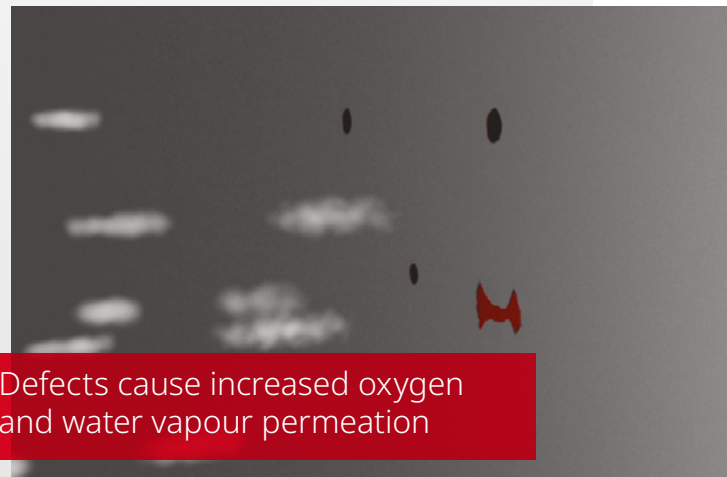
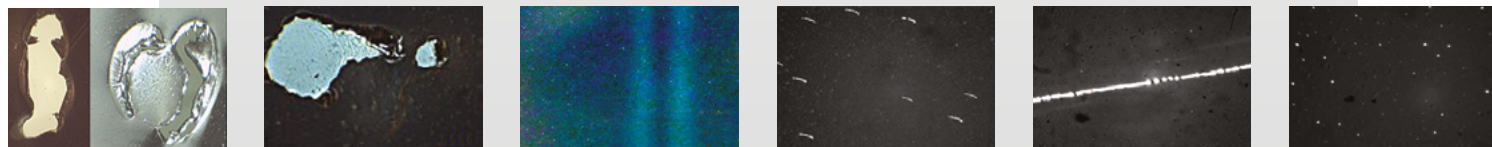


Figure 1.



Pin-holes

Pin-windows

Tramlines

Micro-scratch

Macro-scratch

Starry Night

Figure 2.

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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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At a glance

BOBST DarkNight®



To meet increasingly demanding standards in the flexible packaging industry for barrier applications and products with longer shelf life, BOBST has developed **DarkNight®**, a unique and innovative process to produce High Barrier metallized films through its EXPERT K5 and VISION K5 vacuum metallizing platforms.

Traditionally, thin Aluminium foils are used as a barrier in laminate structures to protect products from moisture

and oxygen permeation, UV light radiation and aroma/mineral oils migration. The **DarkNight®** process is a major step forward in the journey to full Aluminium foil replacement with High Barrier metallized films.

This move is largely driven by leading brand owners who want to reduce their Aluminium foil consumption in order to reduce packaging cost but need a more consistent quality in their supply chain of metallized films.

90% defect reduction*

80% barrier improvement*

High OTR and WVTR barrier

BOBST DarkNight® Film

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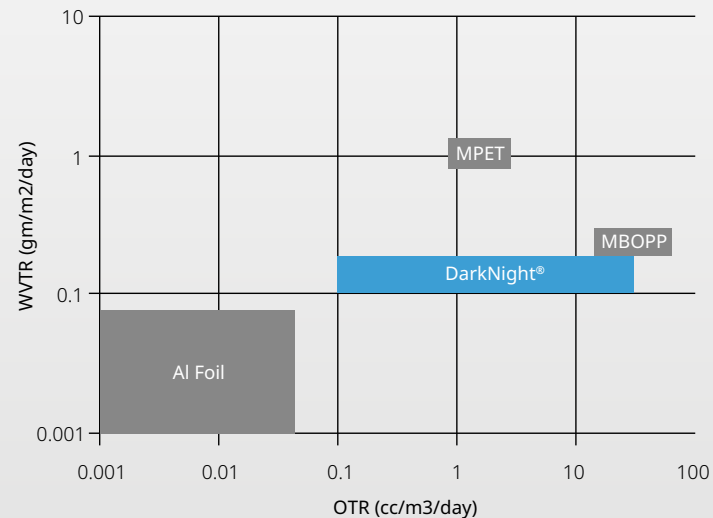
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*NOTE: Actual values largely depend on film properties.

Cost effective High Barrier films

BOBST **DarkNight**[®] is the smarter way to achieve High Barrier metallized films at a lower cost; a major cost advantage arises from the fact that it eliminates the need to use high Optical Density (OD) deposition levels (>3.0 OD) in order to achieve high OTR & WVTR barrier values; as is usually required for High Barrier applications. An enhanced barrier performance is achieved by reducing defects during the vacuum metallization process.

Enhanced barrier performance means superior packaging protection properties (permeation resistance) resulting in increased shelf life for food products. In addition the effective light barrier properties, which BOBST **DarkNight**[®] provides, protects products which are particularly sensitive to UV rays.



BOBST DarkNight[®] allows metallized films to move/ shift into the High Barrier zone which is a step closer to full Aluminium foil replacement.

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Optimised Web-Handling System

The Optimised Web-Handling System also contributes to the low number of defects which the BOBST **DarkNight®** process achieves.

The main features of the system include the six independently direct-driven motors (no belts) and the Automatic Closed loop tension control system, which is monitored by load cells rollers in 3 independent tension zones, to provide “True Tension” control which translates into reduced web wrinkles and other winding defects and also results in less damage on the metallized surface.

The Dual web winding path and Minimum Roller Contact with the metallized side of the film, leads to a reduction of metal pick-offs (micro-defects) and the Closed-loop Rewind tension control is designed to specifically handle thin gauge films. Additionally, the low coefficient friction Ferrofluidic seals avoid web speed mismatches; the seal is formed with oil, and iron filings and magnets hold the oil in an “O-ring shape” which gives the advantage of very low friction. The low friction means that even at low tensions, there is much better control which in turn gives better winding.



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Optimised consumables



BOBST High Precision Aluminium wire feeders for deposition accuracy and wire movement/vibration control, provides excellent automatic (closed-loop) deposition uniformity and minimises the risk of wet Aluminium splashes (spitting), onto the film substrate. High purity Al wire is used for reduced spitting along with "Specially optimised ceramic boats".

Aluminium wire feeds from both sides of the evaporation source, to minimise travel distance to the ceramic boats and reduce wire wander / vibrations that lead to "spitting".

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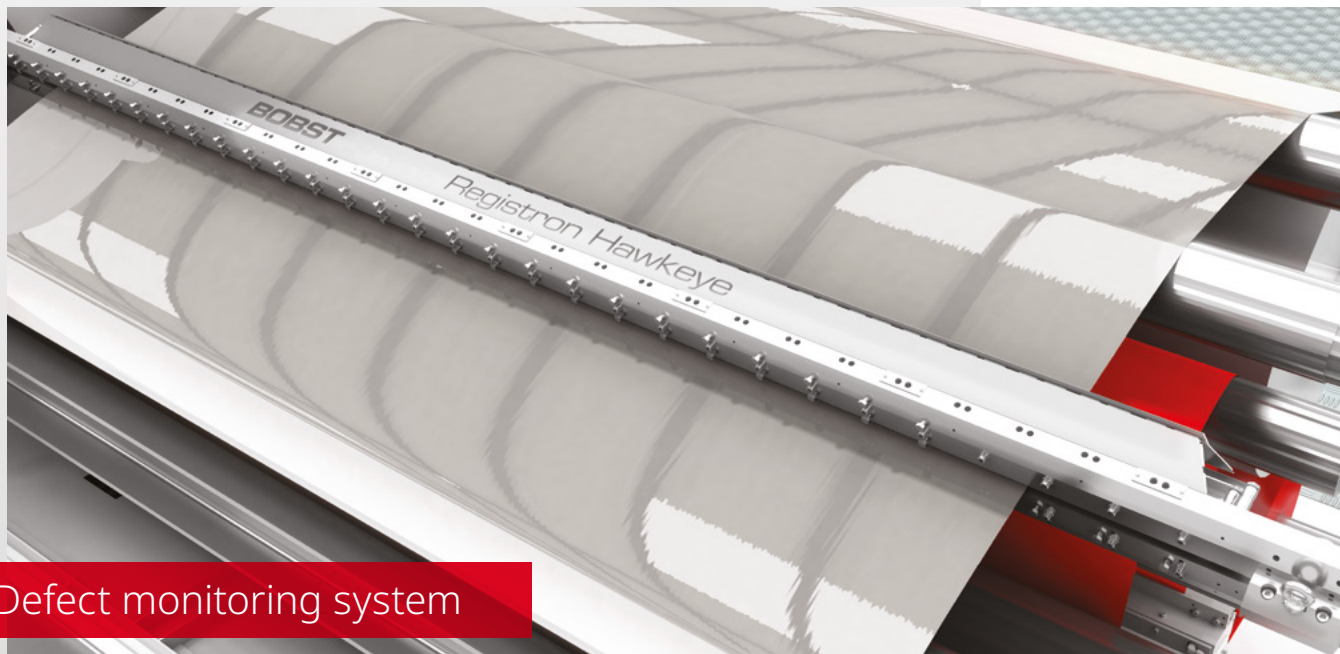
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BOBST Hawkeye

The BOBST **DarkNight**[®] process works in conjunction with BOBST Hawkeye (which comes as standard) to provide a new approach to defect reduction and enables the production of higher barrier films.


BOBST **Hawkeye** is designed and built to the highest standards; when a defect is detected, the operator is alerted and the type of defect is logged. An OD beam measuring up to 4.0 OD at 25mm pitch with maximum web width of 4m, Hawkeye counts and classifies holes in 3 sizes.



Defect monitoring system

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Improved barrier performance

BOBST **DarkNight**[®] results in both barrier improvement and visual quality. Figures 1 and 2 show barrier improvement on both PET and BOPP.

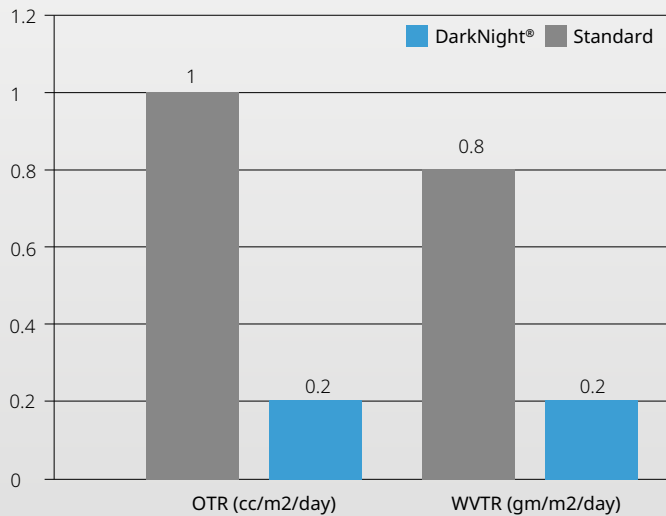


Figure 1: Barrier Performance Improvement (PET)

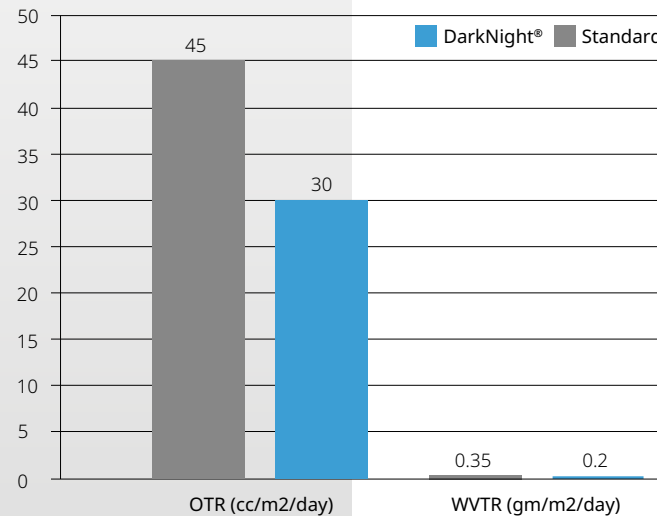


Figure 2: Barrier Performance Improvement (BOPP)

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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
- Enhanced functionality, connectivity and capability
- Future-proofing your investment, maintaining competitive advantage

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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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