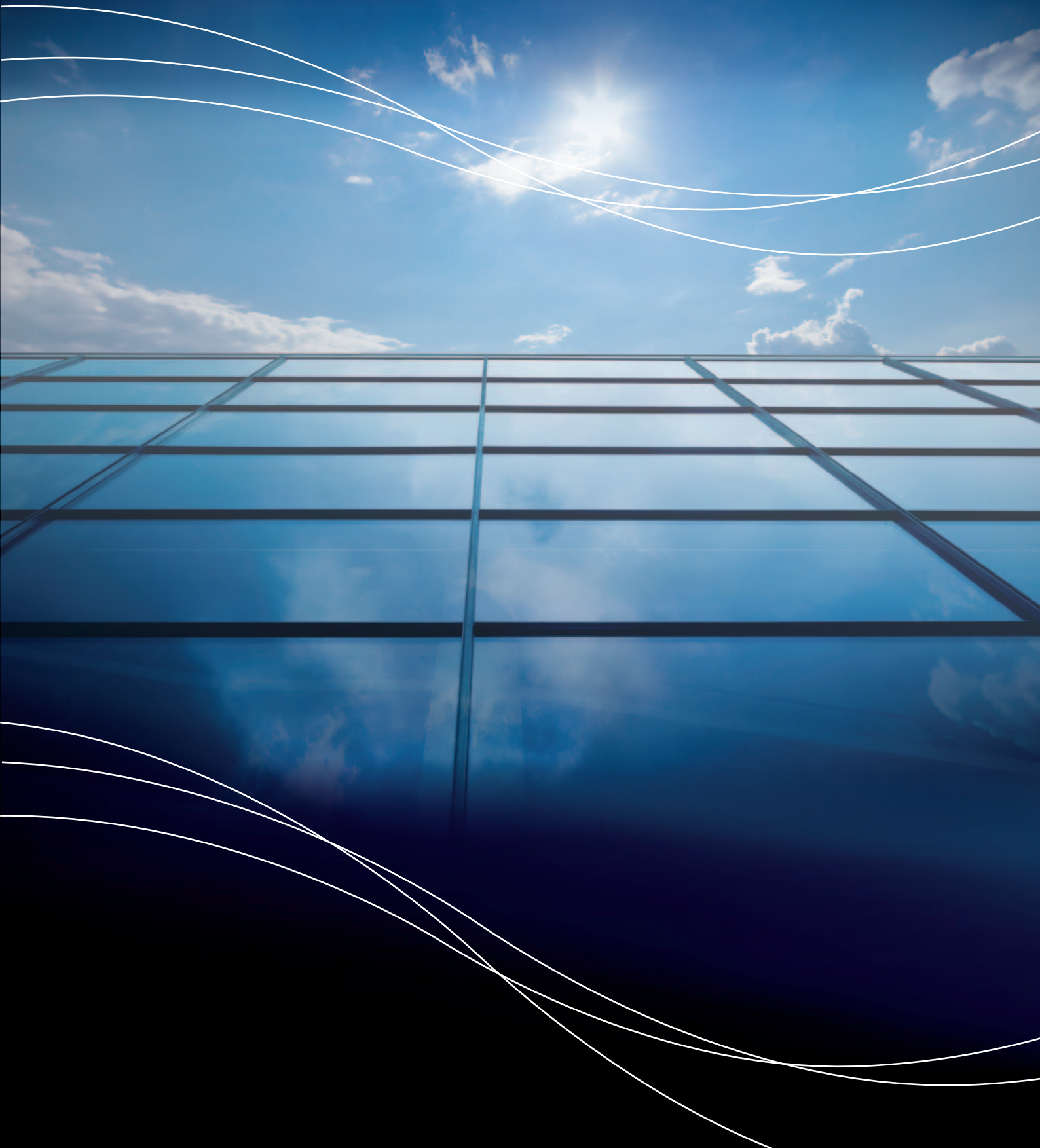


Equipment and Technology for Thin Films





Beneq – the company

Beneq is an application-driven thin film equipment manufacturer. We develop and deliver atomic layer deposition (ALD) and aerosol coating (nAERO® and nHALO®) coating equipment for industrial production and high-end R&D.

Our focus is on equipment and technology for emerging and rapidly growing thin film markets, such as cleantech and renewable energy fields, especially in glass, solar and printed electronics. Coating applications include optics, barriers and passivation layers, as well as energy generation and conservation.

Beneq sees as its mission to identify customer opportunities, together develop solutions for the related challenges and finally commercialize the end product, a piece of equipment. Our ultimate goal is to help enhance the products and processes of our customers, and by doing that, create profit.

As an integral part of our business approach, we protect and defend our know-how, processes and equipment. Along with patenting, offering our technology in the form of licensing is an important part of our business.



The TFS NX300, a fully automated multiple ALD coating system for strengthening glass or surface passivation of crystalline silicon solar cells.

Our customers

Beneq offers a diverse range of equipment that addresses industrial and academic needs. We equip universities, research institutes and corporate laboratories with R&D systems, as well as industry with production tools and integrated manufacturing systems.

A factor that decisively differentiates Beneq from conventional equipment manufacturers is our personal approach and corporate strategy, which drives us to:

- seek for customer opportunities and challenges
- develop and solve them together
- build the equipment to realize them

This methodology puts us in the same boat with our customers, and means that we understand industry needs and priorities. It also means that potential applications are evaluated against cost-of-ownership analyses at an early stage, thus avoiding unnecessary loss of time and expenses.

Applications we cover (selection)

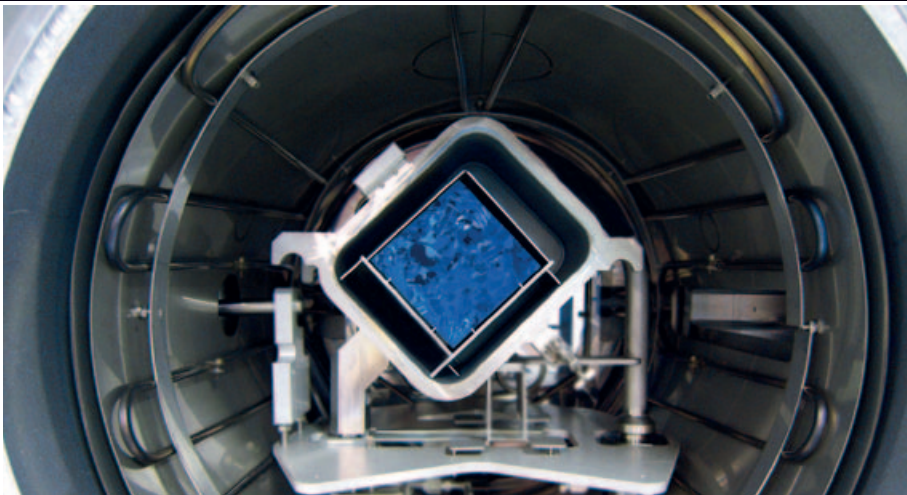
- Photovoltaics: enhanced buffer and passivation layers for thin film and silicon-based solar cells.
- Glass coating: in- and off-line TCO, Low-e and other aerosol coatings.
- Printed electronics: encapsulation and barrier layers for organic and flexible electronics.
- Strengthened glass: crack-resistant glass for displays and flat screen devices.
- Coating services: customer-specific application development and pilot-scale job coating.

Our technology and equipment

For ALD

Several equipment platforms, each designed for specific fields of use, ranging from modular and very flexible batch-type or single wafer R&D tools to units designed for heavy-duty industrial production and in-line coating resources, capable of handling 1200 × 1200 (mm) sized substrates.

Turning Innovations into Success



Beneq – your one-stop thin film company

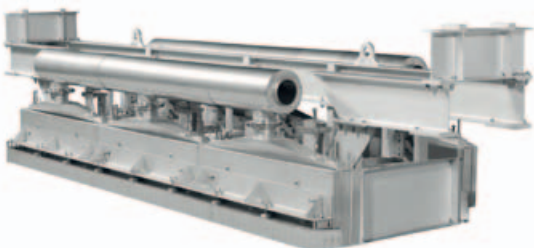
Beneq is a pioneer in introducing roll-to-roll to ALD. The first commercial continuous ALD system, introduced by Beneq in 2009, has set the standard for much of the future development of web coating capabilities of ALD.



The TFS 500, suitable for ALD research and small-scale industrial production.

For aerosol coating

Two different deposition techniques, nHALO® and nAERO®, both with unique properties and applications are covered. The applications and installations range from in-line floatline to continuous off-line coating and from thin film deposition to surface modification. Each aerosol unit is delivered according to customer specification.



Beneq FCS 4000F, designed for in-line aerosol coating on floatlines.

Beneq has the technical experience and expertise, as well as the organizational flexibility, to turn mere notions and ideas into innovations, and innovations into success. In the words of founder, CEO Sampo Ahonen: *"Back in '05, when we started Beneq, all in the team were convinced that many potential seeds of innovation are lost because so few companies can transform them into commercial success. Today, we are enjoying the fruits of the two very first seeds we started to nurture and develop: ALD and aerosol coatings. And what is best, the applications we are developing help save energy and materials, as well as make energy production more efficient. This is what today is commonly referred to as cleantech, and Beneq has become an integral part of it."*

Facts about Beneq

Founded: 2005

Ownership: Privately owned, venture capital funded.

Products:

Thin film coating equipment for industry and R&D
Applications for ALD and aerosol coating
Technology development and licensing in ALD and aerosol coating.
Strong IPR portfolio with more than 90 patent families.

Markets: Cleantech and renewable energy industries, especially photovoltaics, flexible electronics and flat glass.

Main office: Vantaa, Finland

Sales offices: Germany, China, USA (Beneq, Inc.)

Sales network: 34 sales representatives globally

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