

TEXTILES IN ARCHITECTURE

Materials suppliers for building and construction



Claudia Ollenhauer

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Textile Media Services

Textiles in Architecture

Materials suppliers for
building and construction

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Introduction

High-strength, high-modulus textile fabrics are increasingly being used in the building and construction industry as a replacement for more traditional materials, such as wood, concrete, masonry and steel. The mechanical properties of fabrics made with aramid, carbon and glass fibres, combined with cross-linking resin systems to form a composite, provide civil engineers with a range of new materials that offer high strength to weight, high stiffness to weight, and extreme flexibility in design and use.

Fabrics for sun protection made of polyester and combined with polyvinyl chloride (PVC) or polytetrafluoroethylene (PTFE) coatings offer many applications and provide function combined with design to modern architecture, where flexible roofs and wallcoverings are a feature.

Textiles in architecture have played a significantly important role since their first large-scale application in the Munich Olympic Stadium in 1972. German architects Frei Otto and Günter Behnisch conceived the tent-like roof of the main sports arena and launched a trend in architectural design. Using this concept, they adapted the age-old technique of tent design to a modern, large scale based on a new “tensile structure”.

Today, many sporting arenas and official buildings use the appealing lightness and intricate design of textile roofs and cladding – World Cup and Olympic Games stadia, high-end hotels, airports and corporate buildings offer a platform for spectacular textile architecture. Meanwhile, smaller projects, both commercial as well as residential, have profited from the technology developed over the past four decades. Design is an important factor, but lifecycle aspects, including cost, lifespan and recycling issues, have also played a key role.

Concept of the report

This report describes an international selection of highly innovative companies that weave, knit, coat, bond or finish fabrics used in architecture, mainly as tensile structures, but also in other building and construction applications. Among the profiled companies are leading producers of fibres, including glass fibres, and chemicals, such as PTFE, as well as finishing and coating providers.

Some of these fabrics are visible from the outside or inside; others are integrated into walls, ceilings or flooring. Sun and weather protection as well as light and temperature regulation are the main applications for the fabric materials produced by the companies featured.

Producers of nonwoven materials and foils (which are covered by other specialist publications) have been excluded from the report, as are most of the making-up manufacturers, steel construction developers, suppliers of accessories, and high-frequency or heat welding machinery suppliers.

Dense network

Modern textiles made of inert materials, such as glass fibre, can be coated with high-end, dirt repellent, electro-smog absorbing and ultraviolet (UV) reflecting finishes, offering a guaranteed lifetime of 20-30 years, while sophisticated software programs allow rapid design of roofs and other structures.

The sector is highly specialised: architects and designers, fibre and fabric producers, coating companies and cut and trim factories have built up a dense network with steel construction specialists. Often, the companies involved are small and medium-sized, with the exception of raw material suppliers of glass fibres, polyester fibres and yarns, as well as those producing resins and coating and finishing chemicals. The wide experience of all people involved and the reputation gained by finished projects make this a highly specialised sector.

Highly innovative application areas

Textiles are used in a wide range of applications in architecture, either outside or inside, either seen or hidden, as the following table demonstrates.

Examples of textile applications in architecture				
Application	Outdoor	Indoor	Seen	Hidden
Roofing	●		●	
Insulation	●			●
Cladding	●		●	
Reinforcement for wall and roof coverings	●	●		●
Sun protection	●	●	●	
Wind and weather protection	●		●	
Noise protection for walls and ceilings		●	●	●
Light diffusion ceilings		●	●	
Floor reinforcements	●	●		●
Concrete reinforcements	●	●		●
Shielding against UV rays	●	●	●	
Shielding with electromagnetic compatibility (EMC)	●	●	●	●
Lighting effects with integrated light emitting diode (LED) or other electroluminescent materials	●	●	●	
Energy management of buildings	●	●	●	●
In-lining for tubes		●		●
Fireproof wallpapers, floorcoverings and other decorative elements		●	●	

Ferrari Group

**Ferrari SA, F-38352 La Tour du Pin Cedex, France. Tel: +33 4 7497 4133.
E-mail: info@ferrari-texyloop.com; www.ferrari-textiles.com**

Ferrari Group is a leading European weaver and fabric coating specialist with three plants in France and Switzerland; a recycling facility, Texyloop, is located in Italy. The group covers the whole chain from spinning, weaving, coating, extrusion and logistics. The company was founded in 1973, the most recent annual turnover available was reported as €124.8m (2007), and the number of employees is 126 people. A network of sales offices operates worldwide from Europe to Asia, the Middle East, Australia to North and South America.

Main activities

Ferrari is fully integrated from yarn preparation to weaving, coating and finishing. The central know-how consists of the patented Précontraint technology, which consists of applying several layers of coating under constant warp-wise and weft-wise tension (1 t/m) throughout the manufacturing cycle. According to the company, this ensures that textiles have exceptional dimensional stability and resistance. The supporting material consists of a weave of micro-cables made from high-tenacity polyester, glass fibre and similar high-tenacity fibres.

Main departments

Ferrari Industry

This supplier of composite textiles and membranes has a production unit, Stamoid, in Switzerland, which produces:

- environmentally friendly membranes;
- silicone membranes;
- transfer coatings;
- infrared finishings (anti-radar and protection);
- re-positionable adhesive fabrics for the sign market.

Brands

- Batyline, coloured and patterned fabrics for indoor and outdoor heavy-duty furniture, for wall and ceiling coverings, and interior architecture;
- Soltis, a high-performance range for indoor and outdoor applications, including blinds, awnings, canopies, screens and shade sails.

Other fabrics

Other fabrics include:

Batyline

Batyline is a group of composite textiles designed for indoor applications. The fabrics are divided into three families: plain fabrics with a choice of nearly 40 colours; patterned fabrics with up to 30 variations in structure and colours; and “outstanding” materials with 15 different structures and functions. They include:

- Batyline Canatex, with hemp;
- Batyline R, made of materials resulting from Ferrari’s Texyloop recycling business;
- Structural 7763, a reinforced material with steel;
- SK series: glass/silicone membranes.

Batyline: selected versions and applications

	Wall coverings	Interior design and decoration	Tensioned ceilings	Partitions/ screen walls	Decorative sails	Acoustic solutions
Batyline HM Classic	●	●	●	●	●	●
Batyline HM Tweed	●	●	●	●	●	●
Batyline Canatex	●	●		●	●	●
Batyline Mesh	●	●	●	●	●	●
Batyline XP5			●			
Batyline SK 300 & SK Low E		●	●			●

Source: Ferrari Group

Soltis

Soltis is a range of solar protection fabrics for outdoor and indoor use. Manufacturing is

Soltis: selected versions and applications

	External solar protection	Internal solar protection	Roofing and glasswork	Shade sails and static shading	Light blocking blinds
Soltis 86	●		●	●	
Soltis 92	●		●	●	
Soltis B92					●
Soltis 93	●		●		
Soltis 99		●			
Soltis 99 Advanced		●			
Soltis B99					●
Soltis B702					●
Soltis SK 20		●			
Précontraint B702				●	

Source: Ferrari Group

Nittobo

**Nitto Boseki Co Ltd, 4-1-28, Kudankita, Chiyoda-Ku, Tokyo 102-8489, Japan.
Tel: +81 3 3514 3810. Fax: +81 3 3238 4588. www.nittobo.co.jp**

Nitto Boseki (Nittobo) is active in several fields from textiles to real estate, and had a global workforce of 3,607 people in fiscal 2009, when turnover for the whole group, including subsidiaries in Asia, North America and Europe, was ¥114.8bn (US\$1.4bn). The company is known for its ultra-fine yarn and ultra-thin fabrics made of glass fibres, which are used for electrical circuits, industry and architecture.

Main activities

Nittobo works in the field of:

- glass fibre spinning and weaving;
- environmental business;
- textiles for apparel;
- medical and beverage;
- property management.

Main departments

Glass fibre products

This division accounted for approximately 39% of turnover in fiscal 2009. Products range from ultra-fine fibres to yarns and fabrics made of glass. Customers are from the electronics-related industries worldwide. Nittobo has also developed non-electronic materials, including glass fibre for fibre reinforced plastic (FRP) and fibre reinforced thermoplastic (FRTP), as well as a range of industrial-use materials in the automotive and electronic appliance fields.

Textiles division

This division accounted for approximately 9% of turnover in fiscal 2009. With an ongoing business restructuring, the portfolio has moved to high value-added products. A new product integrates garment interlinings with Nittobo CSY stretch fabric. The division produces elastic yarns, textiles, interlinings, apparel and other finished goods, as well as Nittobo dishcloths.

Other operations

This division accounted for approximately 12% of turnover in fiscal 2009. The company also works in the fields of medical (clinical diagnostic reagents in biochemistry, haematology and immunology), beverage (PET bottle beverages and manufacture of large PET

bottles), speciality chemicals (Danrix brand dye fixative), and office building leasing and sports facilities businesses.

Activities in the building sector

The building materials division accounted for approximately 40% of turnover in fiscal 2009. Although Nittobo is streamlining or withdrawing from unprofitable businesses in the building materials sector, it is expanding its activities in environmental, acoustic and plant engineering. The division offers:

- thermal, acoustic and fireproof materials insulation, including rock wool and glass wool;
- engineering operations, including sound and noise abatement systems and plant construction;
- environmental services.

Products

Verre screen

This is the product name of glass cloth for roller blinds woven by original resin coated yarn. Verre screen is a double width cloth with a maximum width of 3.1 m. (Nittobo claims to be the sole provider worldwide.)

Nittobo: Verre screen					
Style	Weave	Thickness (mm)	Weight (g/m²)	Width (mm)	Roll length (m)
WL 5092B	twill	0.62	505	2 or 3	50
WL 5011B	plain	0.47	435	2, 3 or 4	50
WL 5058B	group	0.51	343	2	50
WL 5348	plain	0.37	280	2	50
WL 5405	plain	0.80	615	2 or 3	50

Source: Nittobo

Light Shade

This is a new type of illumination cover, made of fluorine coated glass fibre that is laminated with fluorine resin film. The resulting diffused light provides a soft and calm atmosphere, says Nittobo. It is generally produced in a standard size within 1500 × 1500 mm, but is also available in larger sizes.

Major shareholders

- Japan Trustee Services Bank (trust account): 9.48%;

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TEXTILES SOUTH EAST ASIA

October 2008

Cambodia's clothing sector mates with US slowdown

Following the impact of the US slowdown on export orders. In the first half of 2008, Cambodia exported \$1.9bn of garments to the US, while the US Department of Commerce reported that 10% of all Cambodian apparel exports...



Van Sou Leng

what employers say are over-zealous trade unions and low worker productivity, are hurting the sector.

Monika said the sector grew by only 3% during the first half of this year. "The slowdown only started to hurt us recently, but we expect demand for clothing to fall further," he told the *Phnom Penh Post*.

The US slowdown has been especially damaging to Cambodia because, unlike neighbouring Thailand, Cambodian clothing makers have failed to diversify to export markets in Europe, Russia and the booming Middle East.

About 70% of exports go to the US with only 24% to the EU. The US slowdown is expected to lead to further declines in Cambodia, with clothing sales dropping by 5.5% in July alone.

Frequent strikes and what employers say is low worker productivity is affecting the sector. "Cambodia has lost its reputation because of too many unions and too many strikes," said GMAC president Van Sou Leng. "A Chinese worker produces 100-120 shirts per hour, a Vietnamese worker produces 60-70 shirts per hour and a Cambodian worker produces 30-40 shirts per hour."

Free Trade Union president Chea Mony said the industry itself was to blame for many of the strikes because it sponsored pro-management puppet unions.

Shifting the blame, Sou Leng said: "The industry is not the problem. It is the unions that are the problem."

Manufacturers' Association of Cambodia (AC) had predicted the sector's growth from 20% in 2007 to just 5% in 2008. The industry's largest employer, which employs around 360,000 workers, said the garment sector is threatened it is time for serious concern, said its general manager Kaing Monika. "The question is how we will survive with giant competitors like China and Vietnam."

The past decade has seen industry growth of more than 10% a year but the US slowdown, spiralling costs and

of the textile and clothing industries in the emerging markets of South East Asia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam and Cambodia.

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TEXTILES EASTERN EUROPE

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Czech textile manufacturers outsource more production

A STRENGTHENING currency and an influx of Asian imports are forcing Czech textile manufacturers to look beyond the industry's traditional borders. Many producers are seeking lower energy and labour costs abroad as an increasing number of exporters close their local manufacturing facilities in favour of foreign production.

The latest high-profile company to announce cutbacks is Odevni Podnik Prostějov (OPP). The traditional central Moravian clothing producer reduced its workforce from 3,500 to 2,500 this year, and announced plans in August to lay off a further 500 employees as it moves most of its production to East European and Asian countries, according to a report in the *Prague Post*.

"We have moved the lower and middle levels of production abroad," said production manager Jindrich Korycan. This includes a factory producing jeans in Macedonia and a fabric unit in Ukraine. He added that the company will retain higher-level production at its factory in Prostějov, south Moravia, which produces up to 6,000 custom-ordered garments a day.

Jiri Grund, chairman of the Czech Association of Exporters and chief executive officer of bathroom accessories producer and distributor Grund, said most



Ludmila Halková

textile manufacturers see outsourcing as "a last resort". However, an influx of Chinese imports into the EU puts enormous pressure on Czech companies to use every means at their disposal to cut costs.

In 2005, EU restrictions on Chinese imports expired, leading to a 42% increase in Chinese textile imports to the EU and a 3.5% drop in revenues by Czech textile companies. As a result, 4,000 local textile workers were laid off that year.

"The situation is not good. Classical textile producers have practically disappeared," admitted Ludmila Halková, deputy manager of the Czech Association of Textile, Clothing and Leather Industries (ATOK).

In addition to increased competition, the unprecedented strength of the Czech crown is cutting into the profits of the textile industry, which is heavily dependent on exports. According to the Czech Statistical Office, exports accounted for 66% of the textile industry's CZK55bn (US\$3.5bn) sales last year.

As the crown continues to break records against the euro (the currency temporarily crossed the CZK23/euro mark in July), more Czech textile companies will seek out higher profit potential by moving their production abroad, Grund predicted.

"The critical level is about 23 and 24 [CZK/EUR]," he said. "If it gets worse or even if it remains the same in the next six months, more

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Monthly news of the textile and clothing industries in the emerging markets of Central and Eastern Europe and the former Soviet Union

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Capitalise on the market potential of these developing regions

Textiles Eastern Europe and **Textiles South East Asia** are Invaluable sources of information on the textile and clothing markets of Eastern Europe and South East Asia, respectively.

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These two publications are read by companies with an interest in capitalising on the market potential of these emerging and rapidly developing regions.

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