

Super Absorbent Fibre Technology: Innovative and Sustainable Fluid Management Solutions for the Food Packaging Industry

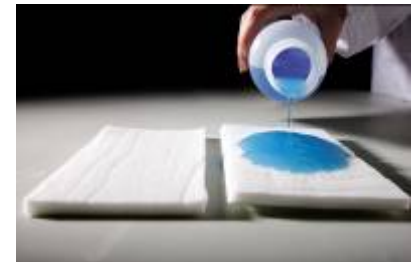


TECHNICAL ABSORBENTS LTD

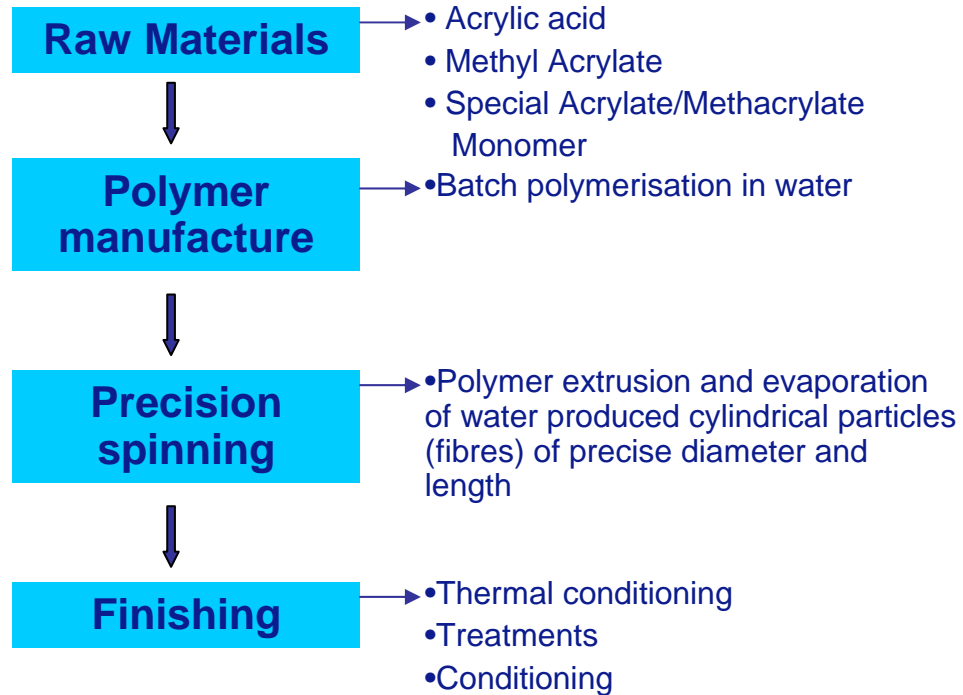
- **Founded in 1993**
- **Manufacturer of OASIS Super Absorbent Fibre (SAF®)**
- **State-of-the-art production methods and protocols**
- **Acquired by Bluestar Fibres in 2007 (owned by China National Bluestar, which is a wholly-owned subsidiary of ChemChina)**
- **Wide range of high performance, versatile Super Absorbent Fibre grades**
- **Toll manufacture and sale of nonwovens, woven fabrics, yarns and finished consumer goods – all containing SAF®**
- **Global customer base and markets**
- **Programme of ongoing investment and expansion**
- **Increased focus on Asian market**
- **Potential for Asia manufacturing facility.**

Super Absorbent Fibre (SAF[®])

- Extremely effective and versatile super absorbent technology
- Handling characteristics of a textile fibre
- Used to produce a wide range of fabrics
- Extremely high rates of water and saline uptake
- Allows for ease of handling
- Substantive and even distribution profiles within final fabric construction
- Easily converted through the majority of existing non woven and textile routes
- **THE** super absorbent of choice for many customers.



SAF[®] Manufacturing process



Key data

- Available in a wide range of highly absorbent grades
- Non-irritant and can be used in applications demanding robust toxicological profiling
- Does not melt. Begins to decompose extremely slowly at temperatures $>200^{\circ}\text{C}$
- Fibre density is approximately 1.4g/ml
- Similar chemistry to powder super absorbents
- Sodium salt X linked polyacrylate
- Non-flammable/stable to light and heat
- FDA indirect food contact listed
- Excellent toxicity profile.



Physical properties

- **Colour:** White
- **Staple lengths (mm):** 6mm, 52mm and 80mm
- **Moisture content (%):** 10-15 (typically 10)
- **Counts (dtex):** 2-20
- **pH (Saline Extract):** 5.5
- **Tenacity:** 10cN/tex
- **Extensibility:** 5%
- **15-minute free-swallow capacity (g/g):** 60 (saline) 200 (DM water)
- **0.5psi retention capacity:** 38 (saline) 120 (DM water)
- **0.3psi absorbency under load:** 17 (saline) 100 (DM water)

Proven applications

- Hygiene
- Food packaging
- Cable yarns & tapes
- Wound-care & dentistry
- Apparel
- Technical textiles.



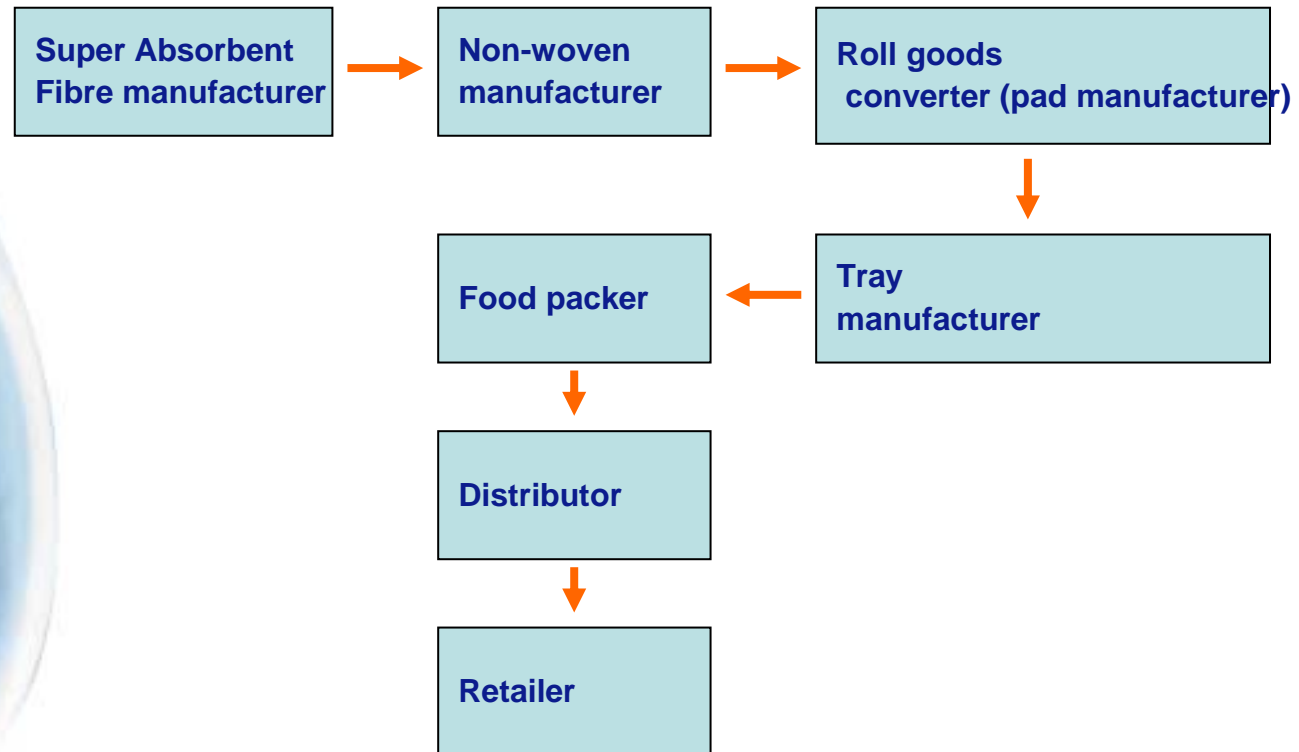
Food packaging – key market demands

- Huge shift towards pre-packaged food in North America and Europe rather than over-the-counter service
- Legislative requirement (particularly in the EU) to control food exudates to ensure optimum conditions at POS
- No free juices allowed in packaging of meats, poultry and fish sold at supermarkets
- Manufacturers recognising that reducing lose exudates lengthens product shelf life, i.e. less food unsold and wasted and also has:
 - Positive impact on product appearance
 - Associated consumer satisfaction.

Food packaging – traditional methods

- Traditionally multiple plies of tissue used and stitched laminated to barrier film material. Although these products were effective and costs were low, they had a number of drawbacks:
 - Limited absorbency capacity
 - Delaminating when wet
 - Poor fluid retention
 - Mushy pulp left on food trays.
- These problems, plus the aforementioned market demands have paved the way for the design and development of Super Absorbent Fibre (SAF®) and Super Absorbent Powder (SAP) food pad materials which exceed the fluid absorbency and retention capabilities of tissue.

Food packaging – supply chain





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■ ■ ■ ■ ■ *We keep it fresh!*

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Walmart 
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Food packaging – super absorbent materials

- Super absorbent pads already well-known within the food industry in the western world
- High absorbency and retention levels
- Placed between food produce and tray
- Ensures food is delivered at POS in optimum condition
- Cost-effective price
- Discrete product designs.



SAF[®]-based food packaging materials

- SAF[®] has been the major choice for food packagers looking to best contain liquid exudates
- Regulated by FDA for direct food contact materials
- Non-migratory properties
- Wide range of fabric designs
- Even distribution profile
- Nature of construction negates need for sealed/pouched pads
- SAF[®]-based roll goods can be cut and shaped as required to suit the type of product and packaging that is being used

*“Super Absorbent Fibres are easier to handle in food packaging applications, allowing manufacturers to produce thinner, more absorbent pads that don’t have to be sealed.”
(Source: Nonwovens Industry February 2007)*

Market development in India

- Limited use of such food packaging materials
- Cultural difference in how food, particularly meat, is sold to the consumer
- Regulations at early stages relating to sale of food
- Increasing share of global food and drinks industry
- Changing consumer lifestyles together with the desirability of pre-packaged foods
- Growth in the number of modern hypermarkets that have tied up with Indian conglomerates (organized retail) entering the market e.g. Wal-Mart and the Bharti Group*
- Of the current 204 million households in India it is estimated that 13 million households have the income to patronise organised retail. It is estimated that this will grow five fold from 13 million to 65 million households by 2015. **
- Growing opportunity to introduce existing SAF® food pad technology for food supply chain management.

* Source: McKinsey retail report entitled 'The Great Indian Bazaar'

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Development summary

- **Versatility of SAF[®] technology**
- **SAF[®] is the core super absorbent solution in the food packaging industry**
- **SAF offers the capability for precise and effective exudates management**
- **SAF[®] can be easily converted and handled throughout the supply chain**
- **Ongoing revolutionary polymer research and development of new fibre grades.**



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