



## Industrial Wear Applications

**Syalons** are advanced ceramic alloys that can be tailored to suit a vast range of **industrial wear** applications. **Syalon 101** and **Syalon 050** have unique properties, which make them ideally suitable as wear parts as **milling media**, **shot blast nozzles** and **paper dewatering foils**, for example.

### Syalon 101 / Syalon 050

**Syalon 101** is a general purpose advanced ceramic whose unique combination of physical properties such as **high strength**, **toughness** and **hardness** impart **excellent wear resistant properties**. In addition **Syalon 101** has excellent **thermal shock resistance**, **corrosion resistance** and can be used at temperatures **up to 1000°C**.

**Syalon 050**, although not as strong and tough as Syalon 101 has significantly **greater hardness**, making it particularly suitable for arduous wear applications. In addition **Syalon 050** as well as possessing excellent **corrosion resistance** can be used in applications **up to 1400°C**.

These unique physical properties give **Syalon 101** and **Syalon 050** a distinct advantage in many wear applications over metals and other ceramics such as alumina and silicon carbide.



### Milling Media

**International Syalons** manufacture a range of grinding media for the preparation of industrial and analytical samples.

In trials, weight losses for **Syalon 101 bowls and media** were about 14% of the reported weight losses for agate, alumina, zirconia and tungsten carbide, thus vastly reducing contamination of the sample as well as extending the media life. In addition, milling efficiencies for Syalon 101 are also generally improved, meaning milling times are reduced.

In circumstances where analytical samples are being prepared and contamination by yttrium oxide, from the Syalon, must be avoided, International Syalons can produce an yttria free version of Syalon 101, while maintaining all the benefits of the original material.

### Shot Blast Nozzles

Shot blasting is a method of surface preparation or cleaning. It involves blasting an abrasive grit, such as sand, alumina or chill-cast iron, at high velocities at the surface to be treated.

Traditionally liners have been made from tungsten carbide. However, at the low angle impacts encountered in many blasting operations, tungsten carbide nozzles wear excessively due to the erosion of the relatively soft and ductile cobalt used to cement the carbide grains together.

**Syalon 050** has a high hardness, fracture toughness and Young's modulus, resulting in excellent wear resistant properties, making it an **ideal material for shot blast liners**. A standard 3/8" nozzle in Syalon 050 tested using chill-cast iron grit and operating at 100psi performed for more than 1000 hours without appreciable wear.





INTERNATIONAL  
**Syalons**

## ADVANCED SILICON NITRIDE & SIALON CERAMICS

### Industrial Wear Applications continued...

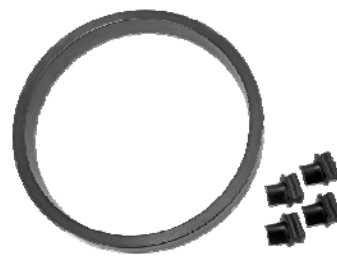
#### Paper Dewatering Foils

During the manufacture of paper a section of the process involves removing water from the fibre/water pulp. To do this, the pulp is spread over a fabric mat which travels over a series of suction boxes. These boxes apply a vacuum which draws the water out of the pulp as the fabric travels over them. The suction boxes consist of a series of rows of foils, which can be many metres long. The foils can be made of high density polyethylene (HDPE) or ceramic material. Ceramics are used in high speed applications. The foils are diamond ground to give a mirror finish, which is important for the quality of finish of the paper.

Initially alumina was the ceramic of choice. However, as machine speeds have increased, up to 100km/min, so the requirement for greater wear resistance has emerged. This is where **Syalon 101** comes in. Its **excellent wear resistant properties**, as well as **thermal shock resistance**, make it the ideal choice for modern high speed applications.

Traditionally, the foils were made up of ceramic segments 20-40mm wide. Thus a 10m long foil would consist of typically 500 pieces. This can lead to a problem known as 'piano keying', in which segments move to ruin the perfectly flat foil surface. To reduce this problem **International Syalons developed a patented method of producing segments up to 750mm long**. This therefore greatly reduces the number of segments and minimizes the chance of 'piano keying'.

**International Syalons** produce a range of standard foils in widths of 16mm, 22mm, 44mm, 53mm and 65mm in lengths up to 750mm long. Other sizes are available upon request.



#### Summary of Benefits

**Syalon 101** and **Syalon 050** offer the following benefits over other ceramic and metals in industrial wear applications:

- **Outstanding combination of physical properties such as high strength, toughness and hardness resulting in excellent wear resistance.**
- **Reduced contamination in milling applications.**
- **Longer life in shot blasting applications.**
- **Allows higher speeds in paper dewatering giving improved throughput and better paper surface finish.**

#### Technical Support

The successful integration of ceramics into industrial and engineering systems requires close collaboration between you, the end-user, and us, the material suppliers. Our Technical Specialists are available to discuss your requirements in detail and assist in exploiting the significant advantages which **Syalon 101** and **Syalon 050** have to offer. Outlined above are just a few successful **industrial wear applications of Syalon**. Should you feel Syalon may be of benefit to your application please contact us.



**International Syalons (Newcastle) Limited**  
Stephenson Street, Willington Quay  
Wallsend, Tyne & Wear NE28 6TT

Tel: +44(0)191 2951010  
Fax: +44(0)191 2633847  
Email: [enquiries@syalons.com](mailto:enquiries@syalons.com)

[www.syalons.com](http://www.syalons.com)