



Delivering together.

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Systems for Kiln & Furnace Construction

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Kiln Car Superstructures

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Support Systems for Ceramics Firing

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Specialised Products

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## Delivering Together.



IPS-Trend was established in 2010 and is a manufacturing, technology and sales partnership between the British company IPS Ceramics Ltd and the Chinese company Trend Industrial Ceramics Co Ltd, both internationally renowned specialists in the field of high temperature ceramics.



Following significant investments that have taken place in new equipment, additional staff, training of operatives and harmonisation of quality control protocols, we have successfully set up the fully integrated IPS-Trend manufacturing complex. These investments are strong testament to IPS-Trend's commitment to modern, energy-efficient production methods for one of the widest available



ranges of kiln, furnace and oven refractories. The good news for all our current and prospective customers is that what we have created is a top quality yet cost competitive manufacturing base.

We have jointly dedicated ourselves to a programme of continuous development of new products and

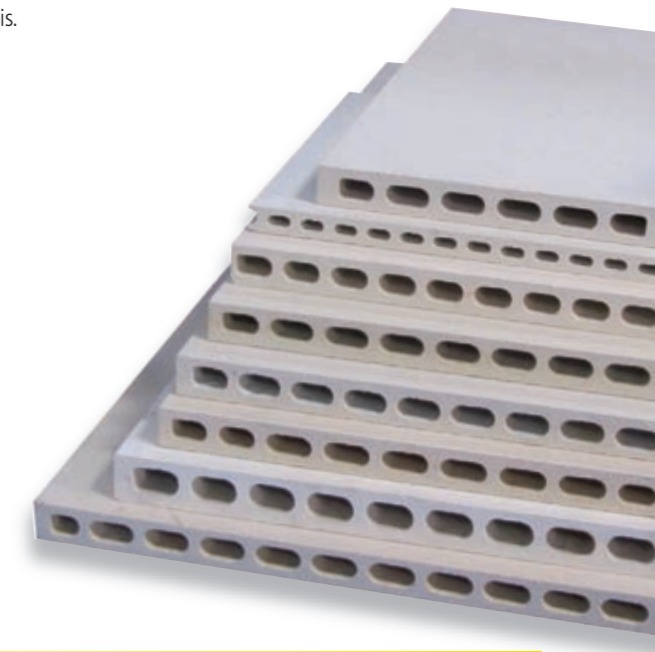


materials and this has resulted – especially recently – in an ever-growing product portfolio.

As a result, our expertise ranges right across all the major industries that require high performance shaped refractory supports to fire their products, including:

- Ceramic Tableware
- Ceramic Sanitaryware
- Technical/Electronic Ceramics
- Powder Metallurgy
- Glass and Glass-Ceramics
- Bread/Pizza Oven
- High-Performance Cast Parts
- Heavy Clay
- Ceramic Tile

This new catalogue introduces and illustrates products in all of the key areas that IPS-Trend serves. For every application we already manufacture numerous different shapes and an extremely wide range of dimensions. We do encourage you to contact us with details of all your own special requirements as the majority of products are designed and manufactured on a bespoke basis.



## Our Pedigree.



**IPS Ceramics** brings with it one of the longest histories in refractories design and manufacture. One of the predecessor companies, Diamond Refractories, began operations over 170 years ago and the other names that came to be represented in the range – Acme Marls, Hewitt Refractories and Norton Gimson – were all very long-standing and respected brands in the world of kiln furniture.

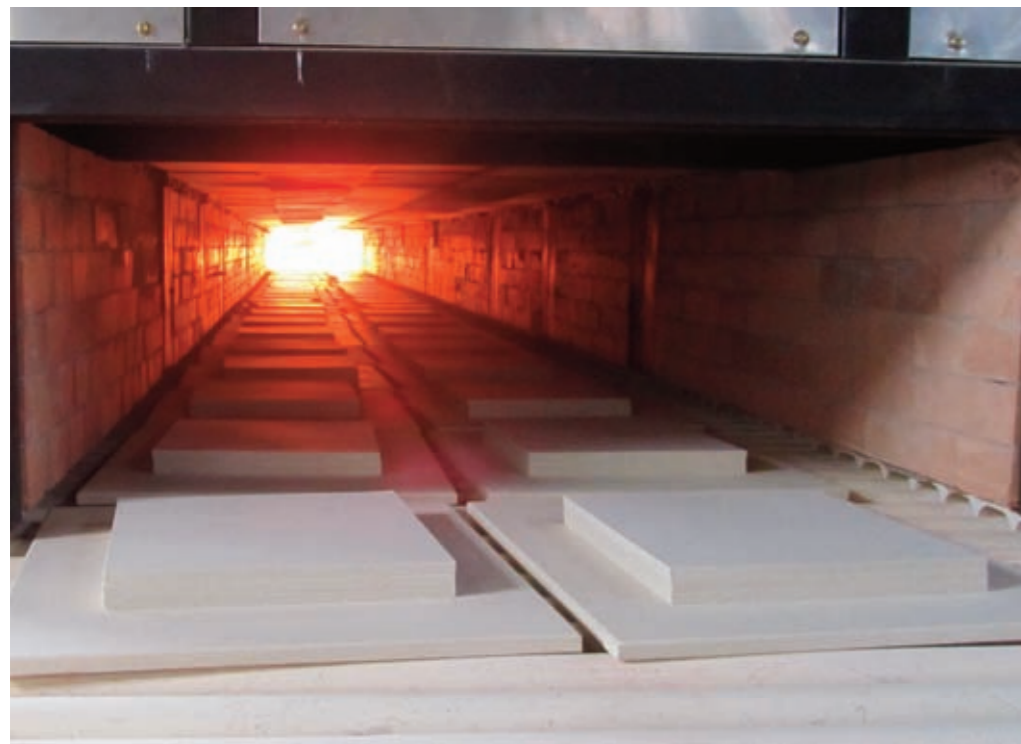
In the 1990s some of these companies came together and eventually – in the year 2000 – all four were fully integrated with the establishment of Dyson Thermal Technologies. This resulted in a virtually unmatched pool of expertise – especially in cordierite-mullite systems – which became the building blocks for a management buy-out in 2009 and the emergence of the name IPS Ceramics.

**Trend Industrial Ceramics** was founded in Beijing in 1998 and by 2000 had developed high temperature cordierite-mullite kiln furniture for use up to 1350°C. The company expanded its range with new extra-large extruded batts in 2001 and then the following year was successful in obtaining ISO 9001:2000 quality system accreditation as well as introducing ultra-low thermal expansion materials into the portfolio.

In 2003, Trend installed a 5,000 tonne per year capacity tunnel kiln and further enhanced its reputation internationally as a provider of lightweight kiln furniture. There was continuing investment and in 2005 this saw the installation of a second tunnel kiln which raised capacity to 9,000 tonnes per year – making Trend the largest manufacturer of cordierite refractories in Asia and the second largest in the world.

The milestones have continued for Trend, with the world's largest extruded batt in 2007, a third tunnel kiln installed in 2008 (capacity further increased to 11,000 tpa) and in 2009 the addition of a special continuous kiln for the production of cast cordierite items. A new high temperature roller kiln was added in February 2011, further increasing production capacity at the IPS-Trend facility.

In coming together, IPS and Trend have established the 'One Team – One Aim' ethos and we believe that the strength of our joint histories and manufacturing expertise is unrivalled.



## R&D, Design & Prototyping.



**The IPS-Trend partnership has at its disposal a kiln furniture and fine ceramics R&D centre – the subject of nearly US\$1 million worth of investment – which possesses a full range of world-class equipment for chemical, physical, high-temperature, mineralogical and microstructural properties testing.**

A number of researchers from various countries are working on new products in the laboratory. This is also where we test alternative materials for the most advanced production of new shapes, sizes and for novel industry applications.

Apart from running an in-house design team, a vital contribution to the flexibility we are able to introduce into our customers' operations – and the speed with which they are able to bring new ranges to the market – is our Rapid Prototyping Unit which is used to provide samples for approval prior to the manufacture of a new die/tool. We are currently the only company in our field in the world to offer this service.

The success of rapid prototyping relies on the development of a low density, lightweight, machinable ceramic. This is already making a big difference in certain areas and is set to make further inroads from both a technical and performance angle. There will be a steady stream of new end uses for IPS-Trend specialty ceramics.

Knowledge, dynamism and an ability to adapt are the critical qualities on which our R&D work relies, and IPS-Trend believes it is in the vanguard when it comes to providing customers with a wide-ranging technical resource.



## Energy Saving & High Technology.

IPS-Trend is your premier design, manufacturing and supply chain partner when it comes to achieving technically advanced manufacturing routes and meeting the demands for energy efficiency.

We supply durable, lightweight, thermally superior products which provide high levels of performance, at the same time as offering in-service consistency and significant energy savings from both reduced fuel consumption and minimised waste.

Via our designers, technicians and support network our efforts towards Total Ceramic Competence mean that we embrace everything necessary to get the mix right – in terms of heat, shape, speed and complexity.

Ultimately, we strive for maximum lifecycles and reduced cost per firing.



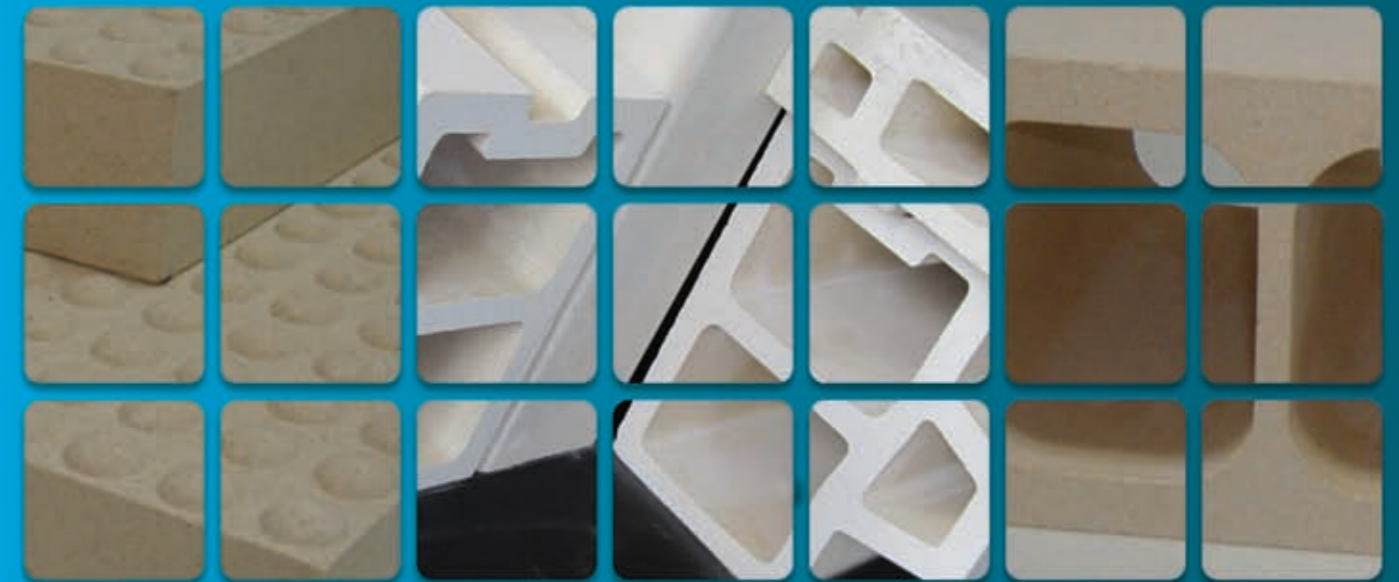
### Quality Assurance.

**Our aim is to become the leading and most trusted worldwide supplier of cordierite-mullite kiln, furnace and oven products.**

We will achieve this by providing unrivalled standards of quality and service and our goal is to be respected as a company that works in total partnership with its

customers, suppliers, employees and all stakeholders for our mutual benefit. Here at IPS-Trend, we engender a 'total quality' culture focussed on continuous improvement, operating a quality management system that exceeds the requirements of ISO 9001:2008. Our commitment is to product quality, customer service, employee development and innovation.

## Systems for Kiln & Furnace Construction



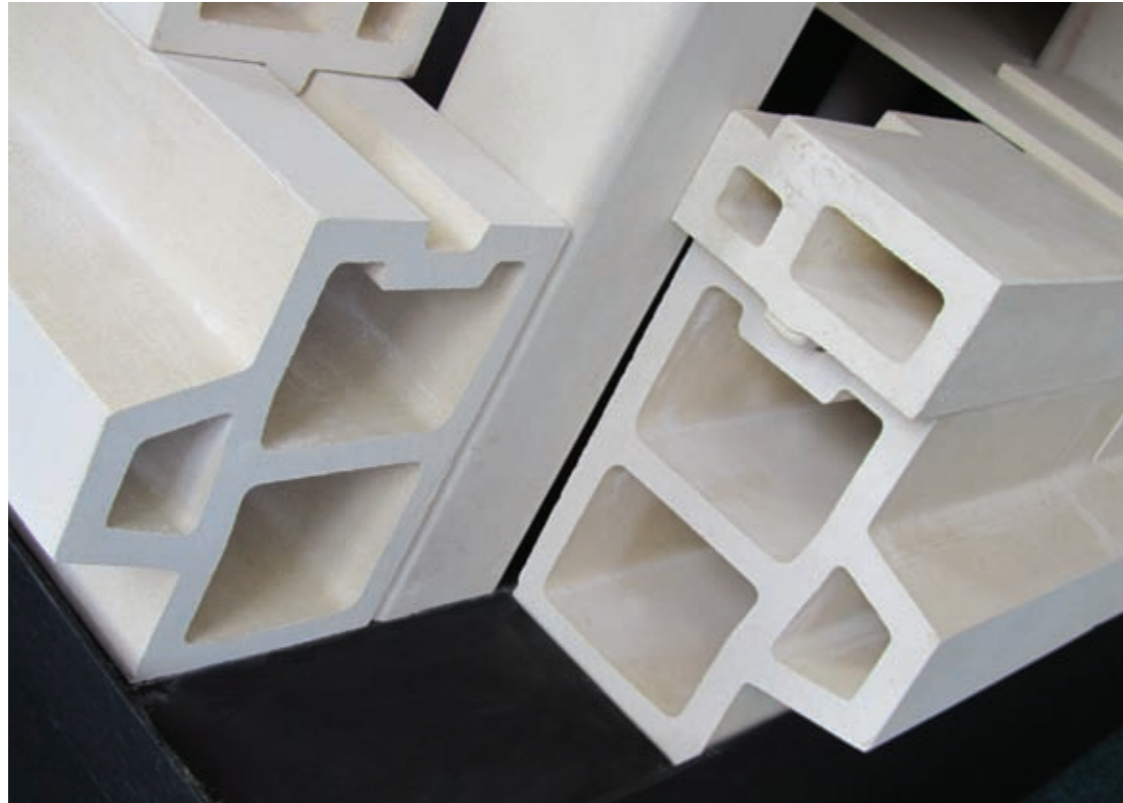
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## Systems for Kiln & Furnace Construction

IPS-Trend is an innovator in the development of cordierite-mullite materials for the construction of kilns, furnaces and ovens. Our well proven refractory construction systems can be applied to the walls and roofs of both new and refurbished kilns. Our range of Low Thermal Mass (LTM) products include both extruded blocks and dry-lock bricks. These offer customers total solutions for modifying existing systems.

### Kiln Car Bases

Of the total heat input during a normal firing cycle, the kiln car base will consume anything between 15% and 50% of this energy. Using insulating bricks to construct the perimeter of kiln cars is prone to cracking and deformation, which in turn leads to a poor seal between the cars and kiln seals as well as between the cars themselves. At worst this can lead to heat transfer to the steel structure – particularly the bearings – leading in turn to deformation or seizure.



**Reduced Mass =  
Reduced Energy Usage.**  
Typical perimeter block configurations.

IPS-Trend offers a perimeter block system designed to eliminate all the above mentioned problems. By employing the very latest designs and techniques, significant energy savings can be achieved.

Extruded hollow blocks fit together to form a perfectly shaped kiln car perimeter, not only improving the seal but also reducing the refractory weight of the car. In addition to saving energy, the service life of kiln cars is greatly increased when compared to an insulating brick structure, and the IPS-Trend system is practically maintenance free.



**Dry-Lock Bricks.**  
A stronger alternative to standard insulation bricks.

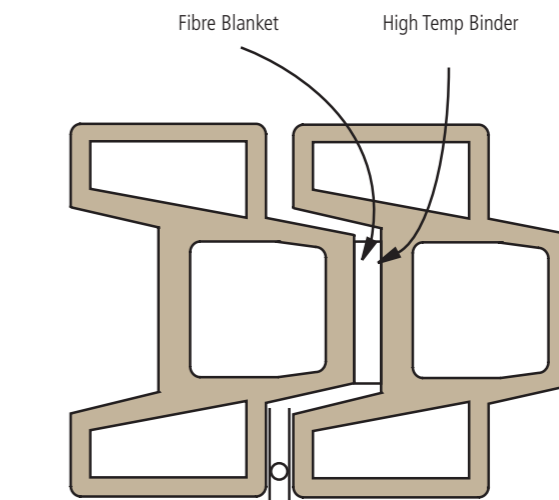


Our products in this area are suitable for both new installations and also the refurbishment of existing kilns and furnaces.

Within the perimeter, our specialised insulating bricks are characterised by low thermal expansion and high thermal shock resistance properties. Kiln car base life can be prolonged significantly by using these products to replace standard insulating bricks. Maintenance costs are also greatly reduced.

While standard dimensions can be supplied (which require mortar for brickwork), IPS-Trend also supplies all the various Dry-Lock kiln car components – displaying the same high performance but which offer customers a mortar-free assembly.

**Designed to suit your needs.**  
A wide range of possibilities are available.



Detailed Boundary between Kiln Cars.

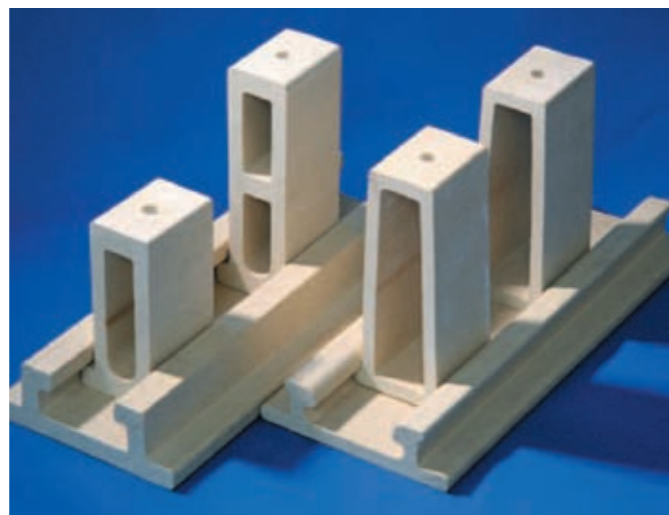
## Systems for Kiln & Furnace Construction

### Kiln Linings & Roof Hanger Systems



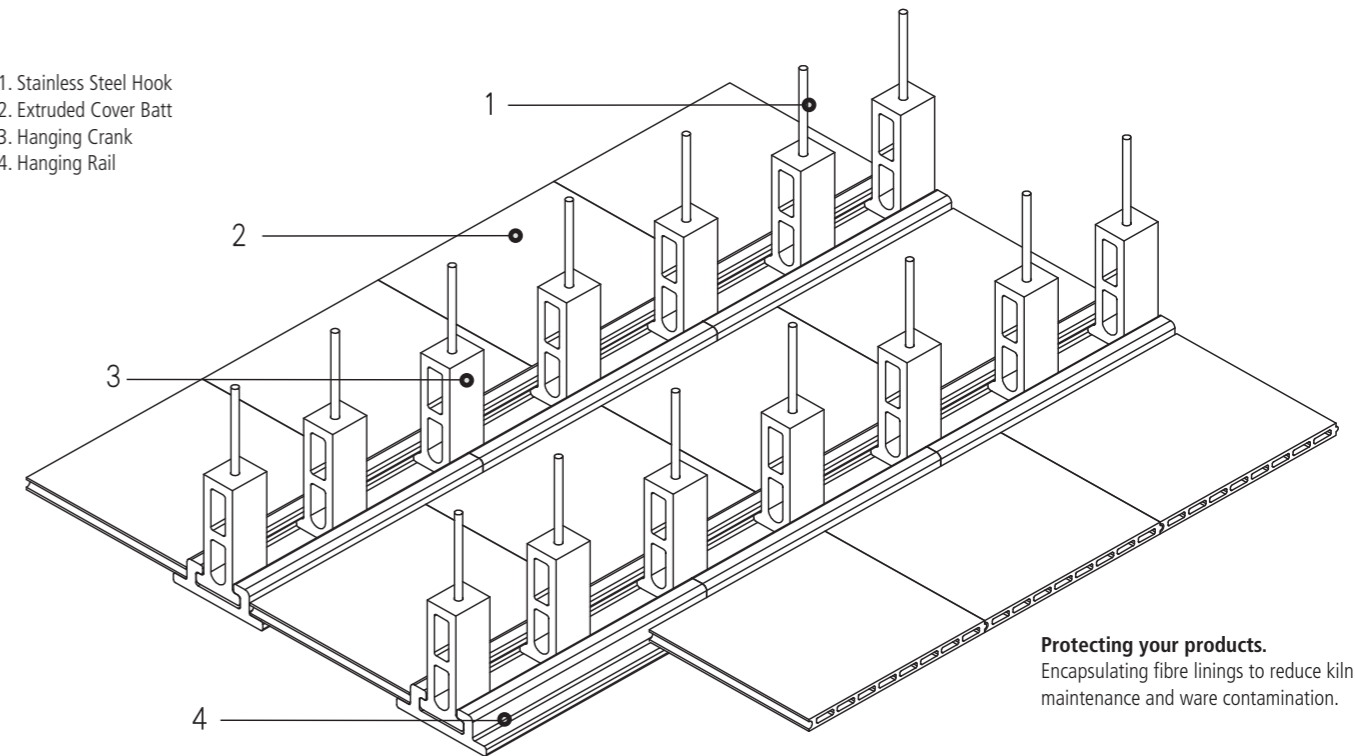
For these parts of the kiln, furnace or oven, IPS-Trend provides a solution which involves using cordierite-mullite batts to cover the ceramic fibre used in the lining. It is well understood that the actual firing process causes contaminants – vaporised glaze and other products of combustion – which will cling to and erode the kiln roof material.

Old kiln roofing techniques, in particular, lead to problems with contaminated ceramic products and these can be costly to manufacturers. There are many customers asking us to refurbish their kiln roof lining system, which is something we regularly undertake in addition to new-build.



**Extruded Lining System.**  
A range of sizes and designs available.

1. Stainless Steel Hook
2. Extruded Cover Batt
3. Hanging Crank
4. Hanging Rail



**Protecting your products.**  
Encapsulating fibre linings to reduce kiln maintenance and ware contamination.

Our system, which uses stainless steel hooks, hanging cranks and rails and extruded cover batts, provides effective protection right across the kiln roof and promotes fuel efficiency while preventing ingress of contaminants as well as degradation and dust production.

For the same reason, kiln wall sections often require this protection and the IPS-Trend system is equally applicable and is hung and fixed in the same way.



**Pressed Roof Hanging System.**  
Typical assembly; range of sizes available.

## Systems for Kiln & Furnace Construction

### Flue Supports

IPS-Trend supplies the complete array of both pressed and cast flue supports used in the construction of today's thermally efficient kiln car bases. These supports are all carefully specified for each kiln car set-up and design.

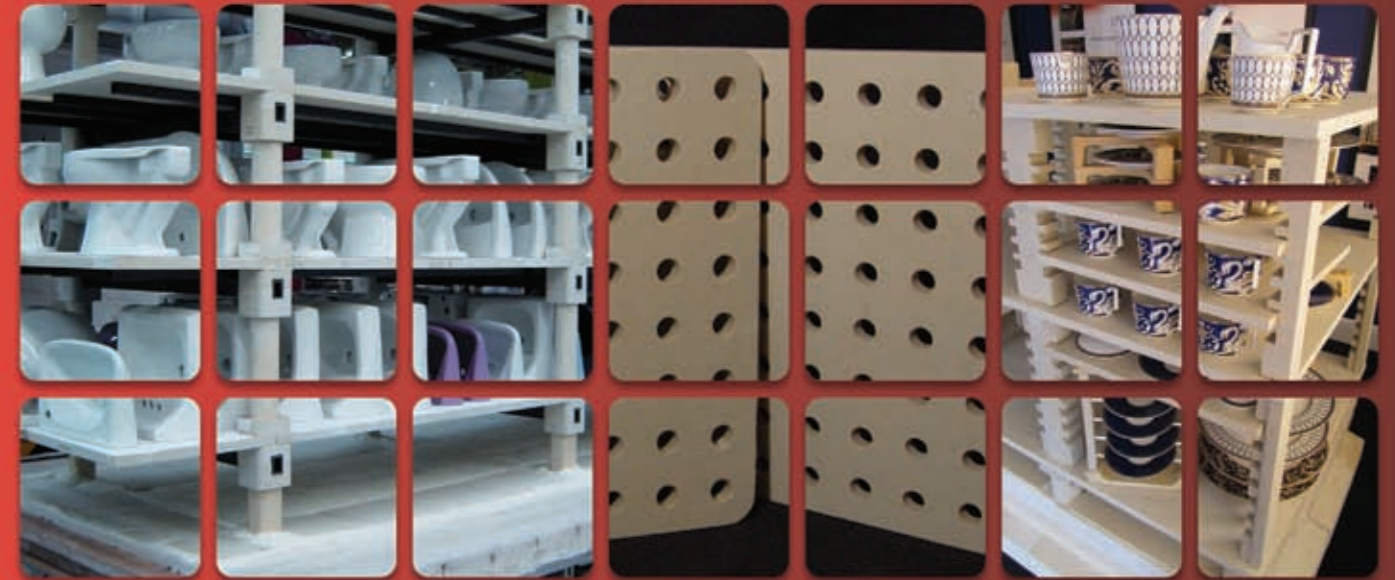


### Roller Blocks

We also design, manufacture and supply roller blocks, or roller bricks as they are sometimes known. These are an important component in the construction of roller kilns for the firing of a wide range of products.



## Kiln Car Superstructures



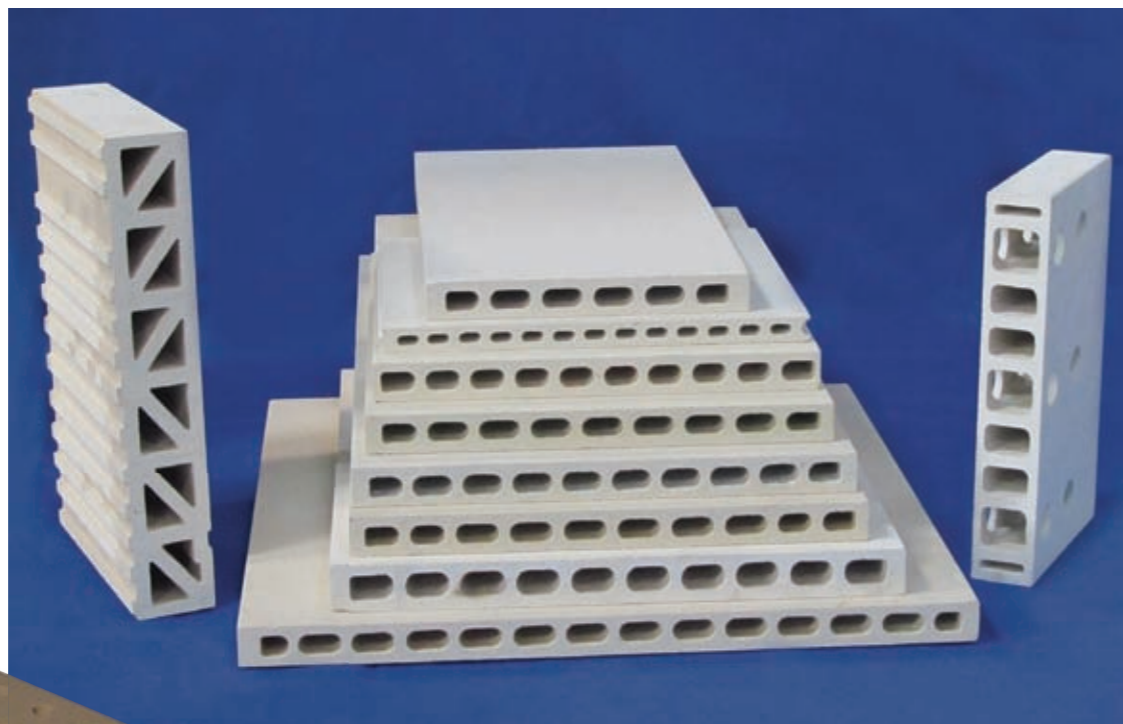
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## Kiln Car Superstructures

Superstructure refractories (sometimes known as 'primary kiln furniture') are mainly used in forming the main structure on which Support System items ('secondary kiln furniture', as featured in the next section) are placed. The main products in this section are manufactured via a number of routes and have few restrictions as to the industries in which they can be used. They are very durable, often designed specifically for an individual customer's needs and offer superior thermal performance.

### Batts – Plain, Perforated, Extruded, Cast

Plain Batts are the most common type used in kiln car superstructures. They are usually produced by semi-dry pressing but can also be made by slip-casting. The range includes grooved, recessed, full and half-discs and special shapes. IPS-Trend offers an extensive range of shapes, sizes and materials and can also manufacture tooling for bespoke items.



#### Extruded Batts.

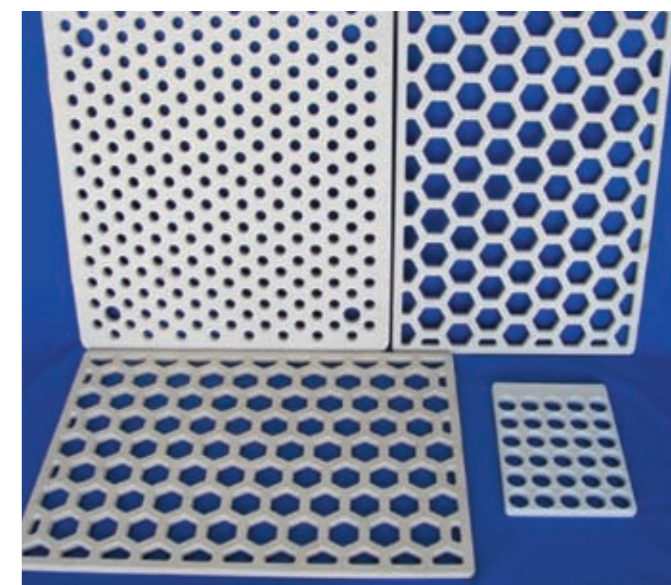
Used in a wide variety of industries and applications.

Perforated Batts can be used in most applications, particularly where good ventilation or reduced thermal mass are required. We have an extensive range with holes of various diameters, sizes and configurations.

Extruded Batts have hollow cores running through the length and are manufactured using vacuum extrusion, before being cut and surface-ground to guarantee the highest standard of flatness and dimensional accuracy. They are principally used by the sanitaryware and glass panel industries, but are also used in the biscuit and glost firing of tableware. Compared with plain batts, benefits include a weight reduction of up to 50%, reducing fuel consumption whilst maintaining the load-bearing ability (e.g. a 38mm-thick extruded batt

has the same weight as a 23mm-thick pressed batt). They have increased ability to disperse heat against a comparative solid batt, which can be improved further with an option of perforating.

Cast Batts are preferred in some applications. The casting process allows for more complex shapes, gives a smooth, wear-resistant surface and is ideal for small production runs, but with limitations on overall dimensions. Working temperatures can be up to 1250°C.



#### Cast Batts.

Low thermal mass batts, with shapes not achievable by other production methods.



#### Featured Batts.

Shaped and formed to individual requirements.



## Kiln Car Superstructures



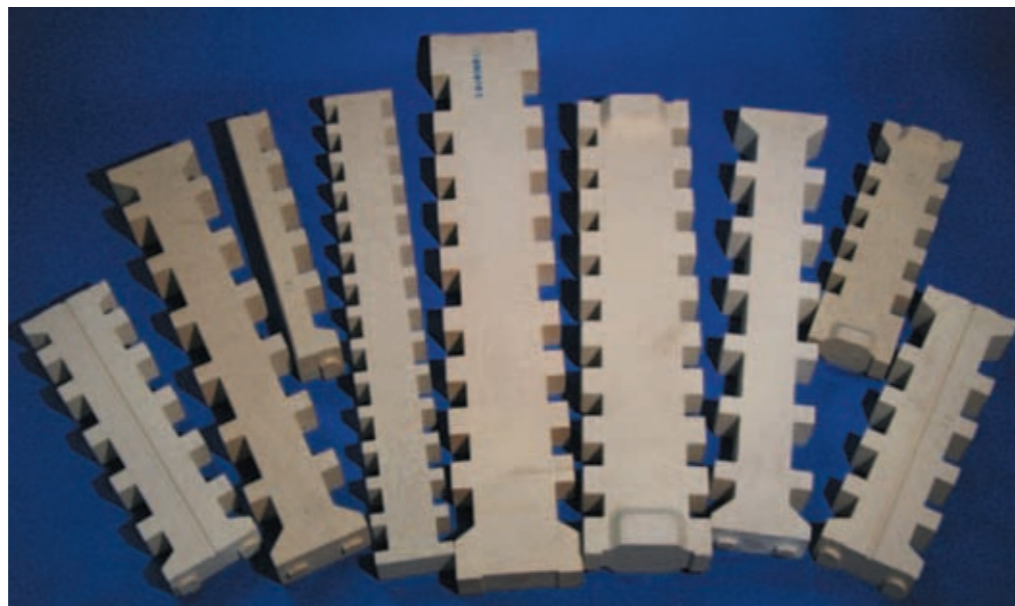
### Tubes

Tubes are used as supports for all types of batts as part of a superstructure or flue support. They are made by vacuum extrusion and we offer a comprehensive range of cross-sections including round, square, rectangular and oval, with an extensive selection of accompanying fittings.



### Props

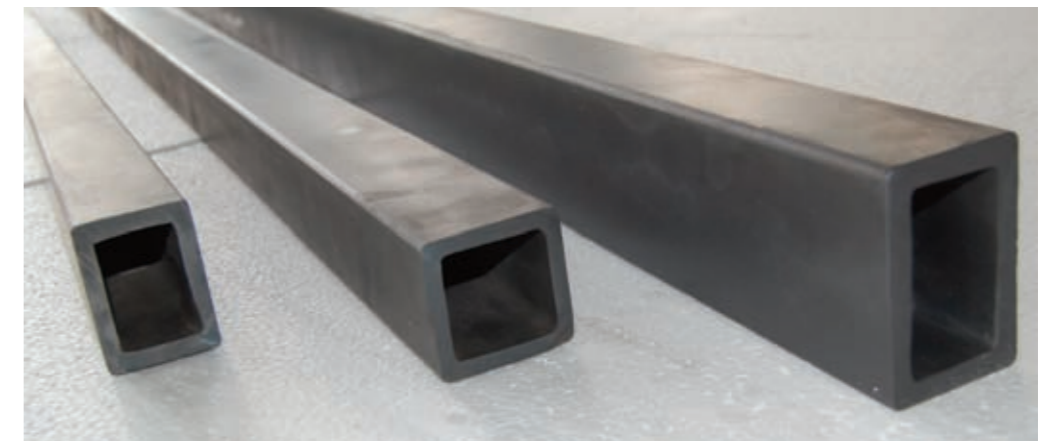
Props are used for all types of batts as part of a superstructure or flue support. They are normally manufactured by semi-dry pressing, which allows more complex shapes to be produced and we offer a comprehensive range of fixed height, interlocked and shelved to give adjustable placing heights.



**Using space efficiently.**  
Fixed and shelved supports to optimise kiln fill.

### Beams

We offer a range of Silicon Infiltrated Reaction Bonded Silicon Carbide (SCS/SiSiC), Recrystallised Silicon Carbide (SCR/RSiC) and Nitride or Oxide-bonded Silicon Carbide (NSiC/SCO). These beams exhibit high thermal-shock resistance, high bending strength, good wear resistance and also chemical resistance, and are available in various cross-sections up to 3 metres long.



# Kiln Car Superstructures

## Fittings - Collars - Caps - Splicers

Effective kiln car superstructures rely on an extremely wide variety of these shaped fittings, whose function is to act as connectors, locators, supports and interlocks between tubes, beams and batts.



**Beam and Splicer System.**  
Maximising load.  
Minimising thermal mass.



# Support Systems for Ceramics Firing



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## Support Systems for Ceramics Firing

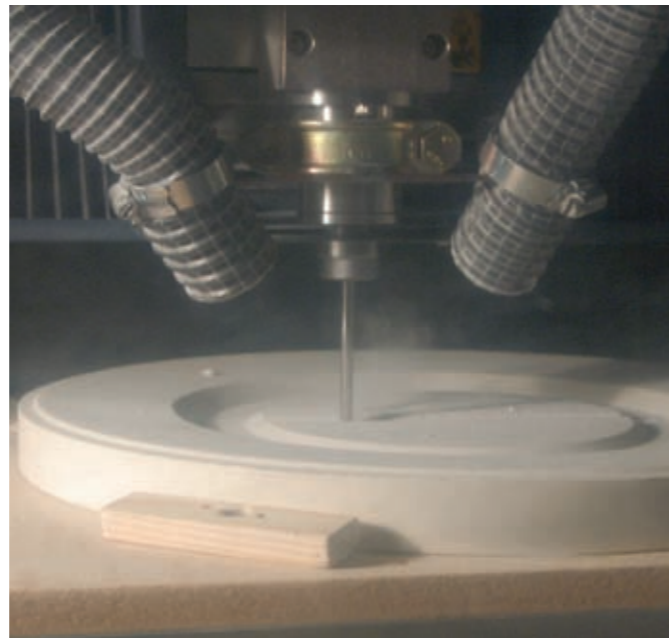
IPS-Trend Support Systems comprise a wide range of kiln furniture items. Across the many industries we serve, there are tens of thousands of products, each subject to a range of processing methods and kiln firing cycles. Choosing the correct kiln furniture for each application – and sourcing it from a quality-assured supplier – is vital in improving yields, achieving greater kiln loads and reducing energy costs. Our offering in this area is extensive, impressive and tried & tested.

### Biscuit Setters

Profile Setters are the main products in this range and are used to maintain the shape of (mainly) bone china tableware during biscuit firing. IPS-Trend has many years' experience in designing and producing profile setters for customers all over the world, including many complex shapes to support the most challenging contemporary designs. We also supply base and bedding setters for supporting earthenware and stoneware, and cup rings to maintain the roundness of the rim of cups and small holloware.



This allows our customers to approve designs in their processes, so that any modifications can be made before manufacturing die tools, which is an expensive and time-consuming process. At the time of going to press, this remains the only such facility that we are aware of in the world.



**The customer is waiting.**  
Rapid Prototyping means shortening time to market by weeks.

18 Our UK-based Design Office incorporates the Rapid Prototyping unit, which is equipped with a super-fast Roland CNC Router and uses our special lightweight, machinable ceramic material. Using your product or AutoCAD (or similar) design files, we can develop and despatch a prototype setter anywhere in the world within days.

### Pin Crank Systems

Our rim support Pin Crank System has been designed to give minimum refractory-to-ware ratio. The unit

consists of interchangeable bases, covers, uprights and a number of triangular-section pins, which give

minimum surface contact. Multi-fitting bases and covers are available for larger ware sizes.

#### Features:

- Maximum kiln fill and full fuel efficiency.
- Choice of pin angles to minimise pin-to-ware contact area.
- Accommodation of either 10mm, 6mm or 5mm ceramic pins for different weights of ware.
- Variety of upright lengths available to suit your deck spacing.



### Total Foot Supports

Total Foot Supports (TFS) are predominantly used for once-fired tableware to help prevent distortion during firing. We can produce a range of shapes and sizes with either integral legs or separate legs, from traditional robust setters to modern lightweight designs.



# Support Systems for Ceramics Firing

## T & Y Cranks

Our T & Y Cranks are designed to support ware at three points around the foot during glost and decorating firings. Energy efficiency is promoted as the maximum amount of support can be achieved with the minimum amount of refractory material.

T-pieces are designed to be placed in stacks on kiln cars, allowing ware

to be loaded directly into the cranks, increasing work efficiency.

Flexibility in placing heights can be achieved using our extensive range of integral or separate-leg cranks in

conjunction with specially produced spacers. Slots on the upper surface are used to accommodate pins, which enable point contact and good air-flow across the ware to aid complete vitrification of the glaze.



## Specialised Batts

We have a long history in batt production and are able to design and manufacture a whole host of specialised batts for applications that require a range of firing temperatures and support methods. Available in many shapes and sizes, we can provide solutions for both volume supply and short runs where required.



**Shaping up.**  
Challenge us to find a solution.  
Your problems – our projects.



## Support Systems for Ceramics Firing

### Discs

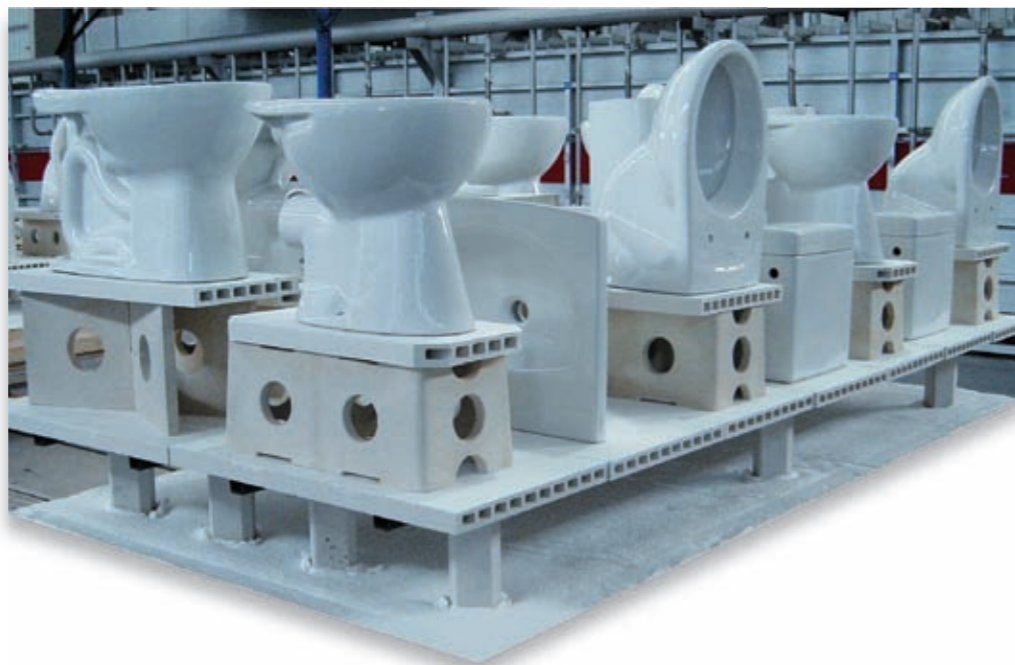
With diameters ranging from 30mm to over a metre, our Full and Half Discs are employed in a number of different industries. With operating temperatures to 1300°C and excellent thermal shock resistance, our products can be used in different firing/sintering atmospheres.



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### Sanitaryware Setters

In order to support the various types of ceramic sanitaryware – WCs, bidets, tanks, basins, shower trays etc – IPS-Trend has become a renowned supplier of the full range of Sanitaryware Setters:



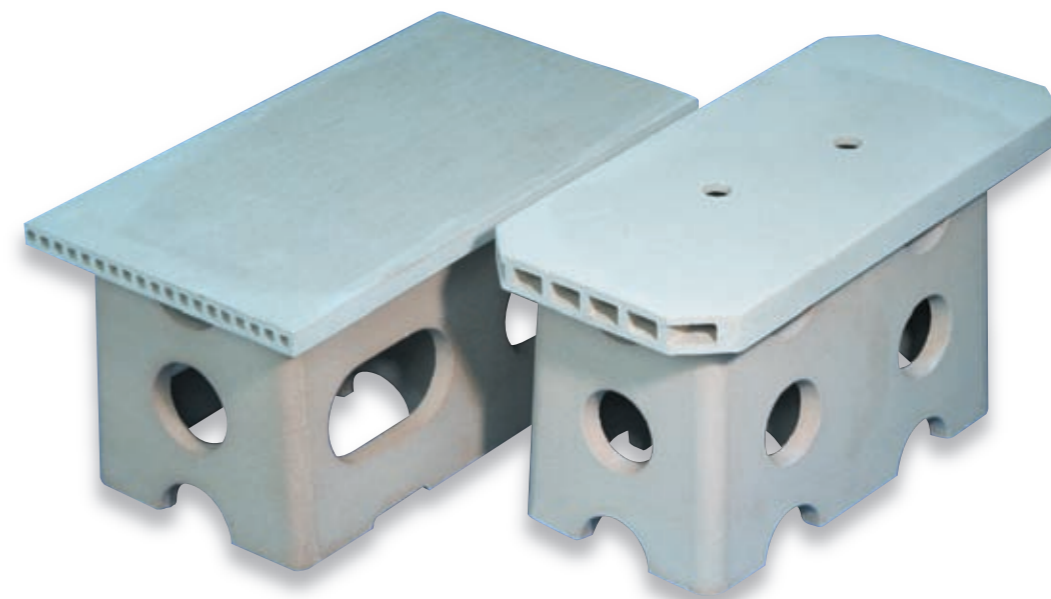
- Wash/Vanity Basin Setters
- Shower Tray Supports
- Cast Stools
- Modular Stools
- Special Setting Supports
- Special Accessories

We supply a range of standard items and can design bespoke shapes according to your needs.



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**Sanitaryware Accessories.**  
 A range of quality products designed to maximise kiln fill.



## Support Systems for Ceramics Firing



### Saggars



Saggars are the oldest type of kiln furniture in the world, originally used to protect ware from dirty bottle-oven atmospheres. Today these products are widely used for the calcination of powders and for firing small or intricate components and are available in a range of sizes and shapes.



**Tried & Tested.**  
Up-to-date designs based on an age-old concept.

## Specialised Products



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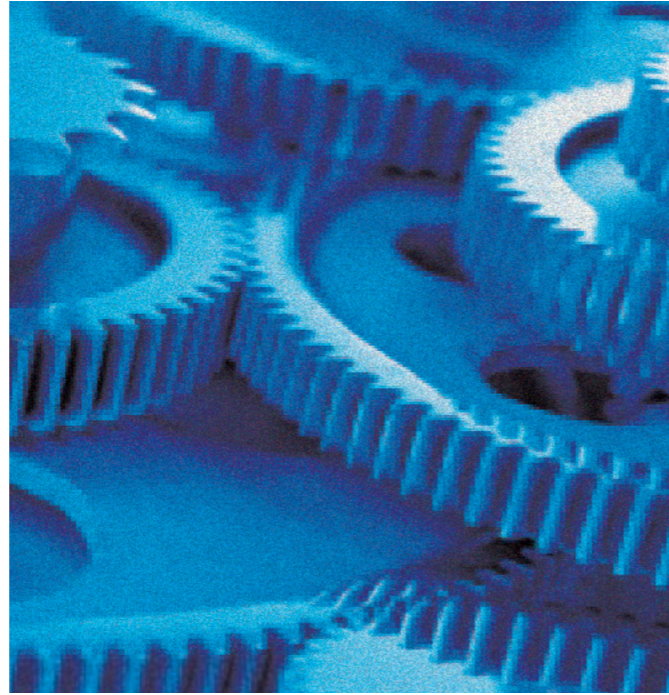
# Specialised Products



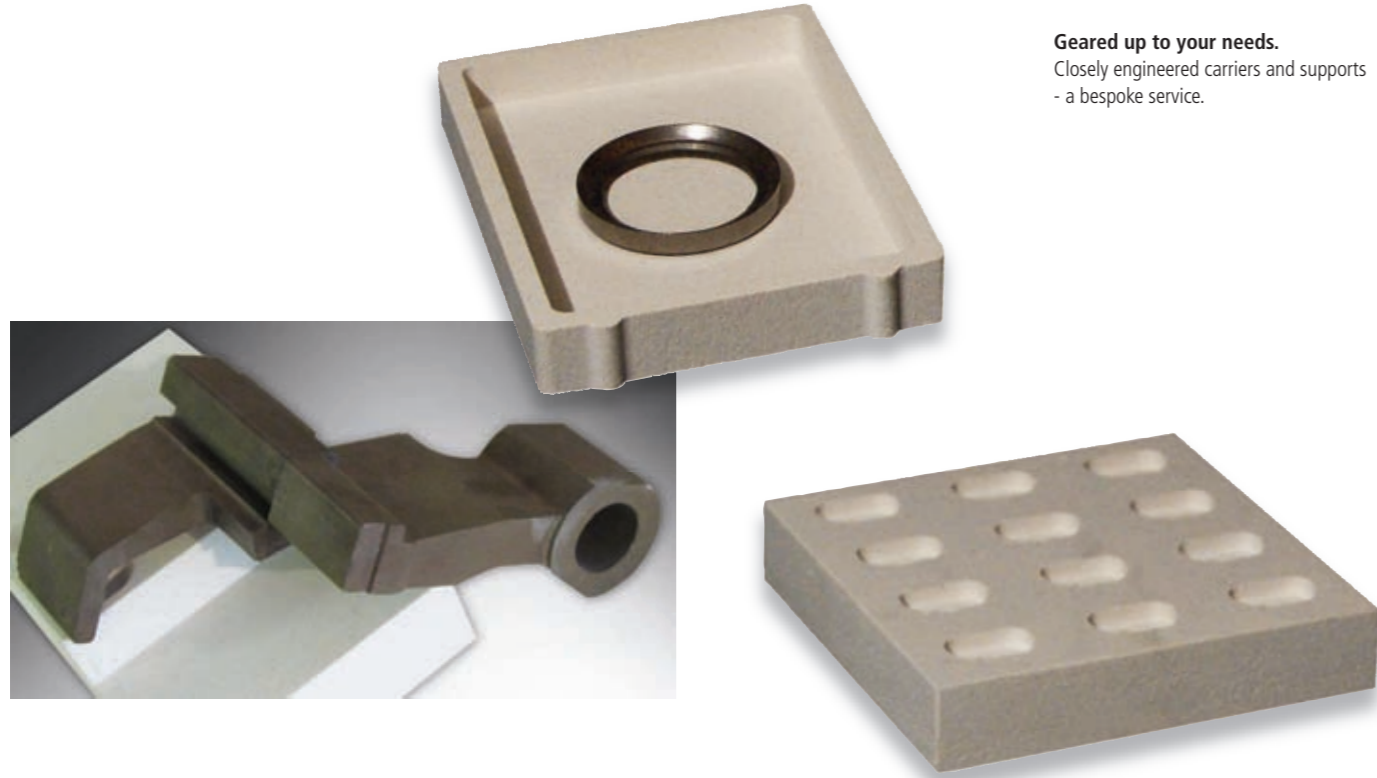
## Powder Metallurgy

Sintering powder metal compacts to make complex components is an ever-growing manufacturing route, particularly in the automobile, aerospace and precision engineering industries and in recent years IPS-Trend has increased its customer base in this area. Powder metal (PM) components tend to be fired in a protective atmosphere to prevent oxidation or reduction of the metal oxide during sintering. The refractories that support them during sintering therefore need to perform consistently well under these conditions.

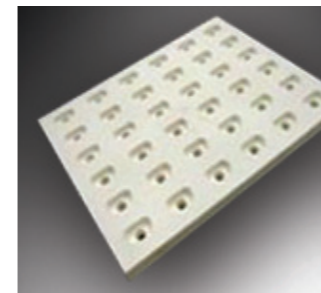
Tight tolerances on products are called for in these applications, especially with regard to flatness, and we can achieve this by surface-grinding. Specially developed materials, able to withstand rapid thermal cycling, offer a cost effective alternative to traditional carriers.



**Geared up to your needs.**  
Closely engineered carriers and supports - a bespoke service.



**Multiple methods minimising costs.**  
An ever-increasing range of specialist, highly cost effective refractories to meet a range of sintering demands.

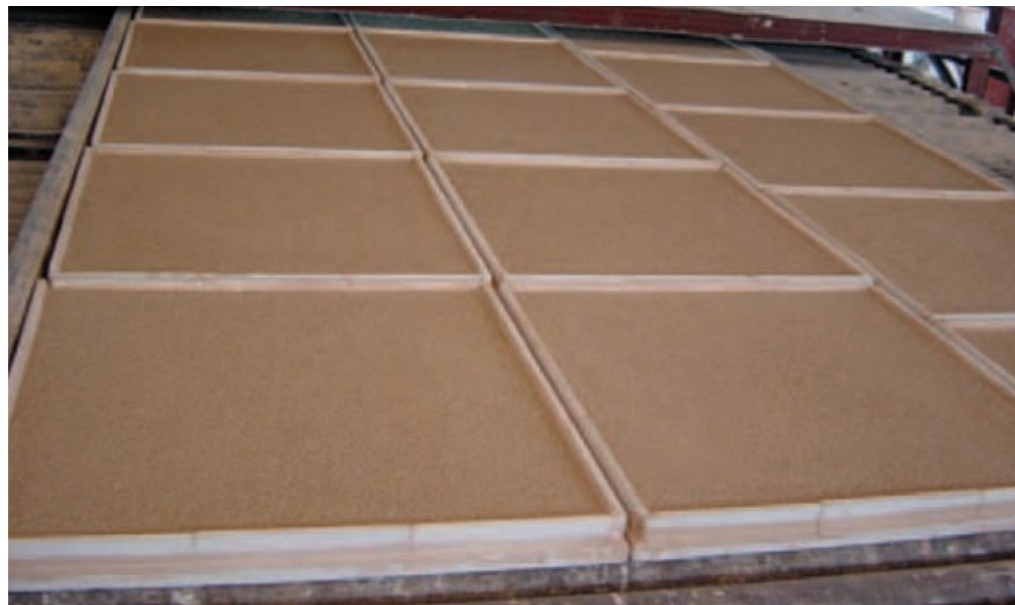
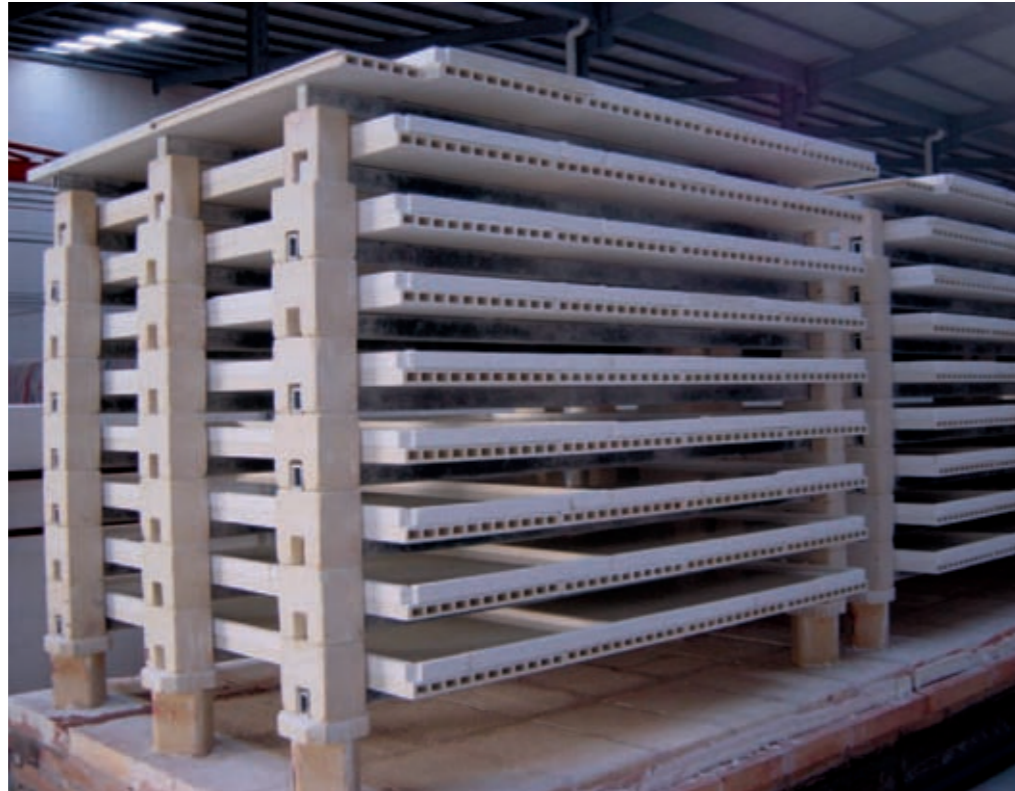


## Specialised Products



### Glass and Glass-Ceramics

Crystallised Glass Panels offer an environmentally friendlier alternative to granite and marble. The panels are formed by crystallising fused material within a refractory mould formed using specially developed large extruded batts. IPS-Trend has been a leading innovator and supplier to this growing industry and a market share of over 90% is testament to the superior performance of our system.



**'Greener' Glass - a clear choice.**  
Above: Standard shuttle kiln set-up for crystallised glass panels.  
Below: Roller kiln batt configuration for the same product.



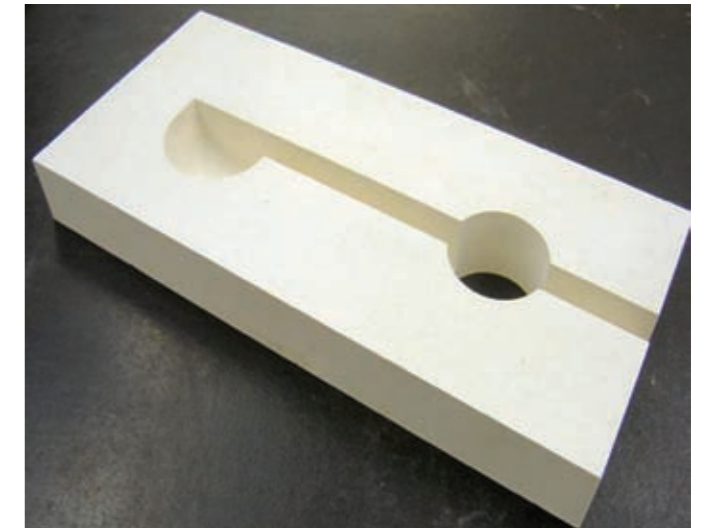
We also continue to develop products for other glassware production, just some of which are glass covers for induction stoves, laboratory equipment, glass sanitaryware and glass artware (fused, slump, hot bent etc). The key requirements for these refractories are long life, resistance to sticking, ease of cleaning and excellent thermal shock resistance.



**Art Glass.**  
Various products offered for different techniques.



**Crystallised Glass Panels.**  
Variable height support systems are needed.



**Laboratory Glass.**  
This piece has been machined for a complex design, short-run requirement. A cost-effective solution.

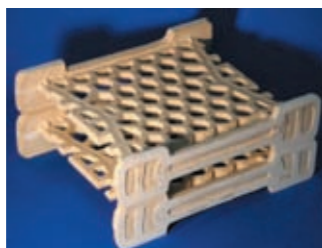


# Specialised Products

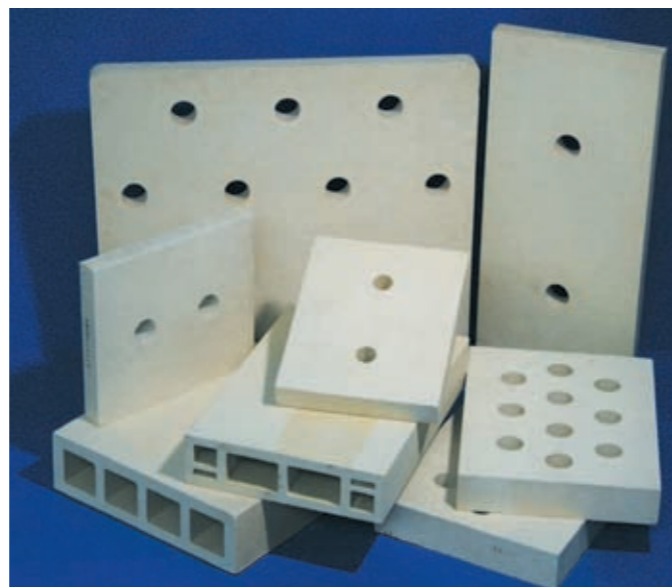


## Heavy Clay

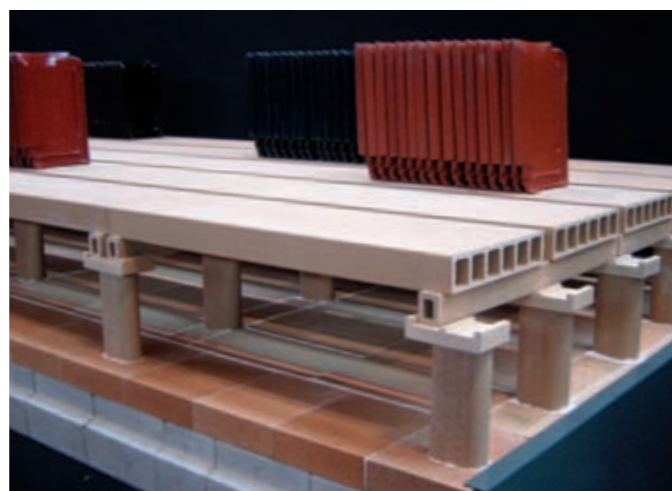
Heavy clayware includes a wide range of building ceramics, such as bricks, pavers, hollow blocks, split tiles, roofing tiles, pipes and many special items. Although firing temperatures are normally lower than other ceramic sectors, the kiln furniture for this industry must display high compression strength, high impact resistance and excellent thermal shock properties. Support systems can be specially designed to accommodate specific shapes, H-cassettes and U-cassettes for roofing tiles being typical.



**Covering all the options.**  
A full range of roof tile cassettes is available.



**Robust Support.**  
The use of higher quality materials gives longer life and increased performance.



## Bread, Pizza & Specialised Ovens

IPS-Trend has collaborated successfully with leading oven manufacturers to develop refractory solutions for the food industry. Our cordierite products are used as shelves or linings for ovens, so must be free from chemicals, odourless, easy to clean, not affect the taste of the food and offer long life. All of our products adhere to international standards for food industry use.



**Catering for your needs.**  
Safe and durable trays for both industrial and domestic ovens.



**We deliver when the heat is on.**  
Specially developed products for consistent, even heating in pizza ovens.

## Specialised Products

### Technical and Engineering Ceramics

This covers a wide range of products and manufacturing routes, with various sintering cycles and conditions. From the small and simple to the large and complex, IPS-Trend can design and develop bespoke systems that can help to improve the quality and efficiency of our customers' processes.





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