

DISCOVER MORE ABOUT THE INSTALLATION OF CERAMIC FIBER INSULATION

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**NUTEC BICKLEY SHINES IN
BRIGHT WORLD OF METALS**

**COMBUSTION SEMINAR
AUGUST 28 - 30, / MONTERREY,
CAMINO REAL HOTEL**





Editorial

**ERNESTO PEREZ,
ENGINEERING MANAGER**

Over the past few years, product diversification at Nutec Bickley has been one of the keys to our continued growth. However, diversification inherently brings many challenges and one that really stands out is product engineering.

Since our inception, engineering expertise in the area of ceramic heat treatment has been a core strength. We have designs for drying between 100°C and 400°C (210°F–750°F), shuttle and continuous sanitaryware kilns firing between 1100°C and 1250°C (2010°F–2280°F), and kilns for technical ceramics that can reach temperatures of up to 1800°C (3270°F).

Our kiln engineering has been steadily refined over many years. We have successfully consolidated the combined experience of Bickley and GFC, companies acquired by Nutec Bickley, giving us solid, reliable, world-class products. Bickley encompassed a very broad range of products, but especially for technical ceramics, and similarly GFC offered the same in the area of ceramic sanitaryware.

For its part, engineering in the area of metals heat treatment – although we have also been developing it for many years – has gained special attention in recent years due to the diversity of products and processes in this market. We started some years ago with, for example, homogenizing furnaces for aluminum, and curing ovens for the transformer and motor production sector. Today we have a wide range of products for different processes: stress relief furnaces, forging furnaces, steel tempering, electrode dryers, cooling units etc.

On the other hand, product handling system engineering – for loading, unloading and moving – has thrown up its own special challenges. While there are many companies developing automated in-process product handling equipment, there are very few who specialize in high temperature environments and, when these products are ‘red hot’, then the number of providers is significantly reduced again.

Nutec Bickley, being involved in furnace manufacturing for many years, has a very wide experience in the design of systems operating at elevated temperatures. This not only involves withstanding these higher temperatures, but also working with expansion and tolerance parameters, plus the fact that in most cases the product will have to be handled in both the cold and hot state.

Servicing two markets, ceramics and metals, with their great variety of processes and products, gives us the opportunity to compare and use designs from two very different industrial sectors, where the common denominator is heat treatment, an area in which we are recognized specialists. Therefore, we can move between both markets: designs, expertise in firing uniformity and shared equipment technology.

Finally, we clearly see that the diversity of ranges, while bringing many technical challenges, also provides the opportunity to take advantage of the experience gained with other products in order to develop better designs and to innovate on the basis of previous successes.



THE INSTALLATION OF CERAMIC FIBER INSULATION

BY ERNESTO PEREZ AND VICTOR DOMINGUEZ

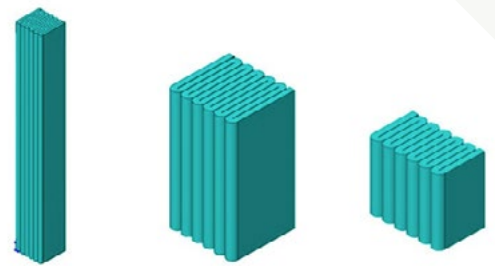
In an interview with our Engineering Manager, Ernesto Perez and our Engineer, Victor Dominguez we talked about the installation of ceramic fiber insulation.

Although we might think that the installation of insulation in an industrial furnace is a simple matter, the reality is that when it is carried out without the appropriate engineering studies, it is most likely that we will later encounter some common problems, such as:

- Heat leaks that are generated by not having the necessary precautions to protect the areas where the material shrinks.
- Degradation due to poor quality or poor choice of fiber.
- Furnace roofs that partially detach or fall, resulting in heat leakage.

ADVANTAGES OF CERAMIC FIBER OVER REFRACTORY BRICK

In the following section, we will describe the substantial benefits of using ceramic fiber insulation in your furnaces:



1. AVOIDING THERMAL SHOCK

When working with high temperatures of 1100°C (2010°F) and opening the furnace in operation, the thermal shock from cooling can cause refractory material to break or for fractures to appear, affecting its operation and significantly reducing its useful life.

With our ceramic insulation there is no danger when opening the furnace, this being especially useful when it comes to the operation of shuttle furnaces.

2. OPTIMIZED GAS CONSUMPTION

To heat refractory brick until the desired furnace temperature is achieved, a large amount of energy is required due to its higher density, unlike ceramic fiber which does not require as much energy in order to reach the desired temperature levels.



3. FASTER INSTALLATION ON WIDE ROOFS

The installation of traditional refractory material in furnace roofs needs a considerable reinforcement in the structure to support the brick arch. This installation is faster with ceramic fiber thanks to its lightness and versatility.

4. VIRTUALLY MAINTENANCE FREE

Our ceramic insulation material is extremely resistant, hence any possible damage to the fiber will not affect production as it would in the case of refractory brick.

VARIOUS TYPES OF FURNACE INSULATION

At Nutec Bickley we review the required furnace operating temperature in order to select the correct fiber for the insulation and to determine the necessary thickness, which can range from 6 in to 12 in (15.25 cm to 30.5 cm) in three different grades, as follows:

- LTS fiber insulation: for temperatures up to 1093°C (2000°F)

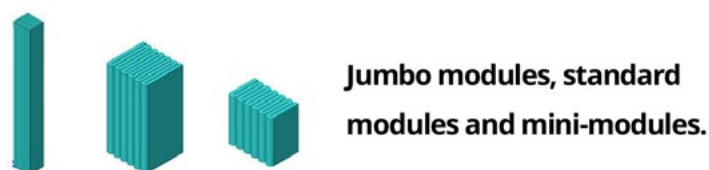
- HPS fiber insulation: for temperatures up to 1316°C (2400°F)
- HTZ fiber insulation: for temperatures up to 1425°C (2600°F)

FIBER INSTALLATION METHODS

In the following section, we will talk about our various insulation techniques for furnace insulation:

1. INSULATION WITH CERAMIC MODULES

This method is suitable for furnaces that will operate at temperatures between 500°C and 1100°C (930°F to 2010°F). We have different subdivisions according to the length of the module:



Jumbo modules, standard modules and mini-modules.

- Mini-modules – 12in (30.5cm) long
- Standard modules – 48in (122cm) long
- Jumbo modules – longer than Standard

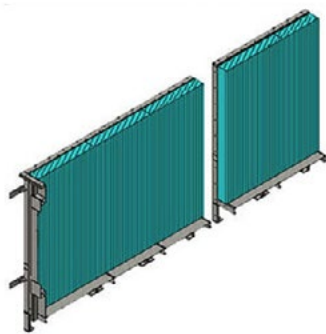
In the case of heights up to 200in (508cm), we join one module with another to provide greater stability.

Advantages

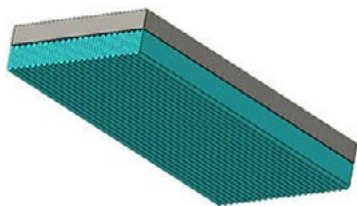
- Extremely easy to manipulate, and versatile given its diversity of sizes, especially with smaller modules.
- Reduced risk of heat leaks.

2. INSULATION WITH MACRO-MODULES

Macro-modules comprise a single monolithic piece without joints, custom made to the size required by the user for the insulation of walls, roofs and doors in furnaces with operating temperatures greater than 1100°C (2010°F).



Walls with macro-modules before installation.



Macro-module seen from the inside of the furnace/kiln.

Advantages

- Ideal for very high temperatures where there is risk of heat leakage.
- No risk of fractures thanks to secure anchorage with a rod in each layer, which prevents vibrations that damage the structure.
- Extremely stable building element.

3. JOINTLESS

Jointless is a Nutec patented component and is used in roofs that present greater exposure to leaks. It is manufactured in one piece to avoid any possible infiltration.

The installation of this system requires a thorough study to determine the optimal process, which if not followed can be very expensive and lead to leaks and production problems.

Advantages

- Very useful for the gas exhaust area.
- Ideal for very high temperatures.
- Manufactured in one piece.
- It can be fixed with both H-type and U-type anchors.
- It can be type T or type L.



**Double 'T' type seal
for two outlet gases.**



**Clamping of 'T' type
in anchors.**



**Final aspect of outlet gases
during fabrication.**



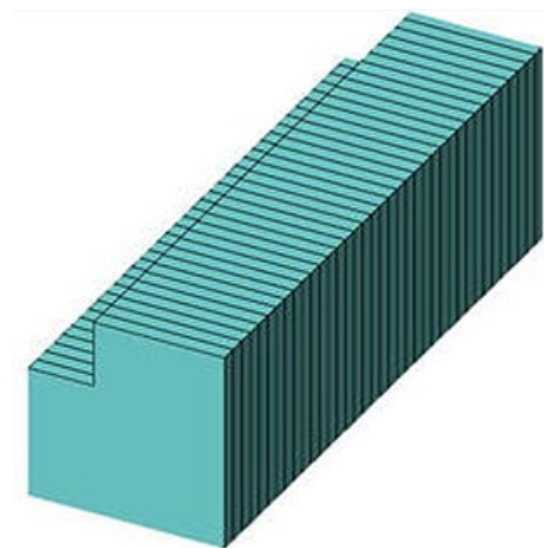
**Final structure of outlet
gases with Jointless system
insulation.**

4. STACK BOND

This system consists of several stacked fiber blankets with cut-outs to enable fitting, and is specifically designed for the sealing of doors and the perimeter of furnace walls.

Advantages

- Better compression due to several layers protecting the area.
- Adjustable according to the dimensions required by the client.



3D model of 'L' type seal.



INSULATION FOR SPECIAL CASES

5. JOINTLESS II

This is the same as Jointless technology, but instead of the gas exhaust area it is used in the insulation of the furnace door.

It is important to consider that if the insulation is not well aligned and final adjustment is not made correctly, it may leak at the top and bottom.

Advantages

- For high temperature furnaces.
- One-piece module without risk of leaks.
- Greater ease of construction, unlike the traditional stack bond insulation commonly used in furnace doors.

6. 'DONUT' STYLE VENTS

These vents are used to expel gases from the furnace to the environment by creating round or square holes in the fiber to allow gas to escape. This design helps avoid the need to use ducting or steelwork that would enlarge the furnace envelope.

Advantages

- Space reduction due to reduced steelwork.
- Economic method.
- More space freed up in the client's factory.

7. J-TYPE SEALS

This design consists of a figure J with a bar in the middle that acts as a wall support, allowing the sealing of areas where there is no structural part that provides the mechanical strength required to seal the door.

Advantages

- Provides a strong seal without leaks.
- Ideal for areas where there is no structure to rely on.

At Nutec Bickley we are experts when it comes to understanding the behavior of ceramic fiber, so we use our experience to employ various techniques designed specifically to avoid operational failure. Contact us and tell us about your next project, where our expert advisors will be ready to assist you.



IN PLAY

A QUICK ROUND-UP OF OUR LATEST PROJECTS



SHUTTLE KILN

- Location: Indonesia
- Industry / Segment: Sanitaryware
- Currently testing at our facilities
- Operational Temperature: 1,205°C (2,200°F)

WATER QUENCH SYSTEM

- Location: USA
- Industry / Segment: Aluminum Heat Treatment
- Currently delivering to customer



ROLLER HEARTH

- Location: Mexico
- Application: Heat treatment (normalizing)
- Industry / Segment: Steel Heat Treatment
- Currently operating at customer's facilities
- Operational Temperature: 1,000°C (1,830°F)



NUTEC BICKLEY SHINES IN BRIGHT WORLD OF METALS

Nutec Bickley has returned from its highly successful participation in THERMPROCESS that, alongside GIFA, NEWCAST and METEC, make up the world renowned Bright World of Metals event. This year, with an offering of 2,360 exhibitors spread cross 12 halls in Düsseldorf, the massive exhibition attracted around 72,500 visitors from 118 countries.

“We consider THERMPROCESS 2019 to have been a resounding success for Nutec Bickley,” commented Metal Furnaces Sales Manager, Manuel Montes. “We not only took the opportunity to exhibit on a truly international stage, thereby maintaining our presence at this type of event and consolidating our profile, but we increased the opportunities to meet up with both current and potential customers, as well as industry experts.”

The Nutech Bickley team noted some new points of emphasis during the week's activities, including advanced automation and digitalization, new routes to energy efficiency and the power offered by Industry 4.0. Manuel Montes added, "These are all well-known elements of our furnace lines. As stated by the organizers, the Bright World of Metals provides a beacon for the future of metallurgy and steel production and its exhibitors presented solution concepts that primarily reflected the futuristic highlights for the

industry. Nutech Bickley was once again proud to be a part of this group."

In addition to technological advances, the increased internationalization was also noticeable. Some 70% of the exhibitors hailed from outside Germany (65% in 2015) and 66% of the visitors came from foreign countries (62% in 2015).

The next Bright World of Metals will be held in June 2023; the precise date will be set over the next few months.



HOT SPOT-NB

COMBUSTION SEMINAR

AUGUST 28 - 30,
MONTERREY
CAMINO REAL HOTEL

The main focus of this seminar is to study different methods in order to increase knowledge of relevant combustion processes, and at the same time:



**REDUCE FUEL CONSUMPTION
(FUEL SAVINGS)**



IMPROVE PRODUCT QUALITY



INCREASE PRODUCTIVITY



REDUCE POLLUTION



**WORK MORE SAFELY,
CONFORMING TO REGULATIONS**

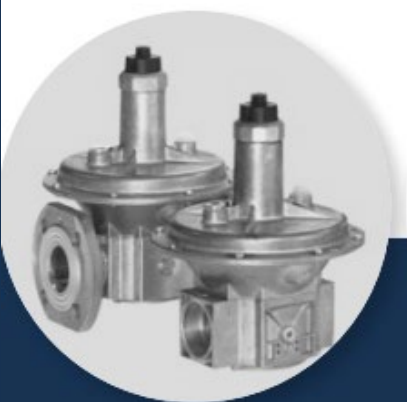
MORE INFORMATION



The Seminar has a charge for each participant and is only available in Spanish language.
For more information contact us at anakarenestrada@nutec.com or +52(81) 2354 6445.



WE ALSO SUPPLY EQUIPMENT FROM THESE BRANDS:




These brands include combustion solutions and gas controls for heating and process applications: from filters, regulators, shut-off valves and safety controls, to sophisticated burner management systems.


MORE INFORMATION

WE HOPE YOU'LL JOIN US

ALUMINUMUSA

Booth 307


 **September**
12-13, 2019

 **Nashville, TN**



**Investment
Casting**

Booth 235

 **October**
27 - 30, 2019

 **St. Louis, MO**

CHALLENGE

INSTRUCTIONS:

Analyze the problem below and answer the question that appears at the end of the text.

Two friends meet up after not having seen each other for a while. The first one asks the other "How old are you now?" – to which the second replies: "I am twice the age that you were when I was the age that you are now, and when you get to the age I am now, then our combined ages will add up to 63.

Here's the question: **What are the current ages of these two friends?**



GET YOURSELF FEATURED IN OUR E-BULLETIN!

Answer this problem correctly and send your solution to **bulletin@nutec.com**. We'll publish the solution and a list of winners in our next edition.



DO YOU NEED A QUOTE FOR ANY OF THESE SOLUTIONS?

Contact us at bulletin@nutec.com and let us know about your project requirements so that we can respond effectively and as soon as possible. We look forward to hearing from you.