

Data sheet

ENGLISH

# Superwool® XTRA Module Systems

## Description

Superwool XTRA has been developed to work as a module system. This includes Stack module comprising strips of high quality spun fibre blanket, compressed and banded with plastic strips and including two stainless steel tubes mounted transversely through the strips remote from the hot face. They can be anchored to the furnace casing in any one of three standard versions, Y, M, and T.

In the Y module, the tubes are connected with a central, internal yoke, which includes a stainless steel stud and aluminium extension tube. This version is installed directly onto a metal plate casing, without pre-welding, using the special Pyro Bloc stud gun. It offers the fastest installation rates of any currently available modules.

The M module also includes the central yoke, which is fitted onto pre-welded studs using the special M module stud locating equipment.

The T module is anchored with a pre-studded, external, side-fix yoke.

M and T modules are used where the lining specification calls for either or both a backing blanket and anticorrosion treatment of the casing.

## Type

Stacked blanket anchored modules.  
Blankets for expansion joints and batten strips.

## Classification temperature

Superwool XTRA Module Systems: 1450°C (EN 1094-1) 2600°F (ASTM C892-17)

## Maximum continuous use temperature

Superwool XTRA Fibre: 1300 - 1325°C (2372 - 2417°F)

The maximum continuous use temperature depends on the application. The wide range of available densities and thicknesses allow for the most effective deployment of the superior thermal characteristics in a wide variety of applications.

For further advice please contact your local Morgan Advanced Materials partner.

## Features

Pyro-Stack modules combine some of the features of Pyro-Bloc and convoluted blanket modules:

- The Pyro-Stack module maintains the lightweight, thermal efficiency and resistance to thermal shock, which are characteristic of ceramic fibre linings
- They share the flexibility of anchorage and ease of installation of the Pyro-Bloc modules the decompression of the blanket gives tightly sealed inter-modular joints
- The resilience of the blanket can accommodate some flexing of the furnace casing without opening gaps between modules
- The resilient blanket is resistant to mechanical damage
- Y Modules – Fast installation. All welds automatically torque tested. One-step installation
- M and T Modules – Allow use of backing insulation and casing treatment. Module compression guaranteed. Simple fixing components. Use standard, commercially available welding equipment

## Benefits

There are some specific benefits of using Superwool XTRA Pyro-Stack modules:

- Excellent thermal insulating performances
- Exonerated from any carcinogenic classification under Nota Q of directive 97/69EC, certificate available on request
- Does not form crystalline silica when exposed to high temperatures
- Excellent resistance to chemicals and pollutants, especially alkali metals
- High thermal coefficient of expansion to counteract shrinkage in operation
- Excellent thermal stability with time
- Low heat storage
- Immune to thermal shock
- High resistance to erosion when used in stack modules; no damage up to 50 m/sec at 1250°C (2282°F)
- Resistant to water and steam
- Good sound absorption



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# Superwool® XTRA Module Systems

|  |                                | Superwool XTRA<br>Pyro-Stack™ Module Systems                |             |             |             |
|--|--------------------------------|---|-------------|-------------|-------------|
| <b>Physical Properties</b>   |                                |   |             |             |             |
| Classification Temperature, °C (°F)  |                                | 1450 (2600)   |             |             |             |
| Melting Point, °C (°F)   |                                | 1650 (3000)   |             |             |             |
| Colour   |                                | White   |             |             |             |
| Density, kg/m <sup>3</sup> (pcf)   |                                | 170, 192, 210 (10.6, 12, 13.1)                              |             |             |             |
| Modulus of Rupture, MPa (psi)  |                                | Flexible  |             |             |             |
| <b>High Temperature Performance</b>  |                                |   |             |             |             |
| Maximum Continuous Use Temperature, °C (°F)                                  |                                | 1300 - 1325 (2372 - 2417)                                   |             |             |             |
| Shrinkage, @ 1450°C (2642°F), %, modified EN 1094-1 method                   |                                | <4  |             |             |             |
| Modified Density availability, kg/m <sup>3</sup> (pcf)                       |                                | 170, 192, 210 (10.6, 12, 13.1)                              |             |             |             |
| Erosion resistance @ 1250°C (2282°F)   |                                | No damage up to 50 m/sec                                    |             |             |             |
| <b>Chemical composition, %</b>   |                                |   |             |             |             |
|  | Al <sub>2</sub> O <sub>3</sub> | 32 - 38   |             |             |             |
|  | SiO <sub>2</sub>               | 27 - 33   |             |             |             |
|  | K <sub>2</sub> O               | 23 - 28   |             |             |             |
|  | ZrO <sub>2</sub>               | 5 - 9   |             |             |             |
|  | MgO                            | 0.5 - 1.5   |             |             |             |
| <b>Thermal Conductivity, W/m•K (BTU•in/hr•ft<sup>2</sup>•°F), ASTM C-201</b> |                                |   |             |             |             |
| Measure density, kg/m <sup>3</sup> (pcf)                                     |                                | 128 /25<br>blanket<br>values as<br><u>reference</u><br>only | 170 (10.6)  | 192 (12)    | 210 (13.1)  |
| Mean temperature   | 200°C (390°F)                  | 0.06 (0.42)   | 0.08 (0.56) | 0.08 (0.56) | 0.08 (0.56) |
|  | 400°C (750°F)                  | 0.09 (0.62)   | 0.11 (0.76) | 0.11 (0.76) | 0.12 (0.83) |
|  | 600°C (1110°F)                 | 0.16 (1.11)   | 0.18 (1.25) | 0.19 (1.32) | 0.19 (1.32) |
|  | 800°C (1470°F)                 | 0.26 (1.80)   | 0.28 (1.94) | 0.29 (2.01) | 0.29 (2.01) |
|  | 1000°C (1830°F)                | 0.40 (2.77)   | 0.42 (2.91) | 0.44 (3.05) | 0.42 (2.98) |
|  | 1200°C (2190°F)                | 0.57 (3.95)   | 0.59 (4.09) | 0.61 (4.23) | 0.61 (4.23) |
|  | 1300°C (2372°F)                | 0.67 (4.65)   | -           | -           | -           |

Pyro-Stack Modules data represented in the table above is based on edge grain orientation of a module made of 160kg/m<sup>3</sup>, 25mm (10pcf, 1in) blanket.

### Complementary items to the module system

Superwool XTRA blankets are only available as complementary products for Module systems. This includes specific complex shapes, expansion joints and batten strips. We recommend to contact your Thermal Ceramics Applications Engineering team to discuss best practise for your design.

### Fixing components and installation

The standard tubes and yokes for all Pyro-Stack modules are ASTM 316 stainless steel, but higher grades of steel (ASTM 310 or Inconel 601) are available for more arduous service conditions. Studs are ASTM 304 stainless steel or of such higher grade which are warranted by the service conditions. Full details of the installation of all Morgan Advanced Materials modules are included in our Module Installation Manual.

### Availability and packaging

Pyro-Stack modules are normally supplied as 300 x 300 mm square and of thicknesses ranging from 100 mm to 305mm, in 25 mm increments. Other sizes, shapes and densities, including L-shaped modules can be made available on request.

Pyro-Stack modules are delivered packed either in cartons 315 mm square x 930 mm long or on palletted jumbo cartons, 1250 mm x 1110 mm x 1100 mm high (including pallet).

Blankets are available in 13 and 25 mm for the purpose mentioned above.

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**SUPERWOOL®** is a patented technology for high temperature insulation wools which have been developed to have a low bio persistence (information upon request). **SUPERWOOL®** products may be covered by one or more of the following patents, or their foreign equivalents:

**SUPERWOOL® PLUS** and **SUPERWOOL® HT** products are covered by patent numbers:

US5714421 and US7470641, US7651965, US7875566, EP1544177 and EP1725503 respectively.

**SUPERWOOL® XTRA** products are covered by patent number: US8088701 and EP2086897B1.

A list of foreign patent numbers is available upon request to Morgan Advanced Materials plc.

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