

FACT SHEET

CLASSIFICATION TEMPERATURE



Consistent use of
pure raw materials...

...higher classification, low
shrinkage, consistent quality

Superwool® Plus™
Insulating fibre

The consistent use of pure raw materials in all our factories worldwide has led to the 4% shrinkage temperature rising from > 1100°C (2012°F) Superwool® 607® to > 1200°C (2192°F) Superwool® Plus™.

- For AES fibres the shrinkage is low at the maximum continuous use temperature
- European standard EN 1094-1 test methods are used for tensile strength, permanent linear change and temperature classification
- ASTM C-201 equipment used for thermal conductivity

Does Superwool® Plus™ blanket withstand high temperatures?

Permanent linear shrinkage

Shrinkage is generally to be avoided in designs using fibre products as it results in gap formation at joints, which can give a path for heat to penetrate deeper into the insulation structure. A low linear shrinkage is therefore highly desirable and AES fibres have a low shrinkage at the maximum continuous use temperature. With Superwool® Plus™ fibre, the consistent use of pure raw materials has led to the 4% shrinkage temperature rising from >1100°C (2012°F) to >1200°C (2192°F).

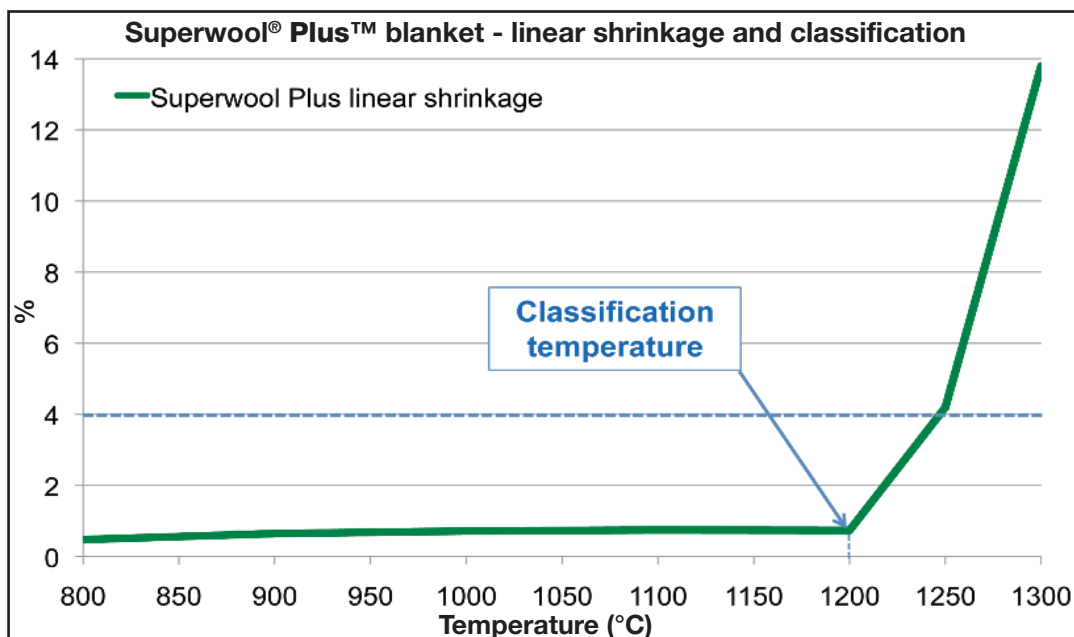
For this reason, the classification temperature is now given as 1200°C in line with EN1094 norm.

What is the difference between classification temperature and maximum continuous use temperature?

- **Classification temperature (EN1094-3)** is the temperature at which the product has a linear shrinkage not exceeding 4% (for blanket, paper, felt) or 2% (for vacuum formed shapes, board).
- **Maximum continuous use temperature** is the temperature in an oxidising atmosphere (no pollution) at which products show fibrous structure and very low linear and thickness shrinkages. Above that temperature, crystallisation can occur and the mechanical properties may be reduced.

	Superwool® 607®	Superwool® Plus™	Superwool® 607® HT®
Continuous use temperature	1000°C (1832°F)	1000°C (1832°F)	1150°C (2102°F)
Classification temperature	1100°C (2012°F)	1200°C (2192°F)	1300°C (2372°F)
Benefits	Original Superwool®, over 15 years market experience	New manufacturing process gives improved insulation and energy savings	Higher temperature allows additional applications

The Classification temperature 1200°C (2192°F) does not imply that the product can be used continuously at this temperature. In practice, as for Superwool® 607®, the maximum continuous use temperature for Superwool® Plus™ is 1000°C (1832°F) (this applies only under oxidising atmosphere without presence of contaminants).





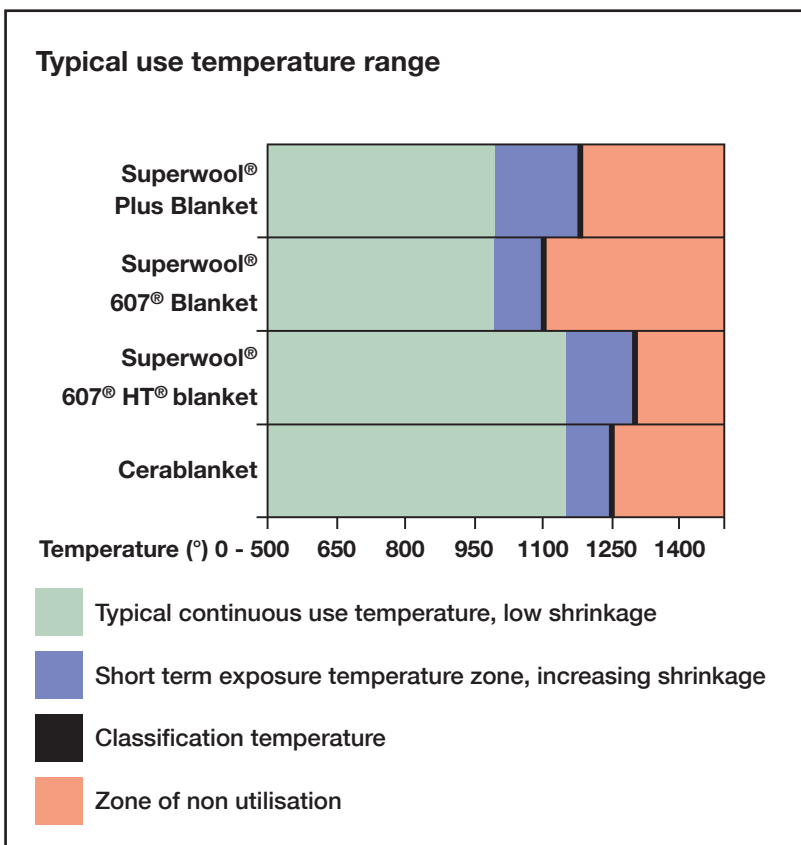
What is melting point and why is it important?

The melting point of Superwool® Plus™ blankets (or similar products) is defined as the temperature when the material exceeds 20% linear shrinkage. At this level of shrinkage the blanket will have lost virtually all of its thermal insulation properties and will become liquid with only a relatively small increase in temperature. It is therefore important to know the temperature of the melting point to ensure that the material is only installed into appropriate areas where the melting point will not be exceeded.

Testing methods (ASTM C-201 and EN 1094-1)

For test methods measuring the properties of high temperature insulation wools (HTIW), the European standard EN 1094-1 (2008) is used for the test methods where appropriate. Superwool® Plus™ data sheets refer to measurements such as tensile strength, permanent linear change and temperature classification. These characterisations are made according to the test methods given in this standard. However there are several test procedures for HTIW products which are currently in development and will not be included into the EN 1094-1 standard until they have been ratified.

Some tests, such as thermal conductivity and leachable chloride use the ASTM methods. In particular the thermal conductivity test uses the methods based on the ASTM C-201 equipment as it is believed that this gives the most accurate data for high temperature insulation. The thermal conductivity method given in the draft European Standard EN 1094-1 has been withdrawn as it was inaccurate and so was not included in the current standard.





Superwool[®] Plus[™]

Insulating fibre

Features

Benefits

An engineered solution (unique)

Takes insulation beyond normal performance

Patented technology

Proven chemical formulation

High temperature insulating wools (Superwool[®] range of products) not classified according to European Regulation (EC) 1272/2008

Restrictions on use do not apply. No special requirements for dust control, can be supplied to the general public and considered as non-hazardous waste for disposal

Lower thermal conductivity

Improves insulation by 20%

Up to 30% more fibres

Efficient prevention of heat transfer and greater strength

Less shot

Cleaner workplace

High Fibre Index

Up to 20% reduction in thermal conductivity giving energy saving

Stronger with good handleability (no tearing)

Ease of installation saving time and waste

Improved handling

Operator satisfaction

Soft & smooth feel

Less mechanical skin irritation

Consistent use of pure raw materials

Higher classification temperature, low shrinkage and consistent quality

Lower density grade for the same result

Material weight savings up to 25%

Thinner lining for the same result

Create more working space within unit

Resistant to vibration

Allows long lifetime under vibration conditions where other products fail

An environmental solution

Potential savings on waste disposal

Worldwide production

Availability



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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). This product may be covered by one or more of the following patents, or their foreign equivalents:

SUPERWOOL® PLUS™ products are covered by patent numbers:
US5714421, US5994247, US6180546, US7259118, and EP0621858.

SUPERWOOL® 607HT™ products are covered by patent numbers:
US5955389, US6180546, US7259118, US7470641, US7651965, US7875566, EP0710628, EP1544177, and EP1725503

A list of foreign patent numbers is available upon request to The Morgan Crucible Company plc.

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