

TRI-ISO SUPER 10



Energy saving insulation for roofs and attics - The technology explained



ACTIS TRI-ISO SUPER 10 Properties include:

- Efficient both in summer and winter
- Certified u-Value of 0.19 W/m².K (BM TRADA)
- Space saving 30mm thick!
- Quick and easy to install
- Flexible can fit the most difficult of roofs
- Durable - will not sag, moisture resistant
- Non-irritant, hypoallergenic – clean and free of irritant fibres
- 19 Layers of heat resisting materials comprising:
 - 2 External reflective films with reinforced mesh
 - 3 layers of soft, flexible wadding
 - 8 layers of closed cell foam
 - 6 internal layers of reflective film

ACTIS TRI-ISO SUPER 10 for use in roofs and attics is a new, improved, version of the popular TRI-ISO SUPER 9 insulation. Super 10 gives increased thermal efficiency and is still only 30mm thick!

This product has been tested under real conditions by TRADA Technology Limited and certified by BM TRADA Certification Limited - (Certificate n°0102, issued on April 3, 2006) as being the equivalent to 210 mm of mineral wool. However, we strongly recommend that users check with their local Building Control regarding Part L Building Regulations issued on April 6, 2006, before purchasing this product.



TRI-ISO SUPER 10
Installed prior to fitting roof tiles

Introduction

ACTIS multi-reflective foils first appeared on the market in 1981. Since then the technology has evolved technically, their effectiveness have been proven in the market for more than 20 years and the European market size for thin multi-reflective foils grows every year.

The concept behind Heat Reflecting Insulation and standard test procedures

When compared with fibre and foam insulation, the technology employed in the manufacture of thin multi-reflective foils limits the transfer of heat by controlling infrared radiation, conduction and movement of warmed air. They obtain a maximum effectiveness within a minimum space. This alternative solution is particularly important for projects where the space saving is an essential criteria. Also thin multi-reflective foils such as ACTIS SUPER TRI-ISO 10 offer superior performance in keeping rooms comfortably cool in hot summer weather.

Over the last 20 years or so, methods of testing have been developed to ascertain the effectiveness of fibre and foam insulation. These tests, essentially done with Guarded Hot Box in accordance with the ISO 8990 norm, or Guarded Hot Plates in accordance with NF X 10022 show poor results when testing multi-reflective foils, the results of such tests are of no value when declaring the actual performance of thin multi-reflective foils.

ACTIS have conducted tests in their laboratories, using the Guarded Hot Box method. In this test environment the actual norm provides results crediting the thin multi-reflective insulation with R- values of between R=0.6 or R=1.9 whether the insulation product is tested with or without an air gap.

Actual Norms: what are they? What is their origin ? And are they suitable for thin multi-reflective insulation products?

The reference background setting up the norms and conditions for testing in Laboratories to test materials go back to the 60's. They are based on:

The calculation of thermal resistance R of materials, obtained with the measure of the conduction. And, therefore the main elements taken into account are the transfer by conduction.

- Homogeneous materials whereas thermal efficiency is directly linked to thickness and lambda ($R = e/l$).
- A measure in compulsory stationary flow, even though this suits traditional insulation, it remains far from meeting thermal conditions found in the construction.



TRI-ISO SUPER 10
Under rafter application

Continued

These testing methods have brought proof for traditional insulation (thick, homogeneous, internal transfer essentially by conduction and little influenced by thermal stationary state).

Nevertheless, they do not seem appropriate when testing thin multi reflective insulation products, which are not homogeneous and use other means of thermal transfer than conduction.

The norm NF EN 75101 listing insulation products susceptible to be tested according to the norms.

No multi-reflective insulation products are mentioned in this document!

Why do ACTIS test in a live dynamic environment?

Various objectives have lead ACTIS to set up tests in-situ:

- To obtain test data closer to reality.
- To have another method of measuring that rejects or confirms the results obtained in laboratories.

The results obtained by measuring thin multi-layer reflective foils in-situ are better than those obtained in laboratories. It is not whether the findings of two different results brings the question to know which one is true, but it is essentially the fact that in-situ results are better than in laboratories. This last conclusion should not be scientifically possible.

In more detail, a laboratory testing method will tend to obtain optimal characteristics of the tested product. However, when installed in real life conditions its efficiency decreases due to installation constraints. This is actually the case for traditional insulation. This shows that it cannot automatically be assumed that the results will be identical when a testing method designed for a laboratory is used in an actual construction. This adds to the case that the dynamic test method used to test thin multi-reflective insulation products takes into account more aspects of the building and defines the performance more accurately.

Two different technologies mean two different testing methods

Multi-foils are made of multi-reflective films (low emissivity), synthetic wadding and foams. Their main thermal characteristics are to limit heat transfer. Traditional insulation's main characteristic is to limit exchanges by conduction only.

Conventional testing methods, for example Guarded Hot Box, have been set up to measure the thermal efficiency by thermal conduction. The same method is too often applied to Multi-Reflective insulation products. The efficiency of the results obtained is equivalent to the precautions before hand to make sure that the test rig used is appropriate. In short: the results obtained do not give a true thermal efficiency of thin multi-reflective insulation products.

A Guarded Hot Box test method gives data that is between 90% and 100% accurate for a traditional insulation product. It gives less than 10% of the information about the conduction of thin multi-reflective products.

BM Trada Certification

ACTIS TRI-ISO SUPER 10 is a certificated product, replacing ACTIS TRI-ISO SUPER 9, and has been independently tested by TRADA TECHNOLOGY (TTL) and it carries a BM TRADA Q Mark. TTL recognised the importance of testing products in a live environment. This method demonstrates the performance of a product over time, how it performs in differing external conditions and gives a true representation of thermal performance.

TTL conducted tests on TS9 to assess its compliance with British Standards/Building Regulations, and, following the analysis of the data collected from the field trials, verified that TS9 is equivalent in performance to 200mm of glass wool.

The certification tests were based on comparative tests using two identical cells. Both cells were closely situated together and so experienced the same real external conditions and the same controlled internal conditions. This is set out in the following extract from ... BM TRADA Certificate 0101:

The construction of the test cells, the instruments used on the ACTIS research and development site for measuring and recording physical values, the trial methodology and rigour of the testing and calibration procedures were considered to be suitable for comparative testing of the ACTIS roof insulation product TRI-ISO SUPER 10 and mineral wool insulation.

The methodology has since been reviewed by an independent expert academic at Imperial College London, who has confirmed that, in his view, the methodology used enabled a valid comparative measurement to be taken.

Hot Box Test, BS EN ISO 8990:1996

The hot box test prescribed by BS EN ISO 8990:1996 records the thermal performance of an insulating material in a static controlled environment. Accordingly, the test takes no account of external temperature variances/changes in humidity or the impact that real life conditions such as wind, sun or rain may have on the thermal performance of the material under test.

ACTIS do not subscribe to this testing methodology but believe that actual in situ performance is a more relevant indicator of real thermal performance.

ACTIS have installed over 35 million square metres of TS9 throughout Europe over the last 24 years. TS9 has an excellent reputation for solving space problems in construction, and from these most challenging of projects TS9 achieves excellent thermal performance.

ACTIS have continued to test TS9 in a live environment over prolonged winter periods and have found that the fuel usage needed to maintain a constant temperature in a building insulated with TS9 is consistent with the performance of 200mm of Glass /Mineral wool in a similar environment.

For ACTIS TRI-ISO SUPER 10

Refer to Technical publication for Physical Characteristics, What to order and Frequently Asked Questions

The texts, photographs and illustrations used in this publication have been reproduced with kind permission of ACTIS Insulation Limited.

ACTIS TRI-ISO SUPER 10 is conveniently available from:

nationwide
build
shoplimited www.nbs-home.co.uk