Feel the Real difference

Insulation that meets the requirements
The Regulator (NRCS) has published legislation regarding energy efficiency in new buildings (NBR-XA)

Here’s what you need to know for your home

South Africa's mounting energy crisis means that we all need to think of innovative ways to save electricity in our homes and of products that can help you reduce our current electricity usage.

Buildings typically account for 40% of all energy consumed in South Africa and yet their potential to save energy is huge. Thermal insulation must be included in the design of all new buildings. This, in combination with energy saving techniques, makes it possible to save up to 78% of a building’s energy consumption for space heating, cooling and hot water services.

The application of this new regulation is good news for the environment and will help you save electricity.

The National Building Regulation (NBR) has been updated to include Part X which addresses environmental sustainability and Part XA which establishes requirements for energy efficiency in new buildings.

The National Standard SANS 10400 (building code) is made up of various parts. Parts A to W are deemed to satisfy rules which, if adhered to, will ensure compliance to the National Building Regulations. Each part covers different aspects of the construction and finishing of buildings. These are the minimum standards that ensure the health and occupational safety of the occupants in these buildings.

There are three ways of complying with the energy regulation.

Option 1:
Comply with the SANS 10400-XA requirements
- Otherwise described as “Deemed to Satisfy”

Option 2:
Rational design
- This option requires input of a relevant professional
- Thermal performance of building needs to be calculated
- Performance should be equal to or better than SANS 10400-XA

Option 3:
Comparison with a compliant theoretical building
- Comparison with the design performance of a “notional” building
- Notional building should be designed to “Deemed to Satisfy” standards
- Thermal performance calculations software used must be approved by Agrément SA

INSULATION / COMFORT
Climatic zones - South Africa

South Africa has been divided into six climatic zones according to their humidity and temperature variations.

An important consideration when building is to determine the relevant climatic zone. Each of the climatic zones has a different R-value requirement for certain walls and ceilings.

Insulation R-value should be indicated on the packaging.

All material has an R-value which is the ability of a product to resist the transfer of heat. Thermal insulation provides a high resistance to the flow of heat from the warm surface to the cold surface in your home, helping you maintain a comfortable living environment, keeping your house cool in summer and warm in winter.
Requirements to comply with SANS 10400-XA “Deemed to satisfy”

Building envelope requirements (SANS 10400-XA)

» Orientation (Guideline)
  • Compact in plan with most glass on the northern side
  • Living spaces on northern side
  • Longer axis of dwelling to be east-west
  • Roof overhang to shield northern windows in midday summer sun

» Floors
  • If under floor heating is installed the floor slab must be insulated with insulation with a minimum R-value of 1.00

» Fenestration (Windows/Glass doors/Skylights)
  • Buildings with up to 15% fenestration area per storey
  • Buildings with fenestration area per storey exceeding 15% shall comply with the requirements for fenestration in SANS 204
  • Air leakage should comply with SANS 613

» External Walls
  Light weight (Non brick/Non concrete) walls must achieve a minimum R-value:
  • of 2.2 for climatic zones 1&6
  • of 1.9 for climatic zones 2,3,4,5

Masonry walls (Brick/Concrete) must achieve a minimum R-value of 0.35
  • Double skin brick with no cavity, plastered internally and either plastered externally or finished with face bricks
  • Single brick/block with a minimum thickness of 140 mm plastered internally and externally

» Roof and Ceiling
  • Must achieve the minimum total R-value specified below:

<table>
<thead>
<tr>
<th>Climatic zones</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum required total R-value (m².K/W) of your entire roof</td>
<td>3.70</td>
<td>3.20</td>
<td>2.70</td>
<td>3.70</td>
<td>2.70</td>
<td>3.50</td>
</tr>
</tbody>
</table>

Direction of heat flow *

* Indicates the direction in which your home loses or gains heat through the roof in each climatic zone.

Example of heat flow and R-value calculation of a roof system

7 - Direction of heat flow
1 - Outdoor air film (moving air) R-value = 0.03
2 - Roofing material R-value = 0.02
3 - Roof air space (unventilated) R-value = 0.18
4 - 135 mm Aerolite insulation R-value = 3.38
5 - Rhinoboard ceiling R-value = 0.06
6 - Indoor air film (still air) R-value = 0.11
Total R-value = 3.78 m².K/W
Hot water supply requirements (SANS 10400-XA)

» Geysers
  • A minimum of 50% of the annual average heating requirement for hot water must be provided by means other than electric resistance heating (Geyser) or fossil fuels
    - See options below but not only limited to these:
      • Solar heating
      • Heat pumps
      • Geothermal heat
      • Renewable combustible fuel
      • Heat recovery from alternative systems and processes

» All exposed hot water pipes ≤ 80 mm diameter
  • Must be insulated with a minimum R-value of 1.00

Helping you save electricity

In order to help you save electricity it is important to understand how, on average, you consume electricity in your home and how your home gains and loses heat.

Typical electricity usage
  • Water heating 35%
  • Space heating and cooling 28%
  • Food preparation 22%
  • Lighting 10%
  • Kettle 5%

A typical un-insulated South African home loses energy as follows:
  • Ceilings - Up to 35%
  • Windows - Up to 10%
  • Walls - Up to 25% (depending on the type of construction)
  • Floors - Up to 20%
  • Air Gaps - Up to 10%

It is important to remember that the internal environment in your home can also be affected by the following factors:
  • Orientation - Does your home face in the correct direction?
  • Shading - Roof overhang or awning to shield northern windows?
  • Air Gaps - Are your doors and windows air tight?

Insulation is often considered a luxury and overlooked when building a home yet its primary purpose is to save energy and improve your home’s comfort. To properly insulate your ceiling and geyser system in a typical home costs less than 1% of the total per square metre building costs, but it is one of the few building materials that will save you money for the lifespan of your home.

The appropriate thickness and R-value of insulation for your climatic zone, correctly installed, will protect your home against the cold, heat and save electricity providing a comfortable, healthy, safe and quiet space for you and your family.
Ceiling Insulation

A typical un-insulated home loses and gains up to 35% of its energy through the ceiling and this can be dramatically reduced by installing insulation of the correct thickness.

**Think Pink Aerolite** is Isover’s thermal and acoustic ceiling insulation solution that reduces the amount of energy required to maintain a comfortable living environment, offering a payback in less than 2 years with continued savings thereafter.

Aerolite is produced from a combination of naturally occurring minerals such as silica sand, which is a sustainable resource, and up to 80% recycled glass making our Glasswool environmentally friendly and non-combustible. It also offers excellent sound absorption properties and is easy to install in your home.

Aerolite has a variety of thicknesses for each climatic zone that complies with the requirements in SANS 10400-XA.

<table>
<thead>
<tr>
<th>Climatic Zones</th>
<th>1</th>
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<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated total R-value (m².K/W) of roof and ceiling materials (Tiles and RhinoBoard ceiling only)</td>
<td>0.35 - 0.40</td>
<td>0.41 - 0.53</td>
<td>0.35 - 0.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated minimum required R-value of insulation (m².K/W)</td>
<td>3.35</td>
<td>2.85</td>
<td>2.35</td>
<td>3.35</td>
<td>2.29</td>
<td>3.15</td>
</tr>
<tr>
<td>Thickness of Aerolite (mm)</td>
<td>135 mm</td>
<td>115 mm</td>
<td>100 mm</td>
<td>135 mm</td>
<td>100 mm</td>
<td>135 mm</td>
</tr>
<tr>
<td>R-value of Aerolite (m².K/W)</td>
<td>3.38</td>
<td>2.88</td>
<td>2.50</td>
<td>3.38</td>
<td>2.50</td>
<td>3.38</td>
</tr>
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</table>

Aerolite 50 mm and 75 mm can be installed as top up in homes that already have insulation but do not meet the stipulated minimum requirements for new buildings in SANS 10400-XA.
Hot water services - Geyser systems

A geyser consumes 35% of a typical household’s electricity. The savings can vary depending on the length of pipes insulated, geyser thermostat setting and hot water usage.

Isover’s **Geyser Pipe Insulation Pack** consists of six 1 metre Glasswool snap on pipes which are non-combustible and achieve an R-value of 1.00 which is required by SANS 10400-XA legislation.

By insulating your hot water pipes you can save up to 37% of the energy used by your geyser system, offering a payback within 6 months.

Isover’s **Geyser Insulation Pack** consists of a flexible foil faced Glasswool insulation blanket, tape and five 1 metre snap on pipes which are non-combustible and exceed the requirements laid out in SANS 10400-XA.

By insulating your geyser and pipes you can save up to 58% of the energy used by your geyser system, offering a payback within 6 months.
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