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|----------|---|--------------------|
| Product: | <b>Roxul<sup>®</sup> Stone Wool</b>               | <b>P.D.S<br/>4</b> |
| Type:    | <b>PIPE INSULATION</b>                            |                    |
| Name:    | <b>TYPE 650 (for use up to 650<sup>o</sup> C)</b> | Page 1 of 4        |

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| <b>Description</b> |
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Roxul Stone Wool pipe insulation Type 650 are strong pipe sections, segments or lags fabricated from specially impregnated high quality Roxul Stone Wool.

Applications for Roxul Stone Wool Type 650 pipe insulation include for industrial and process pipe work operating at temperature up to 650°C making it ideally suited for application to high pressure stream lines, turbines, boilers and integral pipework, control valves, steam heaters, turbine pumps etc. With the addition of an aluminium foil-facing, Type 650 pipe sections are designed for thermal and acoustic insulation of heating, ventilation and air-conditioning pipe work services operating in the temperature range 0°C to 650°C. (80°C limiting the outer foil temperature). The highly water-repellent characteristics make Type 650 pipe insulation extremely suitable for applications in conditions where water can penetrate the insulation system.

**Standard Sizes:**

Length: Standard length 1000 mm  
 Wall Thickness: 25, 30, 40, 50, 60, 70, 75, 80, 90, 100  
 Outside Diameter: Pipe sizes to suit all standard BS 1387, BS 2871 and ASTM C 585 size pipes and other non-standard pipe sizes.

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| <b>Product Performance and Properties</b> |
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**Density:** 128 kg/m<sup>3</sup> (nominal):- being delivered density according to ASTM C612 - 93

**Service Temperature:** Maximum continuous service temperature up to 650°C (1202°F).

**Thermal Conductivity (typical data):** Tested in accordance with DIN 52613

|                       |       |       |       |       |       |       |
|-----------------------|-------|-------|-------|-------|-------|-------|
| <b>Mean Temp °C</b>   | 10    | 50    | 100   | 150   | 200   | 250   |
| <b>K value W/m. K</b> | 0.033 | 0.040 | 0.047 | 0.056 | 0.067 | 0.081 |

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**Corrosion Resistance:  
Chemical Neutrality:** Roxul Stone Wool Type 650 pipe insulation is chemically neutral and will neither cause nor promote corrosion.

**Corrosion Resistance:  
Water Leachable Chlorides:** Roxul Stone Wool Type 650 pipe section have a very low content of water leachable chloride, approximately 4 ppm so it can be safely used on austenitic stainless steel. Meets the requirements for use over stainless steel in accordance with ASTM C795 and of "AS-Quality" of AGI Q135.

**Fire:** Roxul Stone Wool Type 650 pipe insulation is non-combustible when tested according to international standards e.g. ASTM E-136-82, DIN 4102, BS476 Pt4-1970, ISO 1182 and IMO A 799 (19).

**Moisture Resistance Water:** Roxul Stone Wool Type 650 pipe insulation is highly water repellent, non hygroscopic and non capillary. When tested to BS 2972 Section 12 Roxul Stone Wool absorbs approximately >90% by volume of moisture (complete immersion test).

**Moisture Resistance Vapour Diffusion:** Water vapour diffusion resistance factor of  $\mu = 1.3$ . This low value means that water can pass through and cool without condensing.

**Moisture Resistance:  
Absorption from the air:** Roxul Stone Wool absorbs very little water from the air. Tests show at relative humidity of 90% for 30 days the hygroscopic water content is around .004 volume per cent. The water vapour absorption (vapor sorption) in accordance with ASTM C110 4/C 110 M is  $\pm 0.02\%$  (vol).

**Moisture Resistance Capillarity:** Roxul Stone Wool fibres and fibre coating repels water and prevents capillarity.

**Melting Point:** Melting point of Roxul Stone Wool fibre is over 1000°C (1800°F)

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**Specific Heat:** Roxul Stone Wool specific heat factor is 0.84 kJ/kg per degree centigrade.

**Calorific Value:** Roxul Stone Wool Type 650 pipe insulation has a low organic matter content giving a low caloric value of around 600 kJ/kg.

**Biological Properties:** Roxul Stone Wool Type 650 material contains no nutrients and therefore provides no basis for growth of fungi, moulds or bacteria, nor does it attract insects, rodents or vermin.

**Acoustic Properties:** Roxul Stone Wool Type 650 material when measured according to ISO R 354 and applied directly to the wall surface at a thickness of 50mm gives the following sound absorption coefficient:-

|                      |            |            |            |             |
|----------------------|------------|------------|------------|-------------|
| <b>H<sub>z</sub></b> | <b>125</b> | <b>250</b> | <b>500</b> | <b>2000</b> |
| <b>Coeff α S</b>     | 0.22       | 0.66       | 0.92       | 0.89        |

**Durability:** Roxul Stone Wool mineral wool has been proven in services for over 50 years in all types of exposure and as such will give effective protection for the lifetime of the equipment they insulate.

**Compatibility:** Roxul Stone Wool mineral wool is compatible with all materials which it is likely to come into contact in normal industrial and building applications.

**Environment:** Roxul Stone Wool mineral wool presents a very effective ecological profile in all elements of manufacture, recycling use, service life and energy efficiency of material. No CFC's or HCFC's are used in its manufacture.

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| <b>Health &amp; Safety</b> |
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**Roxul 650 is NOT CLASSIFIED as HAZARDOUS according to NOHSC criteria as a consequence of the following events and conclusions about the health effects of long term occupation exposure to mineral wool insulation products.**

- Over 50 years of extensive health research on Stone Wool products in Europe has resulted in the scientific conclusion that there are no long term health problems from using Stone Wool.
- In March 1995 the UK Health and Safety Executive concluded that Stone Wool should not be classified as a potential carcinogen.
- Under note Q of the National Occupational health and Safety Commission (NOHSC) publication "List of Designated Hazardous Substances" (NOHSC; 1005-1999) the classification of NON-CARCINOGENIC is to apply.
- Under the European Union Criteria set out in 67/548/EEC a classification of CARC, Cat O applies, ie; "Not classifiable for carcinogenicity."
- Under World Health Organisation (WHO) and its Monographs Programme of the International Agency for Research on Cancer (IARC) it has been concluded that, "Rock (stone) wool are now considered not classifiable as to carcinogenicity to humans (Group 3),

It is recommended that for the handling and installation of Roxul Stone Wool the internationally recognized Material Safety Data Sheet be followed. These are readily available from Australasian Insulation Supplies Pty Ltd.

**Technical Advice and Thermal Calculation Service:**

Heat transfer calculation for Roxul Stone Wool Type 650 pipe insulation systems in thermal design is readily available. AIS technical advisers are ready to give help and advice on any matter connected with insulation or products manufactured by Roxul<sup>®</sup>.

For further information and technical advice on insulation contact:



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