Introducing E Therm Insulation

"Safety through technology". By adhering to this policy and only offering the best insulation material available, E Therm Insulation are now regarded as one of the major Australian suppliers of superior, high quality, technically advanced insulation which is:

- Thermal
- Electrical
- Non Asbestos
- Non concrete based
- Composite insulation sheet

Over the past fifteen years, we have expanded our services and expertise to include the supply of flat insulation sheet, manufacturing, machining, refurbishment, and assembly of many apparatuses requiring the highest of insulation protection including:

- Arc Chutes
- Dynamic Brake Grids
- Braking Resistor Assemblies
- Thermal Shields
- High Voltage Electrical Insulation Connectors

All work carried out in our factory is governed by strict quality control guidelines. To minimise freight costs and wastage, E Therm Insulation offers a unique manufacturing service to our domestic and overseas clients. Quoting off samples or plans, manufacturing and then dispatching componentry, rather than whole sheets.

In most cases the savings, from lack of waste material and by utilising our professional and economical manufacturing techniques, will offset total freight costs.

Contact our sales team today to find out how E Therm Insulation can benefit your business.

E Therm INSULATION

Product Description ET1200

White in colour, ET 1200 is a fibre glass laminated thermoset composite with an inorganic substrate filler binder. ET 1200 is the most superior in performance of E Therm Insulation's range of advanced thermal and electrical insulation sheet materials.

ET 1200 has a heat resistance rating higher than "H" and has been graded incombustible under fire resistance testing ASTM D 635 (JISK 6911 A) and has a 94V – 0 rating under JIS K 6911 B.

Thickness available:	0.8mm – 30mm
Sheet sizes available:	1 metre x 1 metre and 1 metre x 1.25 metre
Weight:	Approximately 2.5kg per 1mm of thickness x 1 metre square

ET 1200 is versatile, mechanically strong and has excellent anti tracking properties. A resilient insulation material, ET 1200 uses are endless including:

- Thermal Shields
- Heavy Duty Insulation for Electrical Equipment
- Control Equipment
- Arc Chutes
- Thermal Gaskets
- Terminal Boards
- Resistor Panels
- Dynamic Brake Grids
- Thermal Presses

These are only a few suggestions for the uses of ET 1200. The more innovative the design the more chance of utilising ET 1200's excellent insulation properties.

E Therm INSULATION

Product Description ET 1100

White in colour, ET 1100 is a fibre glass laminated thermoset composite with an inorganic and silicon substrate filler binder. ET 1100 performance is similar to that of ET 1200, except that it has a lower constant heat resistant temperature rating (300 degrees Centigrade in comparison to ET 1200's 350 degrees Centigrade). ET 1100 is one of the most popular insulation materials due to versatility and economical pricing.

ET 1100 also has a heat resistance rating higher than "H" and has been graded incombustible under Fire Resistance testing ASTM D 635 (JISK 6911 A) and has a 94V – 0 rating under JIS K 6911 B.

Thickness available:	1mm – 30mm
Sheet sizes available:	1 metre x 1 metre and 1 metre x 1.25 metre
Weight:	Approximately 2.4 kg per 1mm of thickness x 1 metre square

ET 1100 is also versatile, mechanically stronger with a higher binding strength and is more economically priced than ET 1200. A resilient insulation material, ET 1100 uses are also similar to ET 1200 including:

- Thermal Shields
- Heavy Duty Insulation for Electrical Equipment
- Control Equipment
- Arc Chutes
- Thermal Gaskets
- Thermal Boards
- Resistor Panels
- Dynamic Brake Grids
- Thermal Presses

These are only a few suggestions for the uses of ET 1100. The more innovative the design the more chance of utilising ET 1100's excellent insulation properties.

ETherm INSULATION

Product Description ET 1000

Grey in colour ET 1000 is a fibre glass laminated thermoset composite with an inorganic and silicon substrate filler binder. ET 1000 has a technical performance similar to that of ET 1100, with the same constant heat rating of 300 degrees centigrade. ET 1000 is also a very popular insulation material, due to its versality and economical pricing.

ET 1000 has a 94V – 0 rating under JISK 6911 B and a heat resistance rating higher than "H", ET 1000 has been graded incombustible under Fire Resistance testing ASTM D 635 (JISK 6911 A).

Thickness available: 1mm – 30mm
Sheet sizes available: 1 metre x 1 metre and 1 metre x 1.25 metre
Weight: Approximately 2.4 kg per 1mm of thickness x 1 metre square

ET 1000 is also versatile, with the same mechanical strength and binding strength as ET 1100. A resilient insulation material, ET 1000 uses are also similar to ET 1100 and ET 1200 including:

- Thermal Shields
- Heavy Duty Insulation for Electrical Equipment
- Control Equipment
- Arc Chutes
- Thermal Gaskets
- Terminal Boards
- Resistor Panels
- Dynamic Brake Grids
- Thermal Presses

These are only a few suggestions for the uses of ET 1000. The more innovative the design the more chance of utilising ET 1000's excellent insulation properties.

ETherm INSULATION

Machining and Fixing
ET 1200, ET 1100 and ET 1000

MILLING Can be achieved successfully with the use of a solid carbide cutter or indexable inserted milling cutter with sharp uncoated inserts at relatively high cutting speeds. As with any machine process, all safety precautions should be taken.

DRILLING For ease of drilling it is best to utilise a solid carbide drill used at high cutting speeds. An HSS drill will be ineffective, and is not recommended. If an HSS drill is the only option available, minor success may be achieved by drilling at very low cutting speeds.

CUTTING For best results use a high speed diamond tip saw blade. Caution: Always use a diamond tip blade for cutting. DO NOT try to use any other type of blade as injury may occur due to overheating of this blade.

FIXING Mechanical fixing only is recommended when needed. Do not rely on normal fixing methods, although some success may be achieved with conventional methods such as silicones and epoxies. DO NOT rely on these methods. Silicone may be used as a gap sealant in many cases after successful adherence testing is carried out. For your own safety, load and material bonding testing should be carried out before any method of fixing is accepted.

The above information is given as a guide line only, due to the large variations in mills, drilling machines, tungsten bits and silicones available. It is advised that trials be undertaken on scrap material to find the most suitable method for your machining, drilling and fixing when utilizing the high grade insulation materials ET 1200, ET 1100 and ET 1000.

ETherm INSULATION

Technical Data Report

Test Materials

ET 1200 (5mm), ET 1100 (5mm), ET 1000 (5mm)

RESULTS OF COMPARATIVE TESTING OF MATERIALS LISTED ABOVE, TEST METHODS IN RED

Description of Testing		Unit	Processing Condition	ET 1200	ET 1100	ET 1000
Insulation Resistance	Normal Condition	OHM ASTM D 257	A	14 10	14 10	14 10
	After Boiled		Hrs Temp c D 2 / 100	11 10	9 10	9 10
Arc Resistance		Seconds	A	420	380	365
Dialectric Strength		KV / per mm	A	10	10	10
Flexural Strength	Vertical to Laminate	2 kgf / mm ASTM D 790	A	14.2	17.0	17.0
			Hrs Temp c E 3 / 500	6.2	4.6	4.6
			Hrs Temp C E 3 / 650	3.7	3.0	2.9
Loss of Weight (after heating)		%	Hrs Temp c E 3 / 500	0.85	1.5	1.41
			Hrs Temp c E 3 / 650	1.36	2.0	2.13
IZOD Impact Strength	Parallel to Laminate	kgf. cm / cm ASTM D 256	A	37.7	30.0	30.0
Water Absorption		% ISO R 62	D 24 / 23	0.04	0.08	0.08
Density		ASTM D 792	A	2.15	2.03	2.03

A As received Condition
B Processing in Constant Temperature and Humidity
D Processing by Emersion in Water of Constant Temperature
E Processing in Air of Constant Temperature

ETherm INSULATION

Material Safety Data Sheet ET 1000

Section 1 - Identification of the Material and Supplier

Product Name:	ET 1000
Other Names:	Not Relevant
Recommended Use:	Insulating material for high resistance electrical and thermal applications
Supplier:	E Therm Insulation Pty Ltd (ABN 31 703 833 400)
Address:	30/372 Victoria Street, Wetherill Park NSW 2164 Australia
Telephone:	(61) 2 9756 4774 (7am-4pm)
Fax:	(61) 2 9756 4884
Web:	www.etherminsulation.com
Emergency Phone:	0416 202 228

Section 2 - Hazards Identification

Hazard Classification:	Non-hazardous according to criteria of NOHSC.
Risk Phrase(s):	May be irritating to sensitised skin. May cause minor irritation to skin or eyes. May Cause Abrasion To Skin.
Safety Phrase(s):	Care should be taken when machining as dust created may be irritating to sensitised skin & eyes. Avoid inhalation of dust. Approved dust mask should be worn when machining. Local exhaust , as required, when machining. Ensure adequate ventilation. Personal Protective Equipment not required unless machining, may be desirable to protect skin from abrasion. Guard shield or safety glasses when machining.

Section 3 - Composition and Information on Ingredients

Core Information:	ET 1000 is a fibre glass laminated thermoset composite with an inorganic substrate filler binder. Type III ingredients according to NOHSC:2011(2003)

CONTINUED

Section 4 - First Aid Measures

Core Information:

Skin contact: Rinse off with soap water.
Eye contact: Rinse thoroughly with copious water.
Ingestion: Rinse mouth and throat thoroughly with water. Drink water. Seek medical attention if symptoms persist.
Inhalation: Remove from exposure and take preventative measures (see Safety Phrases). In case of irritation or prolonged allergic symptoms, seek medical attention.

Section 5 - Fire Fighting Measures

Non-flammable. Will not support combustion.

Section 6 - Accidental Release Measures

Non-hazardous

Section 7 - Handling and Storage

Handling:

Wear protective gloves whenever handling laminated sheets.
Use caution to prevent dust from dispersing during the cutting, boring, and grinding processes.
Wear a dust-proof mask, gloves, protective goggles and any other suitable PPE eg boots.

Transportation:

For sheets and heavy assemblies use suitable lifting equipment and handle with care.

Storage:

Store away from direct sunlight to avoid discoloration. Use a cover if sunlight cannot be avoided.
Store in a dry and cool area.
Storing in high temperature and humidity conditions may cause a decrease in electrical performance as well as warping or twisting.
Store products on a flat surface.
When storing upright, place a board against the sheets and use further precautions to prevent the sheets from falling over.

CONTINUED

Section 8 - Exposure Controls/Personal Protection

National Exposure Standards:	No National Exposure Standard specified in NOHSC Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003(1995)].
Alternative Standards:	No exposure standard allocated.
Biological Limit Values:	No biological limit allocated.
Engineering Controls:	Ventilation recommended if during the cutting, boring, and grinding processes. Wear a dust-proof mask, gloves, protective goggles and any other suitable PPE eg boots.

Section 9- Physical and Chermical Properties

Core Information:

a) Appearance: white sheet or assembly.
b) Odour: does not apply.
c) pH: does not apply.
d) Vapour pressure: does not apply.
e) Vapour density: does not apply.
f) Boiling point: does not apply.
g) Freezing/melting point: does not apply.
h) Solubility: does not apply.
i) Specific gravity: 1.8-2.2 (Density: 2.03 ASTM D 792)
j) Information for flammable materials: does not apply.

Additional Information:

a) Specific heat value: does not apply.
b) Particle size: not available.
c) Volatile organic compounds (VOC) content: does not apply.
d) Evaporation rate: does not apply.
e) Viscosity: does not apply.
f) Percent volatile: not available.
g) Octanol/water partition coefficient: not available.
h) Saturated vapour concentration: does not apply.
i) Additional characteristics not noted above: not avail.
j) Flame propagation or burning rate of solid materials: non-combustible, extreme flame resistant.

CONTINUED

Section 9- Physical and Chermical Properties

Additional Information: *Continued*

k) Properties that may initiate or contribute to the intensity of a fire: non-combustible, extreme flame resistant.

l) Potential for dust explosion: does not apply.

m) Reactions that release flammable gases or vapours: not available.

n) Fast or intensely burning characteristics: non-combustible, extreme flame resistant.

o) Non-flammables that could contribute unusual hazards to a fire: not available.

p) Release of invisible flammable vapours or gases: not available.

q) Decomposition temperature: not available.

Section 10 - Stability and Reactivity

Core Information: Stable under normal conditions of use. Not reactive.

Section 11 - Toxicological Information

Core Information: No toxicological information is available.

Section 12 - Ecological Information

Core Information: No environmental impact information is available. Avoid contaminating waterways, drains or sewers.

Section 13 - Disposal Considerations

Core Information: Refer to appropriate authority in your State. Dispose of material through a licensed waste contractor. Normally suitable for disposal by approved waste disposal agent.

CONTINUED

Section 14 - Transport Information

Core Information: UN Number: none allocated.
Proper Shipping Name: E Therm Insulation ET 1000.
Dangerous Goods Class: none allocated.
Packing Group: none allocated.
Hazchem Code: none allocated.

Section 15 - Regulatory Information

Core Information: Poison Schedule: none allocated.

Section 16 - Other Information

Issue date: 27 May 2009.
Issued by: Technical Manager.
Supersedes all previous MSDS issued by E Therm Insulation Pty Ltd.

Material Safety Data Sheet ET 1100

Section 1 - Identification of the Material and Supplier

Product Name:	ET 1100
Other Names:	Not Relevant
Recommended Use:	Insulating material for high resistance electrical and thermal applications
Supplier:	E Therm Insulation Pty Ltd (ABN 31 703 833 400)
Address:	30/372 Victoria Street, Wetherill Park NSW 2164 Australia
Telephone:	(61) 2 9756 4774 (7am-4pm)
Fax:	(61) 2 9756 4884
Web:	www.etherminsulation.com
Emergency Phone:	0416 202 228

Section 2 - Hazards Identification

Hazard Classification:	Non-hazardous according to criteria of NOHSC.
Risk Phrase(s):	May be irritating to sensitised skin. May cause minor irritation to skin or eyes. May Cause Abrasion To Skin.
Safety Phrase(s):	Care should be taken when machining as dust created may be irritating to sensitised skin & eyes. Avoid inhalation of dust. Approved dust mask should be worn when machining. Local exhaust, as required, when machining. Ensure adequate ventilation. Personal Protective Equipment not required unless machining, may be desirable to protect skin from abrasion. Guard shield or safety glasses when machining.

Section 3 - Composition and Information on Ingredients

Core Information:	ET 1100 is a fibre glass laminated thermoset composite with an inorganic substrate filler binder. Type III ingredients according to NOHSC:2011(2003)

CONTINUED

Section 4 - First Aid Measures

Core Information:

Skin contact: Rinse off with soap water.
Eye contact: Rinse thoroughly with copious water.
Ingestion: Rinse mouth and throat thoroughly with water. Drink water. Seek medical attention if symptoms persist.
Inhalation: Remove from exposure and take preventative measures (see Safety Phrases). In case of irritation or prolonged allergic symptoms, seek medical attention.

Section 5 - Fire Fighting Measures

Non-flammable. Will not support combustion.

Section 6 - Accidental Release Measures

Non-hazardous

Section 7 - Handling and Storage

Handling:

Wear protective gloves whenever handling laminated sheets.
Use caution to prevent dust from dispersing during the cutting, boring, and grinding processes.
Wear a dust-proof mask, gloves, protective goggles and any other suitable PPE eg boots.

Transportation:

For sheets and heavy assemblies use suitable lifting equipment and handle with care.

Storage:

Store away from direct sunlight to avoid discoloration. Use a cover if sunlight cannot be avoided.
Store in a dry and cool area.
Storing in high temperature and humidity conditions may cause a decrease in electrical performance as well as warping or twisting.
Store products on a flat surface.
When storing upright, place a board against the sheets and use further precautions to prevent the sheets from falling over.

CONTINUED

Section 8 - Exposure Controls/Personal Protection

National Exposure Standards:	No National Exposure Standard specified in NOHSC Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003(1995)].
Alternative Standards:	No exposure standard allocated.
Biological Limit Values:	No biological limit allocated.
Engineering Controls:	Ventilation recommended if during the cutting, boring, and grinding processes. Wear a dust-proof mask, gloves, protective goggles and any other suitable PPE eg boots.

Section 9- Physical and Chermical Properties

Core Information:

a) Appearance: white or gray as sheet or manufactured components.
b) Odour: does not apply.
c) pH: does not apply.
d) Vapour pressure: does not apply.
e) Vapour density: does not apply.
f) Boiling point: does not apply.
g) Freezing/melting point: does not apply.
h) Solubility: does not apply.
i) Specific gravity: 1.8-2.2 (Density: 2.03 ASTM D 792)
j) Information for flammable materials: does not apply.

Additional Information:

a) Specific heat value: does not apply.
b) Particle size: not available.
c) Volatile organic compounds (VOC) content: does not apply.
d) Evaporation rate: does not apply.
e) Viscosity: does not apply.
f) Percent volatile: not available.
g) Octanol/water partition coefficient: not available.
h) Saturated vapour concentration: does not apply.
i) Additional characteristics not noted above: not available.

CONTINUED

Section 9- Physical and Chermical Properties

Additional Information: *Continued*

j) Flame propagation or burning rate of solid materials: non-combustible, extreme flame resistant.

k) Properties that may initiate or contribute to the intensity of a fire: non-combustible, extreme flame resistant.

l) Potential for dust explosion: does not apply.

m) Reactions that release flammable gases or vapours: not available.

n) Fast or intensely burning characteristics: non-combustible, extreme flame resistant.

o) Non-flammables that could contribute unusual hazards to a fire: not available.

p) Release of invisible flammable vapours or gases: not available.

q) Decomposition temperature: not available.

Section 10 - Stability and Reactivity

Core Information: Stable under normal conditions of use. Not reactive.

Section 11 - Toxicological Information

Core Information: No toxicological information is available.

Section 12 - Ecological Information

Core Information: No environmental impact information is available. Avoid contaminating waterways, drains or sewers.

Section 13 - Disposal Considerations

Core Information: Refer to appropriate authority in your State. Dispose of material through a licensed waste contractor.

CONTINUED

Section 14 - Transport Information

Core Information: UN Number: none allocated.
Proper Shipping Name: E Therm Insulation ET 1100.
Dangerous Goods Class: none allocated.
Packing Group: none allocated.
Hazchem Code: none allocated.

Section 15 - Regulatory Information

Core Information: Poison Schedule: none allocated.

Section 16 - Other Information

Issue date: 27 May 2009.
Issued by: Technical Manager.
Supersedes all previous MSDS issued by E Therm Insulation Pty Ltd.

Material Safety Data Sheet ET 1200

Section 1 - Identification of the Material and Supplier

Product Name:	ET 1200
Other Names:	Not Relevant
Recommended Use:	Insulating material for high resistance electrical and thermal applications
Supplier:	E Therm Insulation Pty Ltd (ABN 31 703 833 400)
Address:	30/372 Victoria Street, Wetherill Park NSW 2164 Australia
Telephone:	(61) 2 9756 4774 (7am-4pm)
Fax:	(61) 2 9756 4884
Web:	www.etherminsulation.com
Emergency Phone:	0416 202 228

Section 2 - Hazards Identification

Hazard Classification:	Non-hazardous according to criteria of NOHSC.
Risk Phrase(s):	May be irritating to sensitised skin. May cause minor irritation to skin or eyes. May Cause Abrasion To Skin.
Safety Phrase(s):	Care should be taken when machining as dust created may be irritating to sensitised skin & eyes. Avoid inhalation of dust. Approved dust mask should be worn when machining. Local exhaust, as required, when machining. Ensure adequate ventilation. Personal Protective Equipment not required unless machining, may be desirable to protect skin from abrasion. Guard shield or safety glasses when machining.

Section 3 - Composition and Information on Ingredients

Core Information:	ET 1200 is a fibre glass laminated thermoset composite with an inorganic substrate filler binder. Type III ingredients according to NOHSC:2011(2003)

CONTINUED

Section 4 - First Aid Measures

Core Information:

Skin contact: Rinse off with soap water.
Eye contact: Rinse thoroughly with copious water.
Ingestion: Rinse mouth and throat thoroughly with water. Drink water. Seek medical attention if symptoms persist.
Inhalation: Remove from exposure and take preventative measures (see Safety Phrases). In case of irritation or prolonged allergic symptoms, seek medical attention.

Section 5 - Fire Fighting Measures

Non-flammable. Will not support combustion.

Section 6 - Accidental Release Measures

Non-hazardous

Section 7 - Handling and Storage

Handling:

Wear protective gloves whenever handling laminated sheets.
Use caution to prevent dust from dispersing during the cutting, boring, and grinding processes.
Wear a dust-proof mask, gloves, protective goggles and any other suitable PPE eg boots.

Transportation:

For sheets and heavy assemblies use suitable lifting equipment and handle with care.

Storage:

Store away from direct sunlight to avoid discoloration. Use a cover if sunlight cannot be avoided.
Store in a dry and cool area.
Storing in high temperature and humidity conditions may cause a decrease in electrical performance as well as warping or twisting.
Store products on a flat surface.
When storing upright, place a board against the sheets and use further precautions to prevent the sheets from falling over.

CONTINUED

Section 8 - Exposure Controls/Personal Protection

National Exposure Standards:	No National Exposure Standard specified in NOHSC Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003(1995)].
Alternative Standards:	No exposure standard allocated.
Biological Limit Values:	No biological limit allocated.
Engineering Controls:	Ventilation recommended if during the cutting, boring, and grinding processes. Wear a dust-proof mask, gloves, protective goggles and any other suitable PPE eg boots.

Section 9- Physical and Chermical Properties

Core Information:

a) Appearance: white or gray as sheet or manufactured components.
b) Odour: does not apply.
c) pH: does not apply.
d) Vapour pressure: does not apply.
e) Vapour density: does not apply.
f) Boiling point: does not apply.
g) Freezing/melting point: does not apply.
h) Solubility: does not apply.
i) Specific gravity: 1.8-2.2 (Density: 2.03 ASTM D 792)
j) Information for flammable materials: does not apply.

Additional Information:

a) Specific heat value: does not apply.
b) Particle size: not available.
c) Volatile organic compounds (VOC) content: does not apply.
d) Evaporation rate: does not apply.
e) Viscosity: does not apply.
f) Percent volatile: not available.
g) Octanol/water partition coefficient: not available.
h) Saturated vapour concentration: does not apply.
i) Additional characteristics not noted above: not available.

CONTINUED

Section 9- Physical and Chermical Properties

Additional Information: *Continued*

j) Flame propagation or burning rate of solid materials: non-combustible, extreme flame resistant.

k) Properties that may initiate or contribute to the intensity of a fire: non-combustible, extreme flame resistant.

l) Potential for dust explosion: does not apply.

m) Reactions that release flammable gases or vapours: not available.

n) Fast or intensely burning characteristics: non-combustible, extreme flame resistant.

o) Non-flammables that could contribute unusual hazards to a fire: not available.

p) Release of invisible flammable vapours or gases: not available.

q) Decomposition temperature: not available.

Section 10 - Stability and Reactivity

Core Information: Stable under normal conditions of use. Not reactive.

Section 11 - Toxicological Information

Core Information: No toxicological information is available.

Section 12 - Ecological Information

Core Information: No environmental impact information is available. Avoid contaminating waterways, drains or sewers.

Section 13 - Disposal Considerations

Core Information: Refer to appropriate authority in your State. Dispose of material through a licensed waste collector.

CONTINUED

Section 14 - Transport Information

Core Information: UN Number: none allocated.
Proper Shipping Name: E Therm Insulation ET 1200.
Dangerous Goods Class: none allocated.
Packing Group: none allocated.
Hazchem Code: none allocated.

Section 15 - Regulatory Information

Core Information: Poison Schedule: none allocated.

Section 16 - Other Information

Issue date: 27 May 2009.
Issued by: Technical Manager.
Supersedes all previous MSDS issued by E Therm Insulation Pty Ltd.