

50W DRIVEWAY HEATING CABLE INSTALLATION INFORMATION



Driveways &
Walkways



Ramps &
Parking Bays



Platforms &
Pedestrian Access

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Advanced Ice & Snow
Systems

Heat Mat

Ice & Snow Systems

**Call 01444 247020
to find out more or
visit our website**

www.iceandsnowsystems.co.uk

Outdoor Cable Features

- Specifically designed for ice and snow melting of drives, walkways and ramps beneath asphalt, concrete, block paving and resin
- This cable is designed for outdoor use only and must be installed within a substrate
- Designed to withstand hot asphalt being poured directly on top of the heating cable, speeding up installation
- Incredibly fast to install when fitted directly onto reinforcement fabric
- Improved safety for vehicles and pedestrians in temperatures down to -40°C
- The constant Wattage output of the cable simplifies the electrical connections and power requirements, when compared to ramp heating with trace heating cables
- Alter the distance between heating cables to create a system with your desired output
- Robust cables, designed to be 'building site' safe
- Dual conductor cable design means only one connection lead per heating cable
- Made in the UK
- Supplied with a 10-year warranty

Compatible with



**Ice & Snow
Thermostats**

Heat Mat Outdoor Heating Cable

Cost-effective and robust outdoor heating cable

10mm Black Outdoor Heating Cable

A high-quality uniquely designed cable suitable for heating beneath virtually any exterior surface. The cable forms the major part of Heat Mat's industry leading ice and snow melting systems for ramps, driveways, car parks, pathways and steps.

The sacrificial outer layer of insulation enables the cable to be directly covered with hot asphalt, saving time and costs when compared to a non heat-resistant cable.

The high output cable ensures that installation time is kept to a minimum, as roughly half the cable length is required compared to standard heating cables.

The cable offers great value for money when compared to trace heating cables and also benefits from a fixed-Wattage output simplifying the electrical connections and supply. As the cable requires the same electrical feed (whatever the conditions) the required Amp rating of the supply does not vary as it would with trace heating.

All systems should be controlled by one of Heat Mat's ice and snow melting thermostats, which can use temperature and moisture sensors to ensure the system runs efficiently.

To simplify installation a professional grade metal drum can be purchased to allow easy unspooling of the heating cable on site. A full refund is provided if the drum is returned to Heat Mat following installation.

- Suitable for installation beneath virtually any exterior surface
- Hot asphalt can be poured directly onto the cable, allowing a speedy and cost-efficient installation
- Constant Wattage output simplifying the electrical supply requirements
- High output per linear metre ensures a fast installation due to the low number of cable runs
- When used with one of Heat Mat's intelligent thermostat timers, provides an exceptionally energy-efficient ice and snow melting system
- 3-Phase systems and bespoke sizes of heating cable are available for large projects where required
- A cost-effective option for Ramp Heating; outputs of up to 400W/sqm are possible if a particularly fast-reacting system is required
- Very cost effective to operate; in an average winter the system could be required to run for roughly 30 hours, meaning an electricity cost of less than £1 per metre

Product code	Length (m)	Wattage	Resistance	200W/m ² c-c 25cm	250W/m ² c-c 20cm	300W/m ² c-c 16.5cm
ICE-50W-1050	21m	1.05kW	55Ω	5.25m ²	4.2m ²	3.5m ²
ICE-50W-4250	85m	4.25kW	14Ω	21.25m ²	17.0m ²	14.2m ²
ICE-50W-DRUM	Returnable metal drum to be used for cable dispensing					



50W Outdoor Heating Cable



Choice of output

For normal installations we recommend an output of between 250 and 300W/m² which provides a good balance between speed of operation and power requirements. Often the limiting factor to the size of area which can be heated is the available power supply on site, and with restricted power supplies it is often possible to specify a lower powered system which will still clear the ice and snow. An alternative method is to zone the system so that the restricted power supply can heat zones sequentially, lowering the overall power requirement for the system.

Choice of coverage

For most ramps, driveways and walkways the entire area would be heated to provide a uniform heat. In some circumstances, such as long driveways or where the power supply is restricted, it can be preferable to heat targeted areas. The most common example of this is to heat two tyre tracks on a ramp or driveway, or to heat a specific proportion of a pedestrian walkway.

Installation Methods

There are a variety of installation methods for the heating cables which vary according to the finished surface. An overview of the three most popular installation methods is detailed below; please contact Heat Mat technical support for more details or to discuss your individual requirements.

Hot Asphalt and Resin

Hot asphalt can be poured directly on top of these cables which offers a huge advantage over conventional systems. The base layer that the cables are going to be placed onto should be firm, level and should not contain any sharp elements which could damage the cable. A flexible wire mesh

should be placed in 1.2m strips across the area to be heated, with 2m between each strip. The cables can then be cable-tied onto the mesh at the appropriate spacing. The coldtail connection and coldtail lead are not designed to come into direct contact with hot asphalt so these should be covered with tile adhesive, cement or cold asphalt ahead of covering the main area. A minimum depth of 50mm of hot asphalt should be poured on top of the system and this can be compacted with a light roller if required. If a resin finish is desired this can be laid once the asphalt has cooled.

Concrete

Heating cables are often installed into concrete bases as concrete is particularly prone to damage from rock salt and freeze/thaw activity. The standard installation method would be to level the existing base and place a reinforcement fabric or rebar grid onto this layer. The grid should be raised at least 10mm above the base layer to allow total encapsulation of the cable by the concrete. The cables should be cable-tied in place on the grid at the appropriate spacing. There is no need to provide any additional protection to the coldtail connection or coldtail itself. The concrete can now be poured and it should form a layer with a minimum depth of 50mm; the concrete mix must not include sharp aggregate as this could damage the cables.

Block Paving

Care must be taken not to drop any paving slabs onto the cable during installation as these could damage the heating system. The normal method of installation would be to level the current surface and lay a 60mm layer of sand/grit then compact this as required. A flexible 1.2m wide wire mesh is then laid on top, with 2m between each run, and the heating cables are cable-tied in place. A further 40-50mm layer of sand/grit is then laid on top of the cables and this layer is compacted by hand to ensure no damage. Block paving can then be laid; to achieve the greatest benefit from the heating system, blocks should be no more than 80mm thick.



50W Outdoor Heating Cable

TECHNICAL SPECIFICATION

Supply Voltage	230V +/-10%
Output range	1.05kW - 4.25kW
Maximum load	55W per metre
Standard range	21m - 85m
Coverage at 250W/m ²	4.2m ² and 17.0m ²
Coverage at 300W/m ²	3.5m ² and 14.2m ²
Coldtail lead	5m double insulated cable
Wire thickness	10mm
Cable flexibility	Minimum radius 100mm
IP rating	IPX7
Inner insulation	0.8mm silicon rubber (2G)
Second layer insulation	PVC (105) 90°C
Sacrificial insulation	PVC 1.2mm
Earth protection	100% aluminium earth shield
Cable reinforcement	Fibreglass strands
UV stability	UV stable Not suitable for open air use
Fixing materials	Choice of methods available
Compliant with	17th Edition IEE Wiring Regulations, 2006/95/EC

Wiring

Heating cables must always be controlled by a suitable ice and snow melting thermostat with temperature and moisture sensors as appropriate.

The circuit must be protected by a 30mA RCD and appropriate rated fuse, or circuit breaker.



About Heat Mat

With more than 1,200,000m² of underfloor heating installed, 20 years' experience of the UK underfloor heating market and a wealth of knowledge on Scandinavian ice and snow melting systems, you can rely on Heat Mat to understand your needs and supply the products to satisfy your requirements.

This is why we are the Professionals' Choice, the number one supplier of electric underfloor heating and ice and snow melting systems to the UK's professional installation market.



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Heat Mat

Ice & Snow Systems



To see all of our outdoor heating products use your smart phone to scan this code.

Driveway Heating System

Method Statement – Hot Asphalt



Site preparation:

- The area where the driveway heating system will be laid must be clearly marked out.
- Areas where the driveway heating system will be laid must be smooth surface clear of sharp objects, debris and standing water.
- If temperatures are not guaranteed to be above 5°C ambient during the installation process we recommend that the cables are stored in a heated room and take out one by one just before they are fitted. This ensures that the cables are flexible and easy to manipulate.
- If an RCD protected 16amp 230V supply is available the cables can be powered up for a maximum of one minute on the drum to warm them and make them easier to work with in cold weather.
- The area where the cold-tails of the heating cables/mats will be terminated for connection to the DIN-rail mounted thermostats must be dry and watertight.
- The rough location of the driveway temperature and moisture sensor/s should be notified to the installation team so that these can be taken into account when planning where to lay the heating cables.
- Any areas where expansion joints will sit must be marked out clearly ahead of the installation and these should be taken into account during installation, ensuring cables do not risk being damaged by these joints.
- All other trades are to be excluded from working in or passing through the installation area until the system has been handed over and signed off as complete.

Installation – First/Second Fix:

- **Risk Assessment – Low Risk**
 - During installation the only tools to be used will be side cutters and an electrician's multimeter– no electrical power tools needed.
- Prior to starting installation each cable should be checked for continuity and should be insulation tested. The resistance of the heating wires should be checked to the marking label on the cable.
- The cables can be paid out by hand however a more straightforward method is to use a cable drum dispenser stand. If using a stand Heat Mat can supply a returnable aluminium cable drum, which can be swapped between heating cables to ensure they pay out smoothly. The part number of the drum is ICE-50W-DRUM and a full refund is provided when the drum is returned.
- In normal circumstances the cables should be secured to 0.9m or 1.2m wide flexible mesh that is laid on top of the base layer; the base layer must be smooth and must not contain sharp stones or other items that could potentially damage the heating

cables. The mesh should be laid in runs with 2m between them and these should be directed in the opposite way to the direction of the cable runs. It is important that the mesh does not damage the heating cable as weight is placed above it, so we recommend using a very thin and flexible wire to avoid this. **We strongly recommend using 19 gauge welded wire ½" x 1" mesh for this purpose and under no circumstances should reinforcement mesh be used in this type of installation, as this will damage the heating cables.**

- Cables should be secured to the mesh with plastic cable-ties (20mm x 2.5mm).
- If the system is going to be secured with Heat Mat fixing strips the strips must be secured to the base by a suitable method. Nail-gunning, gluing or double-sided tape are acceptable in appropriate situations.
- The cables should be secured to the fixing strip with plastic cable-ties (20mm x 2.5mm). These should be used to secure the cable to loops onto the fixing strip.
- The cables should be spaced at the distance as specified in the design of the system to provide the correct Wattage output. Standard outputs vary between 200W and 350W/sqm, with cables spacings as follows:

Overall Wattage Output	Cable to cable spacing
200W/sqm	25cm
225W/sqm	22cm
250W/sqm	20cm
275W/sqm	18cm
300W/sqm	17cm
325W/sqm	15cm
350W/sqm	14cm

- The cables should never be spaced at an average distance of closer than 100mm apart or further apart than 250mm, unless the installation is part of a specialist specification as signed off by Heat Mat's technical team. **Cables must always be at least 80mm away from other heating cables, and the coldtail connections and end terminations must be at least 150mm away from other connections.**
- **If the cables are installed on a ramp they must be laid backwards and forwards across the ramp, not up and down the ramp, as this could lead to the cables stretching.**
- If at all practicable the coldtail connections of all cables should be located in defined areas where they can be located at a future date if required.
- Photos should be taken of the system once the installation is complete showing the general location of all cables.
- **Primary Test** - after the heating cables have been installed each cable must be electrical checked for continuity, earth leakage and a high Voltage insulation 'mega' test should be carried out at 500V.
- After the heating cables have been installed all walking on them must be avoided until the cables have been covered.
- **Once the tests have been completed it is the client's responsibility to protect the heating cables from damage.**

Installation – Laying asphalt:

- When the asphalt is being laid over the heating cables, we recommend monitoring the cables by regularly testing them with a multi-meter or using a Heat Mat Cable Safe unit (ACC-CAB-SAFE). These units sound an audible alarm if the cable is damaged.
- The main heating cable is designed to cope with hot asphalt being applied directly on top of it and it is designed to resist up to 240°C for a short period. Asphalt applied above the cables must not be above this temperature.
- **To prevent damage to the cables heavy machinery such as heavy rollers and asphalt laying machines should not be used above the cables.**
- The asphalt layer must have a minimum depth of 50mm measured from the top of the heating cable.
- **The cold tail of the heating cable is not designed to cope with hot asphalt and must be laid in a protective conduit pipe (which can cope with 240°C),** and this pipe should be suitably sealed to ensure asphalt does not enter it. Alternatively you can protect the coldtails as detailed below for the connections.
- **The cold tail connection and the end termination of the cable must be protected from the hot asphalt by covering them in a protective layer before the asphalt is laid.** This can be achieved by covering these sections with a layer of cold tarmacadam/asphalt (no more than 90°C), concrete or flexible tile adhesive before covering with asphalt. It is vital that the protective layer is at least 10mm thick above the cable.
- **The cold tail connection and end termination must never be bent.**
- If a moisture sensor or temperature sensor is being installed the cable for this will also need to be protected from the hot asphalt in a suitable manner as noted above. The temperature or temperature and moisture sensor itself must not be placed in position until the asphalt has cooled to 40°C or below.
- When the asphalt is being spread care should be taken to ensure that the cables are not damaged in any way during this process.
- When the concrete is being poured particular attention should be paid to the location of the driveway sensor to ensure that it can be laid flush with the finished driveway. The sensor's cable must be within the driveway construction and the sensor should be in a position open to the elements. The sensor's cable must be within the driveway construction and the cable must be protected from hot asphalt.

Installation – Final Fix and Initial Setup:

- Once the driveway system has been installed the final fix of the thermostats can be made and the electrical connections can be carried out.
- Before the final wiring is completed each cable should be electrically checked for continuity and insulation tested by a qualified electrician. The same electrician should also confirm that the entire heating system is suitably protected by the required RCD/GFCI before final commissioning can start.

- During all commissioning of the system a suitably qualified electrician should be present on site. If Heat Mat are supporting on the commissioning side it is recommended that a suitably qualified electrician is there to support on site as Heat Mat do not provide any electrical connection support.
- If the total power requirement is above that which the thermostats can safely supply contactors or similar should be used to drive the system. **Please note that the supplied thermostats usually utilise Voltage-free contacts (see their instructions for more details).**
- Once the system is fully wired it should be commissioned and the sensors checked. Freeze spray should be used to test the temperature sensor and water should be poured onto the sensor to check the moisture sensor aspect. Care should be taken to ensure that the freeze spray does not come in contact with bare skin and protective glasses should be worn whenever using freeze spray.
- Once these tests have been carried out and the thermostat has been proved to send the order to heat to the system the thermostat should be set up to the desired programming and overheating levels. Initially these levels should be set to err on the side of caution and start heating when precipitation is falling, but temperatures have reached 5°C. Once the system has been operating for a full season with multiple days of freezing temperatures the activation temperature can be lowered if deemed acceptable to the onsite operator.
- For larger systems (over 150m²) it is recommended that a thermographic survey should be carried out to ensure that all portions of the area are heating as required. October through to March is the usual time to carry out these surveys and these should take place in the early morning or in the evening at least two hours after any direct sunlight has been on the area. Air temperatures should be no higher than 8°C and it is desirable for the heated area to start off with a temperature of 5°C or below. Heat Mat can carry out the thermographic test and sign off procedure if desired for a fee of £500 excl. VAT and travelling/accommodation expenses.
- On the first frosty/snowy days that occur subsequent to installation the system should be monitored to confirm its operation. If adjustments are required to the programming these should be made at the first opportunity to ensure energy efficiency. There is no need to wait for a thermographic survey before first using the system.
- Sensor Sensitivity. If the system is located in an area with particularly low pollution levels (such as mountainous locations) please note that the sensors sensitivity may need to be increased to allow it to register moisture correctly. (Virtually pure water is a very bad conductor of electricity, and it is the conduction of the small electrical current in the sensor, which allows it to register the moisture. In normal circumstances air pollution, particulates and substances already on the sensor allow it to produce a firm reading, but in very low pollution environments the sensors sensitivity must be increased for it to register correctly.)

For more information contact Heat Mat Technical Support – 01444 247020

Updated October 2016

Driveway Heating System

Method Statement – Screed



Site preparation:

- The area where the driveway heating system will be laid must be clearly marked out.
- Areas where the driveway heating system will be laid must be smooth surface clear of sharp objects, debris and standing water.
- If temperatures are not guaranteed to be above 5°C ambient during the installation process we recommend that the cables are stored in a heated room and take out one by one just before they are fitted. This ensures that the cables are flexible and easy to manipulate.
- If an RCD protected 16amp 230V supply is available the cables can be powered up for a maximum of one minute on the drum to warm them and make them easier to work with in cold weather.
- The area where the cold-tails of the heating cables/mats will be terminated for connection to the DIN-rail mounted thermostats must be dry and watertight.
- The rough location of the driveway temperature and moisture sensor/s should be notified to the installation team so that these can be taken into account when planning where to lay the heating cables.
- Any areas where expansion joints will sit must be marked out clearly ahead of the installation and these should be taken into account during installation, ensuring cables do not risk being damaged by these joints.
- All other trades are to be excluded from working in or passing through the installation area until the system has been handed over and signed off as complete.

Installation – First/Second Fix:

- **Risk Assessment – Low Risk**
 - During installation the only tools to be used will be side cutters and an electrician's multimeter– no electrical power tools needed.
- Prior to starting installation each cable should be checked for continuity and should be insulation tested. The resistance of the heating wires should be checked to the marking label on the cable.
- The cables can be paid out by hand however a more straightforward method is to use a cable drum dispenser stand. If using a stand Heat Mat can supply a returnable aluminium cable drum, which can be swapped between heating cables to ensure they

pay out smoothly. The part number of the drum is ICE-50W-DRUM and a full refund is provided when the drum is returned.

- If the system is going to be secured to rebar or mesh, the rebar or mesh must be securely fixed to ensure it cannot move and trap the heating cable.
- The cables should be secured to the rebar or mesh with plastic cable-ties (20mm x 2.5mm).
- The cables should be spaced at the distance as specified in the design of the system to provide the correct Wattage output. Standard outputs vary between 200W and 350W/sqm, with cables spacings as follows:

Overall Wattage Output	Cable to cable spacing
200W/sqm	25cm
225W/sqm	22cm
250W/sqm	20cm
275W/sqm	18cm
300W/sqm	17cm
325W/sqm	15cm
350W/sqm	14cm

- The cables should never be spaced at an average distance of closer than 100mm apart or further apart than 250mm, unless the installation is part of a specialist specification as signed off by Heat Mat's technical team. **Cables must always be at least 80mm away from other heating cables, and the coldtail connections and end terminations must be at least 150mm away from other connections.**
- **If the cables are installed on a ramp they must be laid backwards and forwards across the ramp, not up and down the ramp, as this could lead to the cables stretching.**
- If at all practicable the coldtail connections of all cables should be located in defined areas where they can be located at a future date if required.
- Photos should be taken of the system once the installation is complete showing the general location of all cables.
- **Primary Test** - after the heating cables have been installed each cable must be electrical checked for continuity, earth leakage and a high Voltage insulation 'mega' test should be carried out at 500V.
- After the heating cables have been installed all walking on them must be avoided until the cables have been covered.
- **Once the tests have been completed it is the client's responsibility to protect the heating cables from damage.**

Installation – Screeding:

- When the concrete is being poured over the heating cables we recommend monitoring the cables by regularly testing them with a multi-meter or using a Heat Mat Cable Safe unit – ACC-CAB-SAFE. These units will sound an audible alarm if the cable is damaged in any way.
- When the concrete is being poured care should be taken to ensure that the cables are not damaged in any way during the pouring or spreading process.
- If using internal vibration on the concrete care should be taken not to catch one of the cables.
- When the concrete is being poured particular attention should be paid to the location of the driveway sensor to ensure that it can be laid flush with the finished driveway. The sensor's cable must be within the driveway construction and the sensor should be in a position open to the elements.
- Under no circumstances should the driveway heating system be used to dry out the concrete or prevent it from freezing. Driveway heating systems are too powerful to be used for this purpose and, if concrete curing cables are required, these should be of a lower Wattage 'sacrificial' nature.

Installation – Final Fix and Initial Setup:

- Once the driveway system has been installed the final fix of the thermostats can be made and the electrical connections can be carried out.
- Before the final wiring is completed each cable should be electrically checked for continuity and insulation tested by a qualified electrician. The same electrician should also confirm that the entire heating system is suitably protected by the required RCD/GFCI before final commissioning can start.
- During all commissioning of the system a suitably qualified electrician should be present on site. If Heat Mat are supporting on the commissioning side it is recommended that a suitably qualified electrician is there to support on site as Heat Mat do not provide any electrical connection support.
- If the total power requirement is above that which the thermostats can safely supply contactors or similar should be used to drive the system. **Please note that the supplied thermostats usually utilise Voltage-free contacts (see their instructions for more details).**
- Once the system is fully wired it should be commissioned and the sensors checked. Freeze spray should be used to test the temperature sensor and water should be poured onto the sensor to check the moisture sensor aspect. Care should be taken to ensure that the freeze spray does not come in contact with bare skin and protective glasses should be worn whenever using freeze spray.
- Once these tests have been carried out and the thermostat has been proved to send the order to heat to the system the thermostat should be set up to the desired programming and overheating levels. Initially these levels should be set to err on the

side of caution and start heating when precipitation is falling, and temperatures have reached 5°C. Once the system has been operating for a full season with multiple days of freezing temperatures the activation temperature can be lowered if deemed acceptable to the onsite operator.

- For larger systems (over 150m²) it is recommended that a thermographic survey should be carried out to ensure that all portions of the area are heating as required. October through to March is the usual time to carry out these surveys and these should take place in the early morning or in the evening at least two hours after any direct sunlight has fallen on the surface. Air temperatures should be no higher than 8°C and it is desirable for the heated area to start off with a temperature of 5°C or below. Heat Mat can carry out the thermographic test and sign off procedure if desired for a fee of £500 excl VAT and travelling/accommodation expenses.
- On the first frosty/snowy days that occur subsequent to installation the system should be monitored to confirm its operation. If adjustments are required to the programming these should be made at the first opportunity to ensure energy efficiency. There is no need to wait for a thermographic survey before first using the system.
- Sensor Sensitivity. If the system is located in an area with particularly low pollution levels (such as mountainous locations) please note that the sensors moisture sensitivity may need to be increased to allow it to register moisture correctly. (Virtually pure water is a very bad conductor of electricity, and it is the conduction of the small electrical current in the sensor which allows it to register the moisture. In normal circumstances air pollution, particulates and substances already on the sensor allow it to produce a firm reading, but in very low pollution environments the sensors sensitivity must be increased for it to register correctly.)

Heat Mat Technical Support – 01444 247020

Updated October - 2016

Driveway Heating System

Method Statement – Block Paving



Site preparation:

- The area where the driveway heating system will be laid must be clearly marked out.
- Areas where the driveway heating system will be laid must be smooth surface clear of sharp objects, debris and standing water.
- The cables should be laid onto a level bed of 60mm sand/grit, which should be compacted as required.
- If temperatures are not guaranteed to be above 5°C ambient during the installation process we recommend that the cables are stored in a heated room and take out one by one just before they are fitted. This ensures that the cables are flexible and easy to manipulate.
- If an RCD protected 16amp 230V supply is available the cables can be powered up for a maximum of one minute on the drum to warm them and make them easier to work with in cold weather.
- The area where the cold-tails of the heating cables/mats will be terminated for connection to the DIN-rail mounted thermostats must be dry and watertight.
- The rough location of the driveway temperature and moisture sensor/s should be notified to the installation team so that these can be taken into account when planning where to lay the heating cables.
- Any areas where expansion joints will sit must be marked out clearly ahead of the installation and these should be taken into account during installation, ensuring cables do not risk being damaged by these joints.
- All other trades are to be excluded from working in or passing through the installation area until the system has been handed over and signed off as complete.

Installation – First/Second Fix:

- **Risk Assessment – Low Risk**
 - During installation the only tools to be used will be side cutters and an electrician's multimeter– no electrical power tools needed.
- Prior to starting installation each cable should be checked for continuity and should be insulation tested. The resistance of the heating wires should be checked to the marking label on the cable.
- The cables can be paid out by hand however a more straightforward method is to use a cable drum dispenser stand. If using a stand Heat Mat can supply a returnable aluminium cable drum, which can be swapped between heating cables to ensure,

they pay out smoothly. The part number of the drum is ICE-50W-DRUM and a full refund is provided when the drum is returned.

- In normal circumstances the cables should be secured to 0.9m or 1.2m wide flexible mesh that is laid on top of the 60mm layer of sand/grit, with 2m between the runs of the flexible mesh. The runs of mesh should be laid out in the opposite direction to how the cables will be laid. It is important that the mesh does not damage the heating cable as weight is placed above it, so we recommend using a very thin and flexible wire to avoid this. We strongly recommend using 19 gauge welded wire ½" x 1" mesh for this purpose and under no circumstances should reinforcement mesh be used in this type of installation as this will damage the heating cables.
- The cables should be secured to the mesh with plastic cable-ties (20mm x 2.5mm).
- The cables should be spaced at the distance as specified in the design of the system to provide the correct Wattage output. Standard outputs vary between 200W and 350W/sqm, with cables spacing as follows:

Overall Wattage Output	Cable to cable spacing
200W/sqm	25cm
225W/sqm	22cm
250W/sqm	20cm
275W/sqm	18cm
300W/sqm	17cm
325W/sqm	15cm
350W/sqm	14cm

- The cables should never be spaced at an average distance of closer than 100mm apart or further apart than 250mm, unless the installation is part of a specialist specification as signed off by Heat Mat's technical team. **Cables must always be at least 80mm away from other heating cables, and the coldtail connections and end terminations must be at least 150mm away from other connections.**
- If the cables are installed on a ramp they must be laid backwards and forwards across the ramp, not up and down the ramp, as this could lead to the cables stretching.
- If at all practicable the coldtail connections of all cables should be located in defined areas where they can be located at a future date if required. Photos should be taken of the system once the installation is complete showing the general location of all cables.
- **Primary Test** - after the heating cables have been installed each cable must be electrical checked for continuity, earth leakage and a high Voltage insulation 'mega' test should be carried out at 500V.
- After the heating cables have been installed all walking on them must be avoided until the cables have been covered.
- **Once the tests have been completed it is the client's responsibility to protect the heating cables from damage.**

Installation – Block Paving:

- When the block paving is being fitted over the cables we recommend that they are monitored by regularly testing them with a multi-meter or Heat Mat Cable Safe units (ACC-CAB-SAFE). These units will sound an audible alarm if the cable is damaged in any way.
- A further 40-50mm layer of sand/grit should be laid on top of the heating cables and this layer should be compacted by hand to avoid damage to the system.
- The block paving should then be laid and to achieve the greatest benefit from the system the blocks should be no more than 80mm thick.
- When the paving is being laid particular attention should be paid to the location of the driveway sensor to ensure that it can be laid flush with the finished driveway. The sensor's cable must be within the driveway construction and the sensor should be in a position open to the elements.
- Under no circumstances should the driveway heating system be used to dry out the sand/grit or prevent it from freezing until the block paving has been laid.

Installation – Final Fix and Initial Setup:

- Once the driveway system has been installed the final fix of the thermostats can be made and the electrical connections can be carried out.
- Before the final wiring is completed each cable should be electrically checked for continuity and insulation tested by a qualified electrician. The same electrician should also confirm that the entire heating system is suitably protected by the required RCD/GFCI before final commissioning can start.
- During all commissioning of the system a suitably qualified electrician should be present on site. If Heat Mat are supporting on the commissioning side it is recommended that a suitably qualified electrician is there to support on site, as Heat Mat do not provide any electrical connection support.
- If the total power requirement is above that which the thermostats can safely supply contactors or similar should be used to drive the system. **Please note that the supplied thermostats usually utilise Voltage-free contacts (see their instructions for more details).**
- Once the system is fully wired it should be commissioned and the sensors checked. Freeze spray should be used to test the temperature sensor and water should be poured onto the sensor to check the moisture sensor aspect. Care should be taken to ensure that the freeze spray does not come in contact with bare skin and protective glasses should be worn whenever using freeze spray.
- Once these tests have been carried out and the thermostat has been proved to send the order to heat to the system the thermostat should be set up to the desired programming and overheating levels. Initially these levels should be set to err on the side of caution and activate the heating when precipitation is falling and temperatures

have reached 5°C. Once the system has been operating for a full season with multiple days of freezing temperatures the activation temperature can be lowered if deemed acceptable to the onsite operator.

- For larger systems (over 150m²) it is recommended that a thermographic survey should be carried out to ensure that all portions of the area are heating as required. October through to March is the usual time to carry out these surveys and these should take place in the early morning or in the evening at least two hours after any direct sunlight has fallen on the surface. Air temperatures should be no higher than 8°C and it is desirable for the heated area to start off with a temperature of 5°C or below. Heat Mat can carry out the thermographic test and sign off procedure if desired for a fee of £500 excl. VAT and travelling/accommodation expenses.
- On the first frosty/snowy days that occur subsequent to installation the system should be monitored to confirm its operation. If adjustments are required to the programming these should be made at the first opportunity to ensure energy efficiency. There is no need to wait for a thermographic survey before first using the system.
- Sensor Sensitivity. If the system is located in an area with particularly low pollution levels (such as mountainous locations) please note that the sensors moisture sensitivity may need to be increased to allow it to register moisture correctly. (Virtually pure water is a very bad conductor of electricity, and it is the conduction of the small electrical current in the sensor, which allows it to register the moisture. In normal circumstances air pollution, particulates and substances already on the sensor allow it to produce a firm reading, but in very low pollution environments the sensors sensitivity must be increased for it to register correctly.)

For more information contact Heat Mat Technical Support – 01444 247020

Updated October 2016

50W Driveway Heating Cable Installation Record

Cable Installer Details:	Electrical Installer Details:
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Date of cable installation: ____/____/____

Date of electrical installation: ____/____/____

SERIAL NUMBER	CABLE OUTPUT	1 ST OHMS TEST RESULT (WHEN CABLE HAS BEEN FITTED)	2 ND OHMS TEST RESULT (WHEN DRIVEWAY CONSTRUCTION IS COMPLETE)	FINAL INSULATION TEST
50 _____				
50 _____				
50 _____				
50 _____				
50 _____				
50 _____				
50 _____				
50 _____				
50 _____				
50 _____				
50 _____				
50 _____				
50 _____				
50 _____				
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50 _____				
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50 _____				
50 _____				
50 _____				
50 _____				

This installation record must be completed for each installation of the Heat Mat 50W Driveway Heating Cable (ICE-50W product range). Please complete one form per install and retain with documentation of the system.