

# HELIOS SILICONE RUBBER HEATERS

## INTRODUCTION

Helios Silicone Rubber Tapes, Pads and Cord Heaters are made in Australia.

Where flexibility and low to medium temperatures are required (-20°C +220°C) Silicone Rubber Heaters solve the problem. Manufactured using Silicone Rubber as the prime material, they can be shaped to suit almost any contour or surface. They are resistant to corrosion, moisture, chemicals, weathering, weak acids and vibration and can be manufactured to almost any shape, size or specification.

## APPLICATIONS

- To combat heat losses from pipes, tanks or vessels containing almost any liquid or fluid material.
- To maintain the temperature of oil lines, valves, drains.
- To prevent cooling of materials whilst being piped between process equipment sites.
- To prevent drains. Water lines, cold room door seals and refrigeration cabinet doors from freezing.
- As anti-condensation heaters in electric motors, switch boards and control cubicles.
- As blankets or wraps around drums and vessels of highly viscous materials (honey – resins etc)

## Helios Silicone Rubber Heaters are manufactured in three basic forms.

1. TAPES
2. MATS
3. CORDS

### 1. SILICONE RUBBER TAPES (Now two types available)

Helios  Heating Tapes –

Temperatures to 150 degrees C  
Continuous lengths 120 metres  
(page 47-50)

Helios Standard Tapes –

Temperatures to 220 degrees C  
Maximum length 10 metres  
(page 51)

### 2. SILICONE RUBBER MATS

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### 3. SILICONE RUBBER CORDS

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# HELIOS SILICONE RUBBER HEATERS

## CUT TO LENGTH (EXT) HEATING TAPE

TEMPERATURES TO 150°C

CONTINUOUS LENGTHS TO 120 METRES.

### ECONOMIC CONVENIENT – MADE IN AUSTRALIA

Wherever chemicals, liquids, raw materials and foodstuffs require controlled temperature through pipelines, valves and pumps "EXT HEATING TAPE" solves the problem.

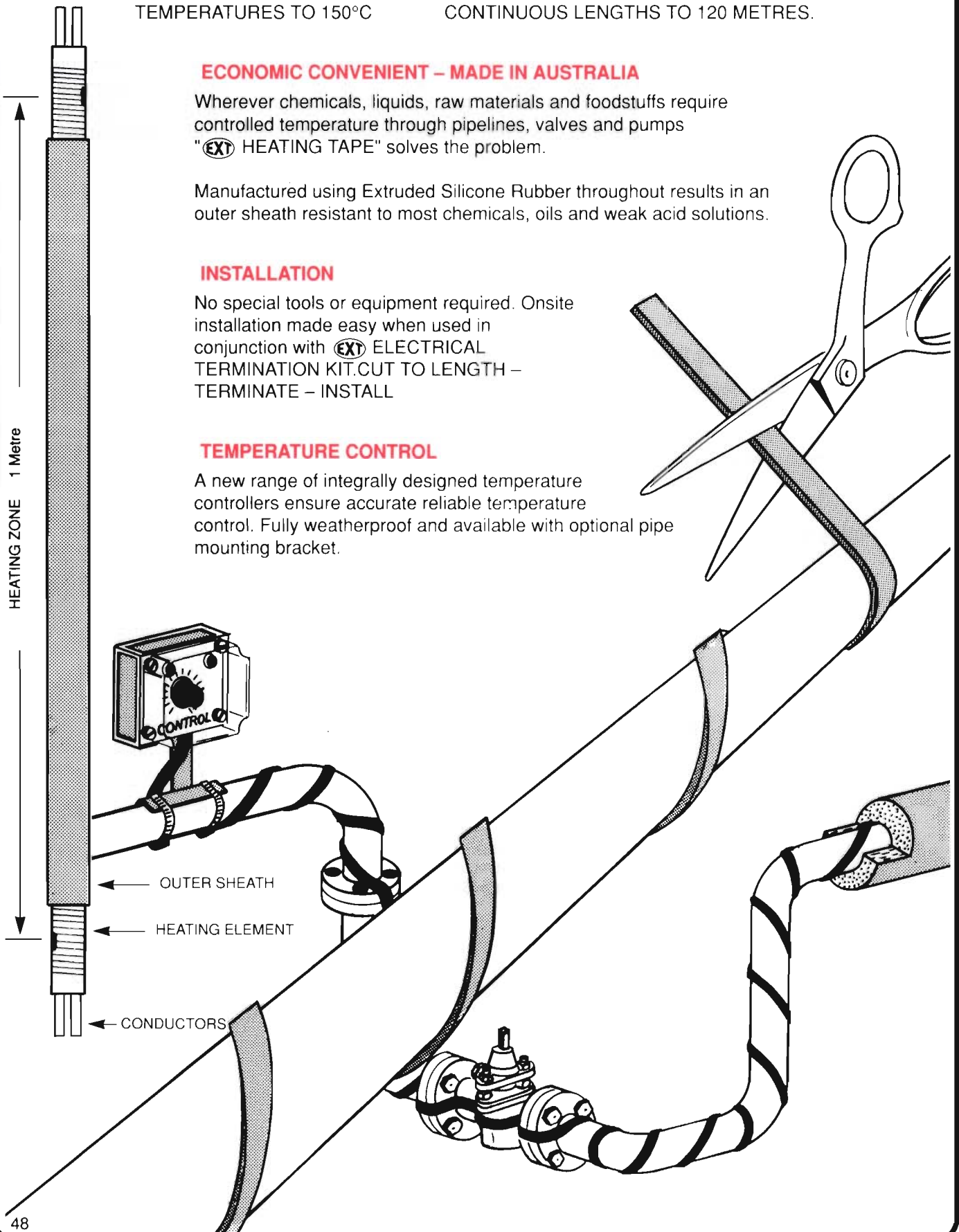
Manufactured using Extruded Silicone Rubber throughout results in an outer sheath resistant to most chemicals, oils and weak acid solutions.

### INSTALLATION

No special tools or equipment required. Onsite installation made easy when used in conjunction with (EXT) ELECTRICAL TERMINATION KIT. CUT TO LENGTH – TERMINATE – INSTALL

### TEMPERATURE CONTROL

A new range of integrally designed temperature controllers ensure accurate reliable temperature control. Fully weatherproof and available with optional pipe mounting bracket.



# HELIOS SILICONE RUBBER HEATERS

## **EXT HEATING TAPE**

The Helios range of **EXT** HEATING TAPES are designed and manufactured having four individual heat ratings to meet the wide range of temperatures and conditions industry demands. Before calculating and selecting the correct heating tape, the following notes should be read and considered.

### PLASTIC PIPE

If the pipe to be heated is made of plastic, in order to avoid damage, the maximum permissible heat output of the tape selected must not exceed 12.5 watts per metre. If the heat losses from the pipe are greater than 12.5 watts per metre, the tape or tapes must be spirally traced along the pipeline to achieve the heat input required per metre.

### HEAT SENSITIVE PRODUCTS

If the product within the pipeline is sensitive to heat, the maximum heat output of the tape selected must not be excessive or a spoiled product will result, for example Glucose and Chocolate are easily degraded – if in doubt consult Helios.

### PIPE DIAMETER

For small diameter pipes it may be adequate to straight trace, providing the heat output per metre of the selected tape is sufficient to equal the losses per metre of pipe (see calculations). For large diameter pipes a spiral or multi spiral trace may be required. Consult our Engineers for helpful advice.

## **EXT HEATING TAPE SELECTION TABLE**

MAXIMUM TEMPERATURES	CATALOGUE NUMBER	HEAT OUTPUT PER METRE	MAXIMUM LENGTH	COLOUR CODE
60 DEG C	EXT 100	100 WATTS	30 METRES	RED
75 DEG C	EXT 50	50 WATTS	60 METRES	YELLOW
125 DEG C	EXT 25	25 WATTS	90 METRES	BLUE
150 DEG C	EXT 12.5	12.5 WATTS	120 METRES	BLACK

## **CALCULATE WATTS REQUIRED PER METRE**

- |    |   |           |                      |
|----|---|-----------|----------------------|
| A. | Determine watts lost per metre of pipe            | (Graph A) | <input type="text"/> |
| B. | Select correction factor for insulation thickness | (Table B) | <input type="text"/> |
| C. | Select thermal insulation efficiency factor       | (Table C) | <input type="text"/> |
| D. | Select correction factor for area of installation | (Table D) | <input type="text"/> |
| E. | Select correction factor for pipe material used   | (Table E) | <input type="text"/> |

WATTS REQUIRED PER METRE = A X B X C X D X E.

NOTE: FOR UNINSULATED PIPE MULTIPLY BY 3.

W/M

### **CALCULATE LENGTH OF TAPE REQUIRED.**

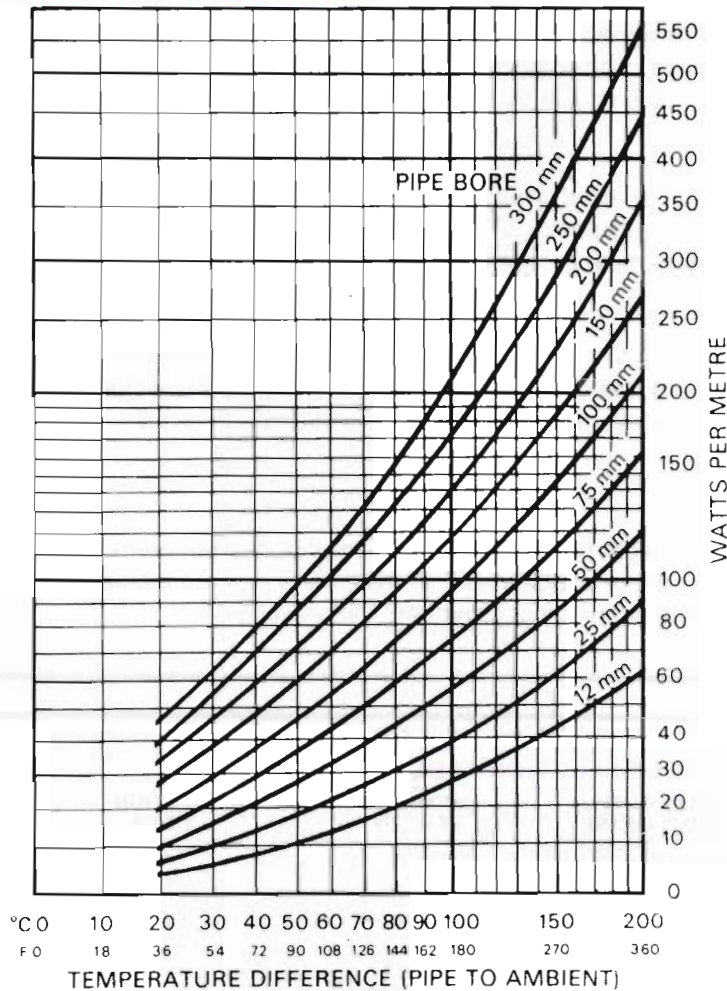
- F. Select appropriate tape from Table above. Always choose the highest watts output per metre within desired temperature range.

LENGTH OF TAPE REQUIRED = 
$$\frac{\text{PIPE LENGTH (METRES)} \times \text{WATTS REQUIRED PER METRE}}{\text{WATTS PER METRE OF TAPE SELECTED}}$$

**NOTE: Where actual pipe length exceeds calculated tape length – select the greater and straight trace.**

# HELIOS SILICONE RUBBER HEATERS

**GRAPH A. HEAT LOSSES**



**TABLE B Insulation Thickness**

25mm	40mm	50mm	75mm
1	.8	.7	.5

**TABLE C Insulation Efficiency**

Polyurethane Foam	.74
Glass Wool – Foam Rubber	1.00
Calcium Silicate	1.38

**TABLE D Location**

Outdoor	1.0
Indoor	0.9

**TABLE E Pipe Material**

Metal	1.0
Plastic	0.7

## EXAMPLE

A 25 metre long 75mm diameter steel pipeline carrying oil is required to be maintained at 25 DEG C. Situated outdoors with a possible ambient of -5 DEG C it is proposed that 25mm polyurethane foam insulation be applied during installation.

### USING THE CALCULATION GUIDE

- A. Temperature difference pipe to ambient = 30 DEG C
- B. Insulation thickness 25mm
- C. Polyurethane Foam
- D. Outdoor Situation
- E. Pipe material – Steel

23.00
1.00
.74
1.00
1.00

$$\begin{aligned} \text{Watts required per metre} &= A \times B \times C \times D \times E \\ &= 23 \times 1 \times .74 \times 1 \times 1 &= & \boxed{17 \text{ W/M}} \end{aligned}$$

- F. Select tape **EXT** 25 (adequate wattage and with temperature limit).

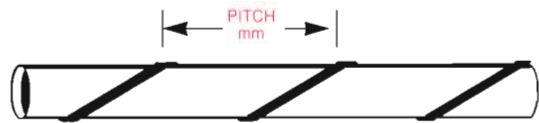
$$\text{Length of tape required} = \frac{25 \text{ (pipe length metres)} \times 17 \text{ (watts required metre)}}{25 \text{ (watts per metre of tape selected)}} = 17 \text{ metres}$$

**NOTE:** As pipelength exceeds calculated tape length, install 25 metres **EXT** 25 straight traced.

# HELIOS SILICONE RUBBER HEATERS

## SPIRALLING PITCH

1. Establish loading ratio of tape length to pipe length.



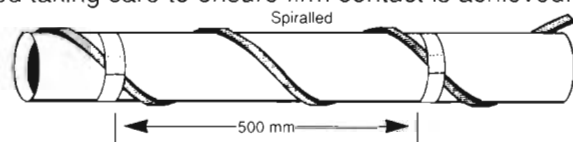
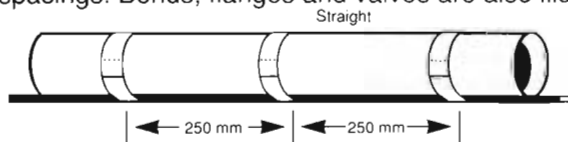
$$\text{Loading Ratio} = \frac{\text{Total metres of tape required}}{\text{length of pipeline (metres)}}$$

2. Using chart below plot nominal pipe diameter against loading ratio

LOADING RATIO	NOMINAL PIPE DIAMETER (MM)											
	25	32	40	50	65	80	100	125	150	200	250	300
1.25	150	165	180	250	300	360	480	590	700	800	1200	1280
1.50	100	115	130	170	210	260	325	400	460	600	780	900
1.75	70	85	100	140	160	185	250	300	350	460	550	700
2.00	55	70	85	115	125	130	200	240	280	375	460	600
2.50	40	50	60	80	100	115	150	190	230	290	350	450
3.00	20	30	40	66	75	90	130	180	220	260	300	390

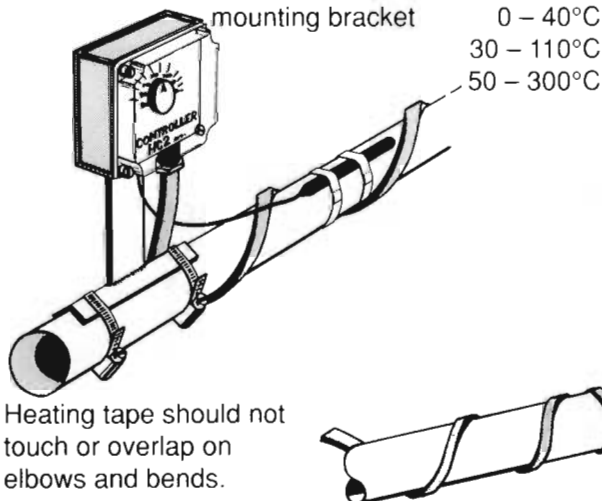
## INSTALLATION

Where **(EXT)** HEATING TAPE is to be spiralled on the pipe, it should be applied at the correct spiral pitch. In practice some adjustment may be required to achieve even distribution over the entire pipe length. Straight tracing should be attached to the underside of the pipe having fixing points at 250mm spacings. Bends, flanges and valves are also illustrated taking care to ensure firm contact is achieved.



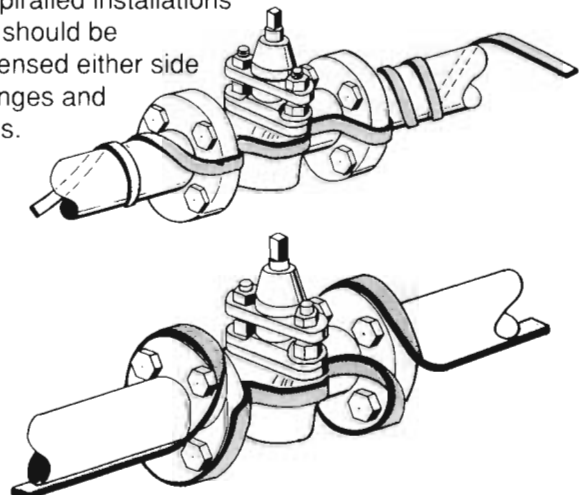
### CONTROL.

Weatherproof polycarbonate enclosure. Resistant to most acids and chemicals. Optional pipe mounting bracket



Heating tape should not touch or overlap on elbows and bends.

For spiralled installations pitch should be condensed either side of flanges and valves.

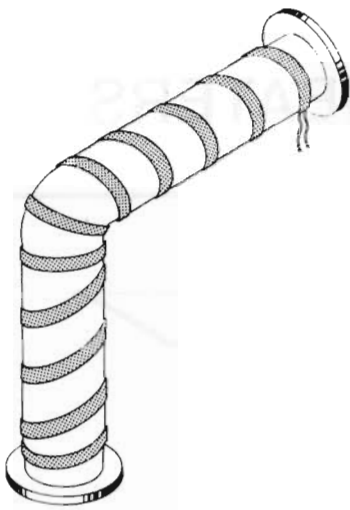


Straight installation showing additional tape applied to flanges and valves.

**(EXT)** HEATING TAPE should make firm contact with the pipe, and not be allowed to hang free or overlap upon itself. Only the recommended fixing materials should be used.

Control is recommended at all times.

SEE PAGE 58



# SILICONE RUBBER HEATERS

## HELIOS STANDARD SILICONE RUBBER TAPES TEMPERATURES TO 220°C — Lengths to 10 metres

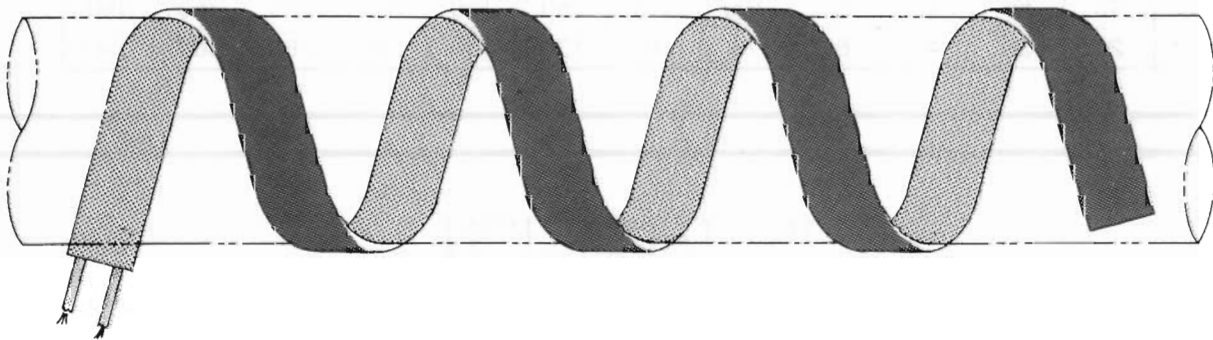
Primarily designed for pipeline applications where insulation would not be fitted, these heating tapes have a maximum rating of 150 watts per metre to replace the large heat losses experienced where no insulation is installed.

The standard tape width is 25 mm and is available in lengths up to 10 metres with lead type terminations of 1 metre length located at one end.

Voltage is standard at 240 Volts but for other variations consult Helios Engineers.

Maximum heater operating temperature is 220°C.

Flexibility is such that it may be coiled around pipes as small as 20 mm (3/4") diameter.



### SPIRAL INSTALLATION

When high loading per (metre) run of pipe is required, spiralling is essential as this method ensures contact between tape and pipe and enables the watts per metre of pipe to be varied by selection of the pitch turns. It is essential that the entire length of the heating tape, including termination, is in close contact with the pipe, especially when flanges or irregular shaped valves have to be crossed, and held in contact by using ties of adhesive glass tape or fibreglass cord etc., according to the temperature.

### STRAIGHT TRACED

When tapes are to be traced along the underside of pipes, the distance between fixing clips should be no greater than 250 mm. Pipes must be clean and free from jagged edges before installation of tapes, and should be applied under slight tension, preferably when the pipes or containers are cool.

#### STANDARD TAPES AVAILABLE EX STOCK

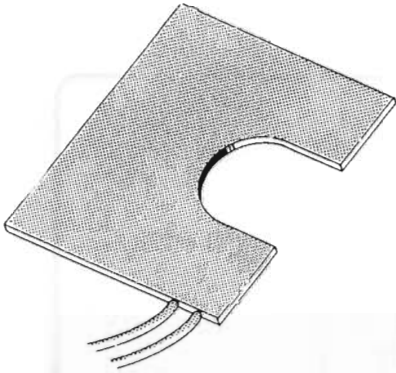
CATALOGUE NUMBER	WATTAGE	VOLTAGE	LENGTH	
			METRES	FEET
SR1	150	240	1.0	3.3
SR1.5	225	240	1.5	4.9
SR2	300	240	2.0	6.6
SR3	450	240	3.0	9.8
SR4	600	240	4.0	13.1
SR5	750	240	5.0	16.4
SR6	900	240	6.0	19.7

All standard tapes rated at 150 watts per metre. (50 watts per foot)

Other sizes, voltages and wattages can be manufactured upon request.

TEMPERATURE CONTROL IS RECOMMENDED AT ALL TIMES. PAGE 54

# HELIOS SILICONE RUBBER HEATERS



## HELIOS SILICONE RUBBER HEATERS

### HELIOS SILICONE RUBBER HEATING MATS TEMPERATURES TO 220°C

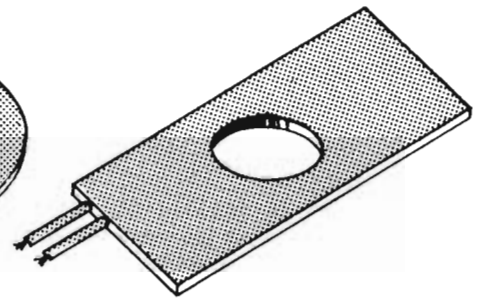
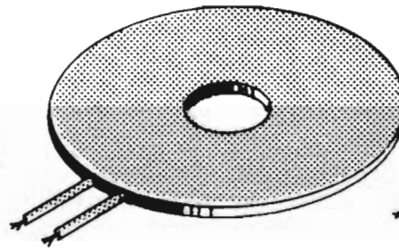
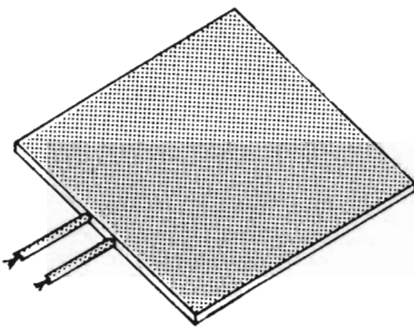
#### CONSTRUCTION

The mat is constructed using fine nickel alloy wire sandwiched between silicone rubber impregnated fibreglass sheet, increasing its strength and flexibility.

The resistance element wire can be laid out in any configuration, giving a varied wattage distribution desired in special heaters, also allowing for any cutouts, holes, clearances, and clamping.

These pads have many uses and can be made in a variety of shapes from a 75 mm square to a pad measuring 0.6 m x 3 m., thickness is a nominal 2 mm and wattages up to 5 kW/sq. m.

As they can be manufactured in almost any shape or size and are extremely flexible, they have found application as heated panels for clamping to the outside of storage tanks or plating vats, defrosting of large industrial freezer units, heating pads for many corrosive substances, or when even heating is required over a large area.



TYPICAL SILICONE RUBBER FORMS

SILICONE RUBBER MAY BE USED TO ADHERE MATS TO WORKING SURFACES.

## SILICONE RUBBER HEATING CORDS

Manufactured in two diameters (4 mm and 6 mm) Silicone Rubber Cord Heaters have a maximum rating of 60 watts per lineal metre.

Constructed using a silicone rubber impregnated braided fibreglass outer sheath, results in a tough waterproof heating cord which can be wrapped around or installed within water pipes and refrigeration drain lines to prevent frost and ice formation.

Cord Heaters are ideal as anti condensation heaters when fitted within electric motors and are easily fitted into cold room door seals to prevent freezing and jamming.

Leads of any length are able to be fitted at each end of the heater, or electrical termination at one end only is an option.

Consult with Helios for informative advice.