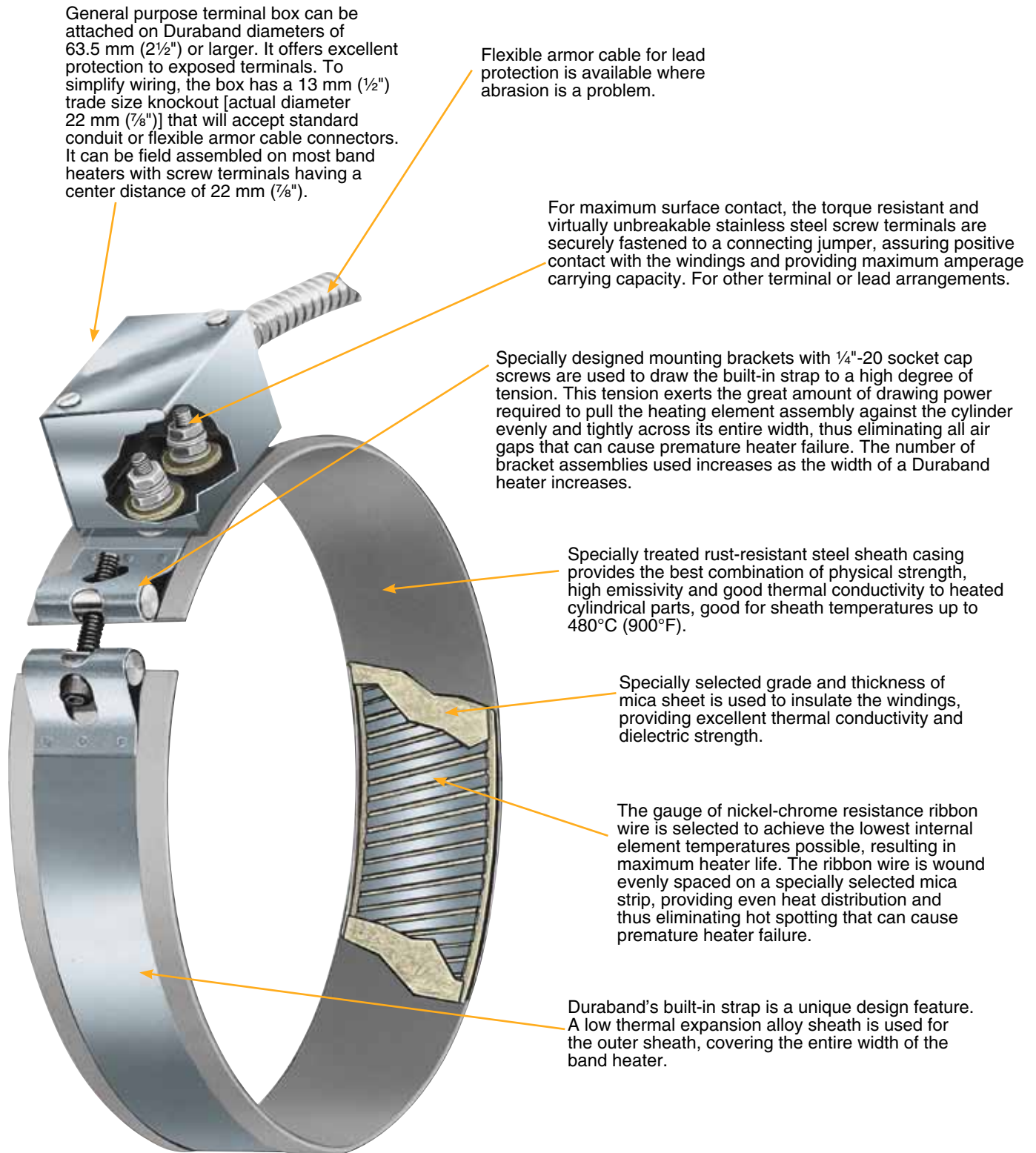


Replacement Band Heaters for Plastic Injection Molding Machines



General purpose terminal box can be attached on Duraband diameters of 63.5 mm (2½") or larger. It offers excellent protection to exposed terminals. To simplify wiring, the box has a 13 mm (½") trade size knockout [actual diameter 22 mm (7/8")] that will accept standard conduit or flexible armor cable connectors. It can be field assembled on most band heaters with screw terminals having a center distance of 22 mm (7/8").

Flexible armor cable for lead protection is available where abrasion is a problem.

For maximum surface contact, the torque resistant and virtually unbreakable stainless steel screw terminals are securely fastened to a connecting jumper, assuring positive contact with the windings and providing maximum amperage carrying capacity. For other terminal or lead arrangements.

Specially designed mounting brackets with ¼"-20 socket cap screws are used to draw the built-in strap to a high degree of tension. This tension exerts the great amount of drawing power required to pull the heating element assembly against the cylinder evenly and tightly across its entire width, thus eliminating all air gaps that can cause premature heater failure. The number of bracket assemblies used increases as the width of a Duraband heater increases.

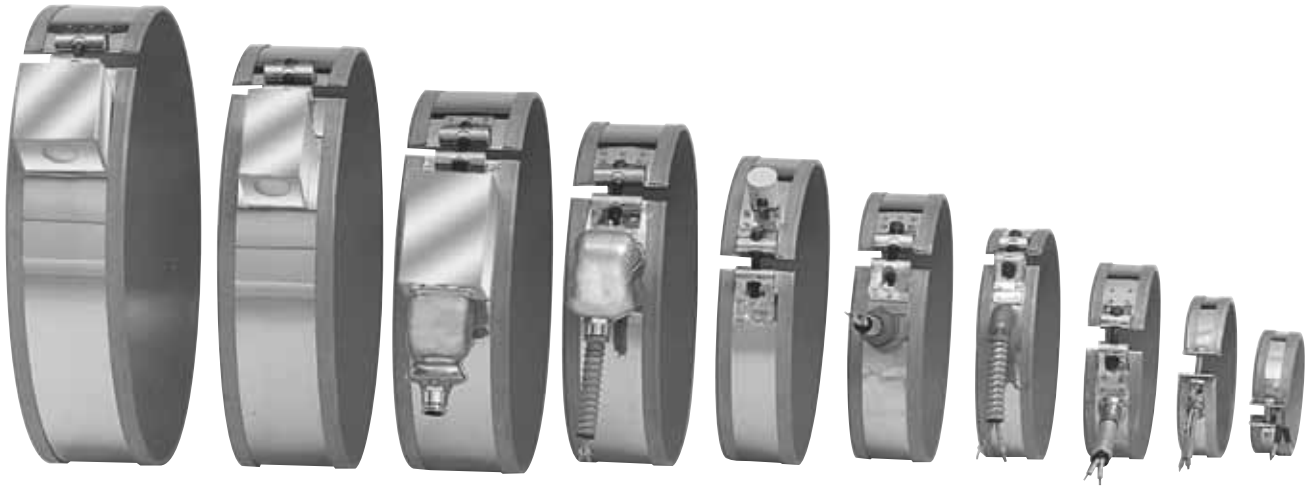
Specially treated rust-resistant steel sheath casing provides the best combination of physical strength, high emissivity and good thermal conductivity to heated cylindrical parts, good for sheath temperatures up to 480°C (900°F).

Specially selected grade and thickness of mica sheet is used to insulate the windings, providing excellent thermal conductivity and dielectric strength.

The gauge of nickel-chrome resistance ribbon wire is selected to achieve the lowest internal element temperatures possible, resulting in maximum heater life. The ribbon wire is wound evenly spaced on a specially selected mica strip, providing even heat distribution and thus eliminating hot spotting that can cause premature heater failure.

Duraband's built-in strap is a unique design feature. A low thermal expansion alloy sheath is used for the outer sheath, covering the entire width of the band heater.

Replacement Band Heaters for Plastic Injection Molding Machines



- Built-In Bracket for Superior Clamping
- Unbreakable and Torque-Resistant Screw Terminals
- Temperatures Up to 480°C (900°F)
- Full Width Stainless Steel Built-In Strap
- Flexibility to Incorporate Holes and Cutouts
- Available Two-Piece and Expandable Designs
- Most Economical Among Various Heater Bands
- Most Versatile and Commonly Used Heater Band

Typical Applications

- Plastic Injection Molding Machines
- Plastic Extruders
- Oil Reclamation Equipment
- Food and Candy Extruders
- Drum Heating
- Extrusion Dies
- Holding Tanks
- Blow Molding Machines
- Vending Machines
- Barrels and Heads
- Food Service Warming
- Autoclaves and Sterilizers
- Metallurgical Analyzers
- Fluidized Beds
- Hot Runner Molds
- Pulp and Paper Processing Equipment

Designed For Trouble-Free Service

The Duraband heater design is the result of many years of research, development and testing for a reliable mica insulated band heater that can perform at the higher operating temperatures [up to 480°C (900°F)] essential to process high temperature resins, providing long, efficient service necessary for today's high productivity of plastic extruders, injection and blow molding machines.

Duraband is a proven heater design for good life efficiency and dependability. It assures maintaining the lowest winding temperatures possible, keeping a low-mass heating element assembly for fast heat-up and quick thermal response to controls. It incorporates the low thermal expansion built-in strap, a unique design feature.

Advantages and Variations

Duraband mica insulated heaters are widely used on operations involving heating of cylindrical surfaces and are manufactured in a full range of standard construction variations, physical dimensions, electrical ratings, and a complete arrangement of screw terminals and lead terminations.

However, these standard Duraband heater variations and terminations do not represent the full extent of our capabilities. OMEGA's engineering staff, with many years of experience in heat processing and temperature control applications, can assist you in designing the right Duraband heater for your specific application.

Replacement Band Heaters for Plastic Injection Molding Machines

Standard Specifications and Tolerances

Performance Ratings

Maximum Temperature:

Standard Sheath: 482°C (900°F)

Nominal Watt Density: 3 to 7 Watt/cm² (20 to 45 Watt/in²)

Maximum Watt Density: Dependent on heater size and operating temperature

Electrical Ratings

Maximum Voltage: 480 Vac

Dual Voltage or 3-Phase: Available depending on heater design

Maximum Amperage:

Lead Wire Termination: 10 Amp

Screw Terminations: 8-32 UNF—20 Amp;
10-32 UNF—25 Amp

Resistance Tolerance: 10%, -5%

Wattage Tolerance: 5%, -10%

Physical Size Construction Limitations

Minimum Width: 19.1 mm ($\frac{3}{4}$ "

Width Tolerance: 1.59 mm ($\pm\frac{1}{16}$ "

Minimum Inside Diameter: 22.1 mm ($\frac{7}{8}$ "

Nominal Gap: 9.5 mm ($\frac{3}{8}$ "—if a larger gap is required for probes or thermocouples, specify when ordering

Built-In Brackets

Heater Width	Number of Brackets
38 to 76 mm (1½ to 3")	1
79 to 127 mm (3⅛ to 5")	2
130 to 145 mm (5⅛ to 6⅞")	3
178 to 254 mm (7 to 10")	4
257 to 381 mm (10⅛ to 15")	5

If tighter tolerances are required, contact OMEGA.

CAUTION: Exposed electrical wiring on band heater installations is a violation of Electrical Safety Codes including O.S.H.A.

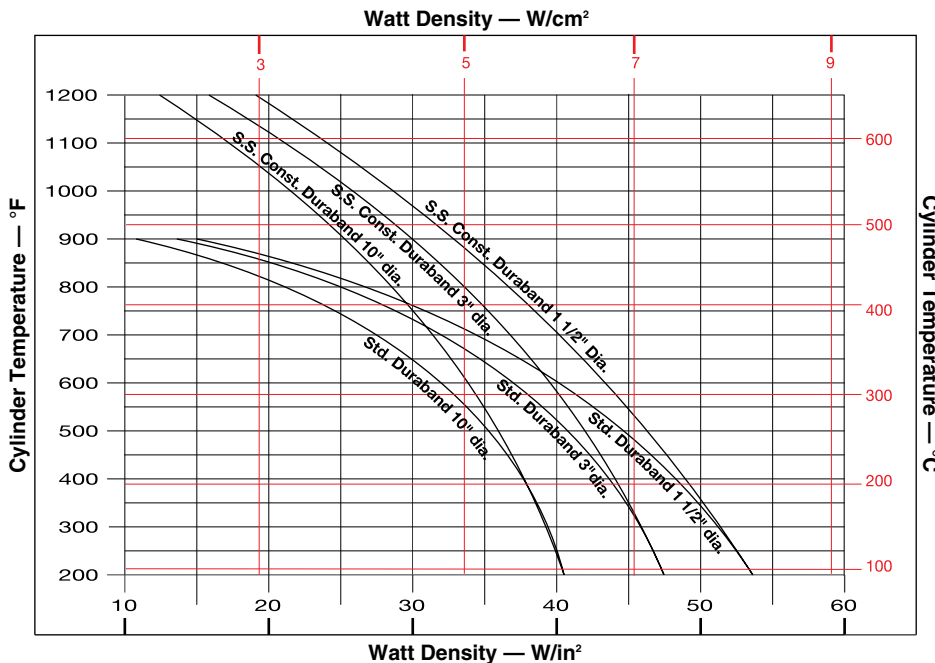
Minimum ID and Width for Construction/Clamping Styles

Style	Minimum ID		Minimum Width	
	mm	inch	mm	inch
NB	50.8	2	31.8	1¼
NS	76.2	3	31.8	1¼
NE	63.5	2½	31.8	1¼
SB	22.1	7/8	19.1	¾
SS	50.8	2	19.1	¾
SE	63.5	2½	31.8	1¼
FB	25.4	1	19.1	¾
FS	50.8	2	19.1	¾
FE	63.5	2½	31.8	1¼
SL	101.6	4	31.8	1¼
NSL	101.6	4	31.8	1¼
NEL	101.6	4	31.8	1¼
LT	177.8	7	38.1	1½
LS	177.8	7	38.1	1½
LE	177.8	7	38.1	1½
TWL	25.4	1	25.4	1
RNB	134.7	5½	25.4	1
RNS	254	10	25.4	1

Note: Refer to individual descriptions for further information. Actual heater minimums will be a combination of termination and construction/strap styles.

Replacement Band Heaters for Plastic Injection Molding Machines

Maximum Watt Densities



Maximum Allowable Watt Density

The chart displays the maximum Watt Density curves for various diameter heaters. Use this chart when determining the appropriate wattage value for your chosen heater.

Be aware that certain factors will require you to derate the watt density (Watt/in²) of your heater selection.

CAUTION: Failure to adhere to the maximum allowable watt density per heater size will result in poor operating life.

Correction Factors

For heaters wider than 76.2 mm (3"), reduce maximum recommended watt density from chart by 20%.

For applications using insulating shroud, reduce maximum recommended watt density from chart by 25%.

Calculating Maximum Watt Density

Factors to be Taken into Consideration:

- A. Type of controls
- B. Voltage variations
- C. Machine cycling rate
- D. Type of resin being processed
- E. Coefficient of thermal expansion and conductivity of the cylinder
- F. Designing a heater that closely matches the wattage requirement will decrease the frequency of cycling and temperature overshoot, thereby increasing the life of the heater.

Once These Factors have been Established, Proceed with the Following Steps:

1. Determine the maximum operating temperature.
2. Calculate the total wattage required to obtain the maximum operating temperature.
3. Determine the quantity and size of the heater bands to be used. 38 through 76 mm (1½ through 3") wide band heaters have proven to be the most efficient and reliable in most cylindrical heating applications.
4. Determine individual band heater wattage by dividing the total required wattage by the quantity of band heaters selected.
5. Determine the band heater watt density by subtracting unheated areas from the band heater diameter created by screw terminals, gaps, holes, and cutouts (see formula below).
6. Determine if the required watt density previously calculated exceeds the maximum recommended watt density. Note the maximum cylinder temperature required on the left-hand side of the graph, follow the horizontal line until it intersects with the line of the band heater being used, and read directly down to obtain the maximum recommended watt density (Watt/in²).
7. If the calculated watt density is higher than the recommended value, it must be corrected or it will cause poor heater life. This can be accomplished by using more band heaters, lowering the heater wattage, or using a different construction type or a different type of band heater.
8. Should you have a problem in selecting the proper band heater or establishing watt density for your application, contact one of the qualified engineers at OMEGA.

Nominal Unheated Areas	
Construction Style	Unheated Area to Subtract
One-piece band	1" × width
Two-piece band	2" × width
Holes and cutouts	Size + ½" × width

Watt Density Formula

Wattage

$$\text{Watt Density (Watt/in}^2\text{)} = \frac{\text{Wattage}}{[3.14 \times (\text{Band ID}) - \text{Gap} - 1\frac{3}{8}] \times \text{Band Width} - \text{Unheated Area (see table)}}$$

Unheated Area (See Table) = Unheated area for construction style + unheated area for any holes or cutouts



Replacement Band Heaters for Plastic Injection Molding Machines NHL Series

- Economically Priced
- 12" Leads and 2" of Protective Sleeving
- Supplied with Low Profile Clamping Strap



Mica Insulated Nozzle Heater

To Order							
Model No.		Inside Diameter		Width		Watts	Watt Density W/in ²
120V	240V	mm	inch	mm	Inch		
NHL00130	NHL00131	22.2	7/8	25	1	85	49
NHL00100	NHL00101	25	1	25	1	100	47
NHL00132	NHL00133	25	1	25	1	125	58
NHL00102	NHL00103	25	1	38.1	1½	150	47
NHL00104	NHL00105	25	1	38.1	1½	200	62
NHL00106	NHL00107	25	1	51	2	250	58
NHL00154	NHL00155	31.7	1¼	15.8	5/8	100	55
NHL00108	NHL00109	31.7	1¼	25	1	175	60
NHL00156	NHL00157	31.7	1¼	31.7	1¼	125	34
NHL00158	NHL00159	31.7	1¼	31.7	1¼	250	68
NHL00110	NHL00111	31.7	1¼	38.1	1½	250	57
NHL00160	NHL00161	38.1	1½	22.2	7/8	100	31
NHL00162	NHL00163	38.1	1½	25	1	100	27
NHL00112	NHL00113	38.1	1½	25	1	150	40
NHL00114	NHL00115	38.1	1½	25	1	200	54
NHL00164	NHL00165	38.1	1½	31.7	1¼	250	54
NHL00134	NHL00135	38.1	1½	38.1	1½	150	27
NHL00116	NHL00117	38.1	1½	38.1	1½	200	36
NHL00136	NHL00137	38.1	1½	38.1	1½	250	45
NHL00118	NHL00119	38.1	1½	38.1	1½	275	49
NHL00138	NHL00139	38.1	1½	38.1	1½	300	54
NHL00120	NHL00121	38.1	1½	51	2	300	40
NHL00122	NHL00123	38.1	1½	63.5	2½	350	38
NHL00166	NHL00167	38.1	1½	63.5	2½	400	43
NHL00168	NHL00169	38.1	1½	76.2	3	350	31
NHL00124	NHL00125	38.1	1½	76.2	3	400	36
NHL00170	NHL00171	38.1	1½	76.2	3	500	45
NHL00172	NHL00173	44.4	1¾	25	1	175	39
NHL00174	NHL00175	44.4	1¾	38.1	1½	200	30
NHL00140	NHL00141	44.4	1¾	38.1	1½	225	33
NHL00176	NHL00177	44.4	1¾	38.1	1½	250	37
NHL00178	NHL00179	44.4	1¾	38.1	1½	300	44
NHL00180	NHL00181	44.4	1¾	76.2	3	500	37
NHL00182	NHL00183	51	2	25	1	200	38
NHL00142	NHL00143	51	2	38.1	1½	300	38
NHL00144	NHL00145	51	2	51	2	400	38

Replacement Band Heaters for Plastic Injection Molding Machines NHL Series (continued)

Mica Insulated Nozzle Heater

Model No.		Inside Diameter		Width		Watts	Watt Density W/in ²
120V	240V	mm	inch	mm	Inch		
NHL00126	NHL00127	54	2 ¹ / ₈	25	1	100	18
NHL00128	NHL00129	54	2 ¹ / ₈	51	2	200	18
NHL00146	NHL00147	57.1	2 ¹ / ₄	25	1	225	37
NHL00148	NHL00149	60.3	2 ³ / ₈	25	1	250	39
NHL00150	NHL00151	63.5	2 ¹ / ₂	25	1	300	44
NHL00152	NHL00153	63.5	2 ¹ / ₂	38.1	1 ¹ / ₂	200	19
NHL00186	NHL00187	63.5	2 ¹ / ₂	38.1	1 ¹ / ₂	350	34

Note: For normal plastic processing OMEGA recommends watt densities under 55 W/in².

NHW Series

- Economically Priced
- 12" Leads and 10' Stainless Steel Wire Braid
- Supplied with Low Profile Clamping Strap



Mica Insulated Nozzle Heater

To Order							
Model No.		Inside Diameter		Width		Watts	Watt Density W/in ²
120V	240V	mm	inch	mm	Inch		
NHW00130	NHW00131	22.2	7/8	25	1	85	49
NHW00100	NHW00101	25	1	25	1	100	47
NHW00132	NHW00133	25	1	25	1	125	58
NHW00102	NHW00103	25	1	38.1	1 ¹ / ₂	150	47
NHW00104	NHW00105	25	1	38.1	1 ¹ / ₂	200	62
NHW00106	NHW00107	25	1	51	2	250	58
NHW00108	NHW00109	31.7	1 ¹ / ₄	25	1	175	60
NHW00156	NHW00157	31.7	1 ¹ / ₄	31.7	1 ¹ / ₄	125	34
NHW00158	NHW00159	31.7	1 ¹ / ₄	31.7	1 ¹ / ₄	250	68
NHW00110	NHW00111	31.7	1 ¹ / ₄	38.1	1 ¹ / ₂	250	57
NHW00160	NHW00161	38.1	1 ¹ / ₂	22.2	7/8	100	31
NHW00162	NHW00163	38.1	1 ¹ / ₂	25	1	100	27
NHW00112	NHW00113	38.1	1 ¹ / ₂	25	1	150	40
NHW00114	NHW00115	38.1	1 ¹ / ₂	25	1	200	54
NHW00164	NHW00165	38.1	1 ¹ / ₂	31.7	1 ¹ / ₄	250	54
NHW00134	NHW00135	38.1	1 ¹ / ₂	38.1	1 ¹ / ₂	150	27
NHW00116	NHW00117	38.1	1 ¹ / ₂	38.1	1 ¹ / ₂	200	36
NHW00136	NHW00137	38.1	1 ¹ / ₂	38.1	1 ¹ / ₂	250	45
NHW00118	NHW00119	38.1	1 ¹ / ₂	38.1	1 ¹ / ₂	275	49
NHW00138	NHW00139	38.1	1 ¹ / ₂	38.1	1 ¹ / ₂	300	54
NHW00120	NHW00121	38.1	1 ¹ / ₂	51	2	300	40
NHW00122	NHW00123	38.1	1 ¹ / ₂	63.5	2 ¹ / ₂	350	38
NHW00166	NHW00167	38.1	1 ¹ / ₂	63.5	2 ¹ / ₂	400	43
NHW00124	NHW00125	38.1	1 ¹ / ₂	76.2	3	400	36



**Replacement Band Heaters for Plastic Injection Molding Machines
NHW Series (continued)**

Mica Insulated Nozzle Heater

Model No.		Inside Diameter		Width		Watts	Watt Density W/in ²
120V	240V	mm	inch	mm	Inch		
NHW00170	NHW00171	38.1	1½	76.2	3	500	45
NHW00174	NHW00175	44.4	1¾	38.1	1½	200	30
NHW00140	NHW00141	44.4	1¾	38.1	1½	225	33
NHW00176	NHW00177	44.4	1¾	38.1	1½	250	37
NHW00178	NHW00179	44.4	1¾	38.1	1½	300	44
NHW00142	NHW00143	51	2	38.1	1½	300	38
NHW00144	NHW00145	51	2	51	2	400	38
NHW00126	NHW00127	54	2⅞	25	1	100	18
NHW00184	NHW00185	54	2⅞	25	1	200	35
NHW00128	NHW00129	54	2⅞	51	2	200	18
NHW00146	NHW00147	57	2¼	25	1	225	37
NHW00148	NHW00149	60.3	2⅞	25	1	250	39
NHW00150	NHW00151	63.5	2½	25	1	300	44
NHW00152	NHW00153	63.5	2½	38.1	1½	200	19
NHW00186	NHW00187	63.5	2½	38.1	1½	350	34
NHW00188	NHW00189	69.8	2¾	38.1	1½	400	35

Note: For normal plastic processing OMEGA recommends watt densities under 55 W/in².