nexthermal®
smart heat management

Built-to-Order Cartridge Heater Solutions

Who is Nexthermal?

Nexthermal is a solution provider that engineers built-to-order electric heaters for industrial manufacturing processes and new product development. When heat is vital to your application, the most cost-effective process improvement is a heater designed specifically for your operating conditions.

Nexthermal can combine your unique process knowledge and objectives with our thermal transfer expertise. This collaboration can lead to shorter cycle times, improved product quality, and extended throughput capabilities.

Together, we can design
If heat is vital to your process... the right heater for you.
add Nexthermal to your team!

- **1986** — Hotset Corporation established in Battle Creek, Michigan as a separate entity and strategic partner to Hotset GmbH.
- **1991** — Initial cartridge heater produced.
- **1998** — U.S. coil heater production launched.
- **2002** — Pressed-in-Brass coil heater introduced.
- **2003** — Production facility expanded.
- **2004** — Heater-based assemblies unveiled.
- **2006** — Manufacturing beg Bangalore, India. Intr anti-seize coating an moisture resistant coil h

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As you engage Nexthermal, our goal is that you conclude we are:

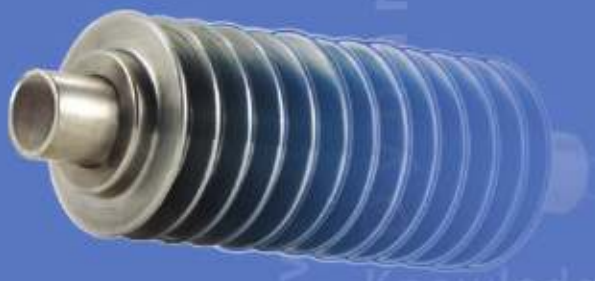
Approachable — Welcoming discussion, highly interested in the details of your application. Sincerely committed to helping you succeed.

Dynamic — Responding with a sense of urgency, proactively anticipating and planning for challenges, demonstrating agility that incorporates your input and experience to accelerate the best solution.

Knowledgeable — Our application experience, ability to understand your process, generating market driven solutions should lead you to clearly see that Nexthermal is your heat management expert.

International — United States roots with a global reach. With customers and strategic partners worldwide, Nexthermal has the resources to generate the right solution delivering world class benefits well beyond your investment in our products and services.

Innovative — Delivering application-based solutions with your requirements in mind. Developing new product capabilities to address emerging needs.



Approachable

Knowledgeable

2008 — Selected as the exclusive Elstein marketing agent in the United States.

2009 — Hotflow circulation heater invented, targeting electric vehicle, medical and food production markets.

2010 — Renamed **Nexthermal** to emphasize our commitment to heat management solutions worldwide. Introduced eheat energy efficient cartridge heaters.

2012 — Nexthermal Thermal Solutions team created , providing customers with option of adding advanced thermal modeling and design capabilities to important development projects.

2014 — Nexthermal proudly becomes a 100% U.S. owned company.

Introduced new Nextflex® Flexible Tubular Heater and began manufacturing Thermocouples.

2015 — Received certified minority owned business certification.

Production expansion of U.S. manufacturing facility.

2018 — Nexthermal begins initial planning stage for another production expansion.

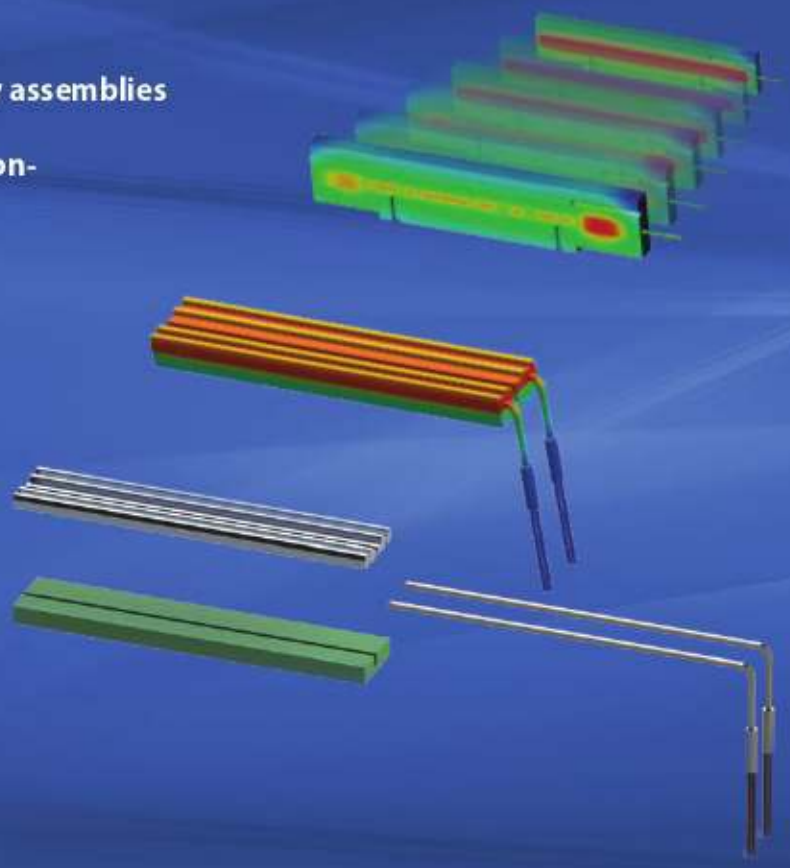
Engineering Solutions and Heater-Based Assemblies

Imagine what we can do when we combine our experiences and innovate together.

When heat is essential to your process, you need a high performance system that is specifically designed to support your core application needs. Let Nexthermal engineers tap into their over 50 years of combined heat management experience to design process-specific solutions and heater-based assemblies that are engineered to achieve your production goals.

Nexthermal can:

- Maximize OEM output with plug-n-play assemblies
- Increase uptime by designing application-specific heaters with longer heater life
- Improve efficiency and streamline production
- Optimize thermal transfer.
- Thermally and mechanically model performance and function prior to prototyping
- Extend capabilities of existing equipment
- Incorporate design standards including GD&T, hygienic design, OSHA, and stress analysis



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Cartridge Heater Performance Options

Distributed Wattage

Nexthermal has developed industry-specific winding profiles to improve thermal profiles for packaging, rubber and injection molding. We have also successfully developed OEM-specific winding profiles to compensate for challenging heater placement.

Moisture Resistance

For applications that require wash down, have high amounts of humidity in the ambient air, or have machining oil nearby, Nexthermal offers built-to-order options to deliver moisture resistance at your operating temperature.

Anti-Seize Coating

Building a heater that lasts longer can make removal more difficult when a heater must be replaced. Removal labor often costs more than the heater itself. Nexthermal's in-house anti-seize coating is a cost-effective option that can be added without impacting delivery.

Removal Aids

Nexthermal offers knock-out tabs and other removal aids that allow you to quickly and confidently remove a heater when it is time to replace it. Knock out tabs are recommended when you are installing the heater in a through bore that's prone to oxidation.

Right Angle Exit

Nexthermal has redesigned the right angle exit with flat sides, making it possible to use a wrench to precisely position lead exit and break oxidation bonds when removing a heater.

Right Angle Block

The Right Angle Block has flat sides and substantial material to provide the strength needed for highly-corrosive environments (such as die casting) where the heater sheath can be bonded to the bore.

Standard Flanges, Special Flanges, and NPT Fittings

For applications requiring a specific insertion depth, or must be held in place, Nexthermal offers standard flanges for most diameters. We can also design special flanges for your application. NPT fittings can be added to your cartridge heater.

Centerless Grind Tolerance

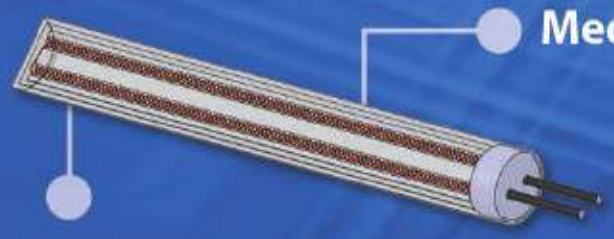
Nexthermal's standard tolerance of ±.002" compares favorably to other cartridge heaters. If heat transfer is critical to your application, Nexthermal offers premium centerless grind tolerances that are ±.0008". Designed to fit nominal cores.

High Watt Density vs. Medium Watt Density Construction

Customers who require precise, durable heat should accept nothing less than Nexthermal's engineering expertise and manufacturing quality. Our swaging process enables Nexthermal cartridge heaters to more responsively deliver heat, and provides the resistance wire with a dense thermal mass — improving performance and heater life greatly over loose fill cartridge heaters. Our processes are ISO 9001: 2015 certified and UL 499 certified.

High watt density heaters

The machine winding of the high watt density heater delivers the most precise distributed wattage profile. High watt density heaters can be built to your specifications from 1" long to over 100". Warranted to 160 watts per square inch.



Medium watt density heaters

The medium watt density heater has a continuous resistance spiral throughout the heater delivering unparalleled reliability. For longer heaters there are fewer internal electrical connections. Medium watt density heaters start at 8" long, and can be built to over 100". Warranted to 65 watts per square inch.

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Specify a high watt density heater if:

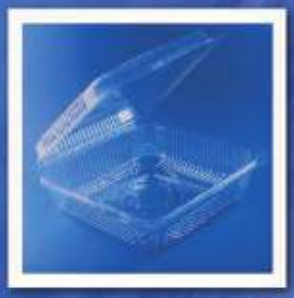
- Watt density is greater than 65 watts per square inch.*
- And/or the heater is less than 8".
- And/or your application requires a precise wattage distribution.

* High watt density heaters are commonly built below 65 watts per square inch and in lengths up to 100" long for specific applications.

Specify a medium watt density heater if:

- Watt density is less than 65 watts per square inch.
- And the heater is 8" or longer.
- And you do not need highly precise wattage distribution.

In the past, only high watt density heaters could support an internal Type J or K TC. Nexthermal can now manufacture medium watt density heaters with an internal TC.



Options for Leads and Lead Protection

Leads

Fiberglass (standard)
Temperature UL Rated to
482 °F | 250 °C

Silicone
Temperature Rating
356 °F | 180 °C

Silicone Cable
Temperature Rating
356 °F | 180 °C

Teflon®
Temperature Rating
500 °F | 260 °C

Teflon® (High Amperage)
Temperature Rating
500 °F | 260 °C

Fiberglass (High temp)
Temperature Rating
932 °F | 500 °C

Lead Protection

Potting Options

Ceramic
Temperature Rating
1000 °F | 538 °C

Epoxy
Temperature Rating
600 °F | 315 °C

Teflon® Plug
Temperature Rating
450 °F | 232 °C

Silicone
Temperature Rating
500 °F | 260 °C

Silicone (Hi-Temp)
Temperature Rating
650 °F | 343 °C

Cartridge Heater Technical Data

	High Watt Density	Medium Watt Density	1/8" Heater
Dimensional			
Length Tolerance	**±1.5% (min ± 1mm)**	**±1.5% (min ± 1mm)**	Plus or minus 3%
Premium Length Tolerance	upon request	upon request	--
Minimum Heater Length	1" (25.4mm)*	8" (203.2mm)**	1.25" (31.75mm)
Maximum Length	Please see chart opposite page by diameter	Please see chart opposite page by diameter	Please see chart opposite page by diameter
	* Shorter lengths may be possible, dependent on required wattage.		** Depending on application requirements.
Material			
Sheath Material	SS304 (rated 842 °F / 450 °C) SS316L (rated 1292 °F / 700 °C) Incoloy 800 (rated 1500 °F / 700 °C)	SS304 (rated 842 °F / 450 °C) SS316L (rated 1292 °F / 700 °C) Incoloy 800 (rated 1500 °F / 700 °C)	SS304 (rated 842 °F / 450 °C)
Electrical			
Maximum Recommended/ Warranted Sheath Load	160 Watts per square inch	65 Watts per square inch	120 Watts per square inch
Standard Wattage Tolerance	+5% / –10%	±10%	+10% -15%
Premium Wattage Tolerance	±5%, lower possible with specific designs	±5%	±10%, ±5%
Standard High Voltage Stability (cold) ≤24V	500V-AC @ 100 mA	500V-AC @ 100 mA	Not available
Standard High Voltage Stability (cold) >24V	1500V-AC @ 100 mA	1500V-AC @ 100 mA	800V @ 100 mA
Premium High Voltage Stability (cold) >250V	Upon Request	Upon Request	Not available
Insulation Resistance	Min 5 Meg ohms at 500V-DC	Min 5 Meg ohms at 500V-DC	Min 5 Meg ohms at 500V-DC
Premium Insulation Resistance	Upon Request	Upon Request	Not available
Discharge Current (cold)/Leakage Current	Max 0.5 mA at 253 V-AC	Max 0.5 mA at 253 V-AC	Max 0.5 mA at 253 V-AC
Maximum Connection Voltage UL Rated	250V	250V	N/A
Maximum Connection Voltage	600V	600V	250V

* Adding end product may increase cold lead end length. Consult engineering for confirmation on final lengths.

Cold Section by Heat Length

Heater OAL (mm)	Cold Length at Cap End (mm) (reference)	Cold Length at Lead End (mm) (reference)	Total Cold Length (mm)
≤35	4	5	9
≥36 & ≤79	5	5	10
≥80 & ≤99	7	5	12
≥100 & ≤120	10	8	15
≥121 & ≤200	12	8	17
≥201 & ≤299	12	8	17
≥300 & ≤399	14	8	19
≥400 & ≤549	16	8	21
≥500	20	8	25

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Standard Cartridge Heater Configuration Chart

	Diameter Tolerances			Construction		Sheath Material Options	
Diameter	Standard Swage to Size Tolerance	Premium Centerless Grind Tolerance	Maximum Heater Length	High Watt Density	Medium Watt Density	300 SS Series : Temps to 842°F 316L SS : Temps to 1292°F 321 SS : Temps to 1472°F Incoloy 800 : Temps to 1500°F	Stainless NPT Size
0.125"**	0.1240" - 0.1200"	0.1240" - 0.1201"	4.0"	●		300 SS Series	
0.250"	0.248" - 0.244"	0.2488" - 0.2472"	60.0"	●	●	300 SS Series	1/8"
0.3125"	0.3105" - 0.3066"	0.3114" - 0.3098"	70.0"	●	●	300 SS Series	1/4"
0.375"	0.373" - 0.369"	0.3732" - 0.3717"	80.0"	●	●	300 SS Series / Incoloy 800	1/4"
0.500"	0.498" - 0.494"	0.4972" - 0.4957"	100.0"	●	●	300 SS Series / Incoloy 800	3/8"
0.625"	0.623" - 0.619"	0.6232" - 0.6217"	100.0"	●	●	321 SS / Incoloy 800	1/2"
0.6785"		0.6866" - 0.6850"	100.0"	●	●	321 SS / Incoloy 800	1/2"
0.750"	0.748" - 0.744"	0.7492" - 0.7476"	100.0"	●	●	321 SS	3/4"
1.000"		0.9984" - 0.9969"	100.0"	●		316L SS	1"
1.250"		1.2484" - 1.2468"	100.0"		●	316L SS	
6.2mm		6.18mm - 6.14mm	1525mm	●	●	300 SS Series	
6.5mm		6.48mm - 6.44mm	1525mm	●	●	300 SS Series	1/8"
7.0mm*		6.98mm - 6.94mm	1525mm	●	●	300 SS Series	
8.0mm*		7.98mm - 7.94mm	1178mm	●	●	300 SS Series	1/4"
9.0mm*		8.98mm - 8.94mm	1800mm	●	●	300 SS Series / Incoloy 800	
9.5mm*		9.48mm - 9.44mm	2030mm	●	●	300 SS Series / Incoloy 800	1/4"
10.0mm		9.98mm - 9.94mm	2540mm	●	●	300 SS Series	1/4"
11.0mm*		10.98mm - 10.94mm	2540mm	●	●	300 SS Series / Incoloy 800	
12.0mm*		11.98mm - 11.94mm	2540mm	●	●	300 SS Series / Incoloy 800	
12.5mm		12.48mm - 12.44mm	2540mm	●	●	300 SS Series / Incoloy 800	3/8"
13.0mm*		12.98mm - 12.94mm	2540mm	●	●	300 SS Series / Incoloy 800	
14.0mm*		13.98mm - 13.94mm	2540mm	●	●	300 SS Series / Incoloy 800	
15.0mm*		14.98mm - 14.94mm	2540mm	●	●	321 SS / Incoloy 800	
16.0mm		15.98mm - 15.94mm	2540mm	●	●	321 SS / Incoloy 800	1/2"
17.5mm*		17.48mm - 17.44mm	2540mm	●	●	321 SS	
18.0mm*		17.98mm - 17.94mm	2540mm	●	●	321 SS	
19.0mm*		18.98mm - 18.94mm	2540mm	●	●	321 SS	3/4"
20.0mm		19.98mm - 19.94mm	2540mm	●	●	321 SS	3/4"
22.0mm*		21.98mm - 21.94mm	2540mm	●	●	321 SS	

*Non-standard metric diameters with special construction

** Teflon Plug & Leads Only, Thermocouples Unavailable

		Temp. Rating		Movement	Moisture
Potting Options	Ceramic	1000 °F	538 °C	Good	Not Recommended
	Silicone - Standard	500 °F	260 °C	Excellent	Excellent
	Silicone - High Temp.	650 °F	343 °C	Excellent	Excellent
	Epoxy	600 °F	315 °C	Very Good	Very Good
	Teflon® Plug	450 °F	232 °C	Very Good	Not Recommended
Lead Options	Fiberglass (Standard)	482 °F	250 °C	Good	Not Recommended
	Teflon®	500 °F	260 °C	Excellent	Excellent
	Silicone	356 °F	180 °C	Excellent	Excellent
	Silicone Cable	356 °F	180 °C	Excellent	Excellent
	High Temp. Fiberglass	932 °F	500 °C	Not Recommended	Not Recommended

Nexthermal Heater Applications

Top Seal

Nexthermal engineers have worked with OEMs in the top seal market to determine the proper placement of the heater and sensor combination to optimize performance and efficiency. You can depend on Nexthermal to deliver heaters that match your application needs. The flexibility of these dimensional coil heater paths opens up the opportunity for packaging innovation.

Form, Fill and Seal

Packaging machine cycle times are greatly impacted by the heater's profile across the working surface of the jaw. Nexthermal's cartridge and coil heaters are utilized in packaging machines ranging from food and beverage to personal hygiene products. We work closely with form, fill and seal OEMs, film manufacturers and end users to develop standard and jaw-specific wattage distribution algorithms to optimize sealing performance.

Hot Runner Systems

Nexthermal has extensive thermal profiling experience in the injection molding industry. Our coil heaters off the best-in-class performance when specifically engineered for injection molding nozzles. And our Nextflex flexible tubular heaters provide optimal heat transfer with fast, easy installation in manifolds.

Plastic Extrusion

Removal of heaters from aluminum or brass bores – which are commonly used in extrusion, screen changers, lip dies, sheet extrusion, and profiled extrusion – is often a difficult process. Our proven anti-seize cartridge heaters are engineered for easy removal, making them an excellent choice for use in challenging plastic extrusion applications.

Thermoformed Packaging

From simple packaging created with thin foil films to more complex, multi-featured designs utilizing thick plastic sheets, a regulated uniform thickness greatly depends on using the right heater with the correct thermal profile. Offering Elstein Ceramic Infrared Radiant Heaters combined with Nexthermal's engineered heating expertise, we ensure your thermoforming process operates at maximum capacity and product integrity.

Diecast

Nexthermal has high watt density cartridge heaters that can be used for hermetically sealed nozzle assemblies and maxi coil heaters with clamping straps and end rings that can be used for zinc and magnesium die casting. Nexthermal manufactures heaters that are specifically designed for the aggressive production environment of die casting.