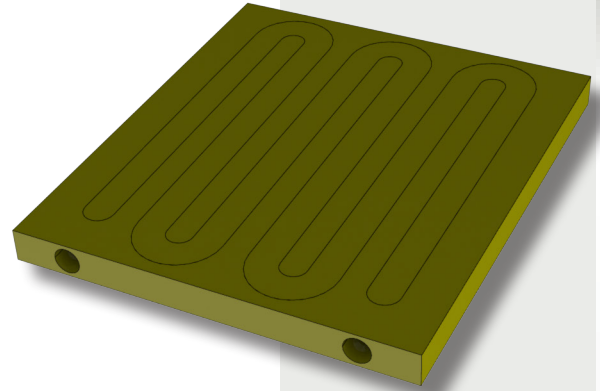


FRICION STIR WELDED COLD PLATES DATA SHEET

Wakefield Thermal produces an extensive array of standard and custom Friction Stir Welding (FSW) Liquid Cold Plates. Friction Stir Welding, a solid-state welding method, seamlessly joins two metal pieces without melting them. Leveraging Wakefield Thermal's in-house Friction Stir Welding capabilities, its products surpass traditional techniques in Cold Plate manufacturing.

FEATURES & BENEFITS

- Solid-State Welding
- High Strength Joints
- Fatigue Resistance
- Compatibility with Dissimilar Metals
- Narrow Heat-Affected Zone
- Versatility
- Dimensional Stability
- Cost Efficiency
- Environmental Friendliness



Throughout the production process, the Friction Stir Welding equipment crafts joints with exceptional strength and fatigue resistance, even when amalgamating dissimilar metals. Furthermore, FSW yields a narrower heat-affected zone compared to traditional welding methods, curtailing distortion and enhancing dimensional reliability.

Wakefield Part Number	Description	Dimensions - Overall	Thermal Resistance @ GPM	Material
131565	Friction Stir Welded Cold Plate 2 Pass- 3.25"	3.25" L x 2.25" W x .6" H (82.55mm x 57.15mm x 15.24mm)	0.0479 @ 1 GPM	Aluminum
131566	Friction Stir Welded Cold Plate 4 Pass- 8"	8.00" L x 5.00" W x .6" H (203.2mm x 127.0mm x 15.24mm)	0.0154 @1 GPM	Aluminum
131567	Friction Stir Welded Cold Plate 4 Pass- 14"	14.00" L x 5.00" W x .6" H (355.6mm x 127.0mm x 15.24mm)	0.0106 @1 GPM	Aluminum
131568	Friction Stir Welded Cold Plate 6 Pass- 8"	8.00" L x 7.00" W x .6" H (203.2mm x 177.8mm x 15.24mm)	0.0121 @1 GPM	Aluminum
131569	Friction Stir Welded Cold Plate 6 Pass- 14"	14.00" L x 7.00" W x .6" H (355.6mm x 177.8mm x 15.24mm)	0.0087 @1 GPM	Aluminum
131570	Friction Stir Welded Cold Plate 6 Pass-26"	26.00" L x 7.00" W x .6" H (660.4mm x 177.8mm x 15.24mm)	0.0063 @ 1 GPM	Aluminum

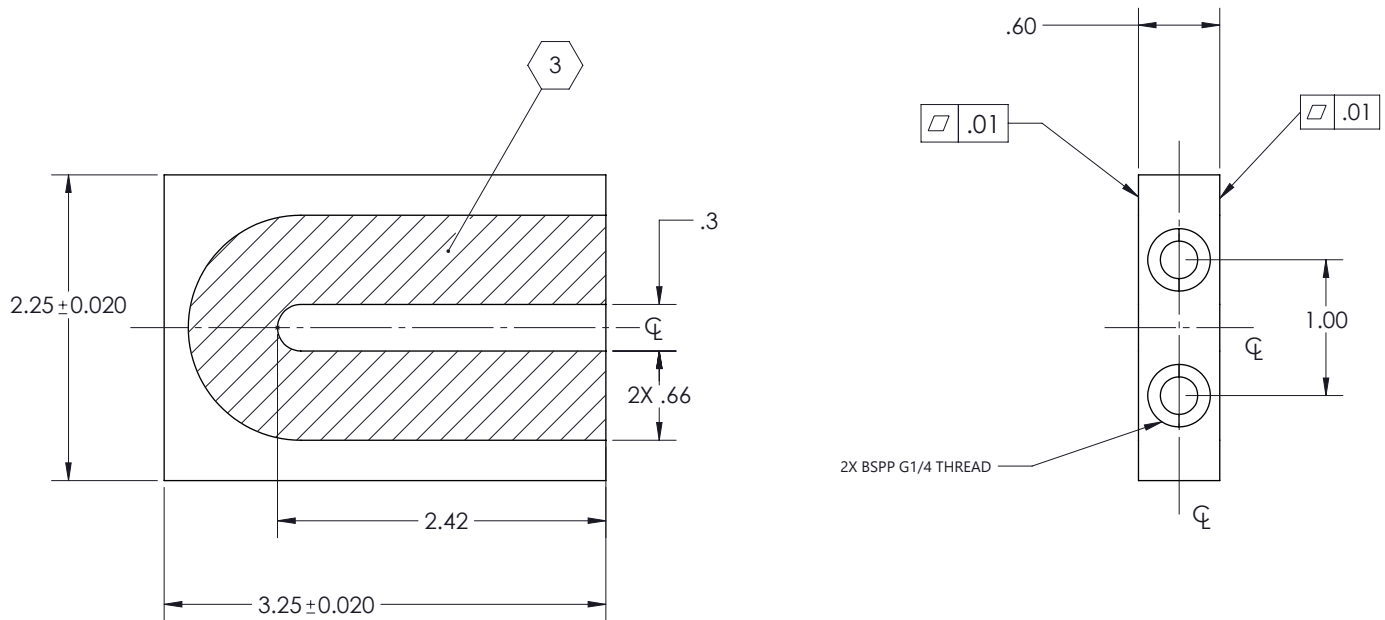
131565

For Custom
Friction Welded
Cold Plates,

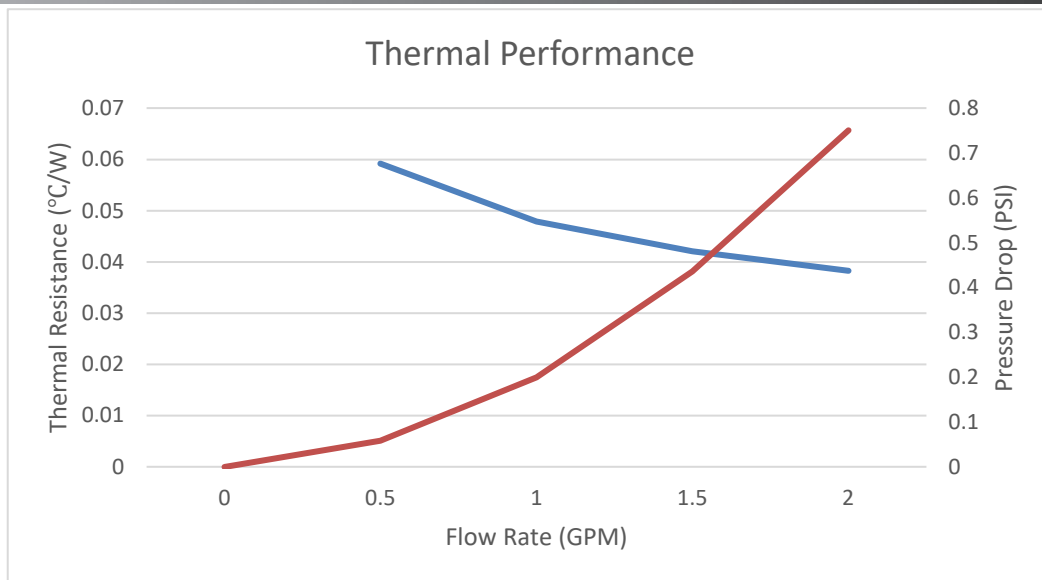
**CONTACT
WAKEFIELD**

NOTES

1. MATERIAL: AL6061-T6
2. FINISH: WASH.
3. KEEPOUT AREA IDENTIFIED WITH CROSS HATCHING FOR TOP AND BOTTOM. DO NOT MACHINE IN THIS AREA.



THERMAL CURVES



Thermal performance is measured as max plate temp - inlet fluid temp / heat dissipation

2

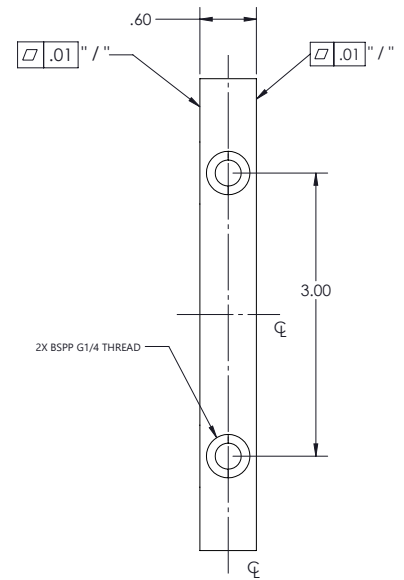
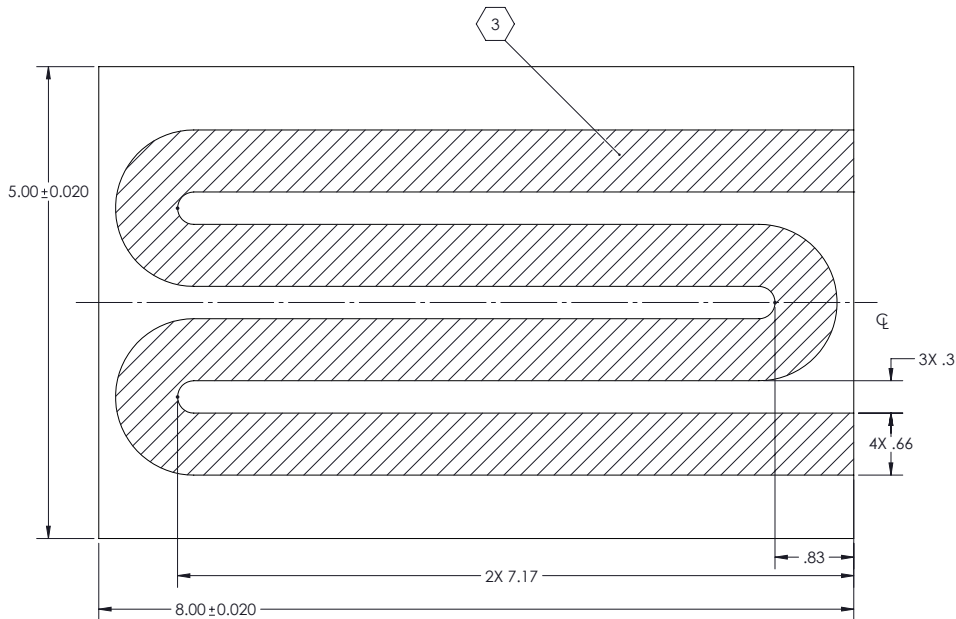
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For Custom
Friction Welded
Cold Plates,

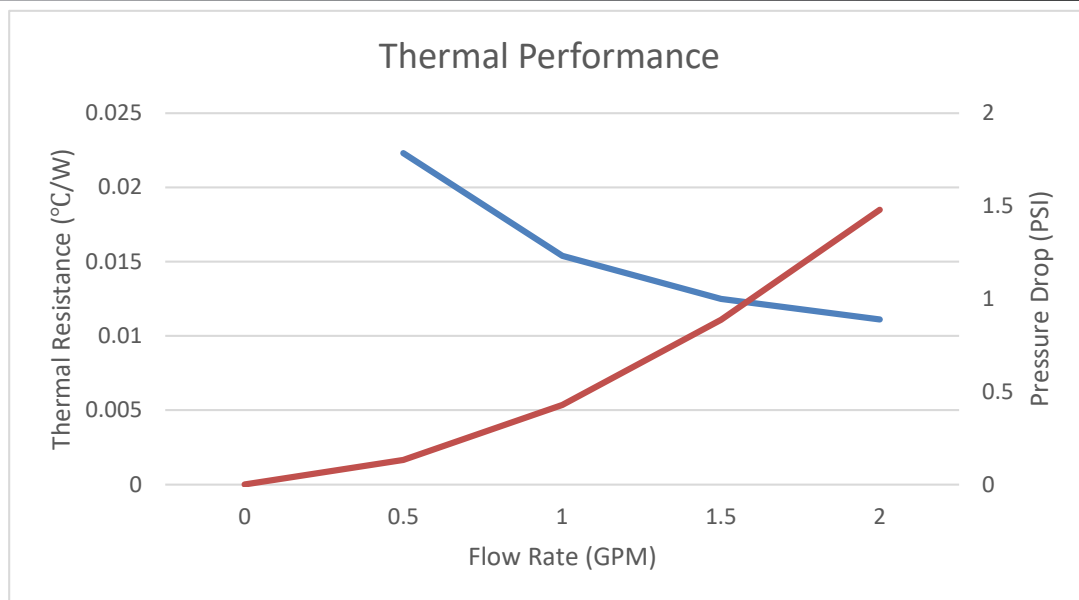
**CONTACT
WAKEFIELD**

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THERMAL CURVES



Thermal performance is measured as max plate temp - inlet fluid temp / heat dissipation

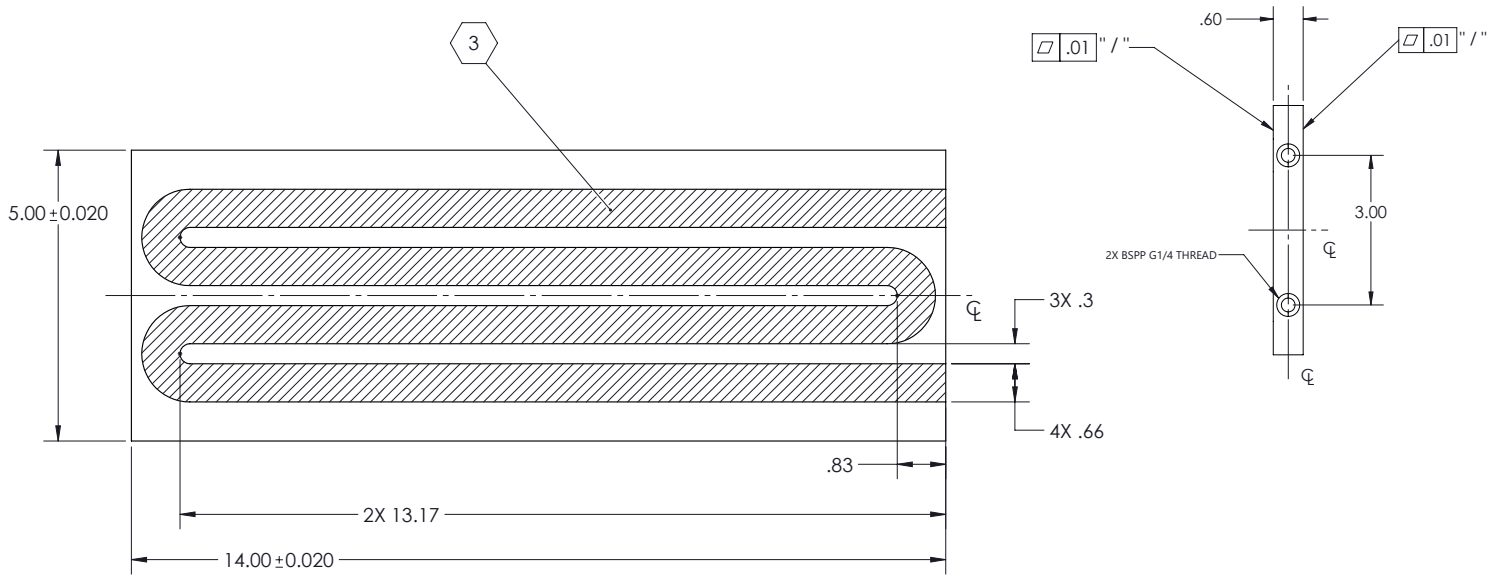
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131567

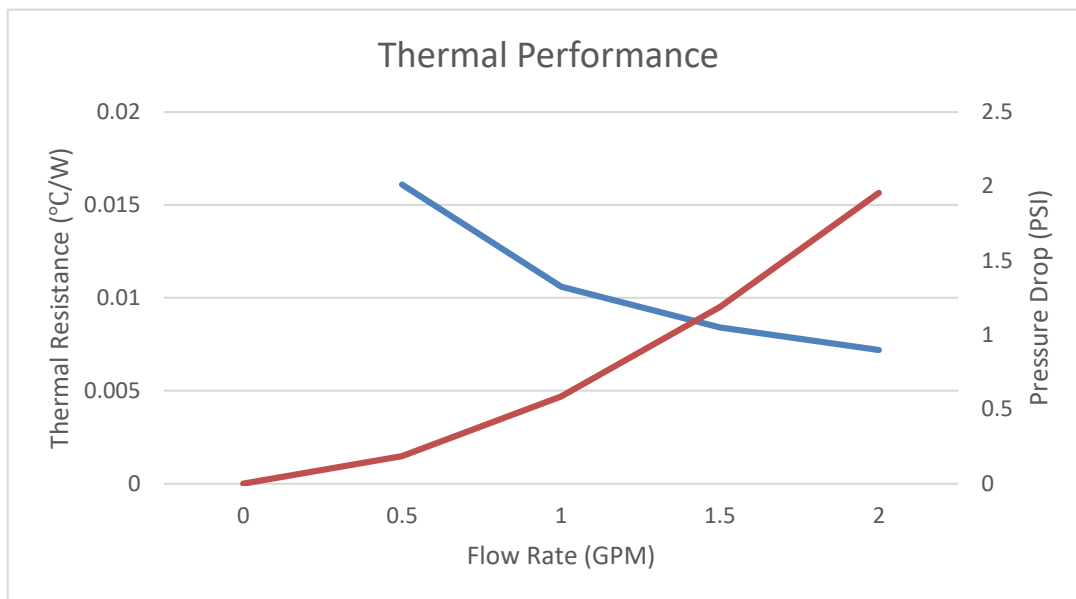
For Custom
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Cold Plates,
**CONTACT
WAKEFIELD**

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THERMAL CURVES



Thermal performance is measured as max plate temp - inlet fluid temp / heat dissipation

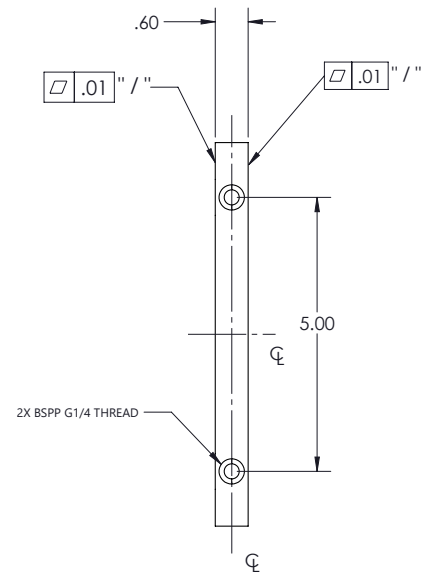
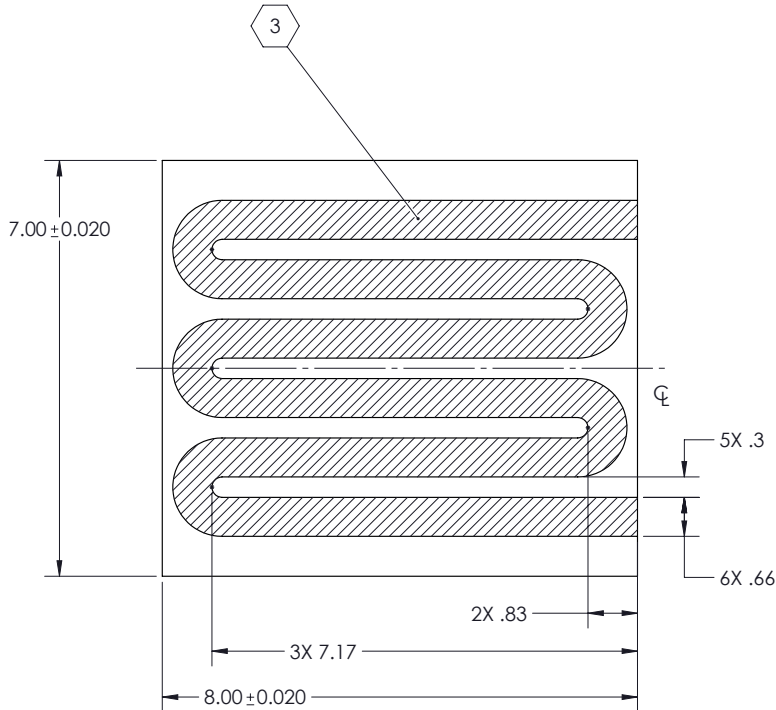
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For Custom
Friction Welded
Cold Plates,

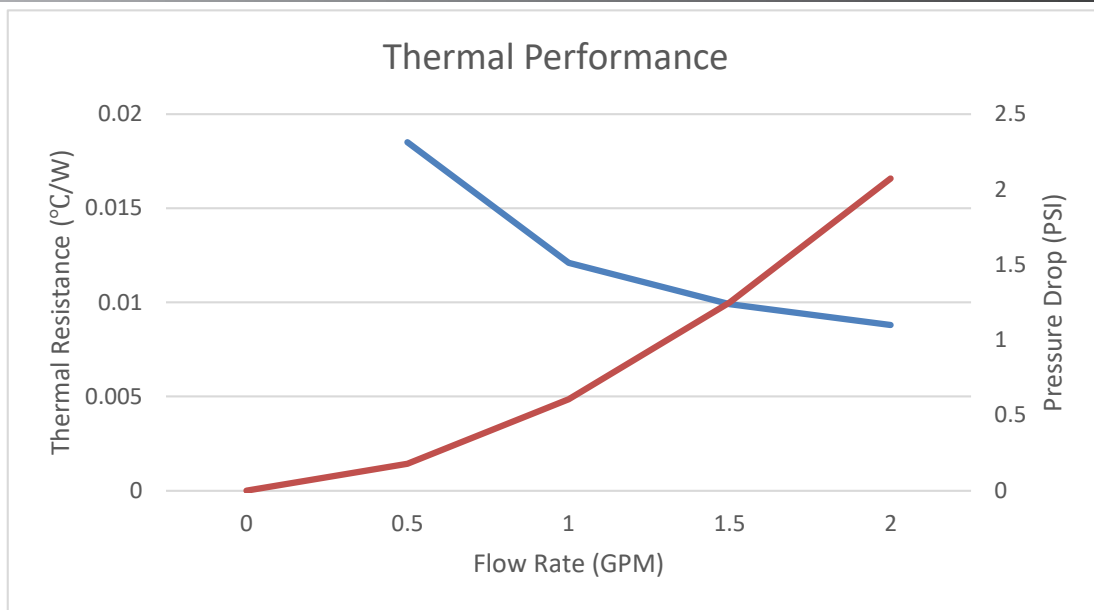
**CONTACT
WAKEFIELD**

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THERMAL CURVES

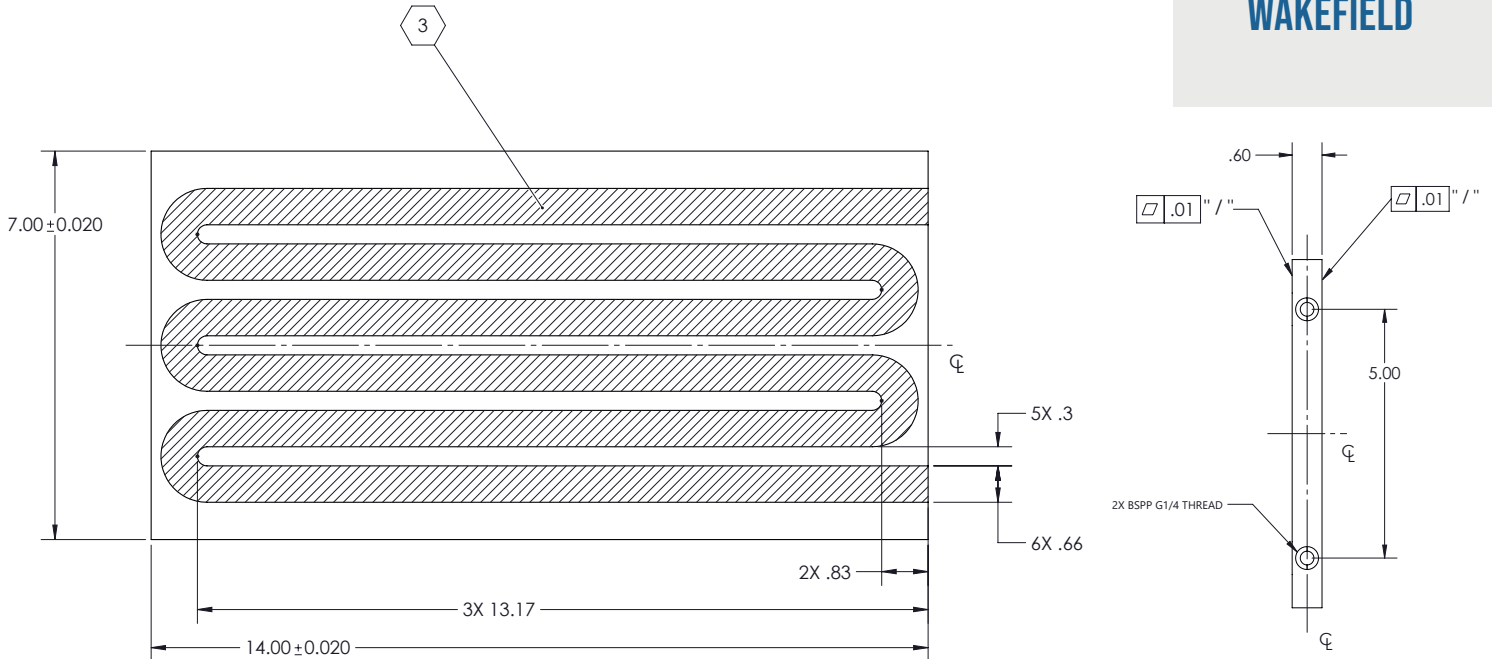


Thermal performance is measured as max plate temp - inlet fluid temp / heat dissipation

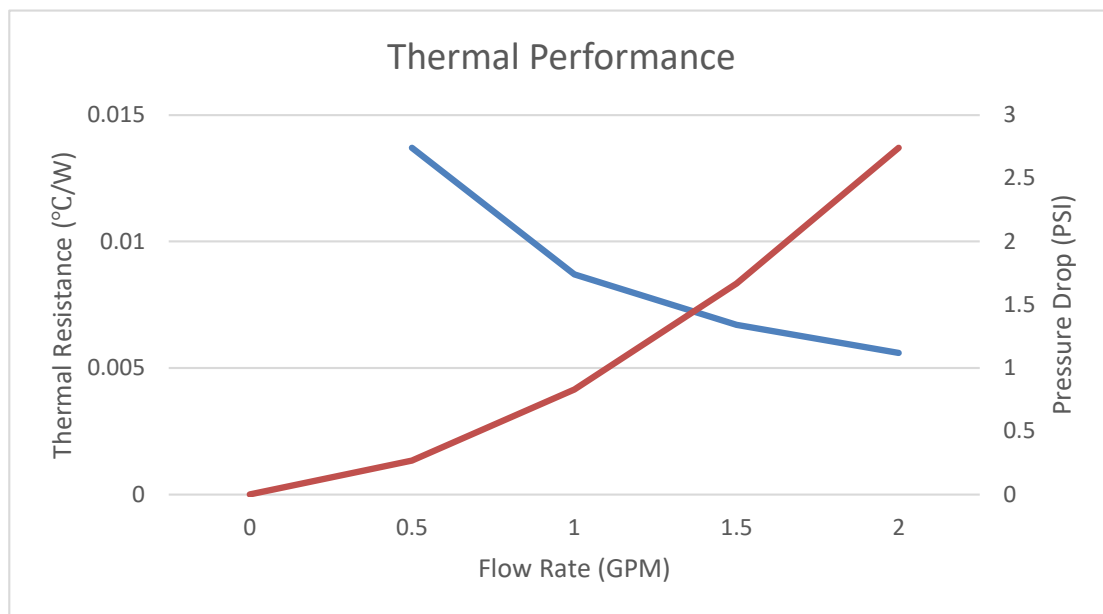
131569

NOTES

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THERMAL CURVES



Thermal performance is measured as max plate temp - inlet fluid temp / heat dissipation

For Custom
Friction Welded
Cold Plates,

**CONTACT
WAKEFIELD**

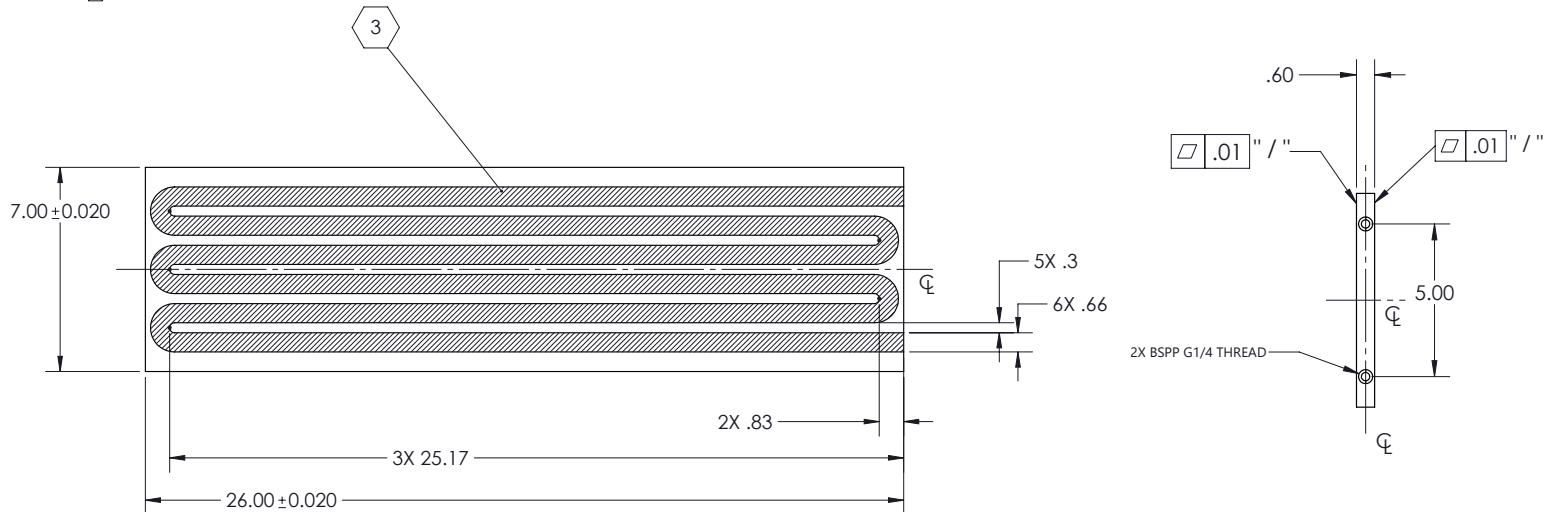
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For Custom
Friction Welded
Cold Plates,

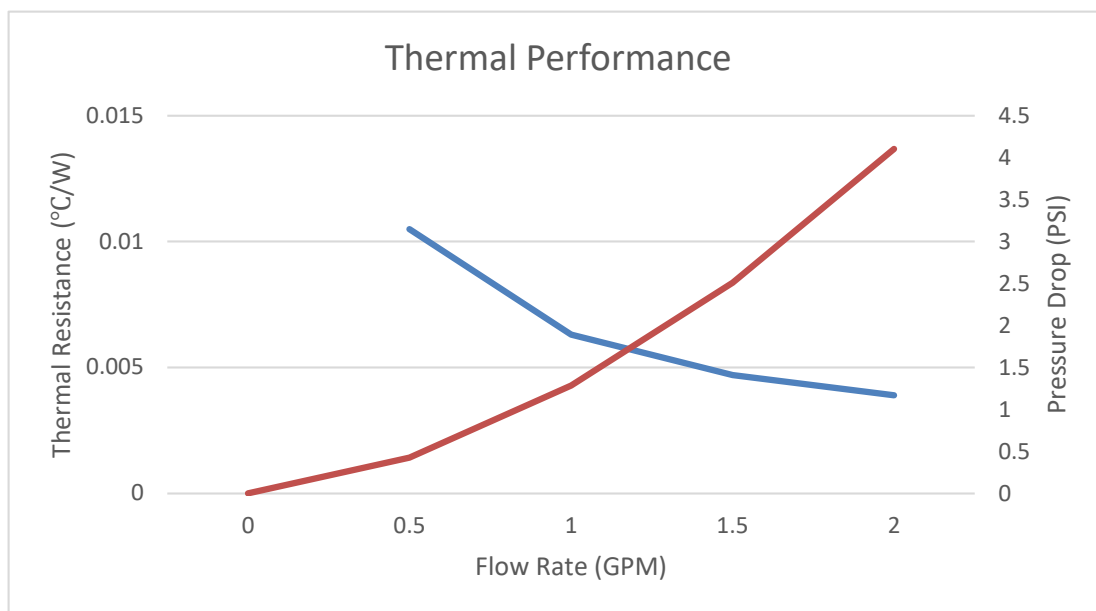
**CONTACT
WAKEFIELD**

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THERMAL CURVES



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COOLVATION

Innovative Thermal Solutions

COOLED BY WAKEFIELD THERMAL

5 STEP THERMAL ENGINEERING GUIDE From Concept To Cooling

COOLVATION provides thermal management engineering services to improve products' thermal performance while applying cost effective solutions to eliminate unnecessary manufacturing costs. COOLVATION is a seamless resource extension for our customers' thermal & mechanical engineering teams from ideation to lab testing.



Customer Thermal Challenge

- Physical limitations
- Power constraints
- Air flow/ fluid conditions
- Environmental conditions
- Component specifications
- Define ideal state



Execution

- Concept analysis (CFD-ansys/ ice pack, fin optimizations software)
- Solid model
- Analysis & verification
- Cost analysis



Global Manufacturing

- Global manufacturing facilities
- Global warehousing
- Global labs to support future program

01
STEP

02
STEP



Collaboration

- Review conditions
- Statement of work to customer
- Historical consideration along with cutting edge technologies to provide cost effective solution



Solution & Verification

- Dedicated new product development center
- Prototype
- Physical thermal lab testing
- Proven manufacturability

03
STEP

04
STEP

05
STEP