

Infrared Thermography Survey

For

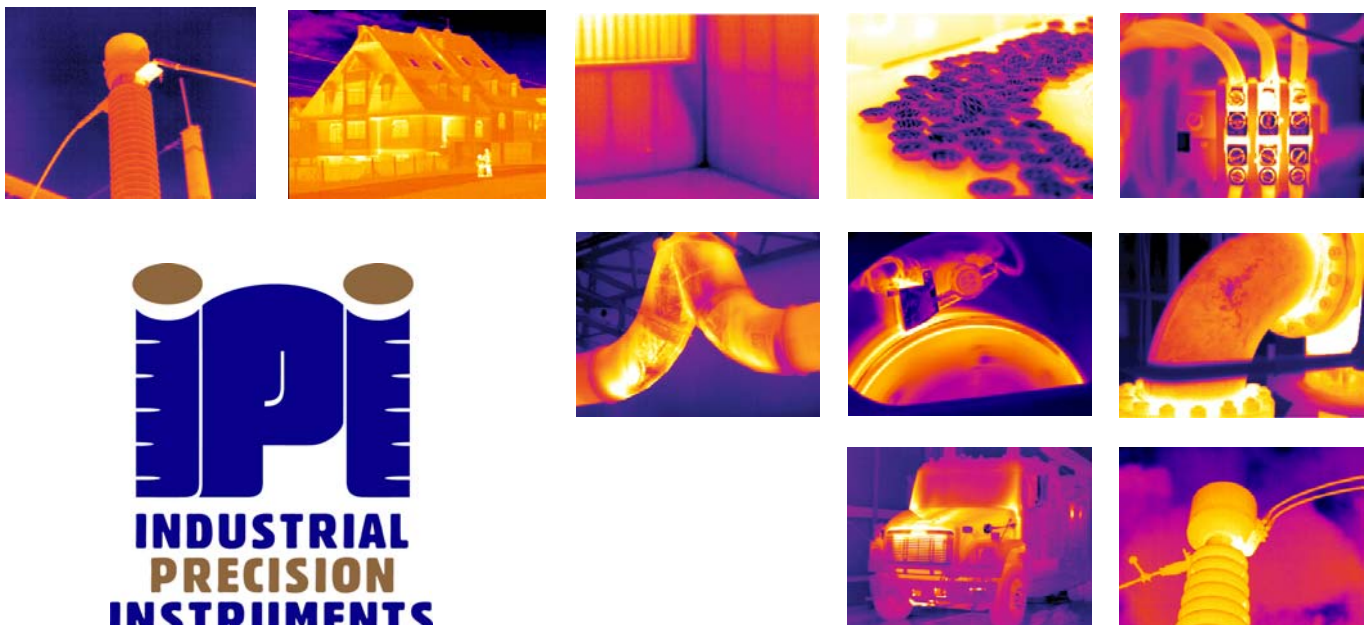
DEMO REPORT

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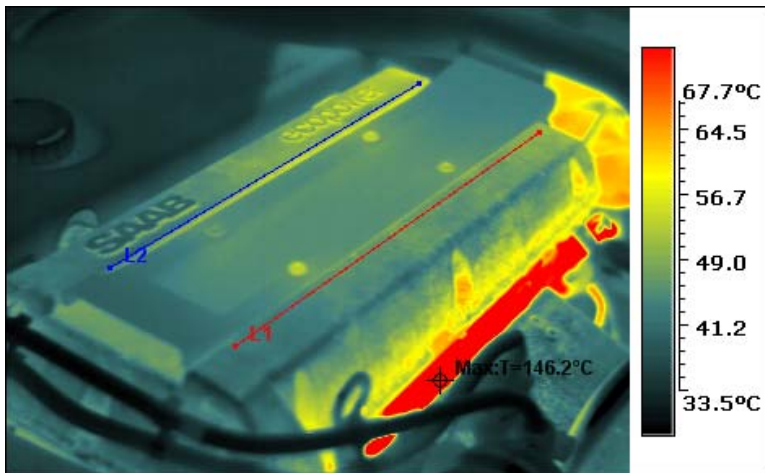


Monday, December 21, 2009



Summary of Images

Picture	Location	Equipment	Priority
1	Loading Bay Driveway	Saab Engine	Example
2	Nerds Office	Graphics Card in Desktop PC	Example
3	Kitchen	Delonghi Benchtop Oven	Example
4	Kitchen	Sunbeam Stainless Steel Kettle	Example
5	Kitchen	Coffee cup with hot water	Example
6	Kitchen	IPI Mug with hot water	Example

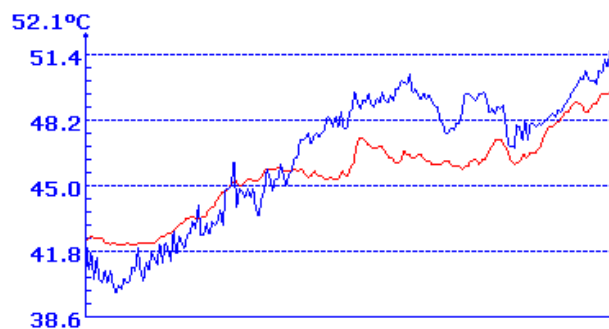


Information:

FileName	IR000394.JPG		
CreateTime	05/11/2009 4:47:17 PM		
Emissivity	0.99	Distance	3.0m
Max Temp	146.2°C	Min Temp	19.3°C
Lens	Standard	Filter	None
Background Temp	24.9°C		
Location:	Loading Bay Driveway		
Equipment:	SAAB engine		

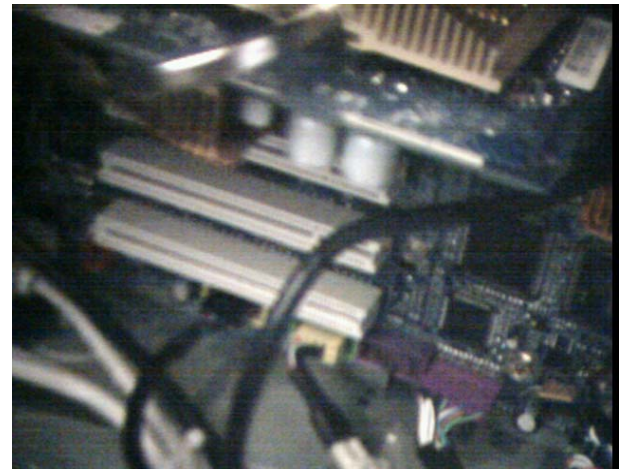
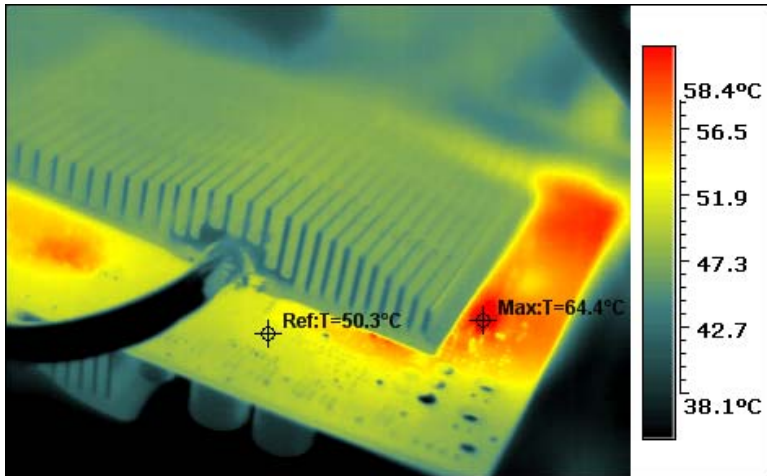
Analyses Table:

Object Parameter	Value
Max	146.2°C
Min	19.3°C
L1:AvgTemp	46.5°C
L1:MaxTemp	49.3°C
L1:MinTemp	42.1°C
L2:AvgTemp	47.3°C
L2:MaxTemp	51.0°C
L2:MinTemp	39.7°C



Comments:

In this image of the SAAB engine we have used an example of line analysis to illustrate how powerful this technique is as a method of comparison. Being able to compare similar regions graphically is extraordinarily useful. Note the difference in emittance between the polished aluminium badge and the cast aluminium finish on the engine cover, enabling us to see the distinctive lettering and symbols. Thermal imaging is regularly used in the automotive industry for R&D, and quality assurance testing of components.



Information:

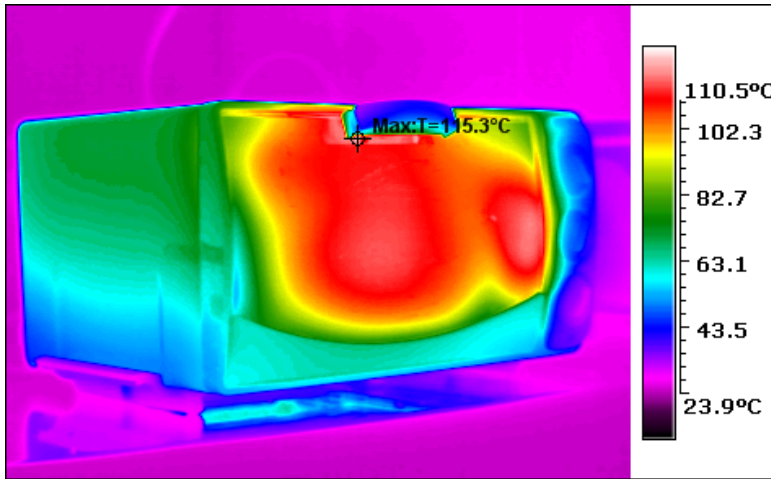
FileName	IR000398.JPG		
CreateTime	06/11/2009 2:56:14 PM		
Emissivity	0.99	Distance	3.0m
Max Temp	64.4°C	Min Temp	27.4°C
Lens	Standard	Filter	None
Background Temp	22.3°C		
Location:	Nerds Office		
Equipment:	Graphics Card in desktop PC		

Analyses Table:

Object Parameter	Value
Min	27.4°C
Max	64.4°C
Ref	50.3°C

Comments:

Thermography is regularly used to identify performance issues on printed circuit boards (PCBs). Measuring tens of thousands of points in a single image, a thermal imager is able to identify very small components and/or areas that may not be conforming to the optimal design and operation of the device.



Information:

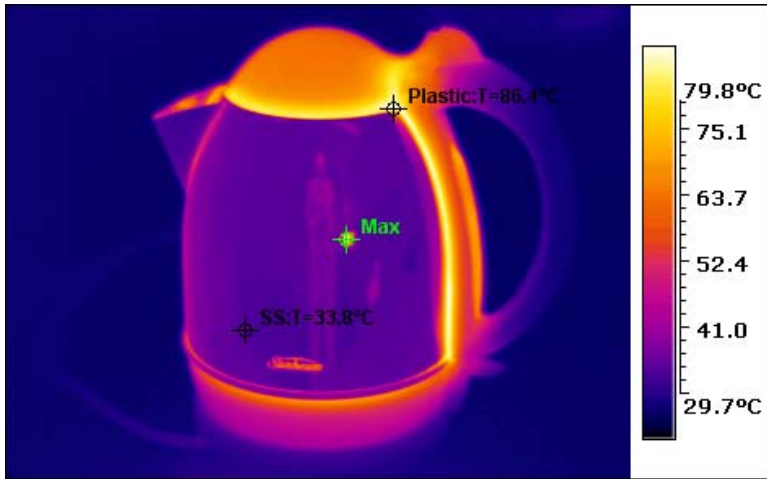
FileName	IR000384.JPG		
CreateTime	05/11/2009 2:39:53 PM		
Emissivity	0.99	Distance	3.0m
Max Temp	115.3°C	Min Temp	23.3°C
Lens	Standard	Filter	None
Background Temp	23.2°C		
Location:	Kitchen		
Equipment:	Delonghi Oven		

Analyses Table:

Object Parameter	Value
Max	115.3°C
Min	23.3°C

Comments:

Thermography is an excellent tool for R&D and product design applications. In this image we are able to analyse the thermal efficiency of this oven. With thermal imaging you can see the uniformity of heating in both internal and external components of the oven. It can also highlight some dangerously hot surfaces that could pose potential hazards to users.



Information:

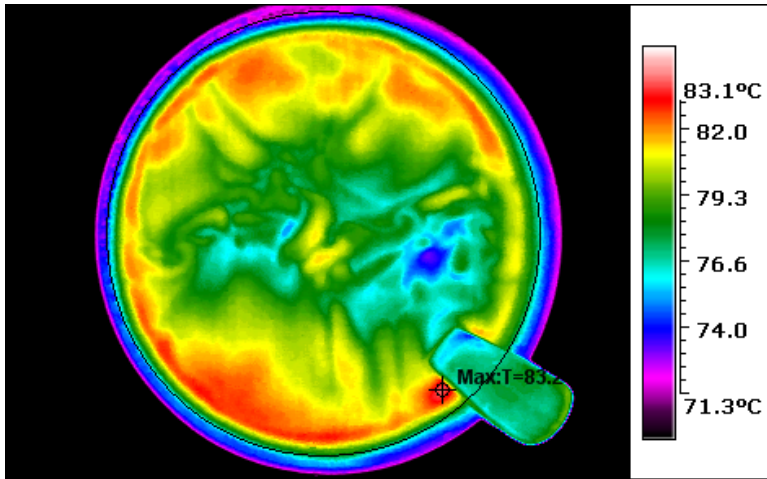
FileName	IR000387.JPG		
CreateTime	05/11/2009 2:41:52 PM		
Emissivity	0.99	Distance	3.0m
Max Temp	91.3°C	Min Temp	22.9°C
Lens	Standard	Filter	None
Background Temp	23.4°C		
Location:	Kitchen		
Equipment:	Sunbeam Stainless Steel Kettle		

Analyses Table:

Object Parameter	Value
Max	91.3°C
Min	22.9°C
SS	33.8°C
Plastic	86.4°C

Comments:

The image of this stainless steel kettle is a perfect example of the difficulties faced when imaging low emissivity targets. Surfaces such as these provide the thermographer with very little (if any) qualitative information. Low emissivity surfaces provide an enormous challenge for thermographers in the field. Also note it's highly reflective properties. In the center of the kettle's surface you can see the reflection of the thermographer and another hot object in the background environment.



Information:

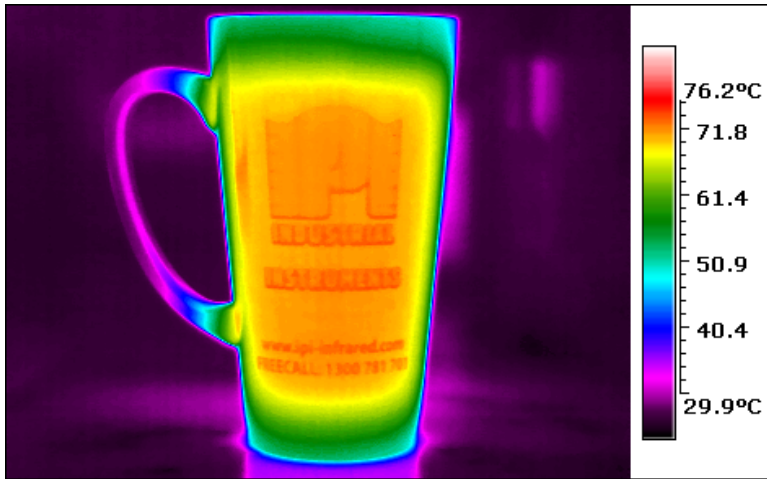
FileName	IR000388.JPG		
CreateTime	05/11/2009 2:56:49 PM		
Emissivity	0.99	Distance	3.0m
Max Temp	83.2°C	Min Temp	26.8°C
Lens	Standard	Filter	None
Background Temp	23.7°C		
Location:	Kitchen		
Equipment:	Coffee Cup with hot water		

Analyses Table:

Object Parameter	Value
Max	83.2°C
Min	26.8°C
C1:AvgTemp	80.2°C
C1:MaxTemp	83.2°C
C1:MinTemp	70.4°C

Comments:

In this image we are using a high contrast rainbow palette to clearly distinguish the convection currents in the hot water. This illustrates the exceptional sensitivity of modern thermal imagers and it is this sensitivity that makes the cameras so incredibly useful in many applications, such as building diagnostics, medical/veterinary, product development, and many scientific applications where we are wanting to observe very small temperature differentials.



Information:

FileName	IR000393.JPG		
CreateTime	05/11/2009 3:11:45 PM		
Emissivity	0.99	Distance	3.0m
Max Temp	72.1°C	Min Temp	21.6°C
Lens	Standard	Filter	None
Background Temp	24.0°C		
Location:	Kitchen		
Equipment:	IPI Mug with hot water		

Analyses Table:

Object Parameter	Value
Min	21.6°C

Comments:

Using a Rainbow colour palette we are able to easily contrast the painted label on the cup surface due to an apparent emissivity difference between the label and the background material. This target provides a good comparison to test imager performance, showing up the qualities of resolution and sensitivity in the instrument being used. Be sure to compare this image against other models of cameras. Note: For very "closeup" work, often the offset (paralx error) of the visual image to the thermal image is significant. For many cameras, the visual will only be useful at a predefined minimum distance that is different from the thermal image. You may need to use a separate digital camera.