

3D Infra-Red Heat Flux Mapping

At the centre of the *Ceramicx Centre for Infrared Innovation (C²I²)*, lies a unique research tool, “The Herschel”. The Herschel is an IR energy mapping instrument, and comprises an ABB robot, a state of the art Infra Red sensing element, and a sophisticated computer processed graphics suite. The instrument was named after Sir Fredrick William Herschel, the discoverer of Infrared Radiation. The Herschel can be used to evaluate and verify heat work solutions in industry including automotive, plastics, composites and aviation and is also indispensable in research and development.

What it does

The Herschel is indispensable for testing and evaluation of new processes to accurately quantify time, energy and temperature.

Herschel, our new Ceramicx 3D IR Mapping tool will enable:

- *A greater understanding and measurement of how IR heating elements of all kinds actually work and perform*

by mapping a previously invisible spectrum of IR radiant heat

- *A greater understanding, measurement and predictability of how IR heat radiation affects target bodies*

Ceramicx are already using Herschel:

- in the design and performance of infrared heating components
- in the design and build of thermoforming and blow moulding machines and other machinery involving IR heating
- in assessing the infrared response of polymers and other materials

The new 3 IR Mapping tool is now able to map the combination of these factors – and their effects on target materials – for processes such as thermoforming, polymer preheating, and also for any novel composites process such as intermediate shaping or curing. In addition, the Herschel

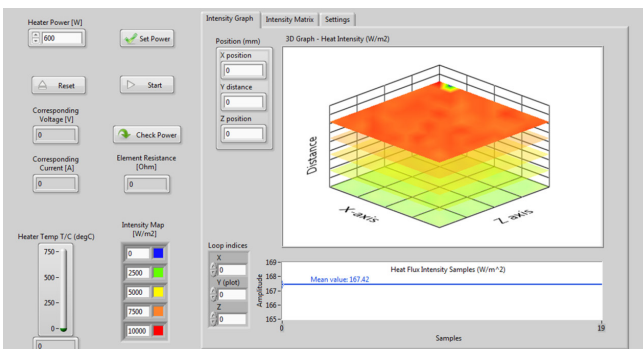
can be used to evaluate heater output for curing coatings or other finishing applications.

Benefits to your process

Heater performance can be precisely quantified in the development stage saving time and money. Not only does the Herschel system build upon past experience, it will also generate new original IR heat research which will enable increased production control, accuracy and cost savings in industry through much more effective IR heatwork. The Herschel finds application in materials and process optimisation, especially where thermal and energy considerations are involved.

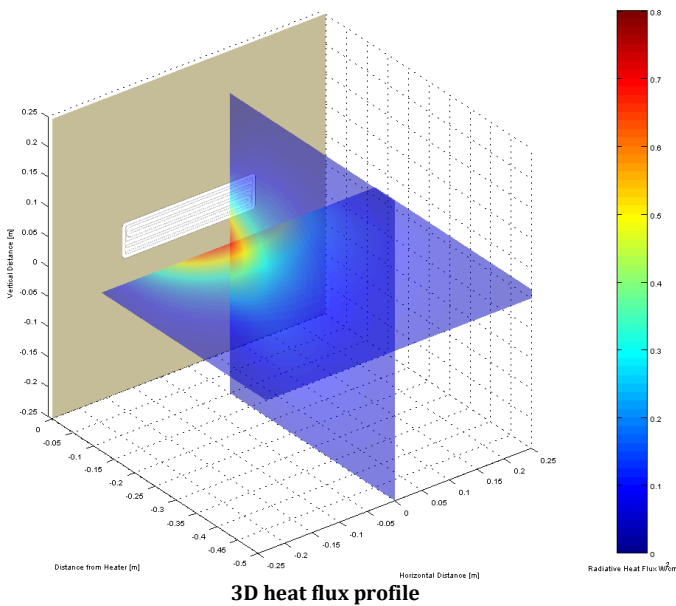
How it works

The automated system robotically guides an infra-red sensor around a pre-determined coordinate grid system in front of any heater element under test.



Full computerised control of the measuring environment

The incident radiant heat flux is saved and then post processed to give a 3D representation of the infra-red heat flux emission of the heating element under test. The resulting 3D graph allows evaluation of the of the heater element tested.



3D heat flux profile

This radiant heat flux “footprint” is a highly useful tool in understanding the current performance of heating elements, and information from these tests can be used in designing to specific requirements such as achieving an

even heat flux at a certain distance from the heater surface, or on the other hand, in designing for a focused “hot spot”.

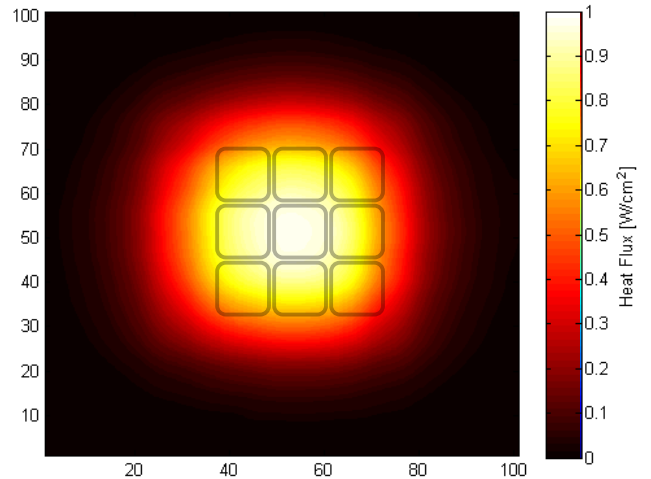


Figure 1: Heat flux from a 3 x 3 array with surrounding reflector.

Ceramicx Research

Ceramicx have recently set up a research and development department called the Ceramicx Centre for Infrared Innovation – C²I². It is staffed by Dr. Cathal Wilson and Dr. Gerard McGranaghan. The main functions of the centre are to

- conduct IR heat mapping and testing for all forms of IR heaters.
- assist in IR heater product design and development.
- offer IR heat mapping and testing on all forms of target bodies, materials & applications.
- Publish this research, where possible with partner universities and research institutes

The most advanced resource in this research centre is the “Herschel”

Ceramicx have had previous university partnerships including with the University of Limerick, the University of Duisburg Essen, Cork Institute of Technology and Trinity College Dublin. Ceramicx continues to maintain strong ties with these universities not only for research and development but also in production improvement projects. In addition, University College Cambridge and Ceramicx are currently participating in strategic workshops regarding business development.

Ceramicx have an excellent history of previous collaborative project experience including FP6 ILIPT and ECODISM. Ceramicx were also founding members of the ICMR and I2E2 Technology Centres both based in Ireland. Ceramicx holds patents in several domestic products developed in conjunction with Applica, a leading consumer goods manufacturer. Ceramicx have previous experience with blue chip clients including Aston Martin, Rolls Royce, Rolls Royce, and GE. Ceramicx also has partners in the USA, Germany, China and the UK.

About Ceramicx

Ceramicx Ireland Ltd is an SME based in the south-west of Ireland which manufactures industrial infrared heating equipment. The company was set up in 1992 by Frank and Grainne Wilson, who are now joined by their son Cathal as

directors. Almost all of the goods produced are exported worldwide. The company has invested heavily in R&D, automation and new equipment as well as establishing a magazine 'HeatWorks' and web-strategy for communications.

Ceramicx is on a trajectory of growth both in regards to its core business of element sales and its secondary focus/activity of infrared engineering applications. Ceramicx core business is the manufacture of infrared heating elements for industrial use. Ceramicx also has an applications engineering section dedicated to building secondary products around its base element family.

Ceramicx is fast-becoming a leading provider of expert technical knowledge, contributing to designing whole system solutions and creating high value added products and services. Not only are we manufacturing and supplying best-in-class heating components around the world we are also matching that with the best in project design, machinery/production line build and heat systems know-how.

Contact us to find out how Ceramicx can help you with your heating application.

C²i²



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Address Ceramicx Ireland Limited
Gortnagrough
Ballydehob
Co.Cork
Ireland
Phone +353 28 37510
Fax +353 28 37509
Email gerard.mcgranaghan@ceramicx.com
cathal.wilson@ceramicx.com