



MAVIS 6.0 for Windows

Desktop Casting Design
& Process Simulation

by

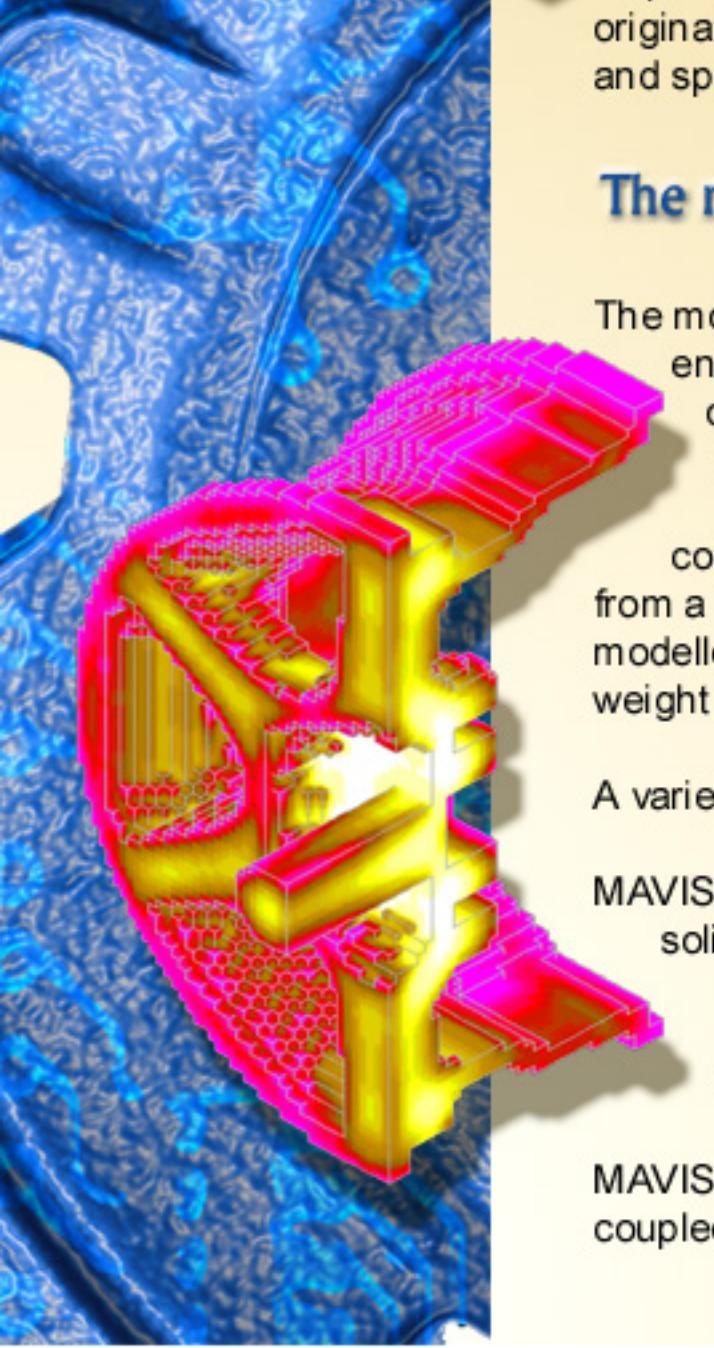
Eidawn Software Ltd

MAVIS

Windows based solidification modelling for foundrymen & casting designers



MAVIS is a powerful, 3D solidification simulation software package developed by Eidawn Software Ltd specifically for use by foundrymen and casting designers. Operating on the Windows platform, the latest MAVIS software is now available in modular form including the new mould filling simulator, MAVIS-FLOW.



The latest improvements and technical developments considerably enhance the predictive capabilities of the software whilst remaining true to the original MAVIS concept of functionality, ease-of-use and speed.

The modular philosophy

The modular approach to simulation technology enables operators to select the simulation module or modules which best suit their needs and allows simple upgrade paths in the future. Each MAVIS module is a complete integrated system containing all of the facilities you would expect from a leading software package including a solid modeller, STL file translator, graphical post-processors, weight estimator, model viewing and animation.

A variety of simulation options are available including:-

MAVIS-RAPID, the entry-level empirically based solidification simulator.

MAVIS-FDM, an advanced numerical finite difference simulator.

MAVIS-FLOW, a Navier-Stokes mould filling simulator coupled with heat transfer and solidification.

MAVIS Modular Systems - Standard Features

Solid Modelling

- Intuitive mouse driven menus
- User friendly interface
- Fast generation of castings & methods
- Standard size feeder import
- Multiple part import (multi-impression)
- High definition models (16 million cells)
- Model animation
- Model re-scaling
- Automatic model sectioning

STL Meshing

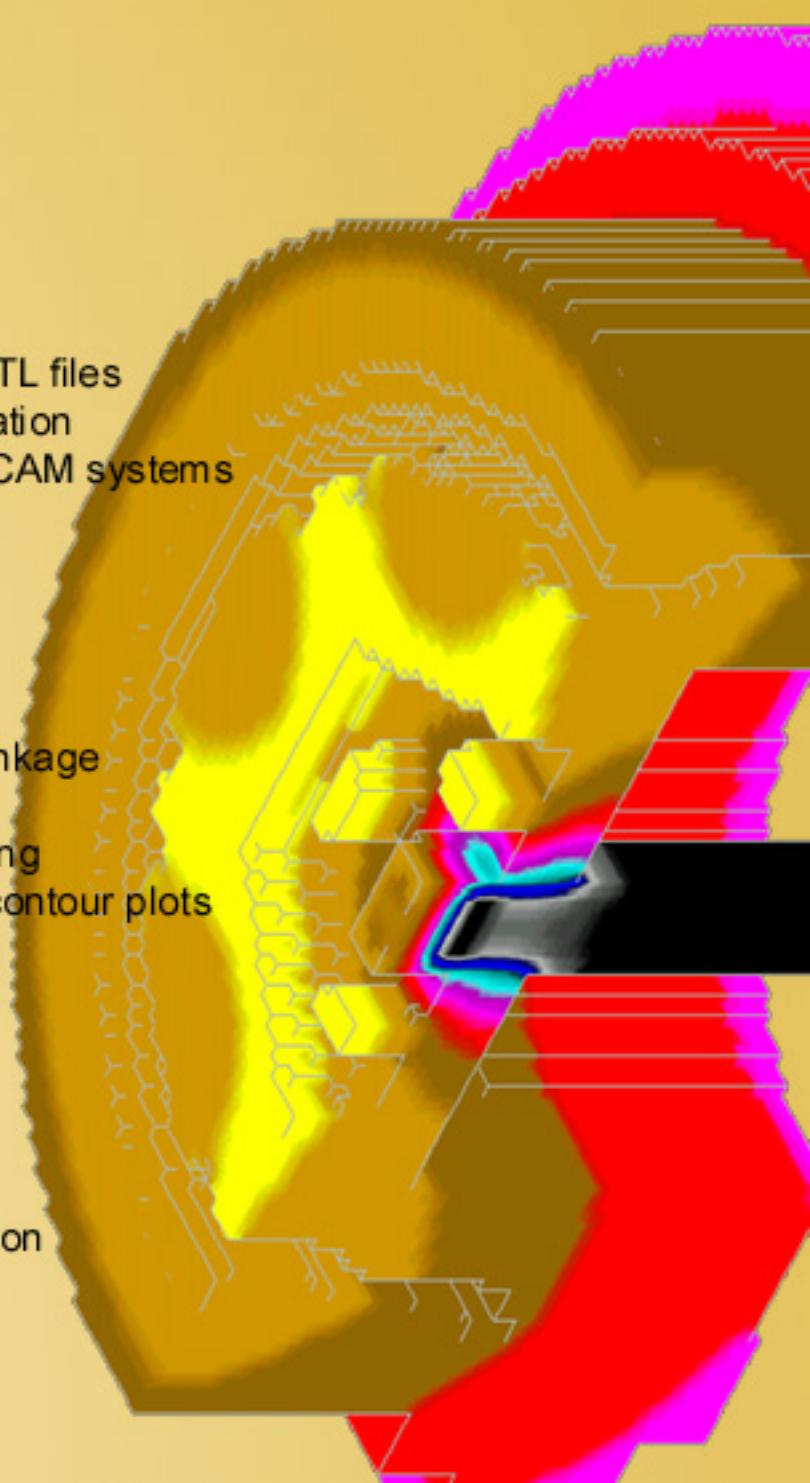
- Automatic meshing of ASCII STL files
- Rapid tooling or casting generation
- Enables integration with CAD/CAM systems

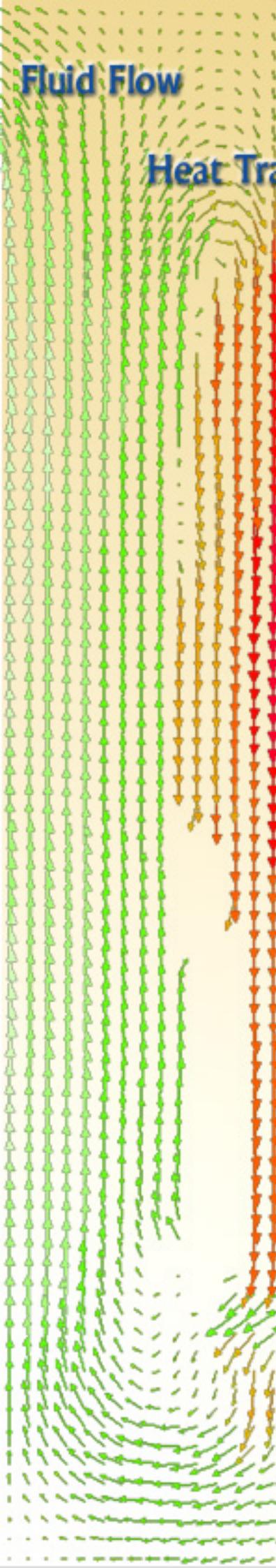
Graphical Post-processing

- Simulated x-ray format for shrinkage
- Colour coded contour plots
- Isometric and orthogonal viewing
- X-ray facility for colour coded contour plots

Weight Estimation

- Casting weight calculation
- Mould material weight calculation
- Surface area calculation





Fluid Flow

MAVIS-FLOW

Heat Transfer

Solidification

MAVIS-FLOW is the new fluid flow (mould filling) simulation package from Eidawn Software Ltd. The culmination of 10 years of research into the filling and solidification phenomena of castings, MAVIS-FLOW takes desktop analysis of casting design another step forward.

MAVIS-FLOW : the harmonisation of science and casting design

MAVIS-FLOW is a full Navier-Stokes solver with arbitrary free surfaces, coupled with heat transfer and solidification. The software can provide essential information on the filling behaviour of castings and the performance of running / gating systems. During the filling simulation the coupled heat transfer analysis enables prediction of the heating of the mould and temperature distribution in the liquid metal. Upon completion of the filling simulation, MAVIS-FLOW will predict the solidification of the casting and porosity distribution.

MAVIS-FLOW

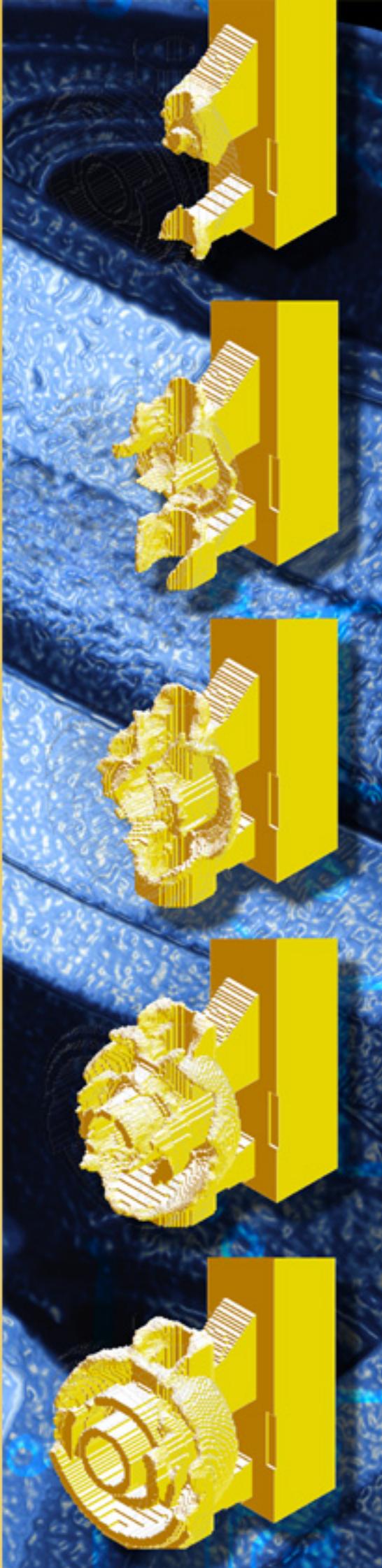
MAVIS-FLOW : prediction capabilities

time dependent output (during filling)

- fluid fronts (animation facility)
- mould temperatures
- casting temperatures
- velocity maps
- pressure maps

post filling output

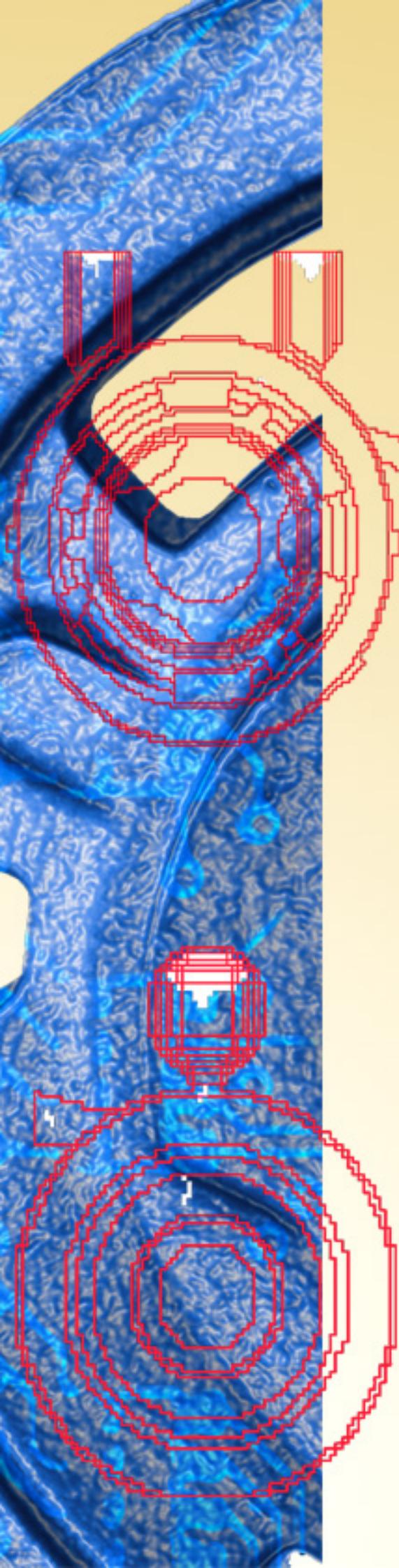
- porosity distribution
- freezing times
- niyama coefficients
- cooling rates
- temperature gradients
- local freezing times
- dendrite arm spacings
- final casting temperatures
- final mould temperatures



Fluid Flow

Heat Transfer

Solidification



MAVIS-RAPID

Entry-level solidification simulation system

- Empirically based solidification simulator
 - Very fast run-times. Typically <15 minutes
 - Rapid analysis of runner/feeder designs
 - Rapid analysis of die cooling systems
 - Dedicated high pressure diecasting simulation
 - Dedicated gravity casting simulation
 - User defined empirical simulation parameters
 - Predicts macroscopic order of freezing
 - Macro-shrinkage distributions
 - Last regions to freeze
 - Relative die face temperature distributions
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- Provides very fast qualitative data
 - Ideally suited to low volume batch production.
 - Optimise feeder size and location

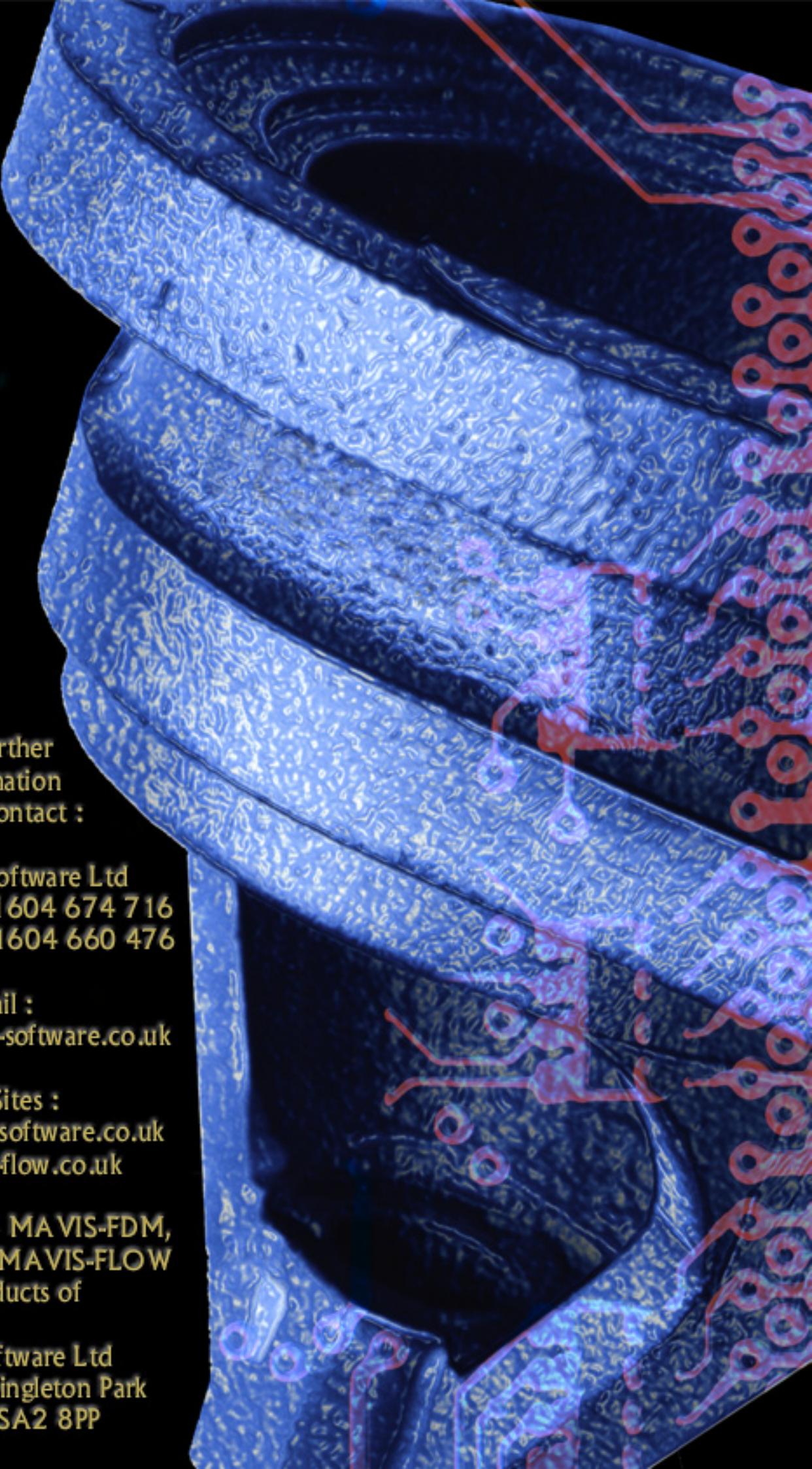
MAVIS-FDM

Advanced numerical solidification simulation system

- Numerical finite difference solidification simulator
 - Comprehensive materials properties database
 - Detailed prediction capability
 - Solidification times to critical fraction solid
 - Macro/micro shrinkage distributions
 - Casting / mould temperatures
 - Niyama Coefficients
 - Average steady state die temperature distributions
 - Simulated thermocouple plotter
-
- Provides detailed analysis of casting design.
 - Ideally suited to safety critical & high volume parts
 - Analyse mould behaviour
 - Optimise production methods

MAVIS Modular Solidification Simulation Systems - Key Features

Software Features	MAVIS-RAPID	MAVIS-FDM	MAVIS 6.0	MAVIS-FLOW
3D Solid Modeller	✓	✓	✓	✓
User Friendly G.U.I.	✓	✓	✓	✓
Multi-part Import	✓	✓	✓	✓
Sprue / Feeder Import	✓	✓	✓	✓
Shell Mould Generation	✓	✓	✓	✓
Insulator/Chill Modelling	✓	✓	✓	✓
Multi-material Models	✓	✓	✓	✓
Multi-point Viewing	✓	✓	✓	✓
Model Animation	✓	✓	✓	✓
ASCII STL Import	✓	✓	✓	✓
Assembly Meshing	✓	✓	✓	✓
Weight Estimation	✓	✓	✓	✓
Post-Processing				
Simulated X-ray Plotter	✓	✓	✓	✓
Contour Plotter	✓	✓	✓	✓
Thermocouple Plotter		✓	✓	✓
Material Properties Database		✓	✓	✓
Simulation Options				
Point Modulus	✓		✓	✓
Rapid Gravity Casting	✓		✓	✓
Rapid Pressure Diecasting	✓		✓	✓
Finite Difference (All Processes)		✓	✓	✓
Mould Filling (Fluid Flow)				✓
Simulation Output				
Macro-freezing Patterns	✓		✓	✓
Macro-shrinkage Predictions	✓	✓	✓	✓
Relative Die Face Temps.	✓		✓	✓
Steady State Die Temps.		✓	✓	✓
Mould Temperatures		✓	✓	✓
Casting Temperatures		✓	✓	✓
Solidification Times		✓	✓	✓
Micro-shrinkage Predictions		✓	✓	✓
Niyama Coefficients		✓	✓	✓
Temperature Gradients		✓	✓	✓
Cooling Rates		✓	✓	✓
Local Freezing Times		✓	✓	✓
Dendrite Arm Spacings		✓	✓	✓
Simulated Thermocouples		✓	✓	✓
Fluid Front Movement				✓
Temperatures During Filling				✓
Velocity Maps During Filling				✓
Pressure Maps During Filling				✓



For further
information
please contact :

Alphacast Software Ltd
Tel : +44 (0) 1604 674 716
Fax : +44 (0) 1604 660 476

Email :
sales@alphacast-software.co.uk

Web Sites :
www.alphacast-software.co.uk
www.mavis-flow.co.uk

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Eidawn Software Ltd
The Abbey, Singleton Park
Swansea, SA2 8PP