Analysis Support Table

		Die casting (HPDC)	Low-pressure die casting (LPDC)	Tilt casting	Centrifugal casting	Gravity casting	Continuous casting
Fluid flow analysis	Back pressure	✓	✓	✓	✓	✓	—
	Behavior of molten metal in sleeves	✓	—	—	—	—	—
	Tilting	—	—	✓	—	—	—
	Centrifugal force	—	—	—	✓	—	—
	High precision scheme	✓	✓	✓	✓	✓	—
	Surface tension	✓	✓	✓	✓	✓	—
Solidification analysis	Shrinkage prediction	✓	✓	✓	✓	✓	—
	Local pressurization	✓	—	—	—	—	—
	Inner mold gas flow	✓	✓	—	—	✓	—
Die temperature analysis		✓	✓	✓	—	—	—
Heat treatment analysis		✓	✓	✓	✓	✓	—
Thermal stress analysis		✓	✓	✓	✓	✓	—
Structural prediction analysis		✓	✓	✓	✓	✓	—
Continuous casting + ESR analysis		—	—	—	—	—	✓
Movement of objects		✓	—	✓	✓	✓	—
Temperature data mapping		✓	✓	✓	✓	✓	—
X-ray data mapping		✓	✓	✓	✓	✓	—
Leak prediction analysis		✓	✓	✓	✓	✓	—

Support

> Upgraded versions provided at no charge
> Help desk support on our dedicated website
> Technical seminars (held once/year)
> User meetings (held once/year)

Operating environment

OS	Windows10 (32/64bit)
Languages	Japanese, English, Chinese (simplified)
CPU	Intel, AMD
On-board memory	32-bit: 2GB or more; 64nbit: 8GB or more
Available disk space	1TB or more (recommended)
Graphics card	OpenGL2.0 or higher (OpenGL4.0 or higher recommended) 256MB or more video card memory

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- Windows 10 is a trademark of Microsoft Corporation (U.S.) registered in the United States and other countries.
- OpenGL is a trademark of Silicon Graphics, Inc. registered in the United States and other countries.
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- If this product is to be exported, follow the required procedures after confirming the regulations of the Foreign Exchange and Foreign Trade Act, and export-related laws and regulations in foreign countries such as U.S. export control regulations.
  If you have any questions on these matters, please contact a sales representative of our company.

• For inquiries regarding ADSTEFAN: https://info.hitachi-ics.co.jp/eng/products/adstefan/

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HITACHI
Inspire the Next

Casting Simulation System

ADSTEFAN

The name ADSTEAN has its origins in the Stefan Study Group, a collaborative initiative between industry and academia originating at Tohoku University.

"Stefan" refers to Austrian physicist known for the Stefan-Boltzmann Law, Josef Stefan(1825-1893), whose name the group borrowed in recognition of his work.

Josef Stefan's achievements in the field of thermal radiation are well known.

His research on the solidification of ice also makes him a pioneer in the field of solidification analysis.

At the same time, the name Stefan also secretly incorporates the last initials of the study group's two lead researchers, Prof. Eisuke Niyama and Prof. Koichi Anzai.

When the technology from the study group's research was transferred to Hitachi to be commercialized, the letters AD, for "advanced," were added to produce the name ADSTEFAN.

While the ADSTEFAN logo is modeled on the letter A, it also represents the character used in Japanese to write the word "person"(hito).

That's because ADSTEFAN has always been, and always will be, person-centered in its development and support.

"Giving shape to people's ideas" that's the guiding policy behind ADSTEFAN's development.

For Every Engineer, A Better Way of Casting Production

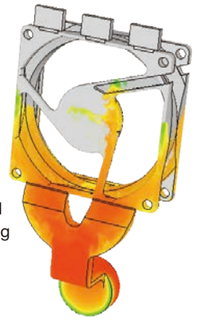
ADSTEFAN is a design support tool that can simulate the flow behavior and solidification processes of molten metal in molds.

It uses an interface specialized for casting which provides a wide range of advantages, such as decreased experimental verifications, improvements in quality achieved by prediction analysis of defect generation processes, reductions in development time, and the ability to pass down technical skills by managing expertise consisting of "intuition and experience" with digital data and converting "rules of thumb" derived from experience into a knowledge base.

Simulation software created together with users

ADSTEFAN is a product that grows and evolves every year with the continuous development and enhancement of useful features. Its development themes are spread among users through partnerships built between industry and academia, and are based on needs identified at user meetings and technical seminars, which serve as opportunities for the exchange of information between engineers who use the software.
ADSTEFAN offers many features for outstanding usability.

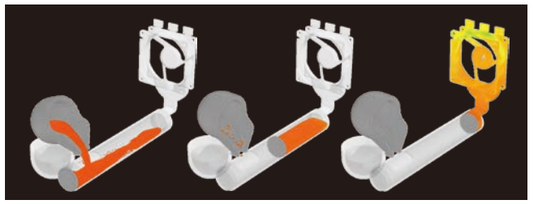
Fluid Flow Analysis



Fluid Flow Analysis visualizes the flow behavior with the change of temperature and pressure of molten metal in molds, supporting effective improvement of casting design.
Various options are provided to consider characteristics in casting processes such as shots by plungers, back pressure, tilting and centrifugal force.

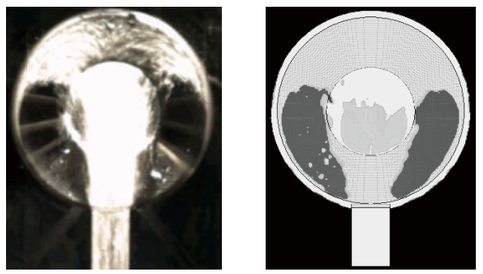
Movement of Objects

"Moving Object" function enables to consider the movement of rigid objects such as ladle pouring and plunger movement in HPDC, or stoppers in the gravity casting.



High Precision Scheme

ADSTEFAN realizes high precision flow analysis which enables high straightness of flow even in the thin-curved section in the casting, which is considered as a tough target for the orthogonal difference method, by means of unique and high precision scheme.

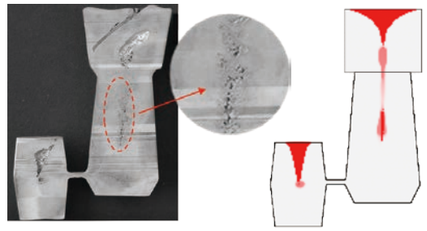


Solidification Analysis

Solidification Analysis simulates the solidification process in molds and outputs detailed information to consider better casting designs for such as wall thickness and risers.
ADSTEFAN provides special options to consider Local Pressurization, Supercooling of Cast Iron and so on.

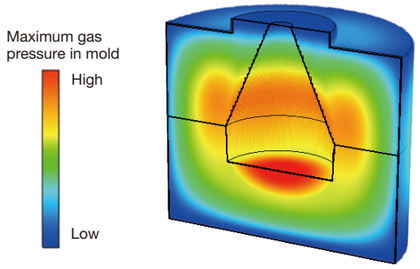
Shrinkage Prediction

Outputs the shapes and size of shrinkage defects quantitatively, considering the solidification shrinkage of metal and the feeding behavior for it.

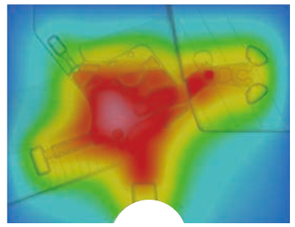


Inner Mold Gas Flow Analysis

Provides gas behavior information which helps to predict gas entering in the casting, by calculating such as the generation from binder, pressure and velocity change of the gas in the sand mold/core.



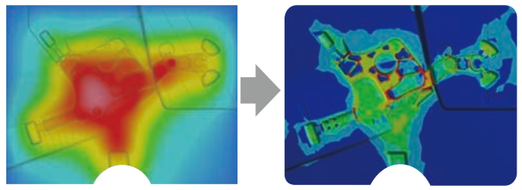
Die Temperature Analysis



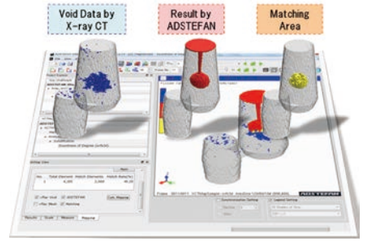
Die Temperature Analysis consists functions to consider the cyclic sequence in HPDC process, such as die preparing, shots followed by solidification and die opening stages.
This function helps you to predict die life, proper preheating shots, etc.

Temperature Data Mapping

Projects the calculated temperature distribution by ADSTEFAN on the meshes for FEM (Finite Element Method), which enables to pass the temperature data to the other commercial software and to perform more precise simulations such as structure analyses.



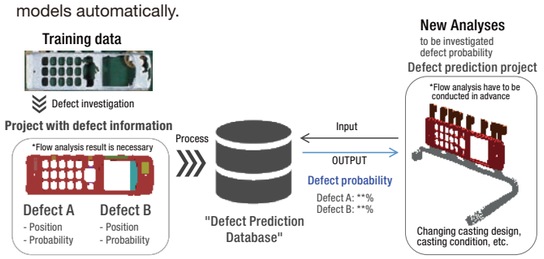
Utilities



ADSTEFAN provides various utility functions to process calculated results to utilize them effectively in the daily production.
E.g. the Material Property Calibration Tool or the X-ray Image Fitting Tool will allow more accurate evaluation of analysis results with less eror from the shop floor.

Advanced Defect Prediction Tool (ADPT)

ADSTEFAN provides the advanced defect prediction using machine learning, ADPT.
ADPT enables more accurate and more shop floor-wise prediction of defect probability by inputting training data and making prediction models automatically.



3 Advantages of ADSTEFAN

High-speed analysis

High-speed casting simulations operated by PC
- ADSTEFAN can analyze a wide variety of casting processes at high speed and with high precision -

Simple operation

Sophisticated operating system based on results from industry-academia collaboration
- ADSTEFAN's operating environment is specialized for casting analysis to ensure smooth operation -

Foundation of reliability

ADSTEFAN's reliability and evolution are supported by universities and users
- Leading-edge research and development are combined with a comprehensive support system -