THE ADVANCED CASTING RESEARCH CENTER – ACRC

Project Fact Sheet

I-Select-Al: An Electronic Tool for Selection and Prediction of Aluminum Die Casting Alloys

Benefits

Established a comprehensive database from the data collected from all available sources.

An electronic tool was built for Al die casting alloy selection and prediction.

The selection and prediction can be: from *chemistry to properties* or from *properties to chemistry*.

Two methods, trend equations and artificial neural network, were used to establish the relations between chemistry and properties.

This is not a simulation tool; it is a predictive tool.

Impact

Facilitates alloy selection.

For a set of specified properties, alloy composition can be predicted.

i-Select can be used to optimize chemistry of existing alloys.

For More Information, Please Contact:

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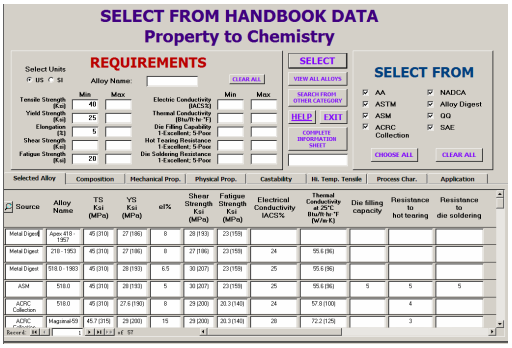
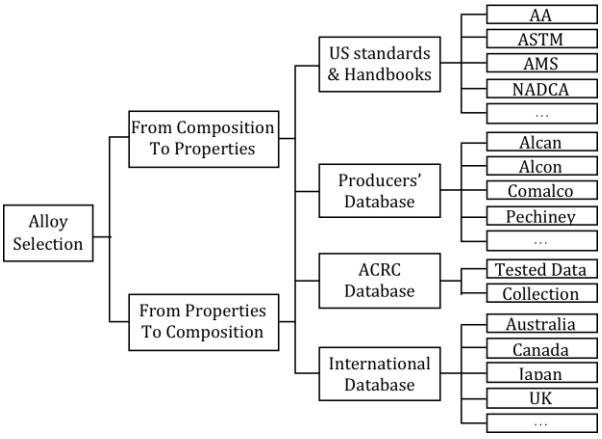
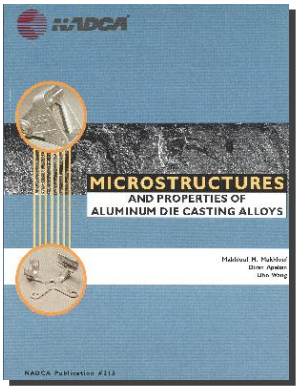
Based on the needs of the die casting industry, ACRC and NADCA initiated a project to develop an electronic tool specific to aluminum die casting alloys and the effort resulted in the *i-Select-Al* software, versions 1.0 and 2.0.

The tool was designed to have two primary functions: *selection and prediction*. Selection refers to obtaining data from existing databases, whereas prediction refers to obtaining data for alloys that may not exist. In both selection or prediction mode, the tool has the capability for the user to specify a set of properties, and alloy chemistry is obtained. Alternatively, the tool can give the properties for a given alloy chemistry.

The tool was essentially composed of three parts: (1) a comprehensive database, (2) a method, which related the alloy composition to its properties and vice versa, and (3) a computer program, which performs the tasks, selection and prediction, and provides interfaces for the users to input requirements and receive the results.







The trend equations were formulated based on a set of data from a comprehensive experimental effort conducted at the Advanced Casting Research Center (ACRC) published in the book Microstructure and Properties of Aluminum Die Casting Alloys. The Neural Network part was done in collaboration with our strategic partner in Xian, China, The National Solidification Laboratory at NPU (Prof. Hwang).

The software can be accessed at:http://www.diecastingdesign.org/