**Foundry Management Data Analysis Document**



**Molding Efficiency Database**

Prepared for

A. Dearnley

By Joel Pickworth

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# Summary

The target users for this system are the management teams of foundries. They will use it to store a large portion of information about their molding practices. Managers will be able to search and query the system to find out useful information they may need, such as the combined weight of Cromite within a particular mold, the optimal time to strip a casting to attain an acceptable temperature to continue after-cast work upon it. Management will store information about the cores, molds, and post-casting knockout information about each casting. Each of these entities then contains a Name, Description, Data Type, Primary and Foreign Key and Examples. The design process then contains the details about why the entities and individuals attributes were added, modified or removed. Finally an ERD Diagram demonstrates a view of the relationships between the entities and attributes showing how various queries could be made.

# Data Dictionary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name  (Entity/Field) | Description | Data Type | PK  /FK | Examples |
| **Cores** | **Holds information about the cores** |  |  |  |
| heatNumber | Uniquely identifies a group of castings | Text (6) | PK | 13-001 |
| moldID | Identifies casting type | Text(20) | PK | TBC140x420-2RA |
| coreNumber | Core specific number | Auto-Number | PK | 01 |
| cromiteWeight | Weight of cromite sand used | Number (Short) |  |  |
| beachWeight | Weight of beach sand used | Number (Short) |  |  |
| sandTemperature | Temperature of sand at time of molding | Number (Short) |  |  |
| paintBaume | Thickness of paint used to cover core | Number (Short) |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name  (Entity/Field) | Description | Data Type | PK  /FK | Examples |
| **Molds** | **Holds information about the molds** |  |  |  |
| heatNumber | Uniquely identifies a group of castings | Text (6) | PK | 13-001 |
| moldID | Identifies casting type | Text(20) | PK | TBC140x420-2RA |
| coreNumber | Core specific number | Auto-Number | FK | 01 |
| cromiteWeight | Weight of cromite sand used | Number (Short) |  |  |
| sandTemperature | Temperature of sand at time of molding | Number (Short) |  |  |
| paintBaume | Thickness of paint used to cover mold | Number (Short) |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Name  (Entity/Field) | Description | Data Type | | PK  /FK | | | Examples |
| Post-Casting Knockout | **Holds information about the Job details** | |  | |  |  | |
| heatNumber | Uniquely identifies a group of castings | | Text (6) | | PK | 13-001 | |
| moldID | Identifies casting type | | Text(20) | | PK | TBC140x420-2RA | |
| pourDateAndTime | Time of pouring | | Date/Time | |  |  | |
| pourTemp | Temperature of metal at time of pour | | Number (Short) | |  |  | |
| knockoutTime | Time casting was stripped | | Date/Time | |  |  | |
| knockoutTemp | Temperature of casting when stripped | | Number (Short) | |  |  | |

# Design Process

## Relationships

|  |  |  |
| --- | --- | --- |
| Entity One | Entity Two | Relationship |
| Molds | Cores | Many to Many |
| Molds | Post-Casting Knockout | Many to Many |

## Entities/Attributes Added or Changed

|  |  |
| --- | --- |
| Name (Entity/Attribute) | Reason |
| **Cores** | The reason this entity was added is because each core going into the mold require individual information. |
| heatNumber | The reason this attribute was added is to identify the casting as a part of a specific furnace melt. |
| moldID | The reason this attribute was added is to be the primary key for the Molds entity in conjunction with the heat number. |
| coreNumber | The reason this attribute was added is to be the primary key for the Core entity in conjunction with the heatNumber and moldID. |
| cromiteWeight | The reason this attribute was added to show the amount of beach sand being used in each individual core. |
| beachWeight | The reason this attribute was added to show the amount of cromite sand being used in each individual core. |
| sandTemperature | The reason this attribute was added is to record the temperature of the sand used at the time of molding. |
| paintBaume | The reason this attribute was added is to record the thickness of the paint used to cover the core. |

|  |  |
| --- | --- |
| Name (Entity/Attribute) | Reason |
| **Molds** | The reason this entity was added is because each mold that needs to be poured requires individual information. |
| heatNumber | The reason this attribute was added is to identify the casting as a part of a specific furnace melt. |
| moldID | The reason this attribute was added is to be the primary key for the Molds entity in conjunction with the heat number. |
| coreNumber | The reason this attribute was added is to be the foreign key for the Core entity. |
| cromiteWeight | The reason this attribute was added to show the amount of cromite sand being used in each individual mold. |
| sandTemperature | The reason this attribute was added is to record the temperature of the sand used at the time of molding. |
| paintBaume | The reason this attribute was added is to record the thickness of the paint used to cover the mold. |

|  |  |
| --- | --- |
| Name (Entity/Attribute) | Reason |
| **Post-Casting Knockout** | The reason this entity was added is because each mold-type requires varying post-cast treatment. |
| heatNumber | The reason this attribute was added is to identify the casting as a part of a specific furnace melt. |
| moldID | The reason this attribute was added is to be the primary key for the Molds entity in conjunction with the heat number. |
| pourDateAndTime | The reason this attribute was added is to record the date and time of the casting being poured. |
| pourTemp | The reason this attribute was added is to record the temperature of the metal at the time of pouring. |
| knockoutTime | The reason this attribute was added is to record the time of stripping the castings |
| knockoutTemp | The reason this attribute was added is to record the temperature of the castings at the time of stripping. |

## Entities/Attributes Removed

|  |  |  |
| --- | --- | --- |
| Name (Entity/Attribute) | Description | Reason |
| **Furnace** | This entity was going to hold information about the melting and pouring process in the foundry. | This entity was removed as this process is too site-specific to use in this system. That is it depends largely on the equipment available to the business as to how it is performed. |
| combinedWeight | This attribute was going to be part of the Core entity and would store the total weight of the core. | This attribute was taken out because the total weight can be derived within a query thus it does not need to be stored within the system. |

# **ERD Diagram**

