PTC Email Newsletter

December 17th, 2001

PTC Product Focus: Pro/ENGINEER Expert Moldbase Extension (EMX)

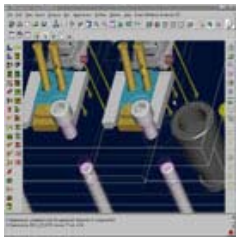
Tip of the Week: Creating and using Inheritance Features

Upcoming Events and Training Class Schedules

PTC Product Focus: Pro/ENGINEER Expert Moldbase Extension (EMX)

An integral part of the design of any mold is, of course, the design and detailing of the moldbase. Mold designers need a design tool that is easy to use, performs repeated tasks automatically, produces 3D solid models that update with changes to design parts, and enables capture of in-house design knowledge that can be reused in subsequent designs.

Much more than just a library, Pro/ENGINEER Expert Moldbase (EMX) provides "smart" moldbases and mold components that handle this job of moldbase design, detailing, and creation. When components are placed, operations such as clearance cuts and drilled and tapped holes are automatically performed on the appropriate neighboring plates and components, thereby relieving the mold designer of time-consuming, repetitive mold-detailing tasks. EMX contains a specialized graphical user interface (GUI) that provides quick, real-time previewing before the 3D components or assembly is automatically placed. EMX allows companies to capture their own specific design best practices directly within the mold assemblies and components.



Pro/ENGINEER Expert Moldbase Animation
(RealPlayer Required)
...more animations!!

Benefits

- Specialized Graphical User Interface (GUI) for quick, real-time previewing
- Supported by 15 moldbase and mold component suppliers
- "Smart" mold components and assemblies
- Automatic drawing, hole chart, and BOM creation

- Automatic mold opening and ejection simulation
- Allows companies to capture detailed best practices directly within mold assemblies and components
- Short learning curve and free tutorials provided

Customer Quotes

- "Easy to check design errors in 3D design environment"
- "Ease of use…easy to learn.."
- "Newly hired designer able to produce complete mold design in a short period of time…"
- "Finished all the molding design in 3 days…"
- "80 molds per month…up from 30 in just 2 months"

Tooling Manager – Foxconn China

Additional Information

- Pro/ENGINEER Expert Moldbase Extension Datasheet (pdf)
- Schedule an On-Line demonstration

Tip of the Week: **Creating and using Inheritance Features**

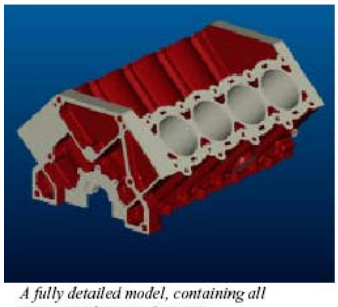
Overview

With Release 2001, Pro/ENGINEER continues to provide new technology to support the complete product development process by introducing Inheritance Features. Inheritance features allow engineers to create unique, independent yet associative variants from a design model, which can be used in downstream processes such as analysis and manufacturing. This technology allows manufacturing engineers and structural analysts, for example, to make process-specific changes to a design, even though they may not have ownership of the design model. However, this is done with no loss of associativity with the original design, ensuring any subsequent changes are seamlessly propagated. The result is a smoother, yet flexible product development process.

Current Process

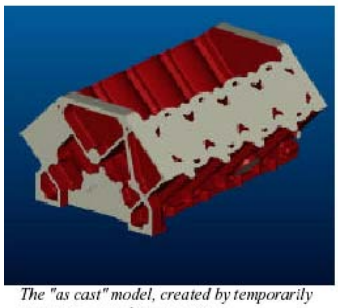
In order to complete many downstream deliverables associated with a design, it is often necessary to make changes to the design itself, or at least create variations of the design.

For example, if a design part is going to be manufactured by first casting it, and then machining it, it is often necessary for the manufacturing engineer to create a variant of the design that does not contain any of the feature that will be machined later. It might even be desirable to add additional material to the design, purely for manufacturing purposes.



A fully detailed model, containing all necessary design information.

In other cases, a design may be analyzed for structural integrity. During this analysis, the analyst may want to "de-feature" the model, removing cosmetic features such as rounds and chamfers that do not add to the structural integrity of the design. They may also want to explore the impact of different changes to the design.



The "as cast" model, created by temporarily removing some design content.

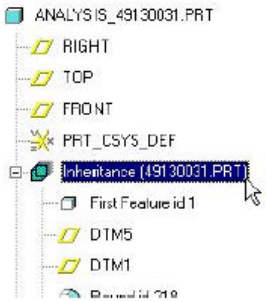
Both of these situations and many others pose a significant challenge to engineers. In many cases, the product development process does not recognize these individuals as "owners" of the design, and they simply do not have permission to make such changes to the design, which in many cases could be a "released" design. Even if they can make changes, the types of changes that they desire are often temporary and serve only a very specific purpose at a particular stage in the process, and they do not want these changes or the resulting variants captured as part of the core design definition.

Many choose to create a non-associative copy of the design model, and make their process-specific changes there. However, as changes are made to the design model, the individuals using the design in these downstream applications must be notified, and their variants need to update accordingly.

Therein lies the challenge. How can analysts and manufacturing engineers make independent changes to a design, without affecting the design everywhere else that it is used, and still be assured that changes to the master design will propagated accurately?

Process Variants through Inheritance Features

Pro/ENGINEER Release 2001 includes new technology called Inheritance Features. Inheritance Features are used to "inherit" feature content from one (parent) model into another derived model, as an associative copy. As subsequent changes are made to the parent model, the inherited feature content in the derived model will automatically update. However, the unique nature of the Inheritance Feature allows changes to be made to that inherited content in the derived model without any affect on the parent model. It is even possible to create additional features in the derived model, based on the Inheritance Feature, with no effect at all on the parent model. This provides flexibility within a release-controlled environment to accomplish process-specific tasks.



Inheritance Features allow independent, yet associative process variants to be created.

This capability allows process variants to be created quickly and easily. It passes the design definition from the parent model into a derived model, while still providing the ability to modify, suppress or completely remove features, as well as add new features.

Beyond the features themselves, the Inheritance Feature ensure that all pertinent design content such as parameters, notes, relations, layers and surface finishes from the parent model is available in the derived model.

Another unique property of the inheritance Feature is that users are able to toggle the dependency of this feature on its parent model. That is, a manufacturing engineer can create a derived model of a design using an Inheritance Feature, and specify that this process variant shall not update to changes that are being made to the design model. At any time, the engineer can choose to resume associativity. This capability is another example of the flexibility that Inheritance Features introduce into the product development process.

Finally, Pro/INTRALINK intelligently tracks the dependency that is established when creating an Inheritance Feature. This ensures that when the design model is changed, and the process variant is expected to update, the update occurs seamlessly, ensuring accurate up-to-date models for all members of the team.

Details About Inheritance Features

An inheritance feature allows a one-way associate merge of geometry and feature data from one part to another. You can select dimensions in the base model for value changes both at the time of the inheritance feature creation and later. You can select features in the base model for status changes both at the time of the inheritance feature creation and later.

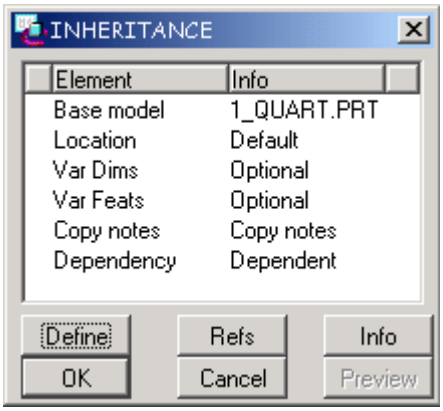
Inheritance features are always created by referencing existing parts. An inheritance feature begins with all of its geometry and data identical to the part from which it is derived. Then you can identify the geometry and feature data that can change on the inherited feature without changing the original part.

An inheritance feature is used similarly to a merge feature. More than one inheritance feature can be used in one part. The following are some inheritance feature capabilities:

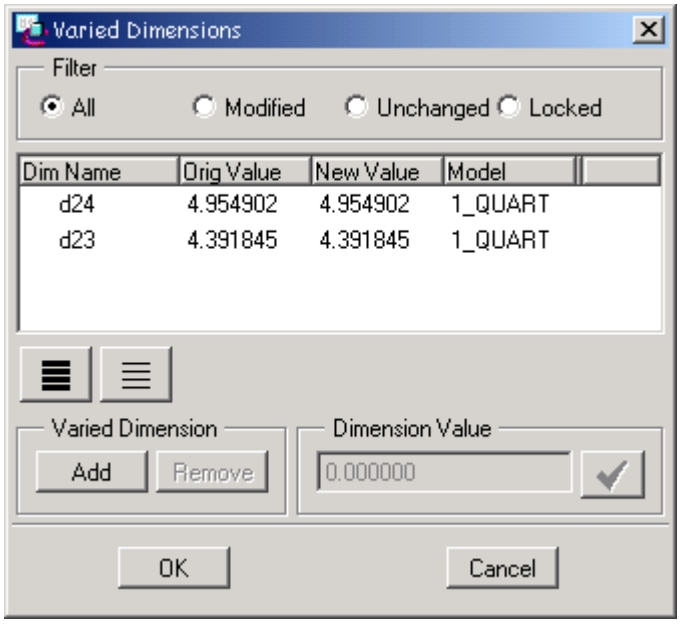
- Access to parameters of inherited models, its features, and their usage provided the prefix "IID_" is used.
- Access to dimensions of the inheritance feature in drawing mode as well as part and assembly mode. This means that inheritance feature dimensions can be shown in a drawing of the derived object, which is a limitation if you use a merged part in a drawing.
- Multilevel nesting of inheritance features
- Support of RefPattern
- Special Resolve Mode for inheritance failure cases
- Non-geometry elements are copied in addition to 3D Notes (GeomTols, Surface Finish, and so forth)
- Parent-child relationship
- Different dimension status including **VarDims:Locked** (suppressed features and so forth) and **Not Applied** (for nested inheritance with independent sublevel)

To Create an Inheritance Feature

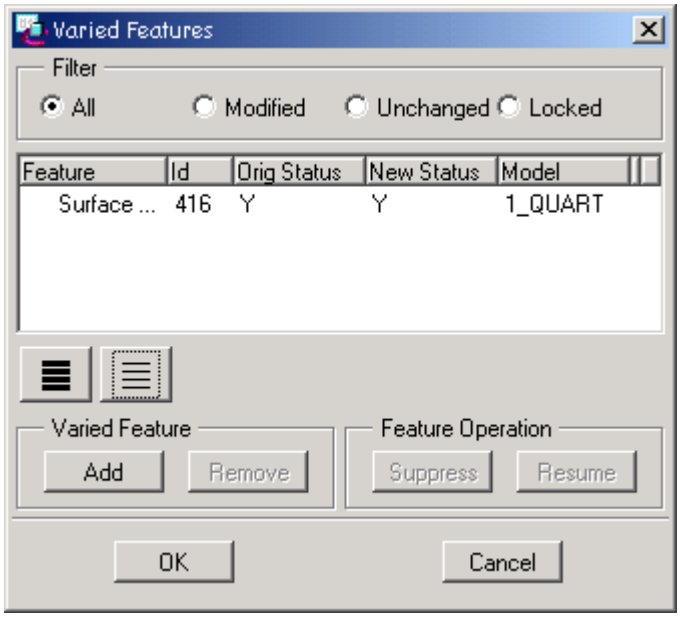
1. Create a new part.
2. Click **Feature** > **Create** > **Data Sharing** > **Inheritance** or **Insert > Shared Data** to open the **Inheritance** dialog box and the **LOCATE MDL** menu.
3. Use the **LOCATE MDL** menu to open the base model, the model from which geometry will be copied. Initially, all data from the base model are present in the inheritance feature.
4. The model opens in a separate window. The **LOCATION** menu opens.
5. Define the placement of the inheritance feature as Default or External coordinate system.



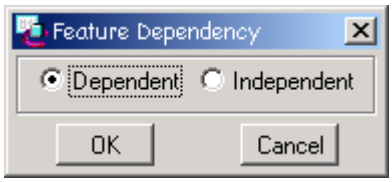
6. Click **Var Dims** > **Define** to open the **Varied Dimensions** dialog box and select specific base model dimensions. These dimensions will be added to the Varied Dimensions table. You may then change the value of the dimension in the table by entering a New Value.



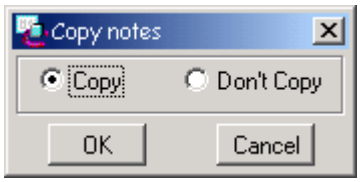
7. Use the **Var Feats** element definition to open the **Varied Features** dialog box. Select the features from the base model that you would like to define as variable. You may then choose to suppress the variable feature before creating the inheritance feature by using the **Suppress** button. When you choose to suppress a feature, you are prompted whether to suppress children of the feature also. If you choose not to suppress a variable feature upon creation of the inherited feature, you will be allowed to suppress that feature within the inheritance feature later.



8. Use the **Dependency** element to make the Inheritance feature dependent or independent of the base model. Making an inheritance feature Dependent will create a dependency between the derived object and the base model. If changes are made in the base model, they will be reflected in the derived object. An independent inheritance feature will not update when the base model is modified.



9. Use **Copy Notes** to define whether 3D notes will be copied to the inheritance feature. In Pro/ENGINEER 2001, 3D notes can be copied to the derived object, but they will not be modifiable in the derived object. Inherited 3D notes cannot be deleted or erased except by using the Copy Notes option in the inheritance feature.



Upcoming Events and Training Class Schedules

Training Classes: Please visit the PTC website for the latest training class schedule and locations.

Click here for Training Classes