Overview
When designing components for use in larger assemblies it becomes important to optimize the part’s feature design to minimize its impact on the rebuild time of the assembly at large. In this case a great deal of processor/rebuild time can be spent on pattern features if they are not optimized.

Pattern Types
There are several variations of patterns but these groupings will be generalized and grouped together on the basis of rebuild efficiency.

Feature and Face Patterns
Feature and Face Patterns will attempt to construct the patterned instances based on the conditions of the seed. If the seed is a cut produced with an end condition “Up to Surface” then the patterned cuts will all seek to produce the same end condition based on the same surface as the seed. In this way the patterned instances adjust their geometry to accommodate geometric changes in the surface based on their locality. In this way they are more adaptable to changing geometric situations but can be processor intense for rebuilds.

“Geometry” Feature, “Geometry” Face, and Body Patterns
Feature and Face Patterns set as a “Geometry pattern” as well as Body Patterns will attempt to construct the precise same geometry as for each patterned instance as it does for the seed. Each patterned instance is not a new recalculation of the geometry but instead and exact copy of the seed. This allows the pattern to be much less processor intense when rebuilding at the cost of being a less flexible feature definition.

Sketch Patterns
Sketch Patterns tend to be the processor intense as they require solving the sketch relation in addition to generating the pattern. Then proceeding with producing the feature itself can lead to long rebuild times.

Cosmetic Hole Patterns
Cosmetic Patterns are the simplest and least flexible pattern definition. They are moreso an appearance applied to a face than an actual feature. They are meant to only give the visual effect of a pattern and are limited to only certain hole shapes and not actual model geometry is produced. These patterns are very efficient.
Example

In this example a square plate is produced with 841 (29 by 29 linear pattern as shown below). Rebuild times for each pattern are measured from the Feature Statistics dialog.

The rebuild times, as measured in seconds, for each setup are as follows:

<table>
<thead>
<tr>
<th>Feature Type</th>
<th>Sketch</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feature and Face</td>
<td>0.00</td>
<td>25.34</td>
</tr>
<tr>
<td>&quot;Geometry&quot; Feature, Face, and Body</td>
<td>0.00</td>
<td>1.34</td>
</tr>
<tr>
<td>Sketch</td>
<td>0.92</td>
<td>23.79</td>
</tr>
<tr>
<td>Cosmetic Hole</td>
<td>-</td>
<td>0.00</td>
</tr>
</tbody>
</table>

From the data it would be recommended to make use of “Geometry” type patterns and “Cosmetic Hole” patterns before resorting to the remaining alternatives.

Example Files

Pattern Rebuilds.zip