

Mini Property Equations Add-In for Autodesk Inventor™ Release 10 and 11

Version 2.0 – November 3, 2006

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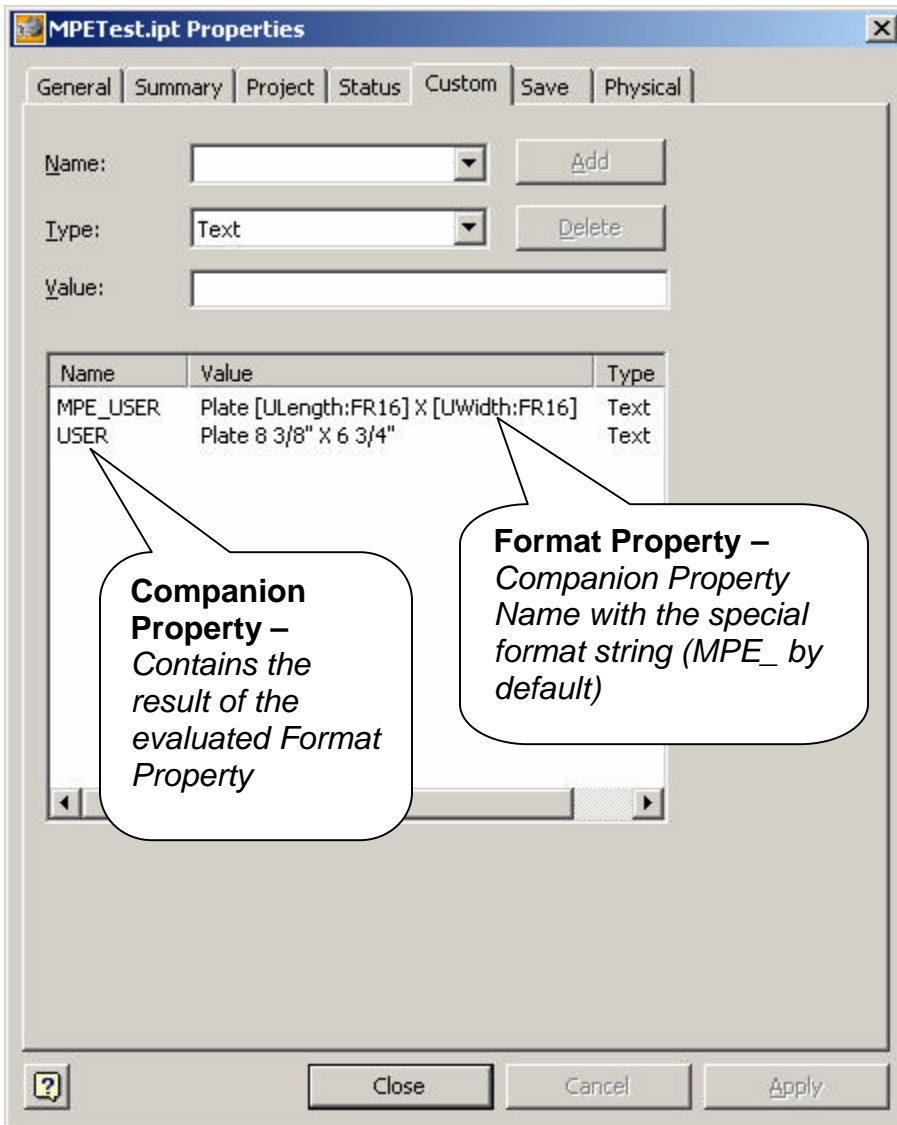
Mini-PE is an add-in that allows you to create parametric Custom Properties using formulas that access Parameters and other Properties. The formula is evaluated during a document update, document save or manually (based on user preference) and the results are displayed in a companion Custom Property.

Add-In features include: (New features for version 2 in **bold type**)

- Supports Multiple Parameters/Properties in formula.
- Allows formatting of numeric values in Parameters.
 - Feet/Inch (“Architectural”) w/configurable precision.
 - Fractional w/configurable precision.
 - Fixed decimal w/configurable precision.
 - Unformatted
- Updates performed automatically without user intervention **or manually if desired.**
- User-configurable Property prefix. (to identify format Properties)
- User can disable processing without unloading/uninstalling add-in.
- User, Model, Table Driven, Reference and Derived Parameters are supported.
- Custom Properties are supported.
- **User configurable to evaluate formulas on Document Update or Document Save.**
- **Access to built-in parameters that return Sheet Metal Flat Pattern Extents (X and Y) in millimeters, meters, inches, feet and centimeters.**
- **Access to built-in parameters that return Mass (Part or Assembly) in Kilograms, grams, pounds and slugs.**
- **Access to iPart table values. The add-in will return the value from the Active Table Row of any specified Table Column.**
- **Manual Update from Configuration dialog and Panel Bar button.**
- **Elimination of a problem that disabled processing (Release 11) if the “Hide extensions of known file types” setting was enabled in Windows Explorer.**

Add-In Operation

Operation of the Add-In (unless manual updating is invoked) is transparent to the user. When the Add-In is activated during an Update/Save, it searches the Custom Property collection of the target document for specially named format Properties. These Properties are prefixed with a user-configurable character string. By default, this special character string is “**MPE_**”. This string can be any set of text characters that can be used in an Inventor™ Custom Property name. When this special format Property is found, it is evaluated and the results are written into a companion Custom Property named the same as the format Property less the special character string.



Format Conventions

When evaluating Property formulas, Mini-PE recognizes three special delimiters: “[]” Square Brackets to denote a Parameter, “< >” Angle brackets to denote an iPart Column Name and “{ }” Curved Brackets to denote a Property. Text that appears outside these delimiters is copied into the results property verbatim.

Parameter Format (All sections are required)

[*Parametername:FormatPrecision*]

[Leading Parameter Delimiter
<i>Parametername</i>	The name of the desired Inventor document Parameter. This is case sensitive as are all Inventor Parameters.
:	Colon. Required delimiter.
<i>FormatPrecision</i>	A 2 character format code followed by a number indicating the desired precision
]	Trailing Parameter Delimiter

Special Parameter names are also recognized by Mini-PE that return values normally not accessible as a Property. They are (case-sensitive):

MPESMXIN and ***MPESMYIN*** – Sheet Metal Flat Pattern X and Y extents in Inches (in).

MPESMXMM and ***MPESMYMM*** – Sheet Metal Flat Pattern X and Y extents in millimeters (mm).

MPESMXCM and ***MPESMYCM*** – Sheet Metal Flat Pattern X and Y extents in centimeters (cm).

MPESMXM and ***MPESMYM*** – Sheet Metal Flat Pattern X and Y extents in meters (M).

MPESMXFT and ***MPESMYFT*** – Sheet Metal Flat Pattern X and Y extents in feet (ft).

MPEMASSLB – Part/Assembly Mass in Pounds (lbs).

MPEMASSKG – Part/Assembly Mass in Kilograms (kg).

MPEMASSG – Part/Assembly Mass in Grams (g).

MPEMASSSL – Part/Assembly Mass in Slugs (sl).

Supported *FormatPrecision* Codes (Apply to iPart Column values also)

<i>UF</i>	Unformatted. The value is returned in its raw form. A precision is not required. If it is included, it is ignored.
<i>DFnn...</i>	Decimal Fixed. The precision indicates the maximum number of decimal places displayed. Trailing zeros are not added.
<i>Flnn...</i>	Feet/Inch (Architectural). The precision denotes the lowest denominator of the fraction. Fraction denominators will be rounded up (e.g. 1/8" will displayed instead of 2/16" or 1/4" will be displayed instead of 4/16")
<i>FRnn...</i>	Fractional. The precision denotes the lowest denominator of the fraction. Fraction denominators will be rounded up (e.g. 1/8" will displayed instead of 2/16" or 1/4" will be displayed instead of 4/16")

Examples of Parameter Formats

Given a Parameter named **Example** with a value of **21.12723 inches**.

d15	deg	90.0 deg	90.000000	90.000000	<input type="checkbox"/>
d16	in	BendRadius	0.120000	0.120000	<input checked="" type="checkbox"/>
User Parameters					
Example	in	21.12723 in	21.127230	21.127230	<input type="checkbox"/>

Display only parameters used in equations

Reset Tolerance:

MPESheetMetal.ipt Properties

General | Summary | Project | Status | Custom | Save | Physical

Name:

Type:

Value:

Name	Value
DECIMAL	PLATE - 21.13
DESCRIPTION	25 13/16" X 8 7/8"
FEETINCH	PLATE - 1'-9 1/8"
FRACTIONAL	PLATE - 21 1/8"
MPE_DECIMAL	PLATE - [Example:DF2]
MPE_DESCRIPTION	[MPESMXIN:FR16] X [MPESMYIN:FR16]
MPE_FEETINCH	PLATE - [Example:FI16]
MPE_FRACTIONAL	PLATE - [Example:FR8]
MPE_UNFORMATTED	PLATE - [Example:UF]
MPE_WEIGHT	[MPEMASSLB:DF2] POUNDS
UNFORMATTED	PLATE - 21.12723
WEIGHT	0.97 POUNDS

Example Format and Companion Properties (With Results Displayed)

iPart Table Format (All sections are required)

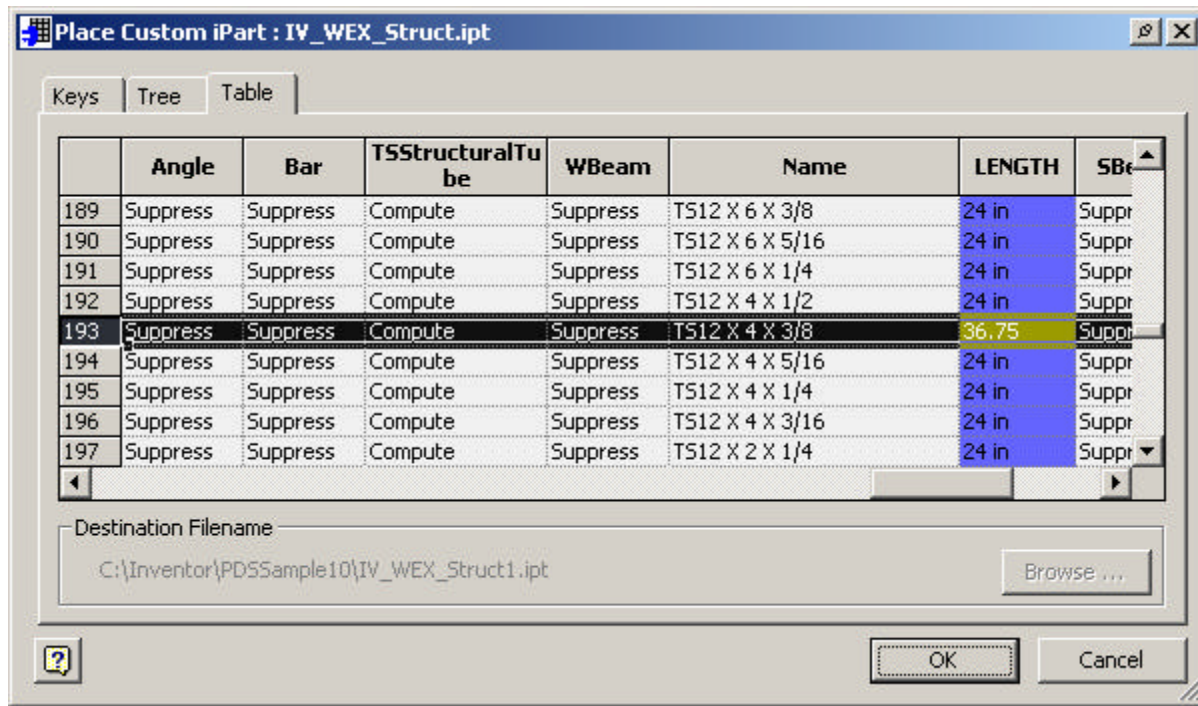
[*Columnname:FormatPrecision*]

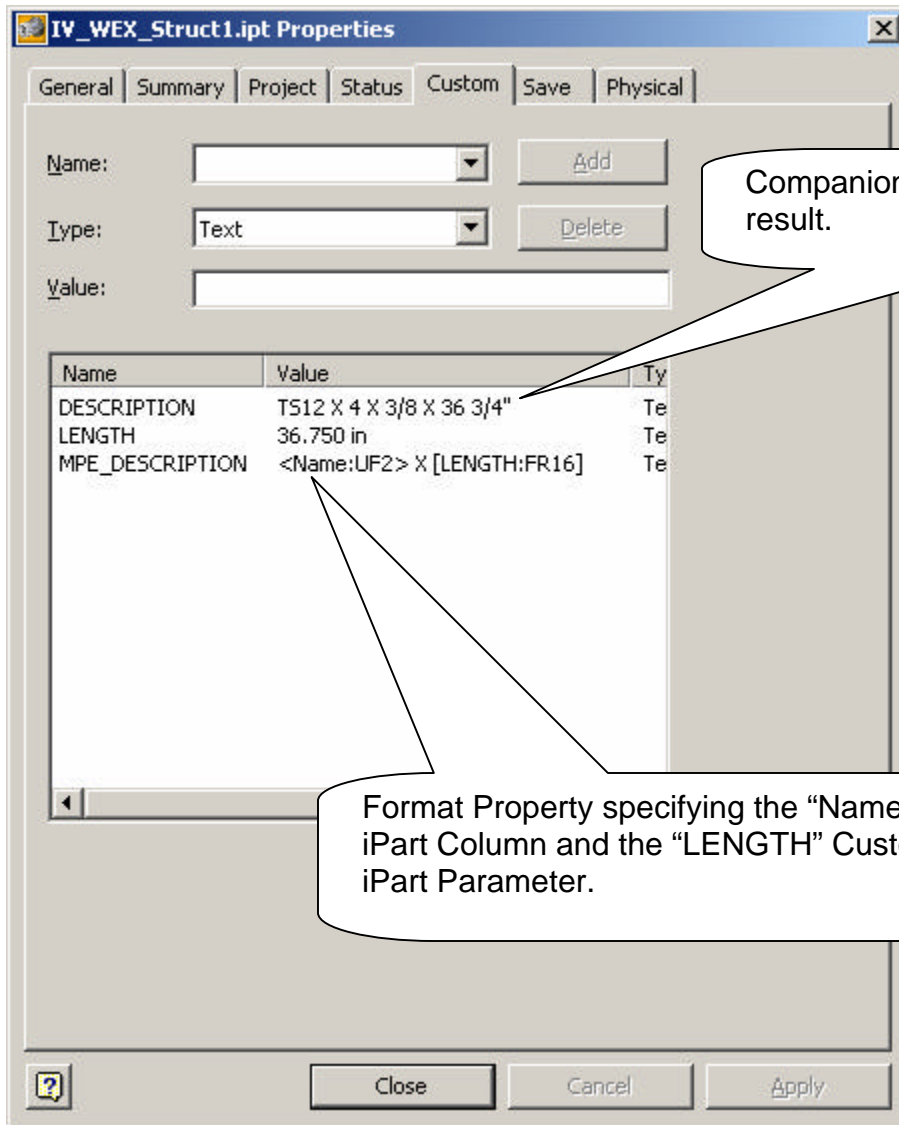
<	Leading iPart Column Delimiter
Parametername	The name of the desired Inventor iPart Column. This is case sensitive as are all Inventor Parameters.
:	Colon. Required delimiter.
FormatPrecision	A 2 character format code followed by a number indicating the desired precision
>	Trailing iPart Column Delimiter

Mini-PE allows you access the values from select Columns in the Active Row of an iPart Child. The Format and Companion Properties can be defined in the iPart Parent. These will be copied and evaluated in each of the iPart children created from the Parent.

Example of iPart Table Formulas

Given an iPart that contains the Column in its Definition Table “Name”. We will extract this into our Companion Property along with the “LENGTH” value (which is a Custom iPart Parameter and is available as a Model Parameter).





Notes on Parameter Units

The current list of internal Parameter units supported is as follows:

- mm – millimeters
- cm – centimeters
- m – meters
- in – inches
- ft – feet
- radians
- degrees
- grads
- ul – unitless

If other formats are used, they will be returned in the Internal Format of that unit within the inventor database. For more on these units, see the Inventor help files.

Property Format

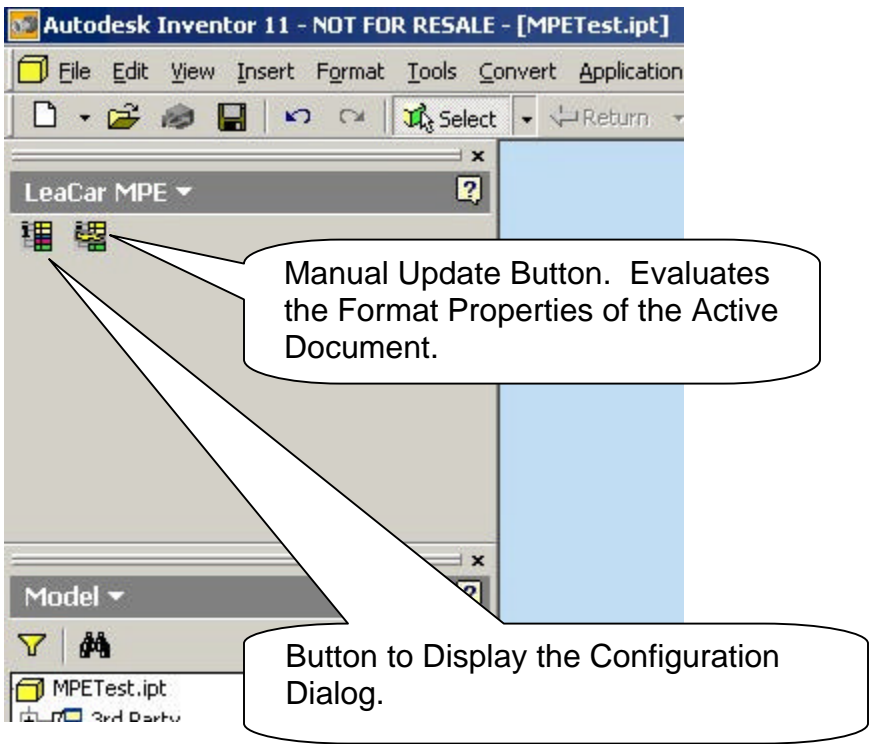
{Propertyname}

{	Leading Property Delimiter
Propertyname	The name of the desired Inventor document Property. This is case sensitive as are all Inventor Properties.
}	Trailing Property Delimiter

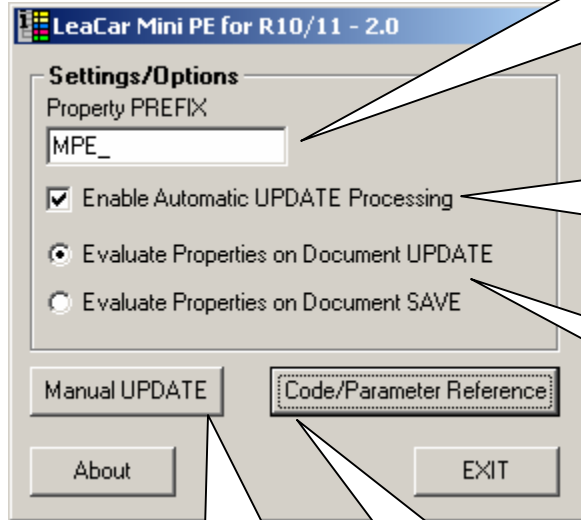
Currently only Custom Parameters are supported. There is no formatting supported as Properties are generally text based.

User Options and Configuration

When installed, the add-in creates a Panel Bar menu named **LeaCar MPE**. This menu will be available in the Part, Assembly and Sheet Metal Environments.



Configuration Dialog



Property PREFIX: (Default Setting shown)
This is the Property Search Prefix used by the add-in. Please note that only the current setting is used for Property Searches. If you change the value, older Property sets with an older prefix will be ignored.

Enable Automatic UPDATE Processing: (Default Setting Shown)
Un-checking this option disables processing of Property formulas.

Selection of Automatic UPDATE Processing: **Evaluate Properties on Document UPDATE** or **Evaluate Properties on Document SAVE**. This selects when Automatic Updating takes place.

Manual UPDATE
Evaluates the Format Properties of the Active Document.

Code/Parameter Reference
Displays a dialog listing the Internal Special Parameter Names and other formatting help.

About: Displays information about the add-in, including version information.

Exit: Exits the configuration dialog.

Error Codes

If a Format Property cannot be evaluated, Mini-PE will return an Error Code in place of the Parameter/Property/iPart Table value request. Mini-PE will evaluate the Format Properties as far as it can, but if a certain format cannot be evaluated, an error string will be returned in its place.

<***ERROR-01***> : Document does not contain an iPart Parent/Child definition.

<*ERROR-02*> : Column Heading name not found in iPart Table.
<*ERROR-03*> : Error in iPart Table DecimalToFeetInch conversion.

<*ERROR-04*> : Error in iPart Table DecimalToFraction conversion.

<*ERROR-05*> : General Error in iPart Table Function.

[*ERROR-06*] : Document is not a Sheet Metal Document.

[*ERROR-07*] : Error in Sheet Metal DecimalToFeetInch conversion.

[*ERROR-08*] : Error in Sheet Metal DecimalToFraction conversion.

[*ERROR-09*] : General Error in Sheet Metal Function.

[*ERROR-10*] : General Error in parsing the Format String.

{*ERROR-11*} : General Error in Get Custom Property Function.

[*ERROR-12*] : Error in retrieval of Parameter Value.

[*ERROR-14*] : Parameter Name in Format does not exist in document.

[*ERROR-15*] : Parameter Unit Conversion Error.

[*ERROR-16*] : Error in Parameter DecimalToFeetInch conversion.

[*ERROR-17*] : Error in Parameter DecimalToFraction conversion.

[*ERROR-18*] : General Error in Mass Property Function.

[*ERROR-19*] : Error in Mass Property DecimalToFeetInch conversion.

[*ERROR-20*] : Error in Mass Property DecimalToFraction conversion.

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About LeaCar LLC

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