

PTC[®] Live Global

Recipe for Success: Digital Viewables

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Subject Matter Experts

Boston, MA
June 15-18th, 2014



The Engineering Services Contract (ESC) and Information Management Communication Support contract (IMCS) at Kennedy Space Center (KSC) provide services to NASA in respect to flight and ground systems design and development. These groups provides the necessary tools, aid, and best practice methodologies required for efficient, optimized design and process development. The team is responsible for configuring and implementing systems, software, along with training, documentation, and administering standards. The team supports over 200 engineers and design specialists with the use of Windchill, Creo Parametric, NX, AutoCAD, and a variety of other design and analysis tools.

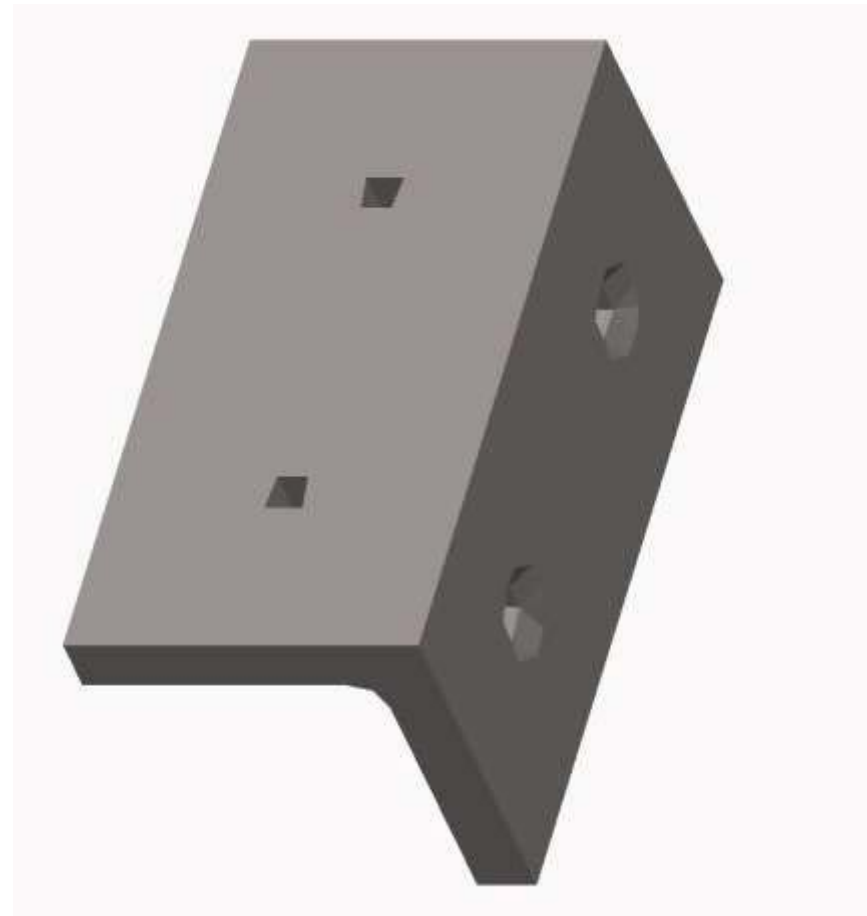
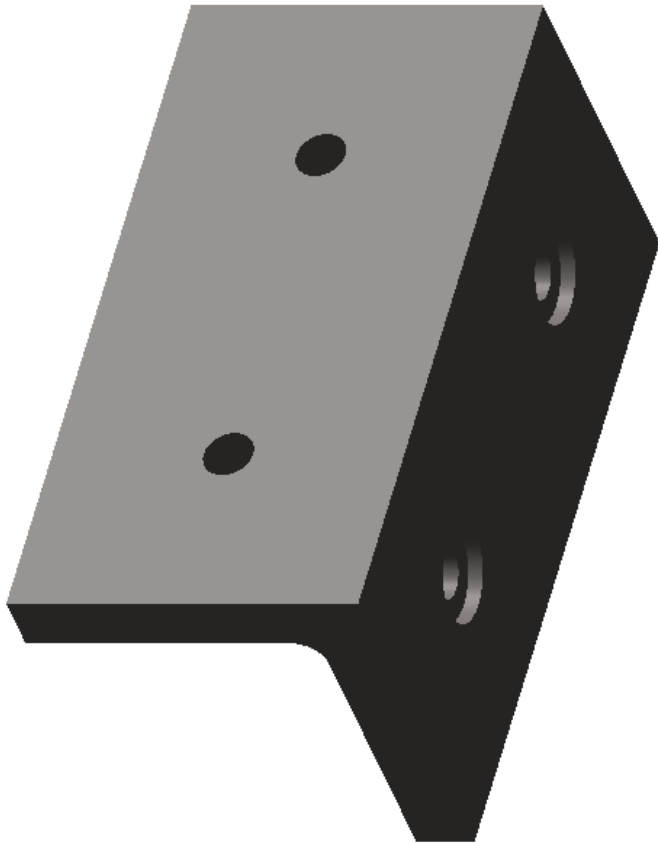


The focus of this presentation is as follows

- Beginner to Intermediate level administrator
- Model Based Design Publishing
- Lessons Learned in CAD Worker/Windchill management

- **PTC Reference Documents**
 - PTC Creo View MCAD Adapters 3.0 Installation and Configuration Guide
 - Installing PTC Creo 3.0: PTC Creo View
 - Windchill Visualization Services Guide
- **Precision LMS Classes**
 - Business Administration of Windchill PDMLink
 - MCAD Data Management of Creo Parametric Designs with Windchill PDMLink
- **Other Helpful Resources**
 - Visualization Blog <http://www.vizpundit.com/>

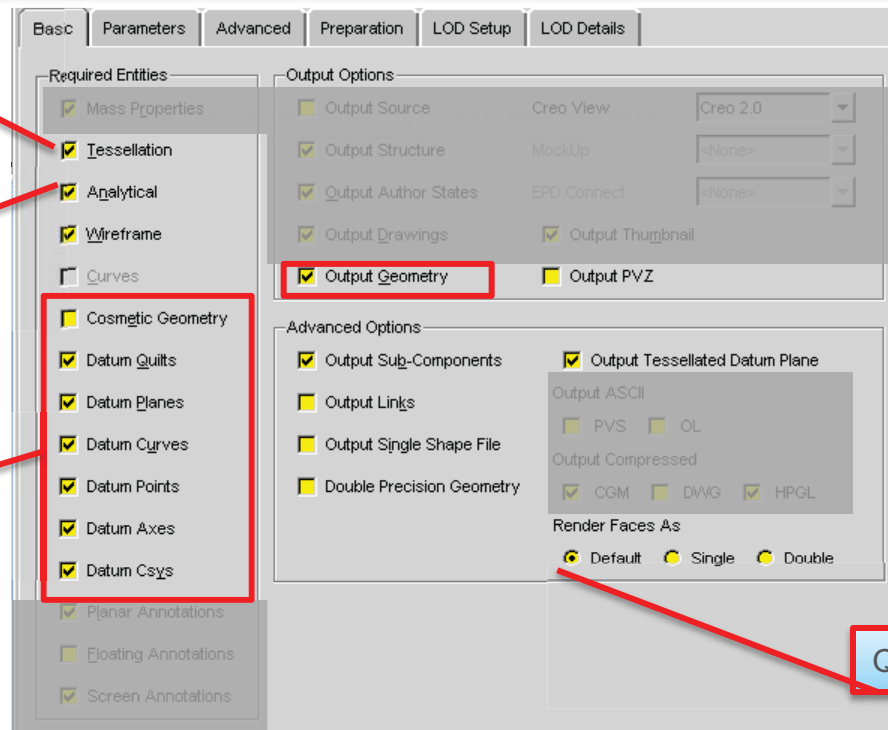
- **Geometry**
 - Solids
 - Surfaces
 - Quilts
 - Cabling
 - Pipelines
 - Cosmetics
 - Datum features
 - Skeletons
- **Annotations**
 - Dimensions/GD&T
 - Notes
- **Views**
 - Orientation
 - Simplified Reps
 - Exploded States
 - Styles
 - Cross Sections
 - Layer States
- **Data**
 - Parameters
 - Mass Properties
 - Analytical Elements
- **Drawings**
 - HPGL/PDF
- **Thumbnails**



Display of shaded, shaded with edges, mesh, or hidden line removal rendering

Allows you to measure analytical elements, more accurate tessellated surface mesh

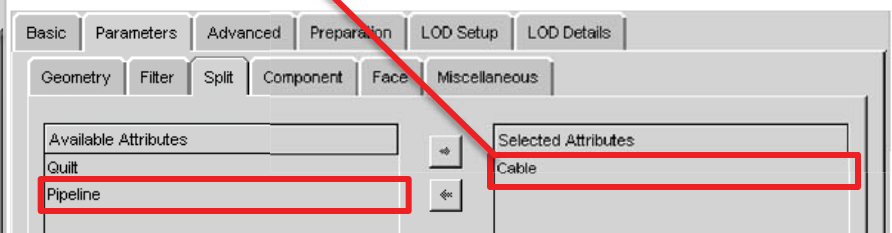
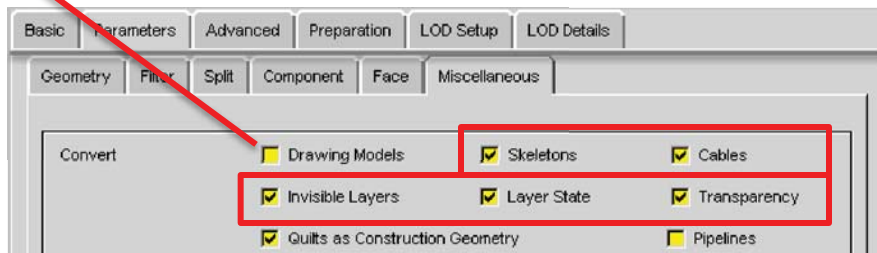
Datum Features & Cosmetic Geometry



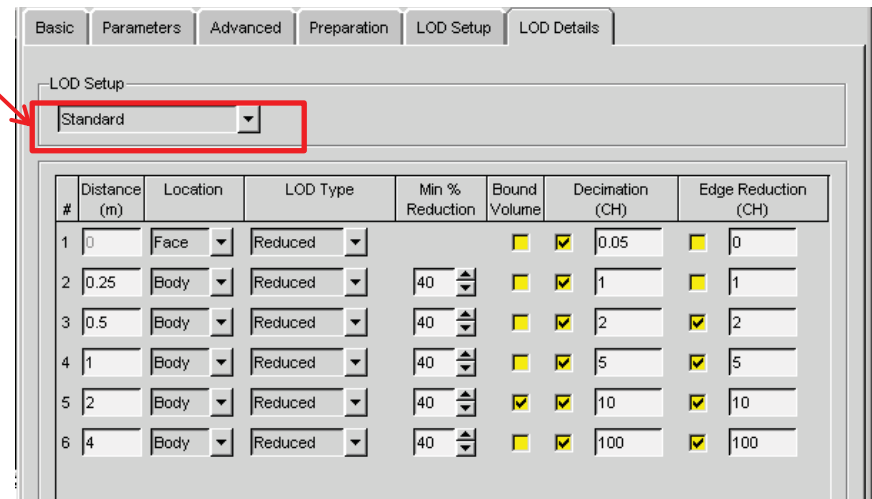
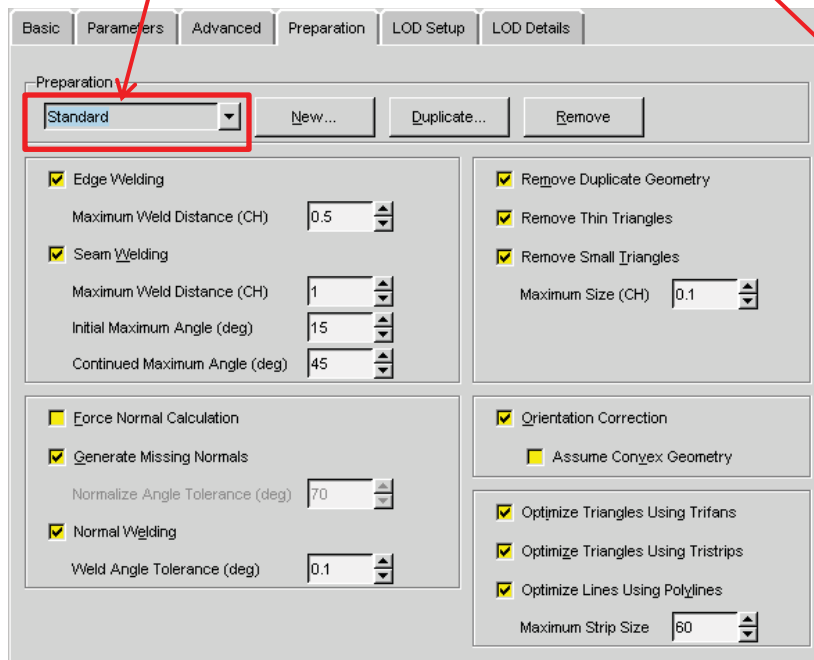
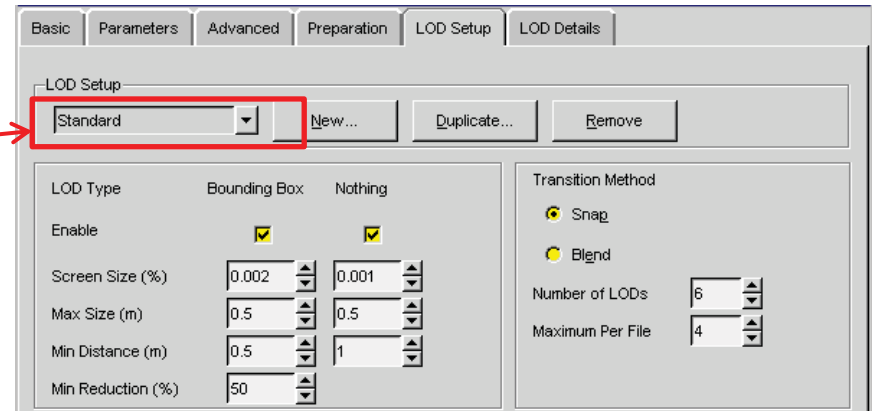
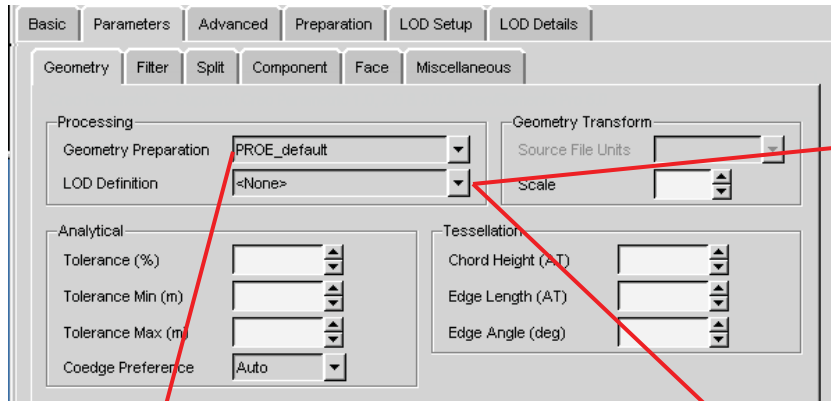
Quilt geometry conversion

Publish models referenced by drawing

Break out components of Object types



Advanced Geometry



Features

Screen Annotations

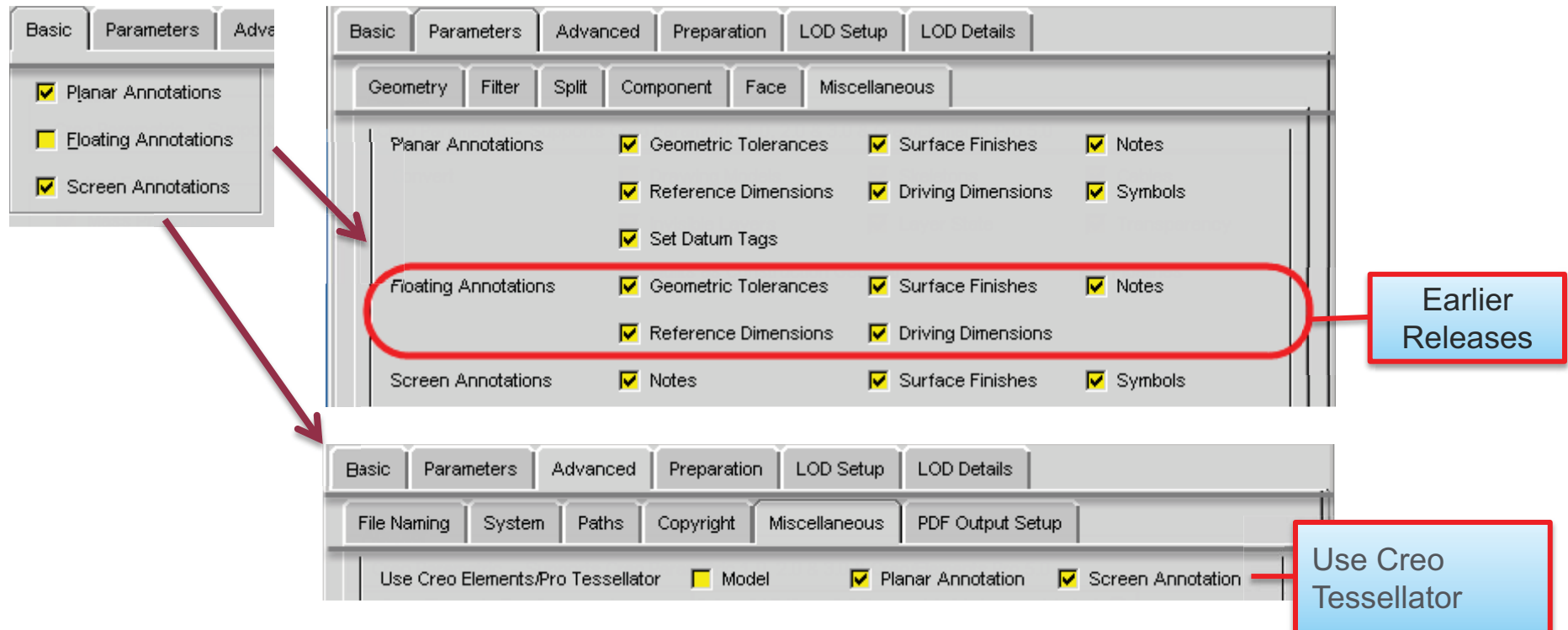
Planar Annotations

**1. REMOVE SCALE AND BURRS AND BREAK SHARP CORNERS AND EDGES.
2. PRIME AND PAINT.**

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.

FRACTIONS	DECIMALS	ANGLES
±1/16	1 PL ± .000	1 PL ± .5
	2 PL ± .030	
	3 PL ± .010	

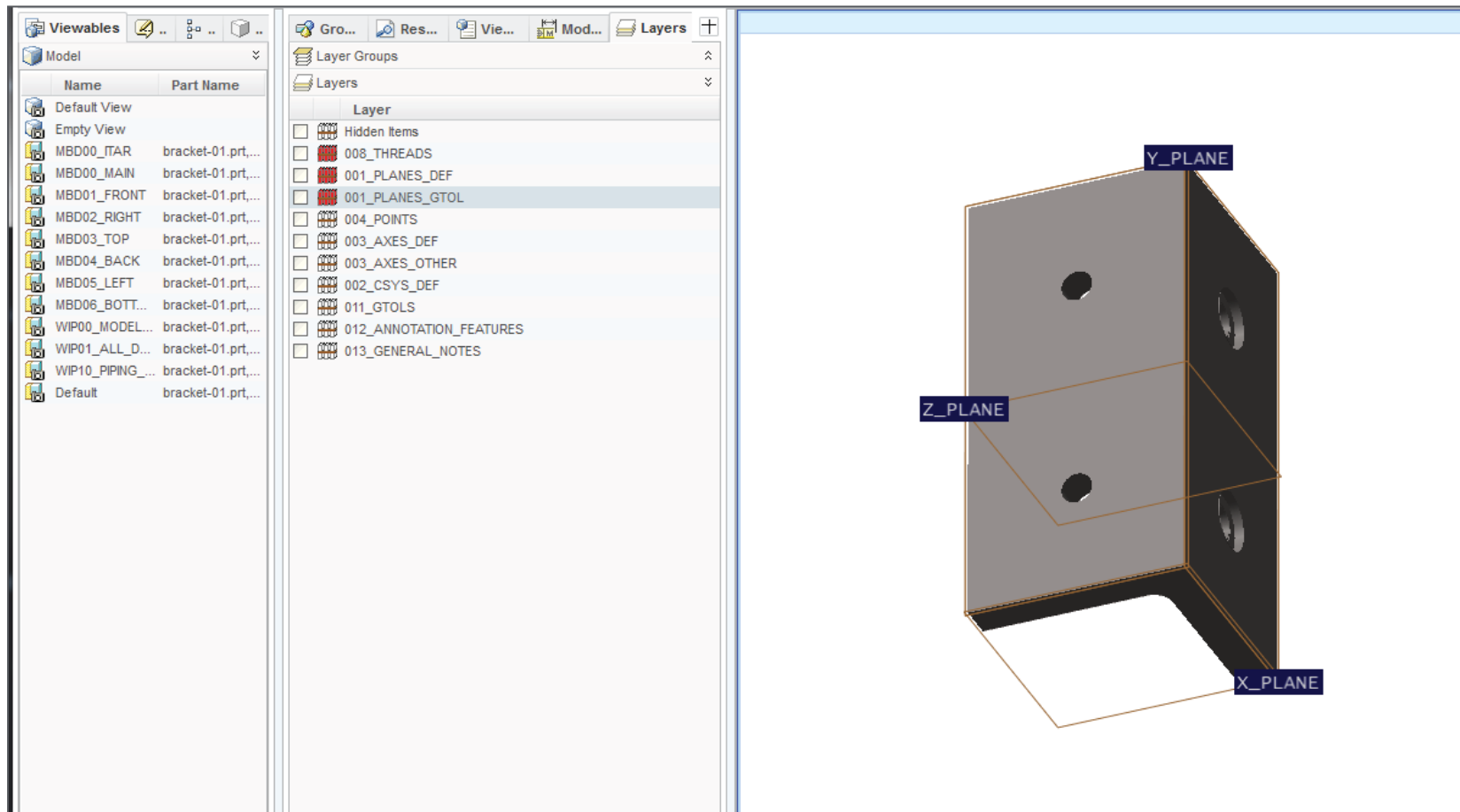
MATERIAL	UNS S30400 304 SS FULL HARD
SPEC	SAE AMS5913
HEAT TREAT	NONE
FINISH	NONE
STOCK SIZE	
WEIGHT	4.635



- Creo View 2.0 and prior, Floating and Miscellaneous model annotation types could be shown by filtering, however cannot be created in Creo Parametric.
- Creo View 3.0 Floating and Miscellaneous Annotation can no longer be displayed
- New Creo View 3.0 – Preference: “Use Model Annotation Default Visibility”

Orientation
Simplified Rep
Combined State

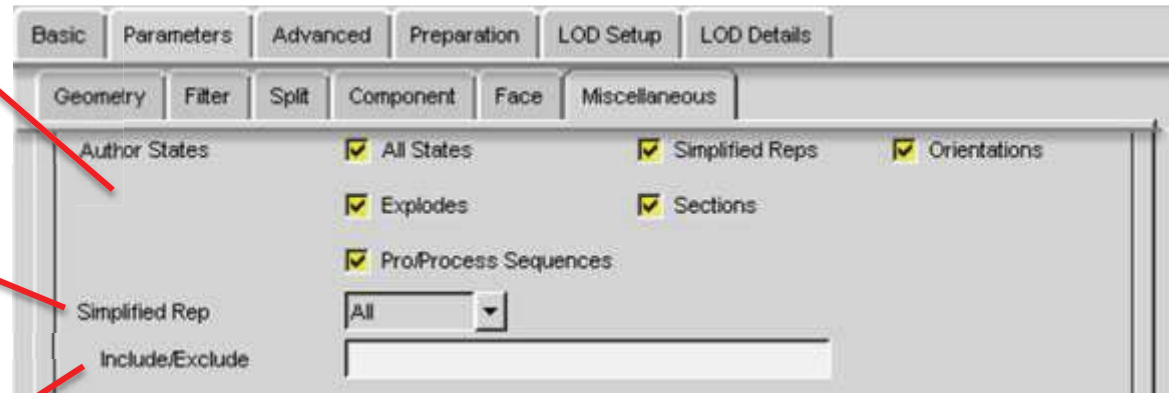
Layers





Publish View States

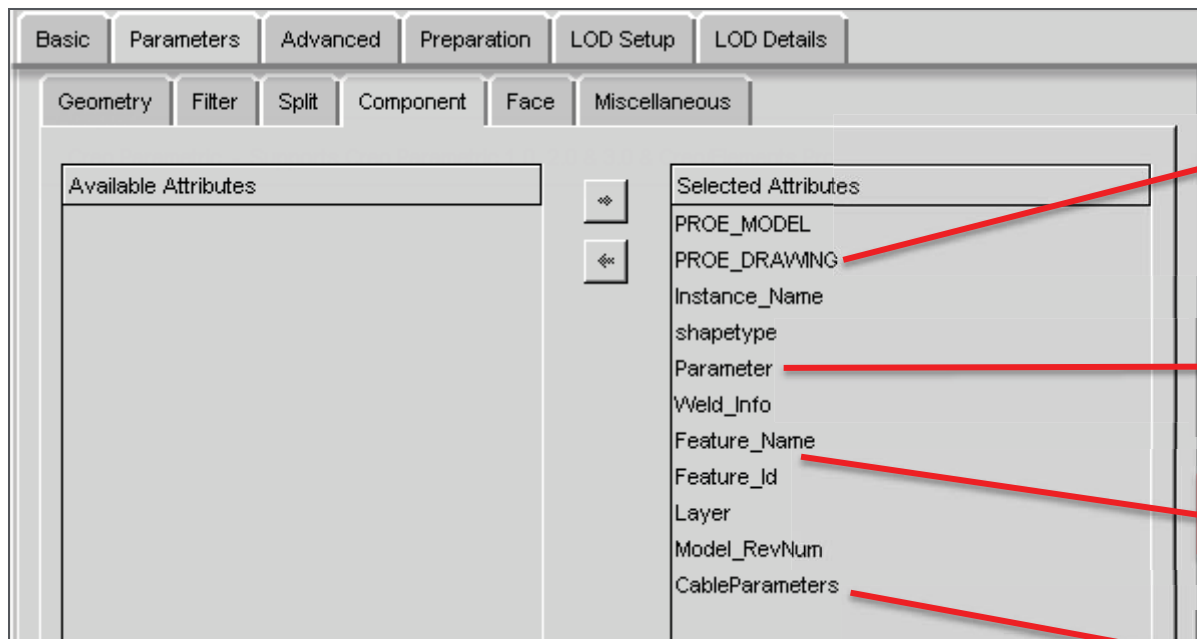
Simplified Reps

Include/Exclude Reps
by name



 bracket-01.prt, -.3  Bill Of Materials		
Name	Category	Value
shapetype	PVS File Properties	OL
Source_file_name	PVS File Properties	bracket-01.prt
Adapter_platform	PVS File Properties	x86e_win64
Adapter_name	PVS File Properties	proe2pv
epmdoc_objectid	PVS File Properties	OR:wt.epm.EPMDocument:821728571
Adapter_version	PVS File Properties	parametric2_F000 Creo 3.0 - M010 (13.2.10.15)
MATERIAL_SPEC	PROE Parameters	SAE AMS5913
PTC_WM_LIFECYCLE_STATE	PROE Parameters	In Work
WEIGHT	PROE Parameters	4.634974
UOM	PROE Parameters	INCHES
PTC_WM_VERSION	PROE Parameters	-.3
PART_NUMBER	PROE Parameters	0000-0001
epmdoc_defaultUnit	WindchillEPM	each
epmdoc_organizationName	WindchillEPM	22264
epmdoc_versionInfo	WindchillEPM	-
epmdoc_EXPORT_CONTROL_NUMBER	WindchillEPM	N/A
epmdoc_MC_VERIFIED	WindchillEPM	True
epmdoc_qualifiedIdentifier	WindchillEPM	-.3
epmdoc_topGeneric	WindchillEPM	false
epmdoc_ownerApplication	WindchillEPM	Workgroup Manager

The screenshot displays the 'LOD Details' tab of a software interface. On the left, a 'Required Entities' list includes options like 'Mass Properties', 'Tessellation', 'Analytical', 'Wireframe', 'Curves', 'Cosmetic Geometry', 'Datum Quilts', 'Datum Planes', 'Datum Curves', 'Datum Points', 'Datum Axes', 'Datum Csys', 'Planar Annotations', 'Floating Annotations', and 'Screen Annotations'. The main area is divided into 'Output Options' and 'Advanced Options'. In 'Output Options', 'Output Structure' and 'Output Author States' are checked and highlighted with red boxes and callouts labeled 'Structure data' and 'View States' respectively. Other options include 'Output Source', 'Output Drawings', 'Output Geometry', 'Output Author States', 'Output Thumbnail', and 'Output PVZ'. The 'Advanced Options' section includes 'Output Sub-Components', 'Output Links', 'Output Single Shape File', 'Double Precision Geometry', 'Output Tessellated Datum Plane', 'Output ASCII', 'PVS', 'OL', 'Output Compressed', 'CGM', 'DWG', 'HPGL', and 'Render Faces As' (Default, Single, Double).

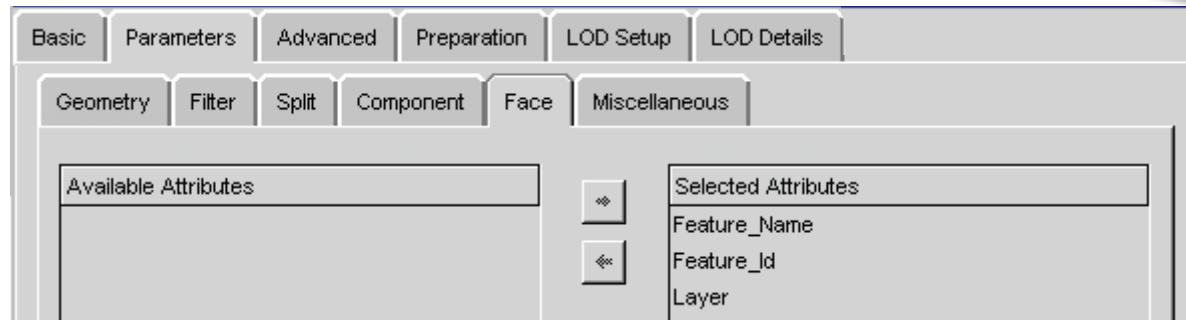


Drawing Parameters

Creo Parameters

Features

Cable Parameters



Enable feature annotations
Mechanica Simulations

Mass Properties

Part(s) Properties

Appearance
Material
Location

Component Material

Material: <PV Default>
Density: 3.61273E-005 lb/in³

Set Material...
Restore Material ▾

Component Summary

CSYS: Global ▾

Characteristic	Results
Area	
Volume	
Mass	
Center Of Gravity	
Bbox Center	
Bbox Dimensions	

Inertia Tensor..
General
Options...

Editing: vms_area_layout.asm, 1.1

Part(s) Properties

Appearance
Material
Location

Component Material

Material: A36
Density: 0.283 lb/in³

Set Material...
Restore Material ▾

Component Summary

CSYS: Global ▾

Characteristic	Results
Area	4531.667 in ²
Volume	3123.925 in ³
Mass	884.071 lb
Center Of Gravity	(477.876, 1810.671, 798.000) in
Bbox Center	~(477.512, 1810.763, 798.000) in
Bbox Dimensions	~(20.727, 6.603, 108.904) in

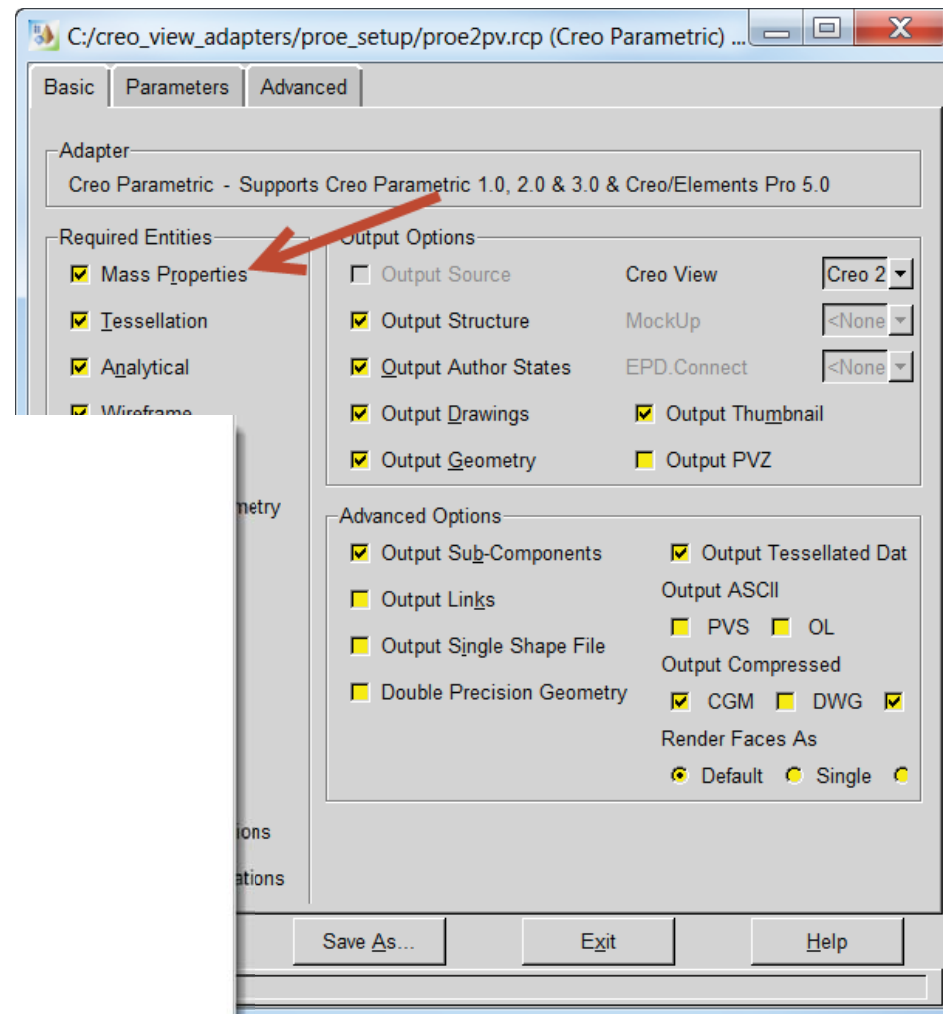
Inertia Tensor..
General
Options...

Editing: trd_104011s2032039.prt, A.1 Close

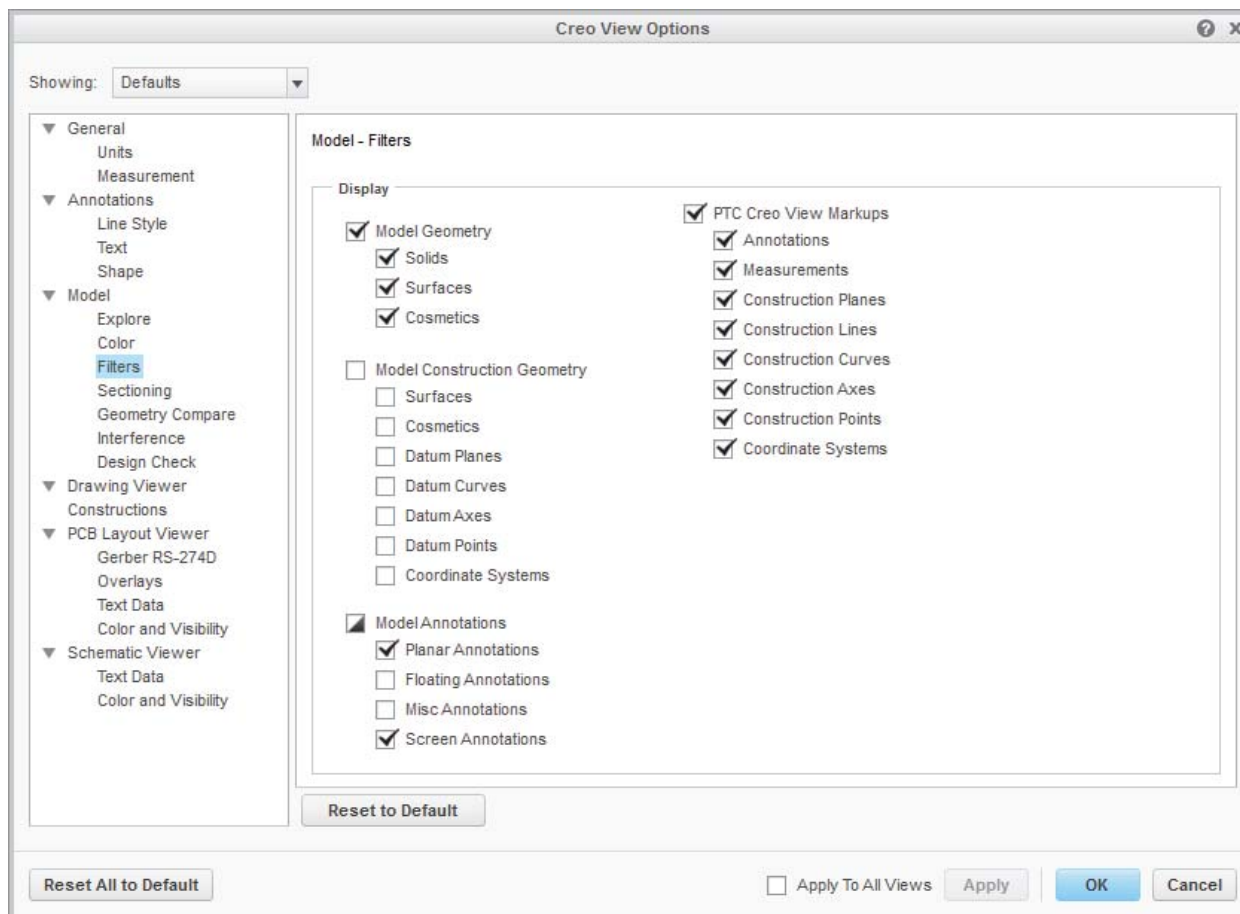
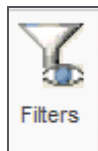
Mass Properties

- Not viewable with Creo View Lite
- May incur severe performance penalty for large assemblies
- A single component can take several seconds to process

```
May 13, 2014 8:30:12 AM: Processing k0000064260-14d3_k0000065210.asm
May 13, 2014 8:31:03 AM: Processing 77820-mtv26rs-25-17pn.prt
May 13, 2014 8:31:04 AM: Getting Mass Properties
May 13, 2014 8:31:05 AM: Processing d38999-26_j17sn.prt
May 13, 2014 8:31:05 AM: Getting Mass Properties
May 13, 2014 8:31:05 AM: Processing k0000064249-2d3_hrn.prt
May 13, 2014 8:31:06 AM: Getting Mass Properties
May 13, 2014 8:31:08 AM: Processing k0000059203-1d4_k0000065210-0.asm
May 13, 2014 8:32:01 AM: Processing k0000059203-1d4_0_hrn.prt
May 13, 2014 8:32:02 AM: Getting Mass Properties
May 13, 2014 8:32:03 AM: Processing k0000059214-1d7_k0000065210.asm
May 13, 2014 8:32:58 AM: Processing 56501_54909beuf.prt
May 13, 2014 8:32:58 AM: Getting Mass Properties
May 13, 2014 8:32:58 AM: Processing k0000059214-1d7_hrn.prt
May 13, 2014 8:32:58 AM: Getting Mass Properties
May 13, 2014 8:33:00 AM: Processing k0000059859-4d8_k0000065210.asm
May 13, 2014 8:33:59 AM: Processing d38999_20sg16pn_ks.prt
May 13, 2014 8:33:59 AM: Getting Mass Properties
May 13, 2014 8:34:00 AM: Processing ms3456w14s-6s_ks_1.prt
May 13, 2014 8:34:00 AM: Getting Mass Properties
May 13, 2014 8:34:01 AM: Processing k0000059859-4d8_hrn.prt
May 13, 2014 8:34:01 AM: Getting Mass Properties
May 13, 2014 8:34:05 AM: Processing k0000059215-1d6_k0000065210.asm
May 13, 2014 8:35:03 AM: Processing 56501_54970be_ks.prt
May 13, 2014 8:35:03 AM: Getting Mass Properties
May 13, 2014 8:35:03 AM: Processing k0000059215-1d6_hrn.prt
May 13, 2014 8:35:03 AM: Getting Mass Properties
May 13, 2014 8:35:05 AM: Processing k0000064520-14d3_k0000065210.asm
May 13, 2014 8:36:04 AM: Processing d38999-20sb2sn_ks.prt
May 13, 2014 8:36:04 AM: Getting Mass Properties
May 13, 2014 8:36:05 AM: Processing d38999-20sb2pn_ks.prt
May 13, 2014 8:36:05 AM: Getting Mass Properties
May 13, 2014 8:36:06 AM: Processing k0000064520-14d3_hrn.prt
May 13, 2014 8:36:06 AM: Getting Mass Properties
May 13, 2014 8:36:06 AM: Processing k0000064260-14d3_k0000065210.asm
```



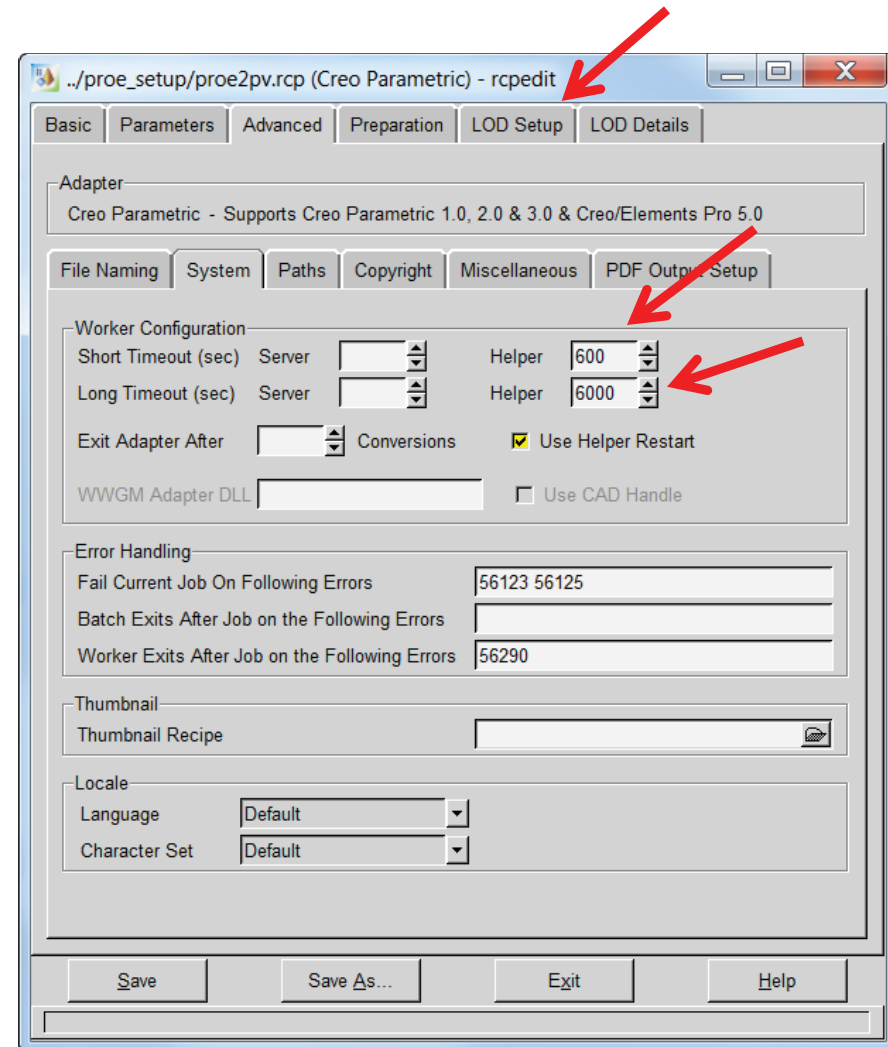
- If data isn't showing up, first check your filter settings (Default and Active Views)



- Found in `wvs.properties` and in the adapter recipe file
- `wvs.properties`:
 - `publish.cadtimeout.component` – 600 second default
 - `publish.cadtimeout.assembly` – 3600 second default
 - `publish.cadtimeout.drawing` – 600 second default
 - `publish.cadtimeout.<ObjectType>.<AuthApp>` - 3600 seconds
 - `publish.cadtimeout.*` properties determine the maximum amount of time that will be spent to complete conversion for a given CAD data set type. These values must be set higher than longest expected publishing time for each type.
 - See [CS56714](#) or the Windchill Visualization Services Guide

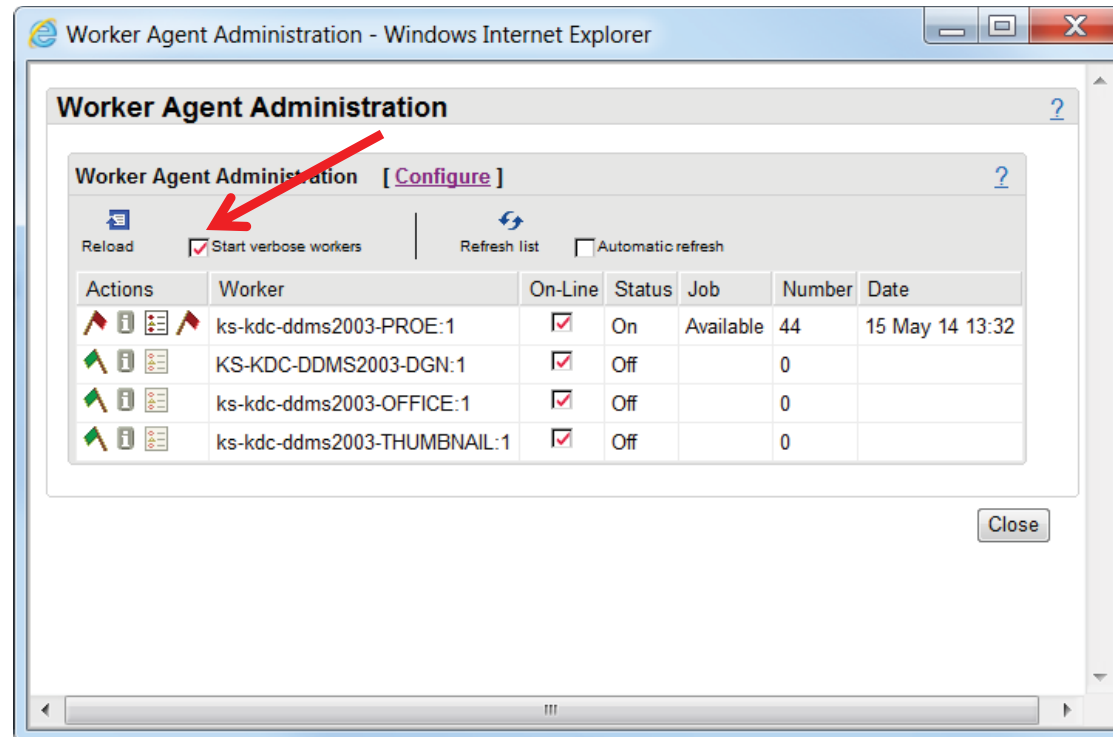
Timeouts – Worker Helper

- Server timeouts not used when a worker helper is utilized
 - Only accessible in admin mode
- Helper timeouts allow more control
 - Short Timeout (60 sec default)
 - Long Timeout (3600 sec default)
- Helper log: *“Worker helper timed out waiting for progress message from worker.”*
- WVS Job Monitor: *“Helper: timed out waiting for progress message from worker.”*



WVS Job Monitor:

May 14, 2014 2:43:54 PM:make temp dir D:\ptc\apps\Windchill\temp\pubtemp\publish2686927680562291532.tmp
May 14, 2014 2:43:54 PM:Start Job: Part - 0000044386, vms_area_layout.asm, 1.1 (Design)
May 14, 2014 2:43:54 PM:Using passed EPMDocConfigSpec for ConfigSpec
May 14, 2014 2:43:54 PM:Start: Assembly - vms_area_layout.asm, 1.1
May 14, 2014 2:43:54 PM:Authoring Application: Creo
May 14, 2014 2:43:54 PM:Transferring Files to: D:\ptc\apps\Windchill\temp\pubtemp\publish2686927680562291532.tmp
May 14, 2014 2:43:55 PM:Number of Files (identified to be) Transferred: 10
May 14, 2014 2:43:55 PM:Creo Asm Conversion
May 14, 2014 2:43:55 PM:Added request to PROE queue for publish queue set CREOQ.
May 14, 2014 2:43:56 PM:No available connected worker
May 14, 2014 2:43:56 PM:Starting new worker ks-kdc-ddms2003-PROE:1, attempt 1 of 3
May 14, 2014 2:44:07 PM:Job 14 submitted to worker: ks-kdc-ddms2003-PROE:1
May 14, 2014 2:44:07 PM:LOGID: worker_17.log
May 14, 2014 2:44:07 PM: Registering Server (long timeout)
May 14, 2014 2:44:11 PM: Downloading vms_area_layout.asm (long timeout)
May 14, 2014 2:44:13 PM: Loading vms_area_layout.asm (long timeout)
May 14, 2014 2:44:20 PM: Saving Model (long timeout)
May 14, 2014 2:44:38 PM: Processing vms_area_layout.asm (short timeout)
May 14, 2014 2:44:39 PM:
May 14, 2014 2:44:39 PM: Getting Mass Properties (long timeout)
May 14, 2014 2:44:39 PM:
May 14, 2014 2:44:52 PM: Converting Author States (short timeout)
May 14, 2014 2:44:53 PM: Generating source output (short timeout)
May 14, 2014 2:45:02 PM: Generating Output (short timeout)
May 14, 2014 2:45:02 PM: Generating thumbnail (short timeout)
May 14, 2014 2:45:22 PM:D:\ptc\apps\Windchill\temp\transferw1i1j14\vms_area_layout_asm.pvs
May 14, 2014 2:45:22 PM:Asm Processing Returned: D:\ptc\apps\Windchill\temp\transferw1i1j14\vms_area_layout_asm.pvs
May 14, 2014 2:45:22 PM:Attempting to delete temporary workspace publish2686927680562291532tmp.
May 14, 2014 2:45:24 PM:Done deleting temporary workspace publish2686927680562291532tmp.
May 14, 2014 2:45:24 PM:Start Store Component Viewable Files
May 14, 2014 2:45:31 PM:Adding Bounding Box Information
May 14, 2014 2:45:31 PM:Uploading Files
May 14, 2014 2:45:32 PM:End Store Component Viewable Files: 23 Files
May 14, 2014 2:45:32 PM:remove temp dir: D:\ptc\apps\Windchill\temp\transferw1i1j14
May 14, 2014 2:45:32 PM:End: Assembly - vms_area_layout.asm, 1.1
May 14, 2014 2:45:32 PM:Representation Name: default
May 14, 2014 2:45:32 PM:End Job: Part - 0000044386, vms_area_layout.asm, 1.1 (Design)
May 14, 2014 2:45:32 PM:Publish Complete event dispatched
May 14, 2014 2:45:32 PM:remove temp dir: D:\ptc\apps\Windchill\temp\pubtemp\publish2686927680562291532.tmp

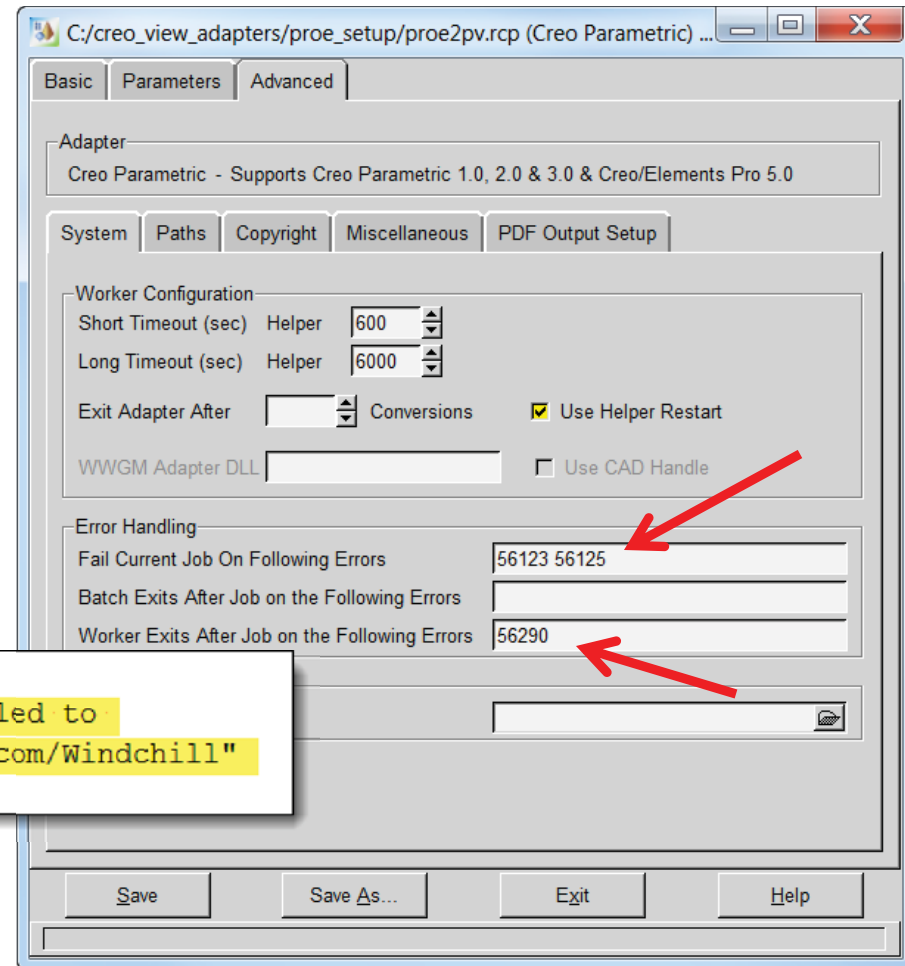


Helper log:

```
[2014-05-15 10:57:23] In message rewriting, original message is  
[2014-05-15 10:57:23] "$TIME$ 180 Processing vms_area_layout.asm  
[2014-05-15 10:57:23] ".  
[2014-05-15 10:57:23] Time from last message from worker is 16162 milliseconds.  
[2014-05-15 10:57:23] Sent rewritten message  
[2014-05-15 10:57:23] "$MSG$ Processing vms_area_layout.asm
```

- “Fail Current Job On Following Errors” will cause the publish job entirely and sets the WVS Job Status to “JOB FAILED”
- Worker reports “The adapter has been configured to exit the current job when this error occurs”
- Error codes can be found in the worker_<n>.log files

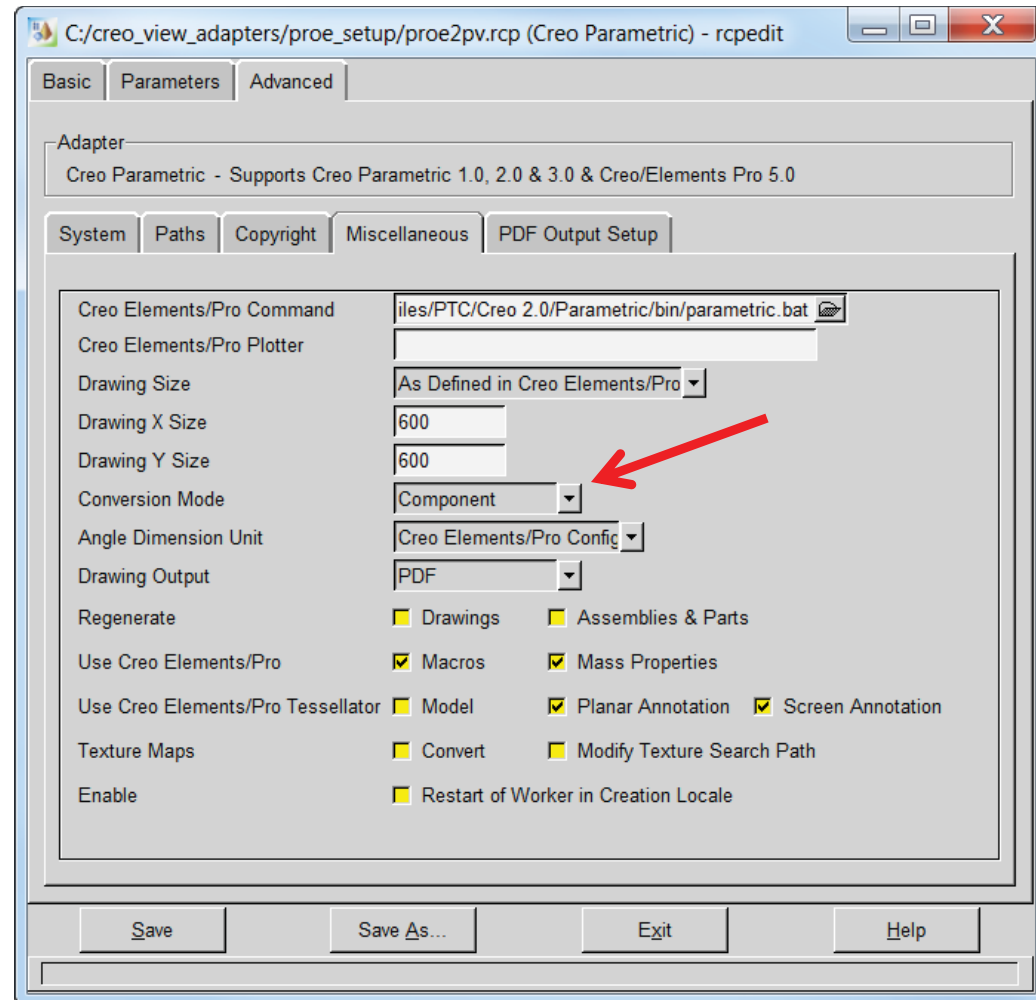
```
[2014-05-11 02:04:11] Registering Server :  
[2014-05-11 02:04:13] proe2pv Error:56113: Failed to  
register Windchill server "http://your.server.com/Windchill"  
[2014-05-11 02:04:13] Restarting adapter
```



- Worker Restart
 - Prostartup.bat ships out of the box
 - Executed by the helper on each start and restart of the worker
 - Deletes the Creo adapter workspace by default
 - Disable prostartup.bat by renaming
 - Can be edited to perform additional cleanup or to capture information for troubleshooting (e.g. terminate hanging processes)
 - **Do not** add commands to kill either the **workerhelper.exe** or **workermonitor.exe** processes
 - See [CS155210](#) for details

```
1 echo off
2
3 taskkill /F /IM xtop.exe
4 taskkill /F /IM preoe2pv.exe
5 taskkill /F /IM pvsthumb.exe
6 taskkill /F /IM ptc_ie_server.exe
7 taskkill /F /IM pro_comm_msg.exe
8 taskkill /F /IM parametric.exe
9 taskkill /F /IM nmsd.exe
10 taskkill /F /IM creoagent.exe
11
12 echo deleting .wf folder
13 if "%PTC_WF_ROOT%"==" " goto startup_err
14 rmdir %PTC_WF_ROOT% /s /q
15 goto :startup_exit
16 :startup_err
17 echo Environment variable PTC_WF_ROOT not set
18 :startup_exit
19
```


- Full
- Component
- Minimum Memory



- Full
 - Generates a unique OL file for every instance of every part in an assembly
 - Most expensive in terms of the number of files generated and conversion time
 - May result in longer downloads when viewing in Creo View
 - Converted assembly exactly corresponds to appearance of original CAD data
- Component
 - One OL file is reused for all component instances in an assembly
 - Uses less disk space
 - Viewables load faster in Creo View
 - May be inefficient in certain cases (CS110013)
- Minimum Memory
 - Intended for very large assembly conversion where available memory is insufficient
 - Loads 3d model one file at a time, processes it, the unloads it
 - All instances use a single OL file as with the Component mode

- Recipe Editor user interface Administrator mode Preparation
 - LOD Setup
 - LOD Details
 - Filter, Split, and Face under the Parameters tab
- To start the Recipe Editor in Administrator mode, use the following command line option:

<creo_view_adapters install point>\bin\rcpedit.exe -admin proe2pv.rcp

- Testing performed to determine which options provide the worst delays
- Started with a 300 piece assembly with a complicated shrinkwrap model

	Duration	Duration - Baseline
No Entities	0:02:22	0:00:00
Mass Properties	0:04:43	0:02:21
Tesselation	0:04:00	0:01:38
Wireframe	0:09:16	0:06:54
Cosmetic Geometry	0:02:52	0:00:30
Datum Quilts	0:02:26	0:00:04
Datum Planes	0:02:28	0:00:06
Datum Curves	0:02:27	0:00:05
Datum Points	0:02:22	0:00:00
Datum Axes	0:02:27	0:00:05
Datum Csys	0:02:25	0:00:03
Planar Annotations	0:02:50	0:00:28
Screen Annotations	0:05:07	0:02:45
All		0:14:21

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