HEXAGON | MSC Software

MaterialCenter User Guide

Step 1. Log in and Personalize Your Homepage

Let us log in to MaterialCenter and explore the home page.

a. Open a web browser (such as Internet Explorer, Mozilla Firefox, or Google Chrome).

b. Type the URL for your MaterialCenter server in the address bar.

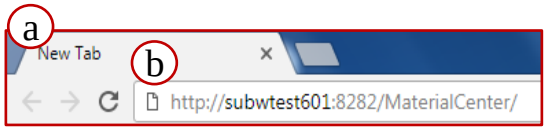
c. At the login screen, enter **user1** for User Name and **sdm** for Password.

d. Click **Login**.

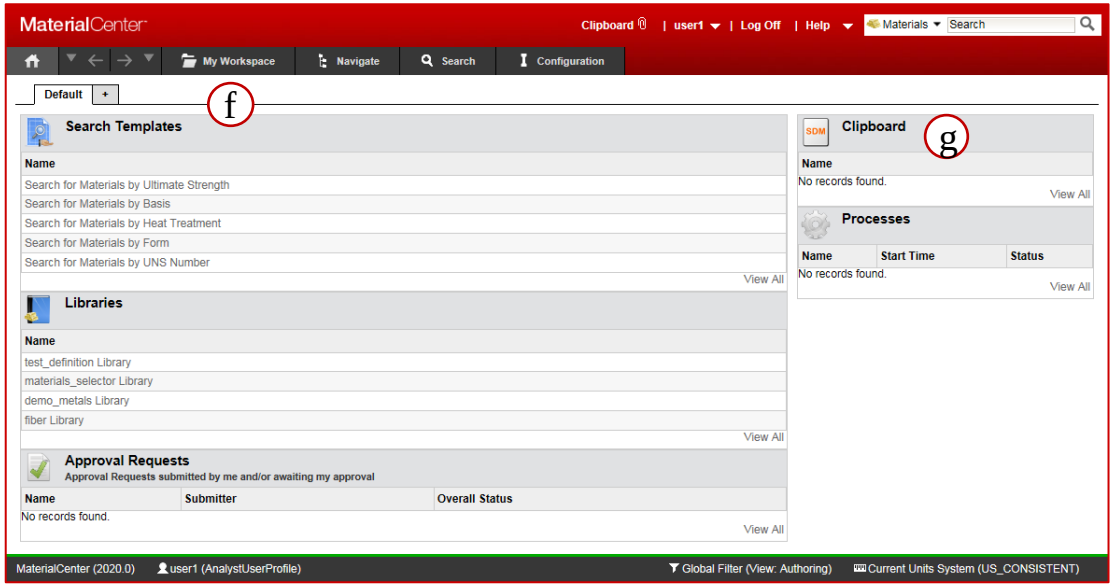
e. Dismiss the Disclaimer by clicking **OK**.

f. The homepage is displayed.

g. Note the arrangement of the homepage gadgets (Clipboard, Libraries, etc).



Obtain the MaterialCenter URL from your instructor or system administrator.



Step 1. Log in and Personalize Your Homepage (Cont.)

You can create a custom homepage dashboard to view specific types of information whenever you log in.

h. In the Main Menu, click the **+** icon next to the Default dashboard.

i. Select **New Dashboard**.

j. Name the dashboard **My Dashboard** and select **Ok**.

k. Right-click the **My Dashboard** tab and select **Edit.**

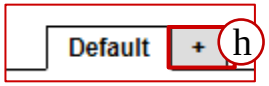
l. Click **+** to add the Folders gadget to the first column.

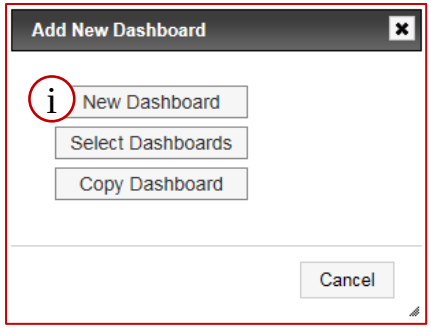
m. Change the Gadget dropdown menu to **My Info**.

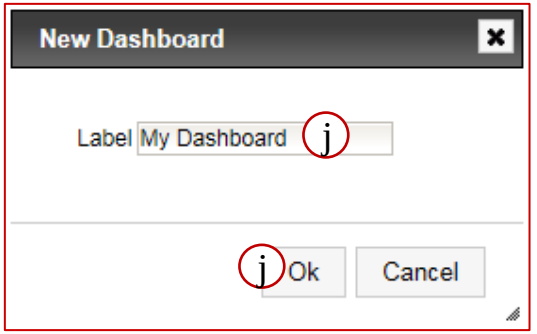
n. Click **+** to add the My Info gadget to the first column.

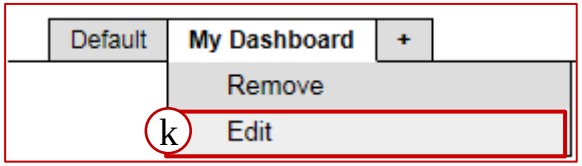
o. Click **Submit** to save your new gadget.

p. Note the new arrangement of your custom homepage dashboard.

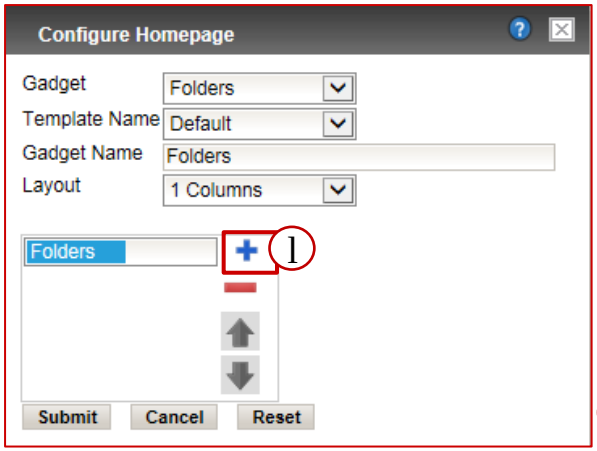


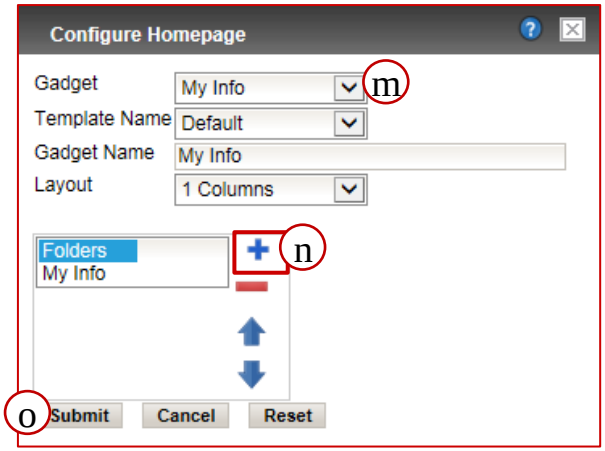


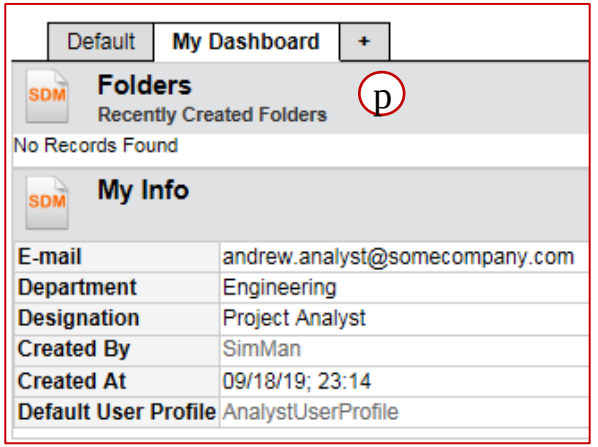




For a description of available gadgets, please visit: https://docs.mscsoftware.com/MaterialCenter/2017/home-page





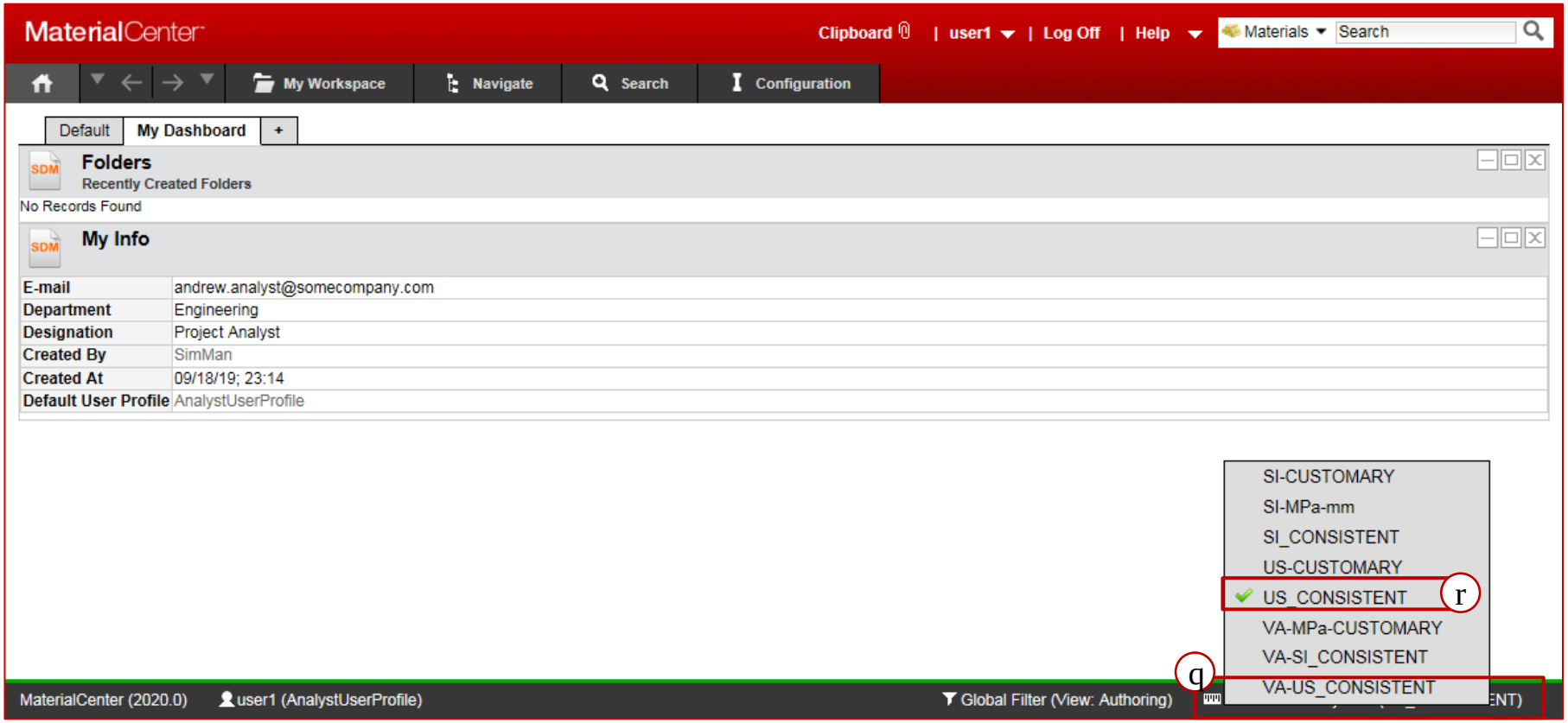


Step 1. Log in and Personalize Your Homepage (Cont.)

The Current Units System for material properties can be quickly viewed and modified directly through the page footer.

q. At the bottom-right corner of any page, select **Current Units System.**

r. In the prompted Units System list, make a selection set the displayed units system across the system.



Step 2. Use the Navigate Workspace

Now let us use the Navigate Workspace to view specific types of materials with the Tree and List View.

a. Click the **Navigate** workspace tab.

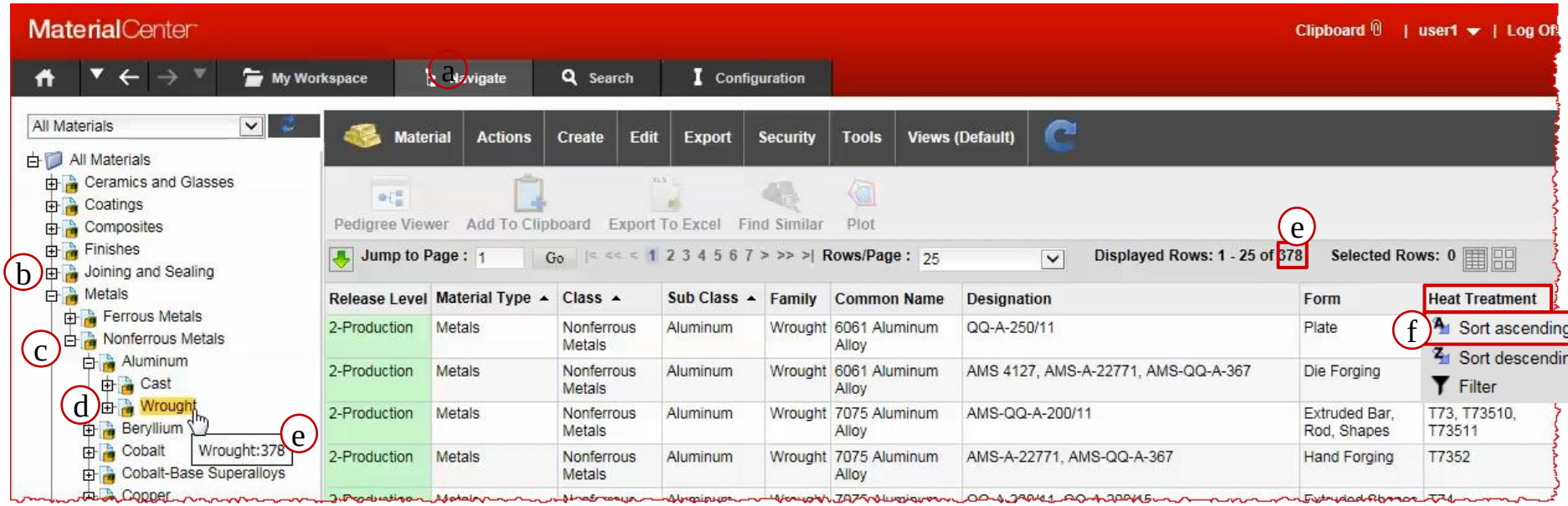
b. On the navigation tree, click the **+** next to **Metals**.

c. Continue expanding the tree by clicking **+** at **Nonferrous Metals** then **Aluminum**.

d. Select the word **Wrought** to show the list of a materials in this family.

e. Hovering the mouse over a node also provides a count of the records within that node. There are 378 materials at this node in the tree.

f. Click the **Heat Treatment** column header in the List View and select **Sort ascending**.



Step 2. Use the Navigate Workspace (Cont.)

Configure your List View and Save it as a Private View.

g. Click the **green arrow** for List View options.

h. Click **Configure Columns**.

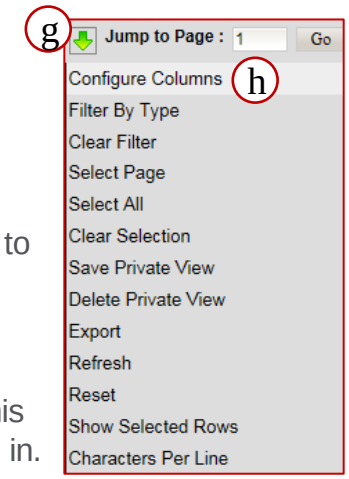
i. Use Ctrl to select **Create At** and **Created By** and move them to the Visible Columns.

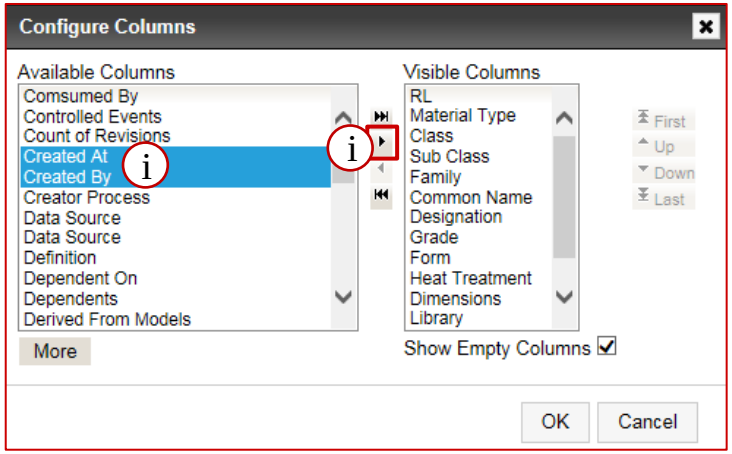
j. Select the two relocated column names and click **First** to place them at the top of the list. Click **OK** to view the new List View configuration.

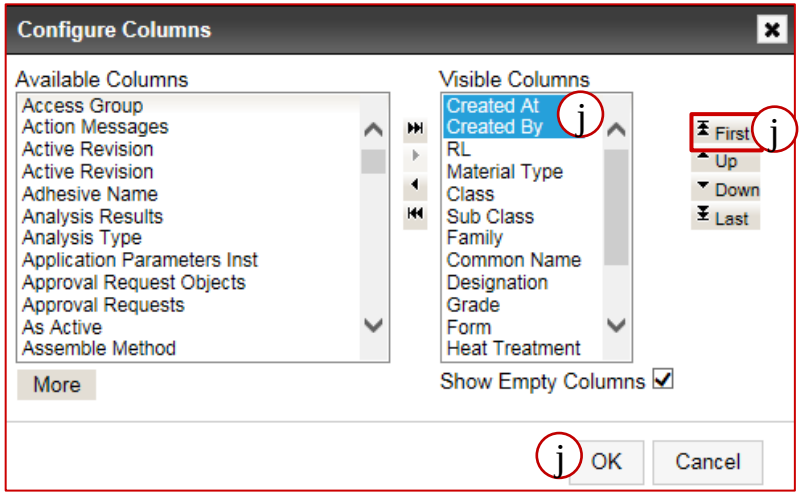
k. Click on the **green arrow** again and select **Save Private View**.

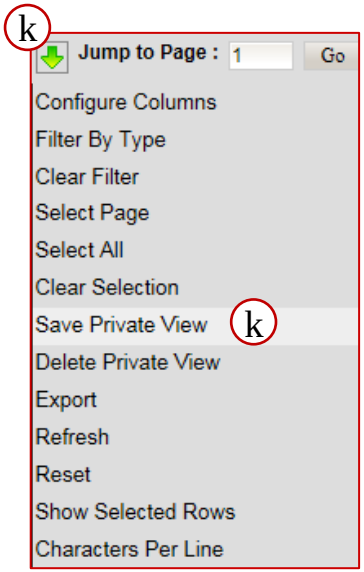
l. Check **Show As Default View** and select **OK.** This will become your new List View whenever you log in.

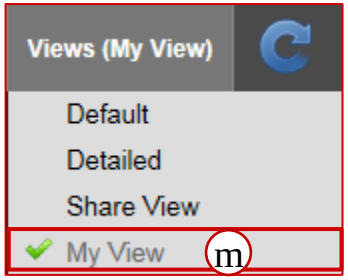
m. Under the Views menu, you can find or change your saved Private Views.











Step 3. Select Materials and Export

After configuring the columns you want to see in the List View, you can export the table to Excel.

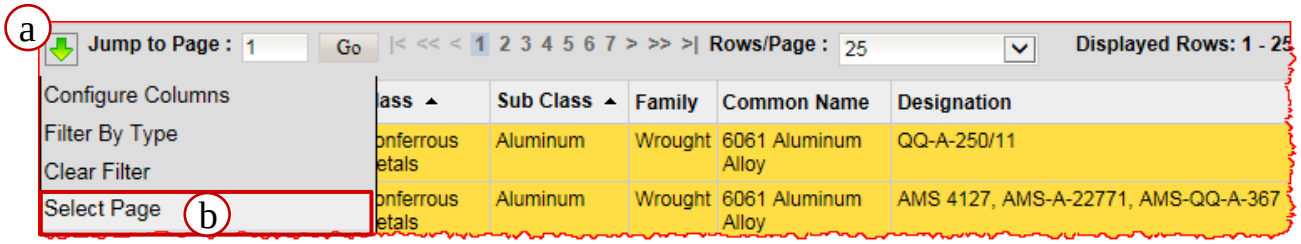
a. Click the **green arrow** for List View options.

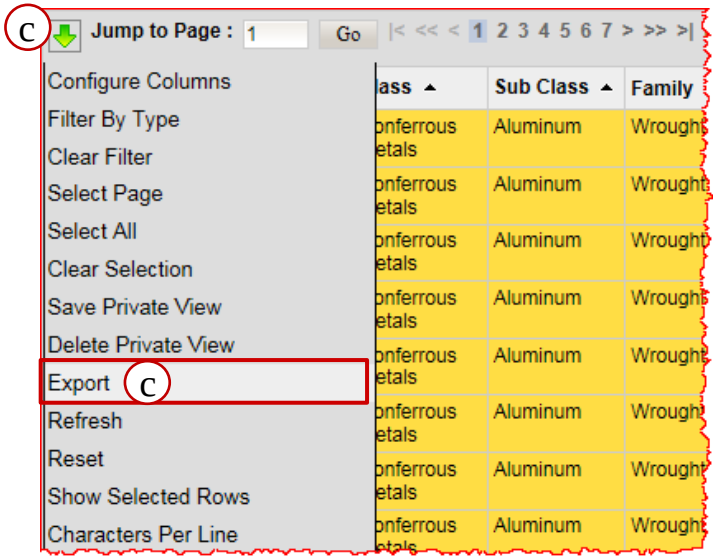
b. Click **Select Page**.

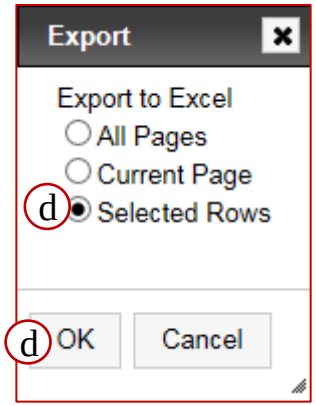
c. Select the **green arrow** again and select **Export**.

d. Click **Selected Rows** and **OK** to download an excel file.

e. Open the excel file to view the exported data. Note that this action only exported the tabulated List View data, not the detailed property or record data.







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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Created At	Created By	Release Level	Material Type	Class	Sub Class	Family	Common Name	Designation	Grade	Form	Heat Treatment	Dimensions	Library	Security Labels	Rev.
2	09/18/19; 23:30	Root	2-Production	Metals	Nonferrous Metals	Aluminum	Wrought		AA 2014			Annealed		[Materials Selector]		1
3	09/18/19; 23:30	Root	2-Production	Metals	Nonferrous Metals	Aluminum	Wrought		AA 2017			Annealed		[Materials Selector]		1
4	09/18/19; 23:30	Root	2-Production	Metals	Nonferrous Metals	Aluminum	Wrought		AA 5052			Annealed		[Materials Selector]		1
5	09/18/19; 23:30	Root	2-Production	Metals	Nonferrous Metals	Aluminum	Wrought		AA 2024			Annealed		[Materials Selector]		1
6	09/18/19; 23:30	Root	2-Production	Metals	Nonferrous Metals	Aluminum	Wrought		AA 2219			Annealed		[Materials Selector]		1
7	09/18/19; 23:30	Root	2-Production	Metals	Nonferrous Metals	Aluminum	Wrought		AA 5005			Annealed		[Materials Selector]		1
8	09/18/19; 23:30	Root	2-Production	Metals	Nonferrous Metals	Aluminum	Wrought		AA 5050			Annealed		[Materials Selector]		1
9	09/18/19; 23:30	Root	2-Production	Metals	Nonferrous Metals	Aluminum	Wrought		AA 5154			Annealed		[Materials Selector]		1
10	09/18/19; 23:30	Root	2-Production	Metals	Nonferrous Metals	Aluminum	Wrought		AA 5056			Annealed		[Materials Selector]		1
11	09/18/19; 23:30	Root	2-Production	Metals	Nonferrous Metals	Aluminum	Wrought		AA 5083			Annealed		[Materials Selector]		1

Ensure that your browser's pop-up blocker is disabled for this step.

Step 4. Open a Material Detailed View

Now let us examine the Detailed View (Datasheet) of one material.

a. In the navigation tree, expand **Metals**, **Ferrous Metals**, then **Alloy Steels**.

b. Select **Ultra-High Strength.**

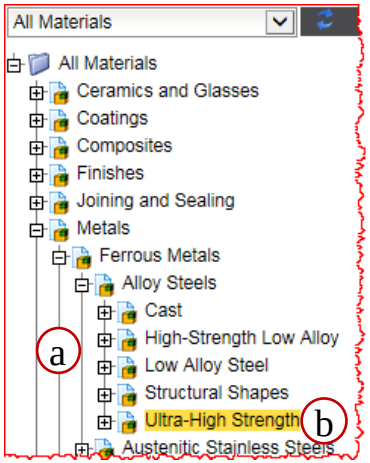
c. Double-click the row with Common Name: **D-6A Alloy Steel**.

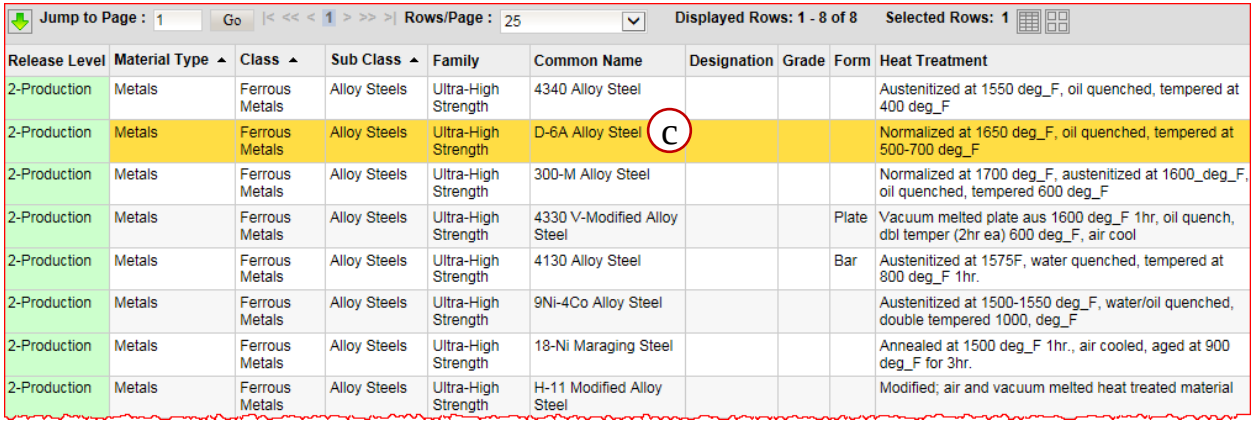
d. The Detailed View is displayed in My Workspace.

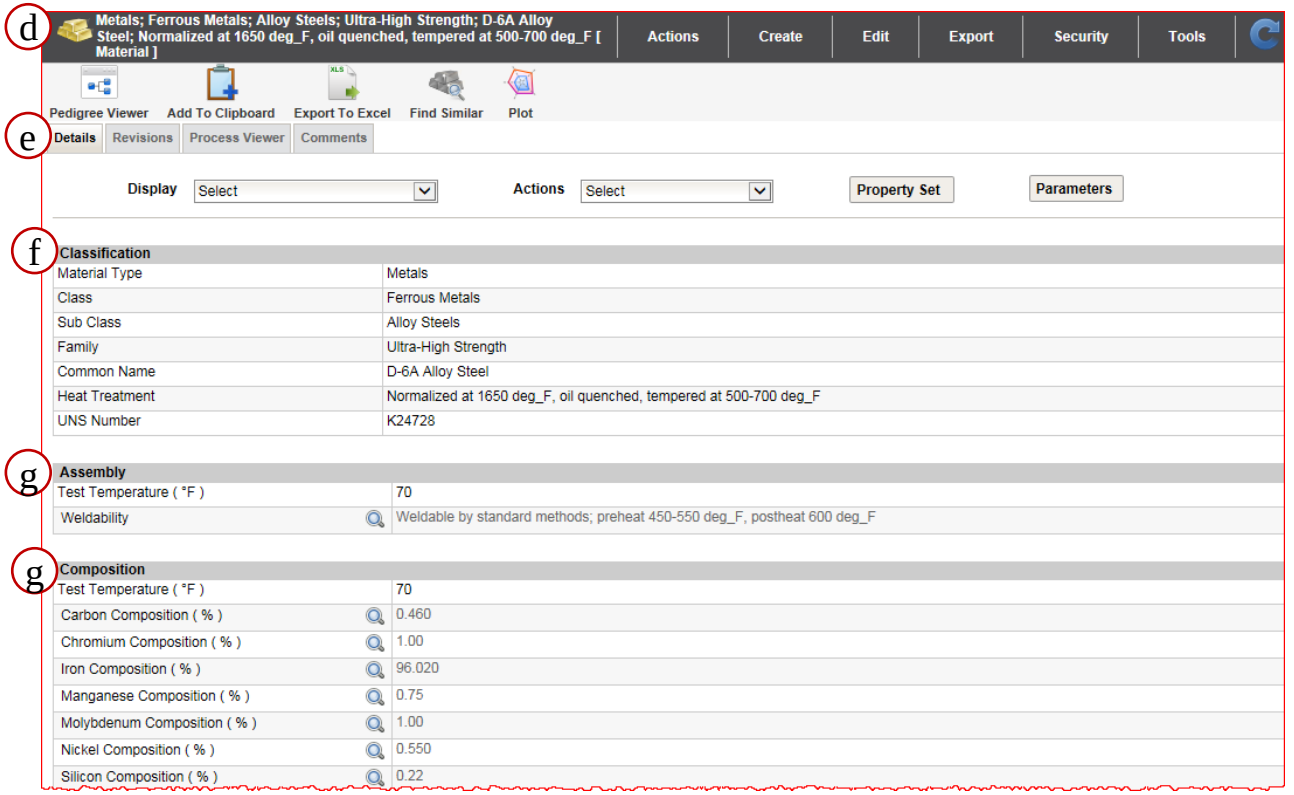
e. The Details tab is opened by default.

f. The Classification data is listed at the top of the datasheet.

g. The Property Sets (Assembly, Composition, Mechanical, etc.) are listed below the Classification.







Step 4. Open a Material Detailed View (Cont.)

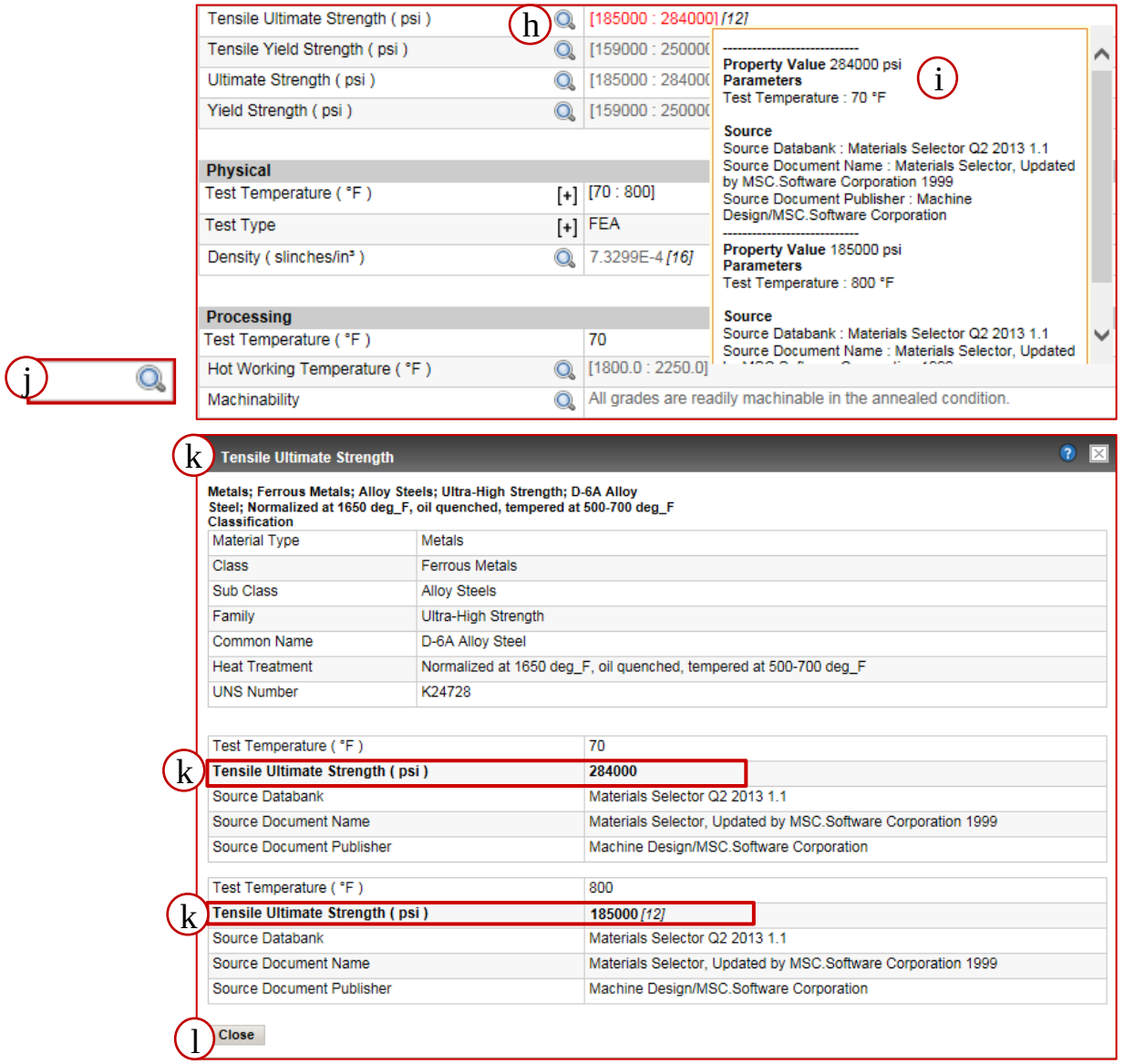
h. Hover the mouse over a property value, for example, the **185.00E+3 - 284.00E+3** range for *Tensile Ultimate Strength*.

i. The Property Value, Parameters, and Source attributes are displayed in a tool-tip.

j. To open a separate window containing all the properties for one row, click the **magnifying glass icon** at the right end of the row.

k. The Material Classification is at the top, followed by each value of that property with corresponding parameters and source attributes.

l. Close the Property details window.



Step 5. Collapse Parameters and Filter Parameters

The property table columns can be expanded or collapsed, and displayed parameter values can be filtered.

a. Click the **[+]** symbol next to the **Test Temperature** parameter.

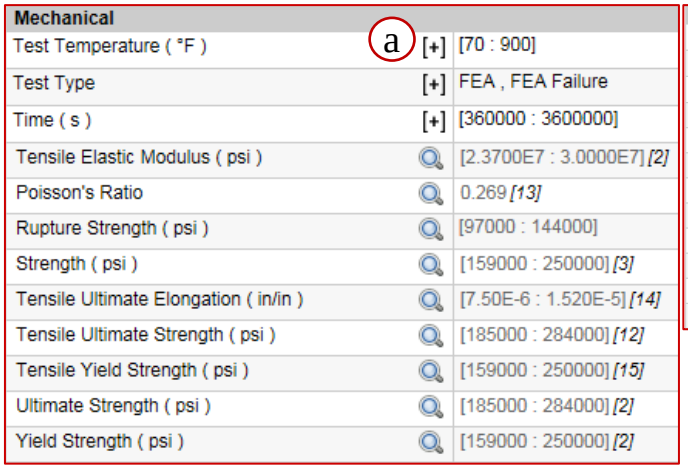
b. The parameter ranges and the corresponding property values are now expressed as individual columns.

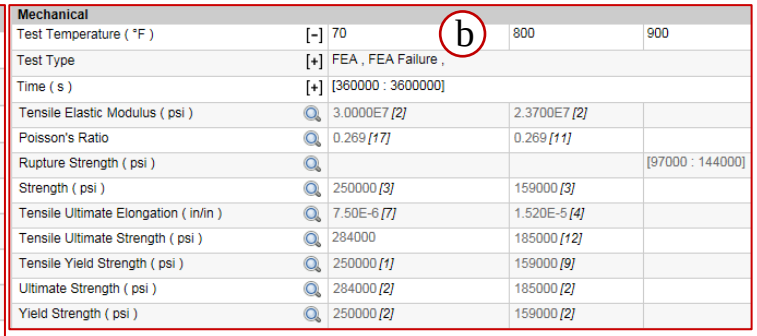
c. You can also use the **Expand Parameters** button to expand all the parameters at once at the top of the Datasheet.

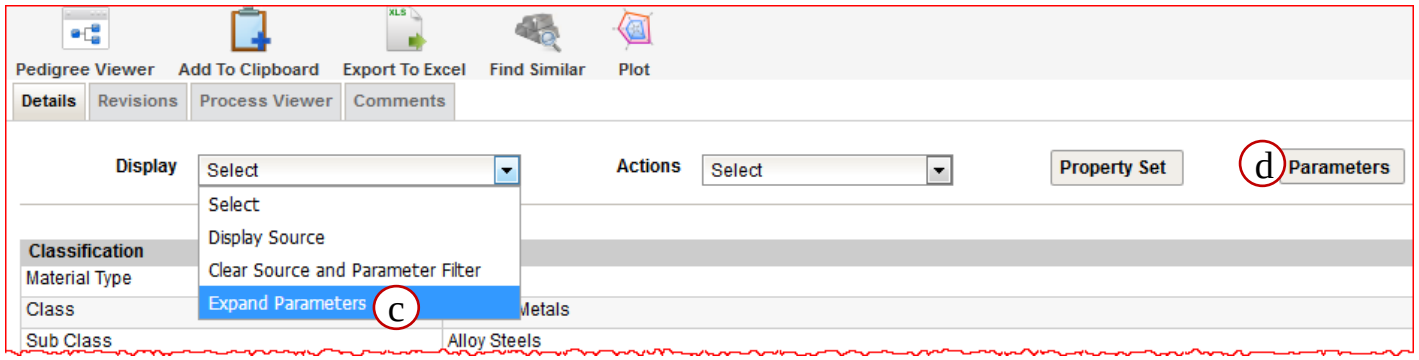
d. Click **Parameter** at the top of the Datasheet.

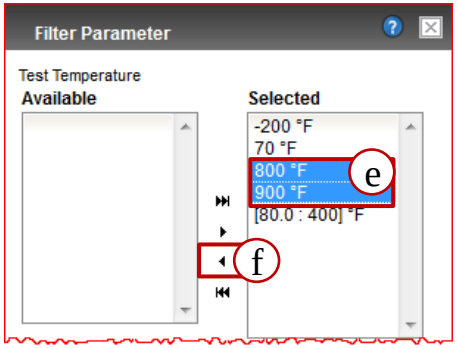
e. For Test Temperature, **Ctrl** select **800 deg_F and 900 deg_F**.

f. Click the **left arrow** to move these parameters to the Available column.







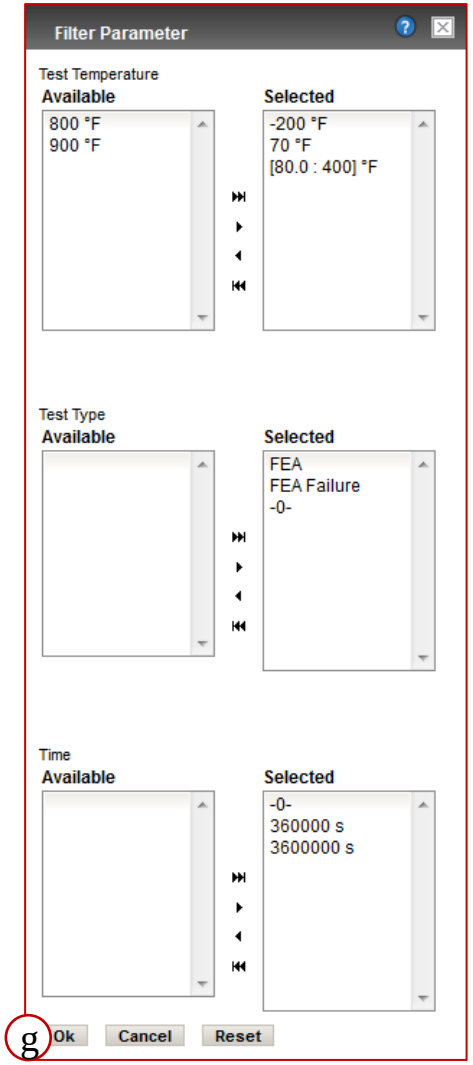


Step 5. Collapse Parameters and Filter Parameters (Cont.)

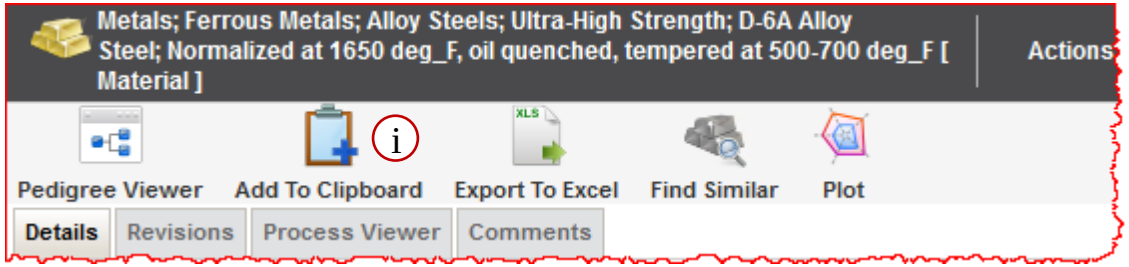
g. Click **Ok**.

h. After applying the filter, notice that the Mechanical property set table only has one Test Temperature value shown.

i. Select **Add To Clipboard** in the toolbar. This will allow you to quickly return to this material in the future.



Mechanical		
Test Temperature (°F)	h	70
Test Type	[+]	FEA , FEA Failure
Time (s)	[+]	
Tensile Elastic Modulus (psi)		3.0000E7 *[2]*
Poisson's Ratio		0.269 *[17]*
Rupture Strength (psi)		
Strength (psi)		250000 *[3]*
Tensile Ultimate Elongation (in/in)		7.50E-6 *[7]*
Tensile Ultimate Strength (psi)		284000
Tensile Yield Strength (psi)		250000 *[1]*
Ultimate Strength (psi)		284000 *[2]*
Yield Strength (psi)		250000 *[2]*



Step 6. Add Source Attributes

By default, Source attributes are not displayed. The Display Source button is used to add them to each property in the Detailed View.

a. Click **Display Source** at the top of the Datasheet.

b. **Ctrl** select **Source Databank** and **Source Document Publisher**.

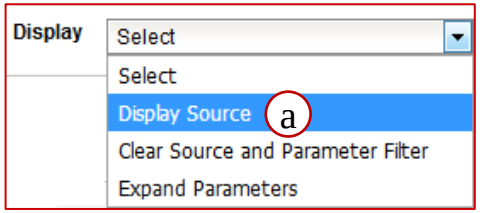
c. Click the **right arrow** to move these to the Selected column.

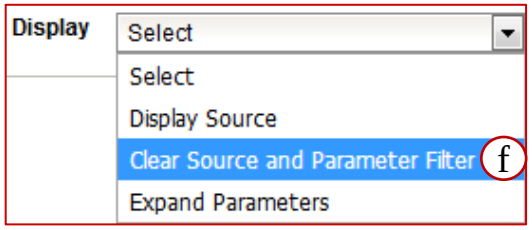
d. Click **Ok**.

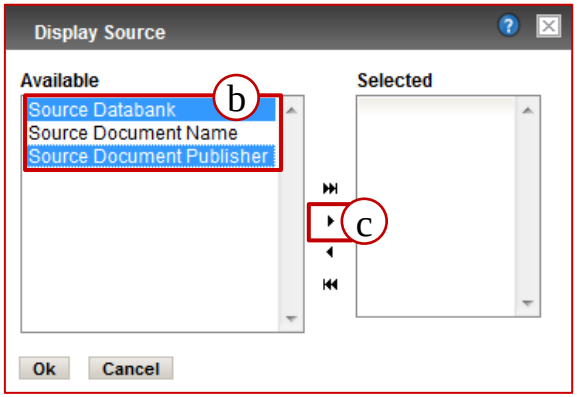
e. The selected Source attributes are now added to the detailed view, in italic font, and indented below the relevant property name.

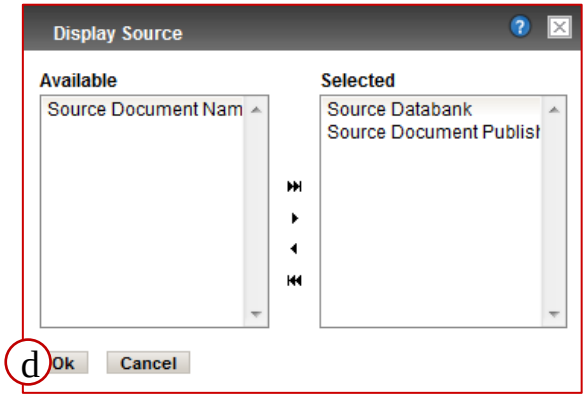
For example, Charpy Impact Strength, now has its Source Databank and Source Document Publisher shown.

f. Click **Clear Source and Parameter Filter** to reset the current view to the default view (all Parameters shown and all Source attributes hidden).









Impact		
Test Temperature (°F)	[+]	[-200 : 70]
Specimen Details		Unnotched
Charpy Impact Strength (Btu)		[10.0 : 14.0]
Source Databank		Materials Selector Q2 2013 1.1
Source Document Publisher		Machine Design/MSC.Software Corporation

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Step 7. Change the Footnote Display in Options Panel

Footnotes can be displayed as a tool-tip, or in-line with Properties. Let's look at both options.

a. Scroll to the Mechanical properties table.

b. Hover the mouse over the footnote: **[13]**, next to Poisson's Ratio.

c. Note the tool-tip displayed on mouse-over. [SAE Handbook...]

d. In the Main Menu, click the **down-arrow** next to your user name, user1, and select **Options**.

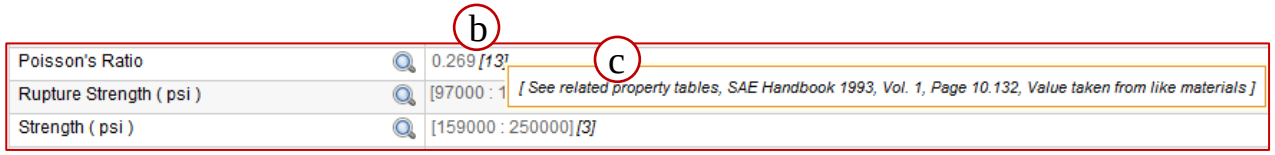
e. Scroll to the bottom of the Options panel, and select the **Footnotes Inline** check box.

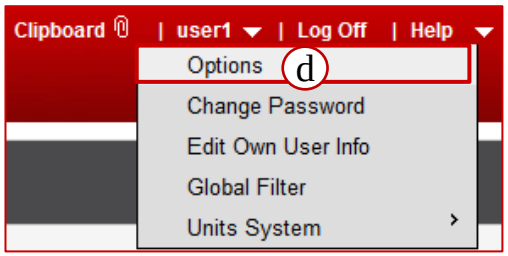
f. Click **Submit**.

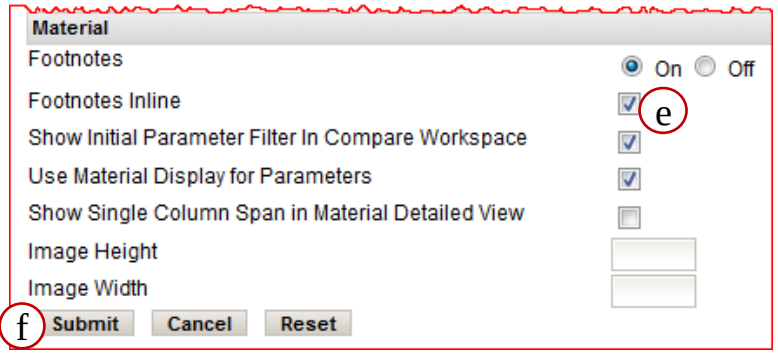
g. After saving Options, you will be taken to the Home page.

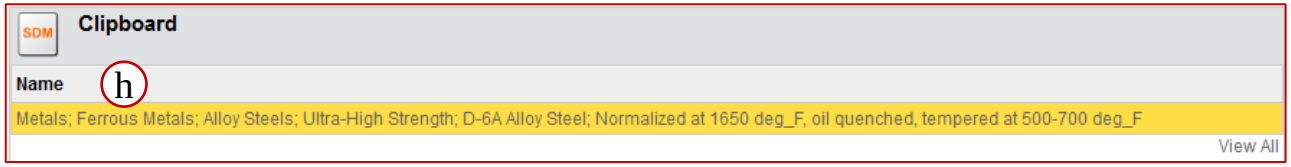
h. In the Clipboard gadget, select the **D-6A Alloy Steel** material which you placed in the previous step.

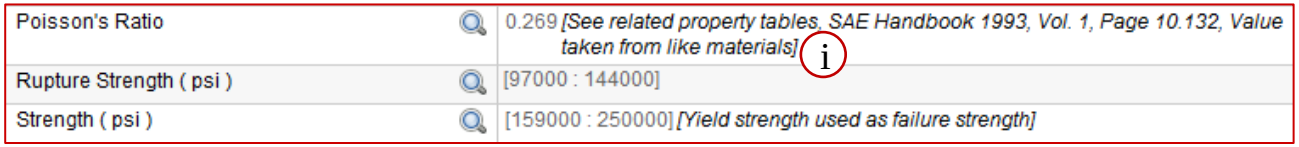
i. Review the Property Set tables and note that the footnotes are now displayed in-line next to the property value.











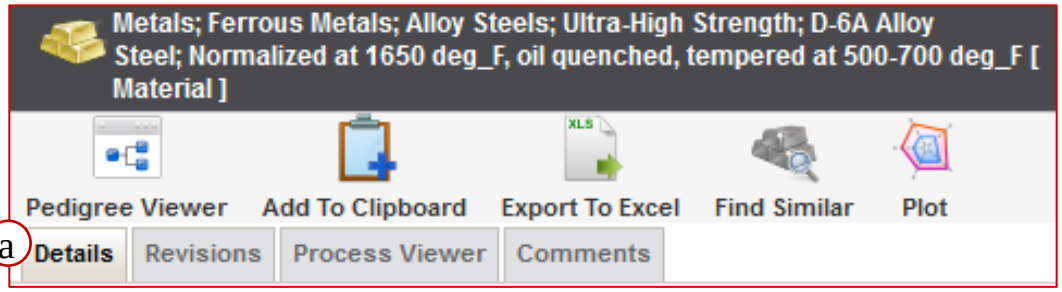
Step 8. Explore the Datasheet Tabs and Pedigree Viewer

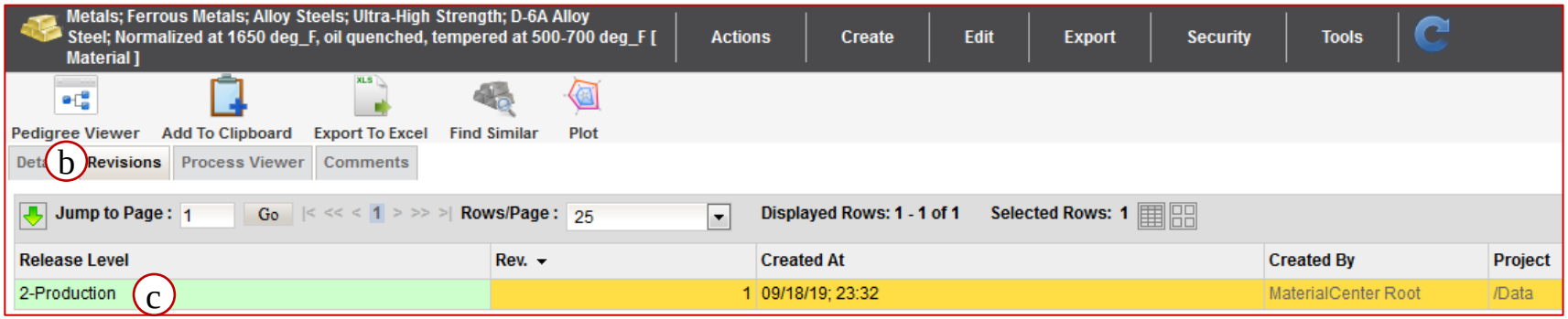
A material detailed view (Datasheet) is a multi-tabbed interface. Let us look at the available features under each tab.

a. When opening a material detailed view, you will be directed to the Details tab (as previously mentioned).

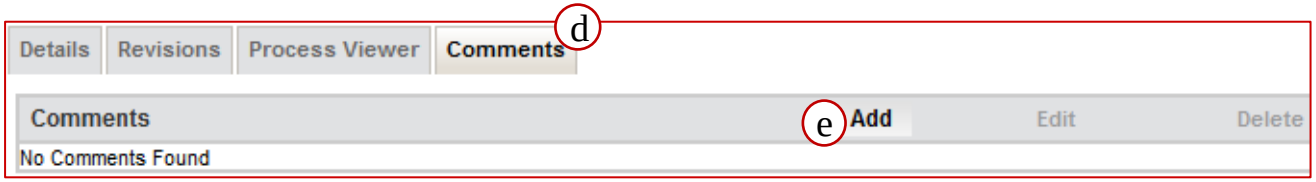
b. Click the **Revisions** tab.

c. Under this tab, the user has access to useful information regarding the Revision of a material, date that the material was Created At, who the material was Created By, and which Project the material belongs to.

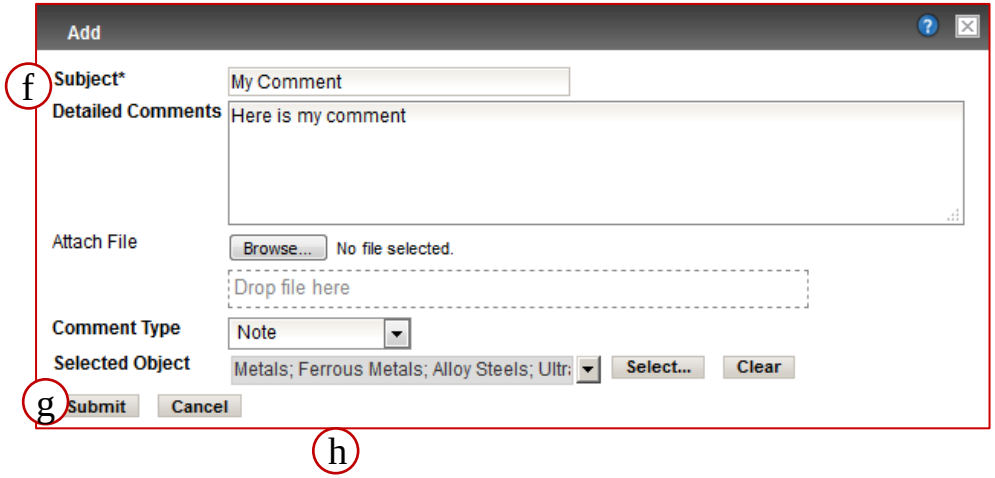


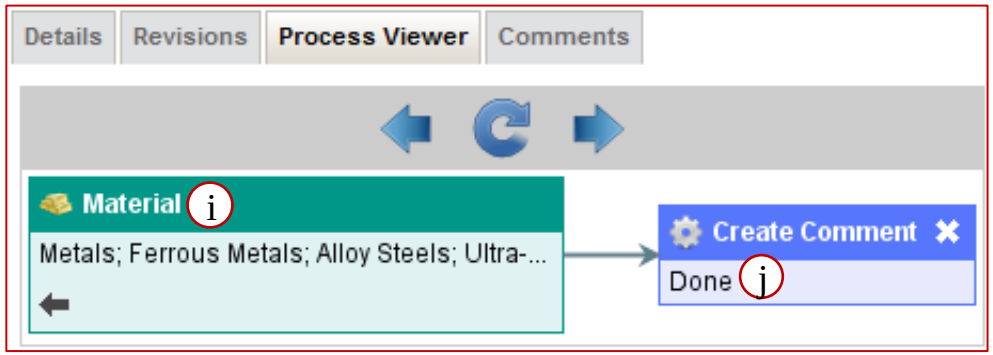


Step 8. Explore the Datasheet Tabs and Pedigree Viewer (Cont.)



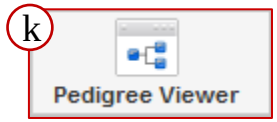
d. Click the **Comments** tab.
e. Click **Add** to create a comment.
f. Enter a **Subject** and **Detailed Comments**.
g. Click **Submit** to add a comment.
h. Click the **Process Viewer** tab. This shows an interactive diagram of object and process relations.
i. Objects are in green (Material) and Processes are blue (Create Comment). The order of the Pedigree flows from left to right (i.e. the Material was created first, followed by the Comment).
j. Each box contains a link to the relevant object or process.

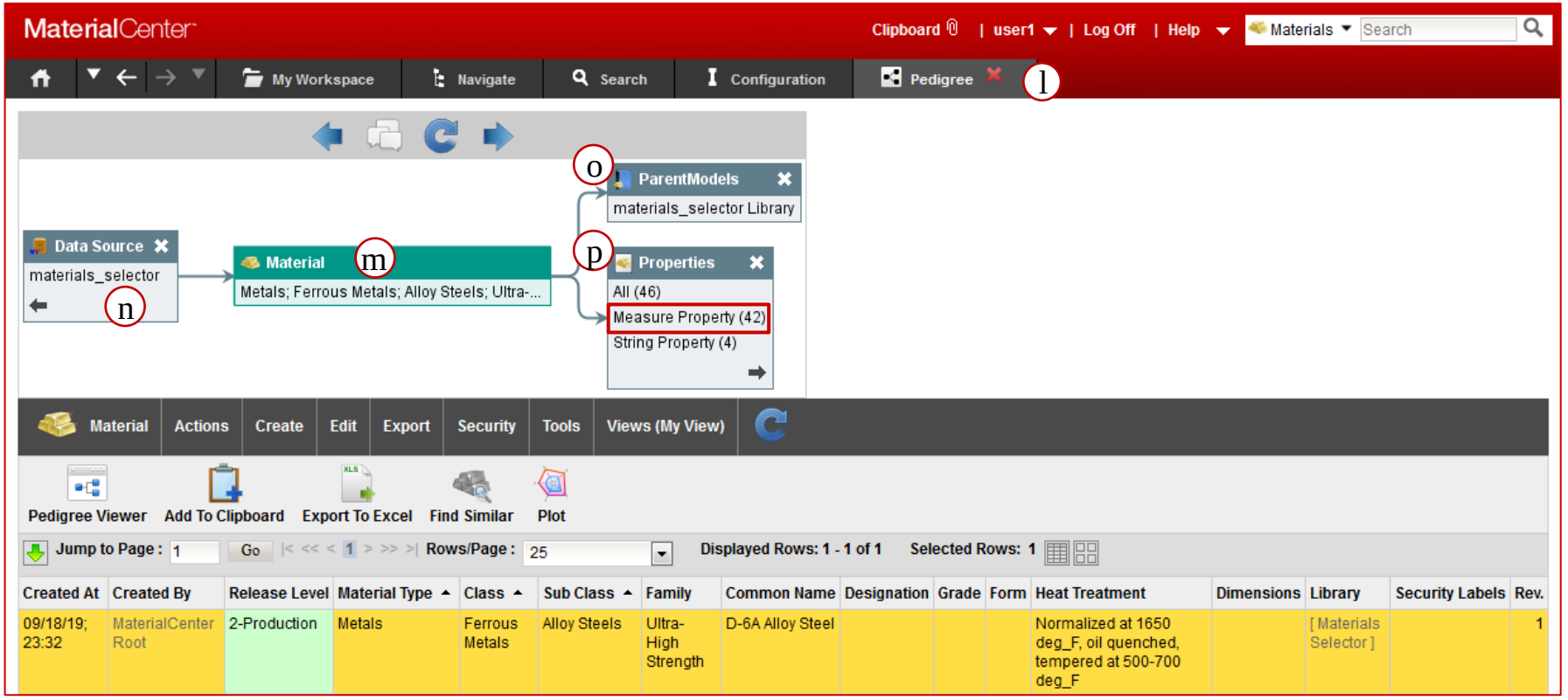




Step 8. Explore the Datasheet Tabs and Pedigree Viewer (Cont.)

k. Click the **Pedigree Viewer** icon on the toolbar.
l. The Pedigree Viewer opens in a Pedigree workspace tab.
m. The selected material is in the green box at the center of the diagram.
n. Parent objects are to the left of the material.
o. Child objects are to the right.
p. Click the Measure Property Set link: List (42). The list at the bottom will show all the measure property sets in the material record.





Step 9. Use Easy Search, then Filter the Results

You can always use the *Easy Search*, from any workspace, to quickly perform string-based and conditional searches through the “top-down” search method.

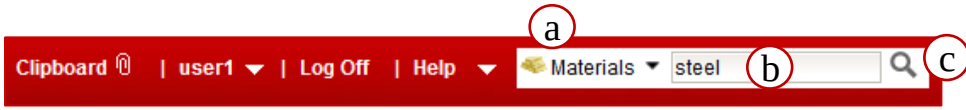
a. Use the default query for **Materials**.

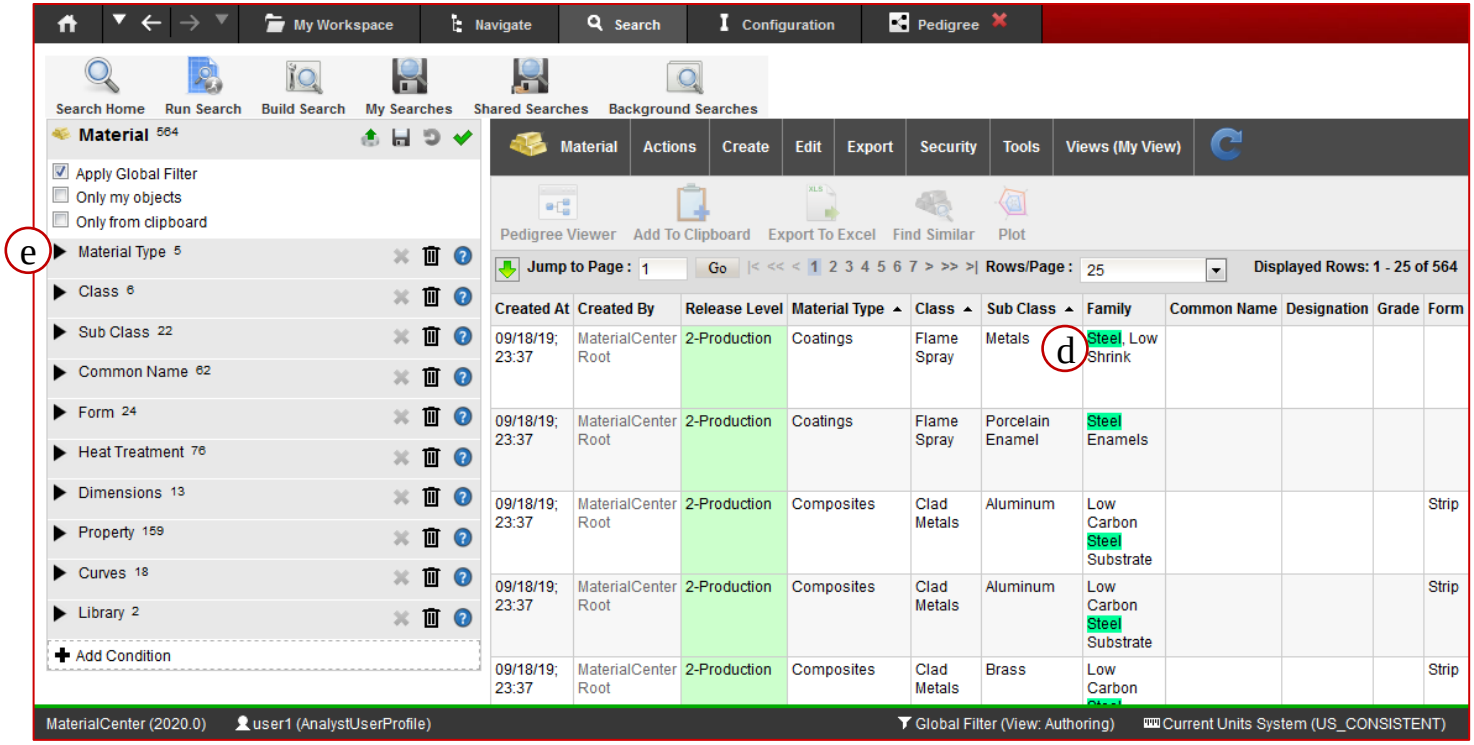
b. Type **steel** in the Easy Search box.

c. Click the **Search** icon (or hit **Enter** on your keyboard).

d. The Search workspace is opened and lists all the matching materials, with the search string highlighted in green.

e. On the left side is a filter panel with pre-configured search conditions (attributes) for refining your search results (Material Type, Class, etc.).





Step 9. Use Easy Search, then Filter the Results (Cont.)

f. Click the **arrow** next to Material Type to expand this attribute.

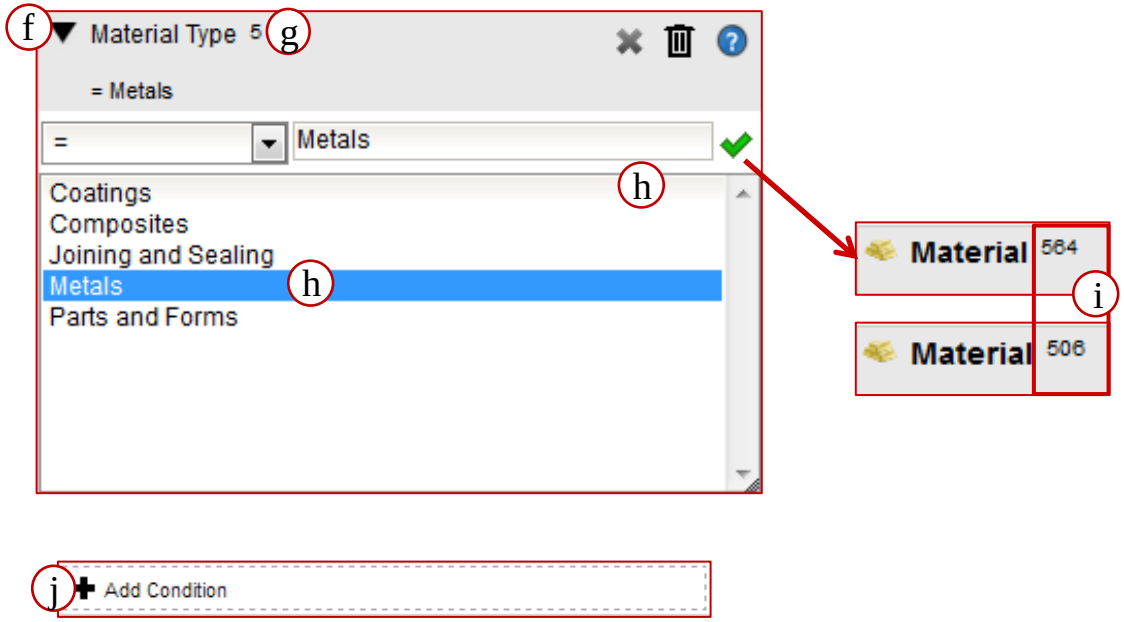
g. The number 5 indicates the number of unique values that apply to this attribute.

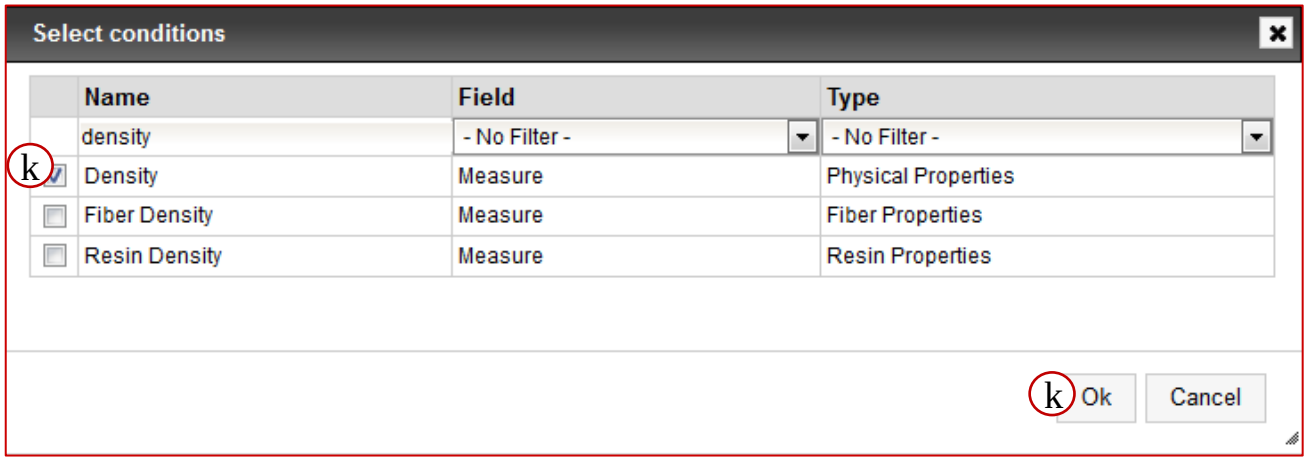
h. Select **Metals** and click the **check** symbol to apply the filter.

i. The number of matching materials is reduced from 564 to 506.

j. Select **Add Condition** at the bottom of the filter panel to apply additional filters.

k. Type and select **Density,** then click **Ok**.





Step 9. Use Easy Search, then Filter the Results (Cont.)

l. Click the **arrow** next to Density to expand this category.

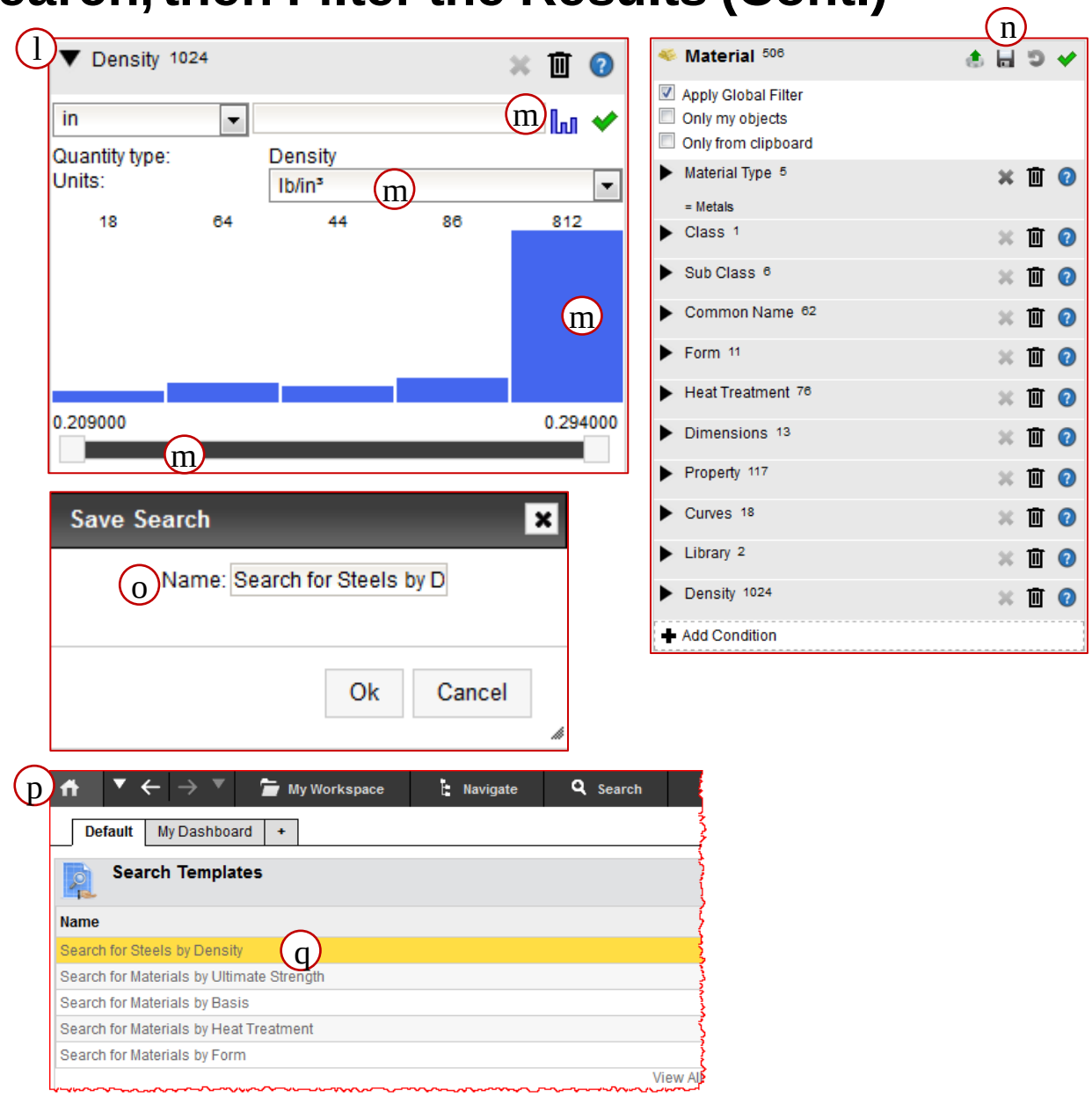
m. Within this search condition, you can change the **Units**, click on the **histogram** bars to drill into a specific range, or use the **sliding bar** to apply a range of values. Click the **check** mark to apply your search condition.

n. Click the **Save** icon to save the search template for later use.

o. Enter a Name for the search template, for example: Search for Steels by Density.

p. Return to the Home Page.

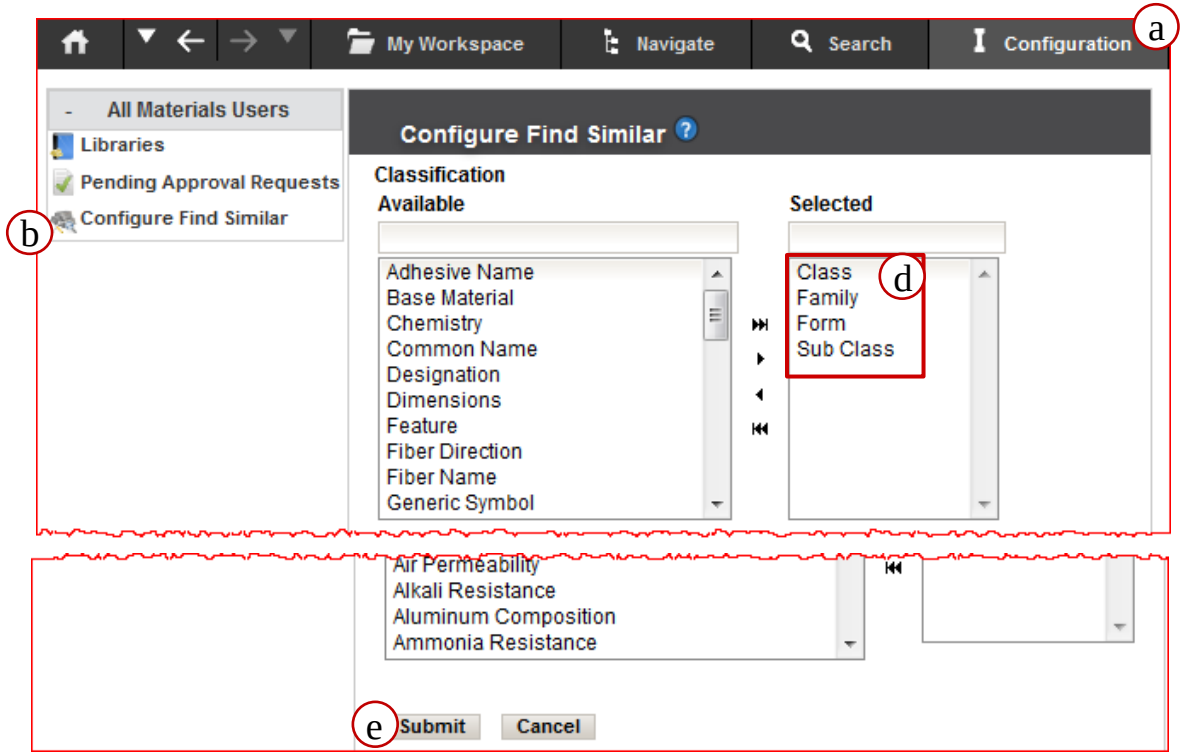
q. Your new saved search template is now in the Search Templates gadget and can be executed or edited by double-clicking the template name.



Step 10. Configure the “Find Similar” Search.

Another method of searching for records is with the Find Similar feature. Let us configure the behavior of the Find Similar search.

a. Click the **Configuration** tab.
b. Click the **Configure Find Similar** link.
c. In the Classification table, select the following, while holding the **Ctrl** select: **Class, Family, Form**, and **Subclass**.
d. Click the right arrow to move these to the Selected column.
e. Click **Submit**.



Step 11. Perform a “Find Similar” Search

After defining the Find Similar criteria, let us use the Find Similar function.

a. Return to Homepage.

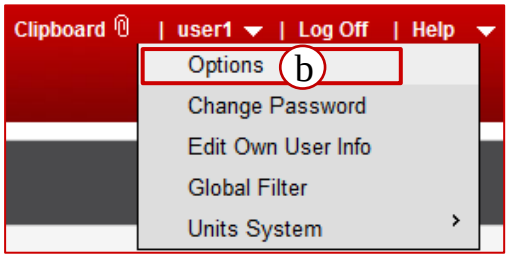
b. Open the **Options** panel.

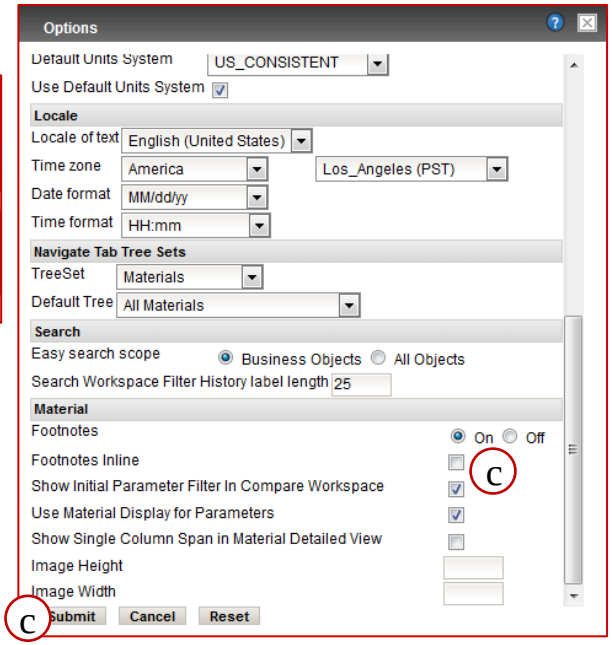
c. Turn **Off** the **Footnote Inline** option and **Submit**. This will produce a more compact display.

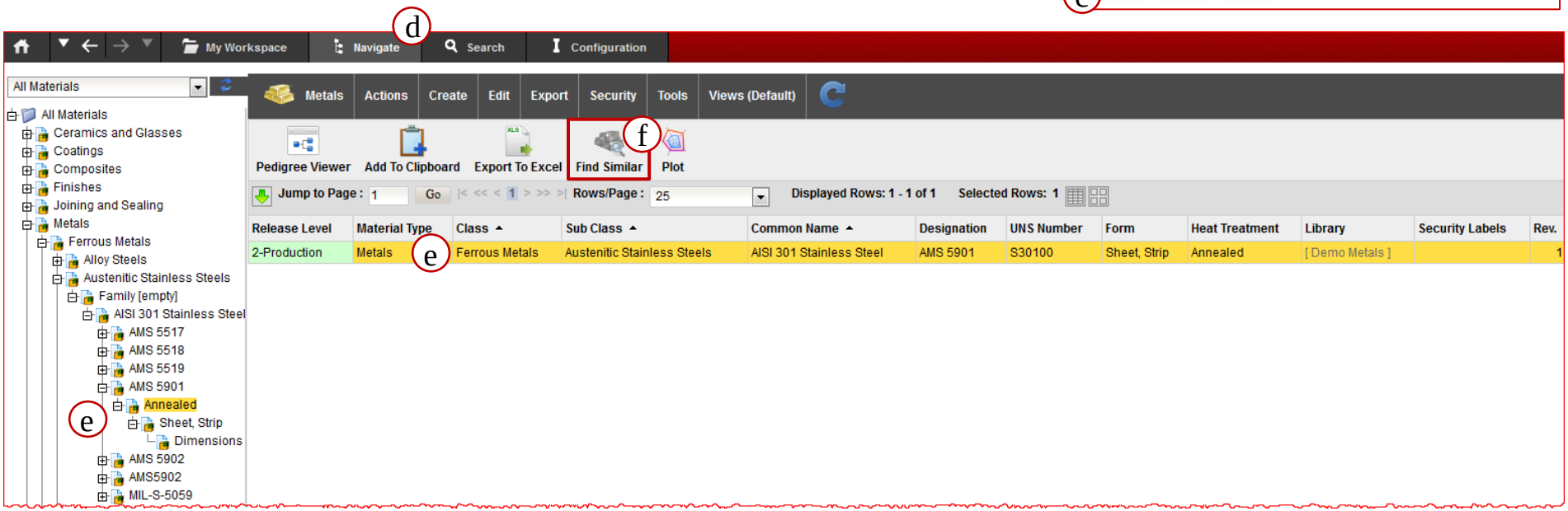
d. Click the **Navigate** tab.

e. Select the following material: **Metals; Ferrous Metals; Austenitic Stainless Steels; AISI 301 Stainless Steel; AMS 5901; Annealed**.

f. Click the **Find Similar** icon.







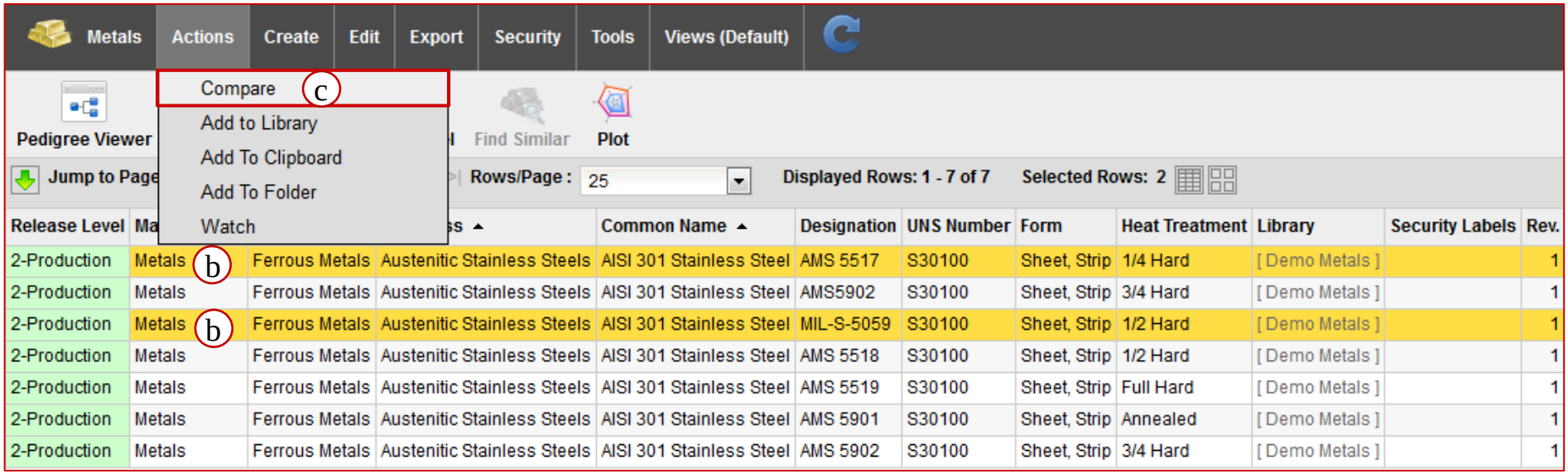
Step 12. Compare Two Materials

Comparing records is as simple as selecting multiple records, then launching the Compare tool.

a. The Find Similar search produces a list of several materials with the same Class, Family, Form, and Subclass. (As configured in Step 10.)

b. Select the **MIL-S-5059** and (**Ctrl** select) **AMS 5517 material** in the list.

c. Select the **Actions** menu → **Compare**.

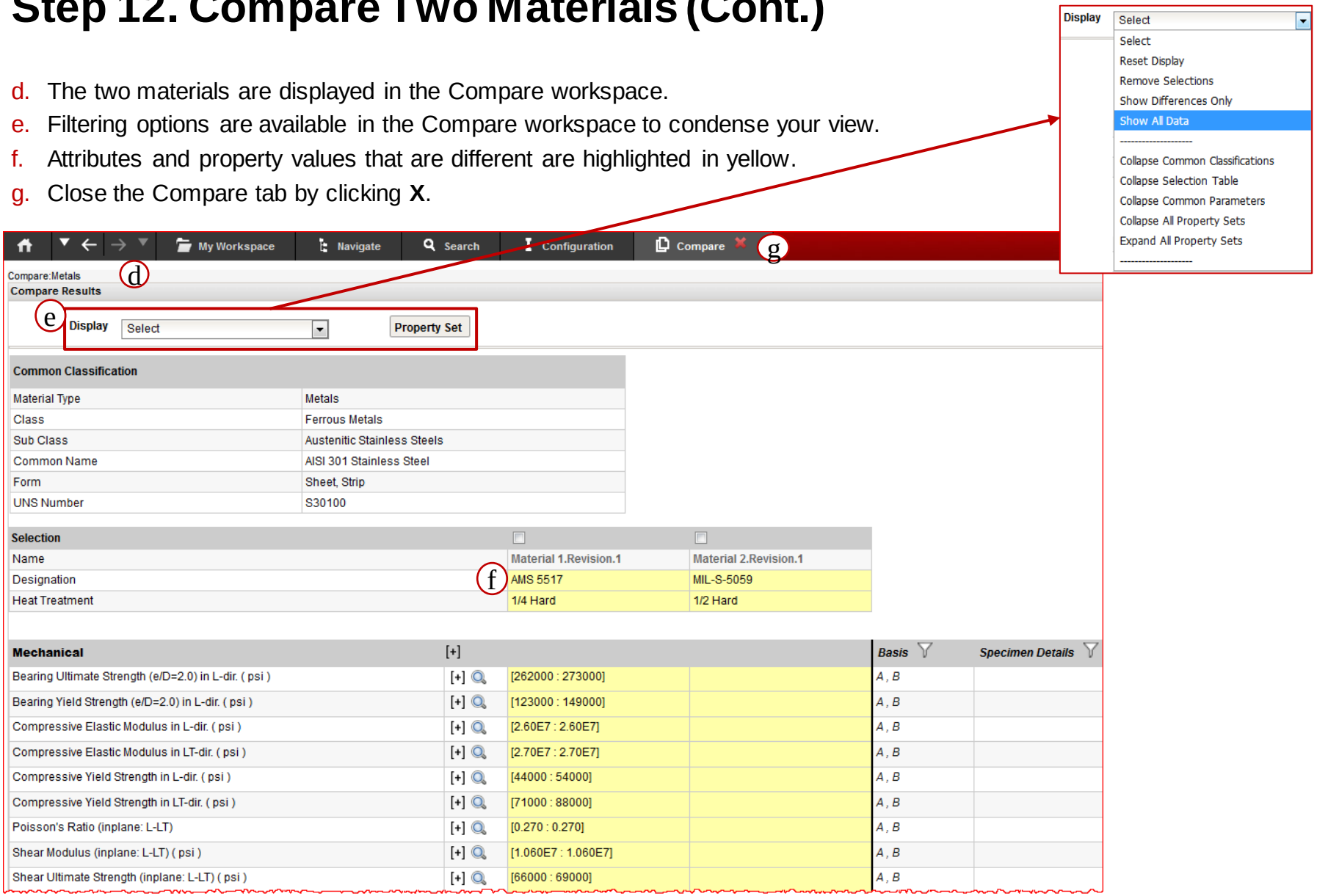


Release Level	Ma		ss ▲	Common Name ▲	Designation	UNS Number	Form	Heat Treatment	Library	Security Labels	Rev.
2-Production	Metals	Ferrous Metals	Austenitic Stainless Steels	AISI 301 Stainless Steel	AMS 5517	S30100	Sheet, Strip	1/4 Hard	[Demo Metals]		1
2-Production	Metals	Ferrous Metals	Austenitic Stainless Steels	AISI 301 Stainless Steel	AMS5902	S30100	Sheet, Strip	3/4 Hard	[Demo Metals]		1
2-Production	Metals	Ferrous Metals	Austenitic Stainless Steels	AISI 301 Stainless Steel	MIL-S-5059	S30100	Sheet, Strip	1/2 Hard	[Demo Metals]		1
2-Production	Metals	Ferrous Metals	Austenitic Stainless Steels	AISI 301 Stainless Steel	AMS 5518	S30100	Sheet, Strip	1/2 Hard	[Demo Metals]		1
2-Production	Metals	Ferrous Metals	Austenitic Stainless Steels	AISI 301 Stainless Steel	AMS 5519	S30100	Sheet, Strip	Full Hard	[Demo Metals]		1
2-Production	Metals	Ferrous Metals	Austenitic Stainless Steels	AISI 301 Stainless Steel	AMS 5901	S30100	Sheet, Strip	Annealed	[Demo Metals]		1
2-Production	Metals	Ferrous Metals	Austenitic Stainless Steels	AISI 301 Stainless Steel	AMS 5902	S30100	Sheet, Strip	3/4 Hard	[Demo Metals]		1

You can also access the **Compare** option by right-clicking the table.

Step 12. Compare Two Materials (Cont.)

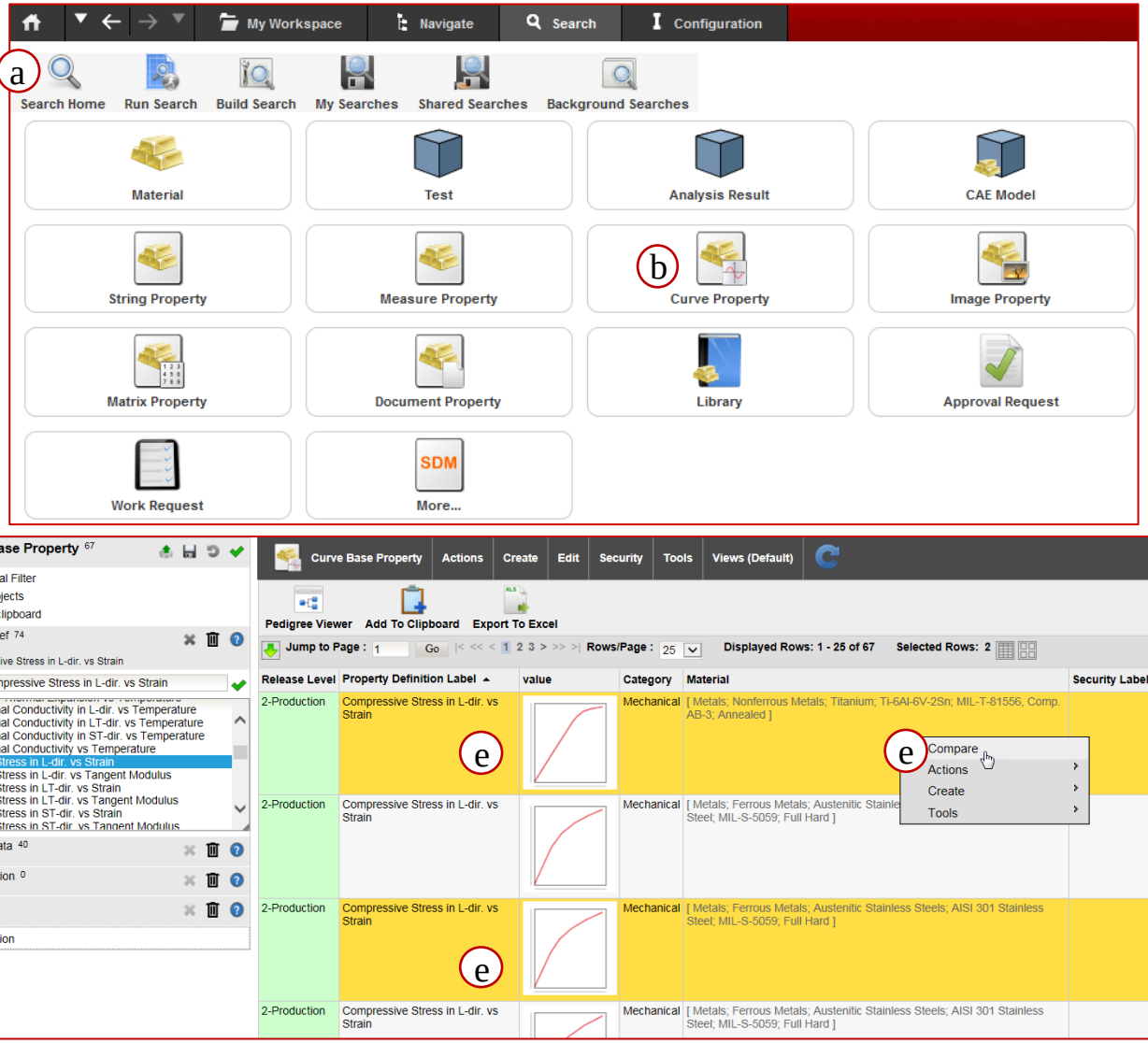
d. The two materials are displayed in the Compare workspace.
e. Filtering options are available in the Compare workspace to condense your view.
f. Attributes and property values that are different are highlighted in yellow.
g. Close the Compare tab by clicking **X**.



Step 13. Search for Curve Properties in Search Workspace

Curves can be displayed as icons, thumbnails, or full size images. Multiple curves can be overlaid onto one plot, and interactive options are available in the Curve Viewer.

a. Click the **Home** icon under the Search tab.
b. Click the **Curve Property** icon.
c. The Search results page displays all curve properties.
d. Under the Property filter, select **Compressive Stress in L-dir Vs Strain**, then click the **check** symbol to apply.
e. **Ctrl** select the **first** and **third properties**, **right-click** the selection. and click **Compare**.



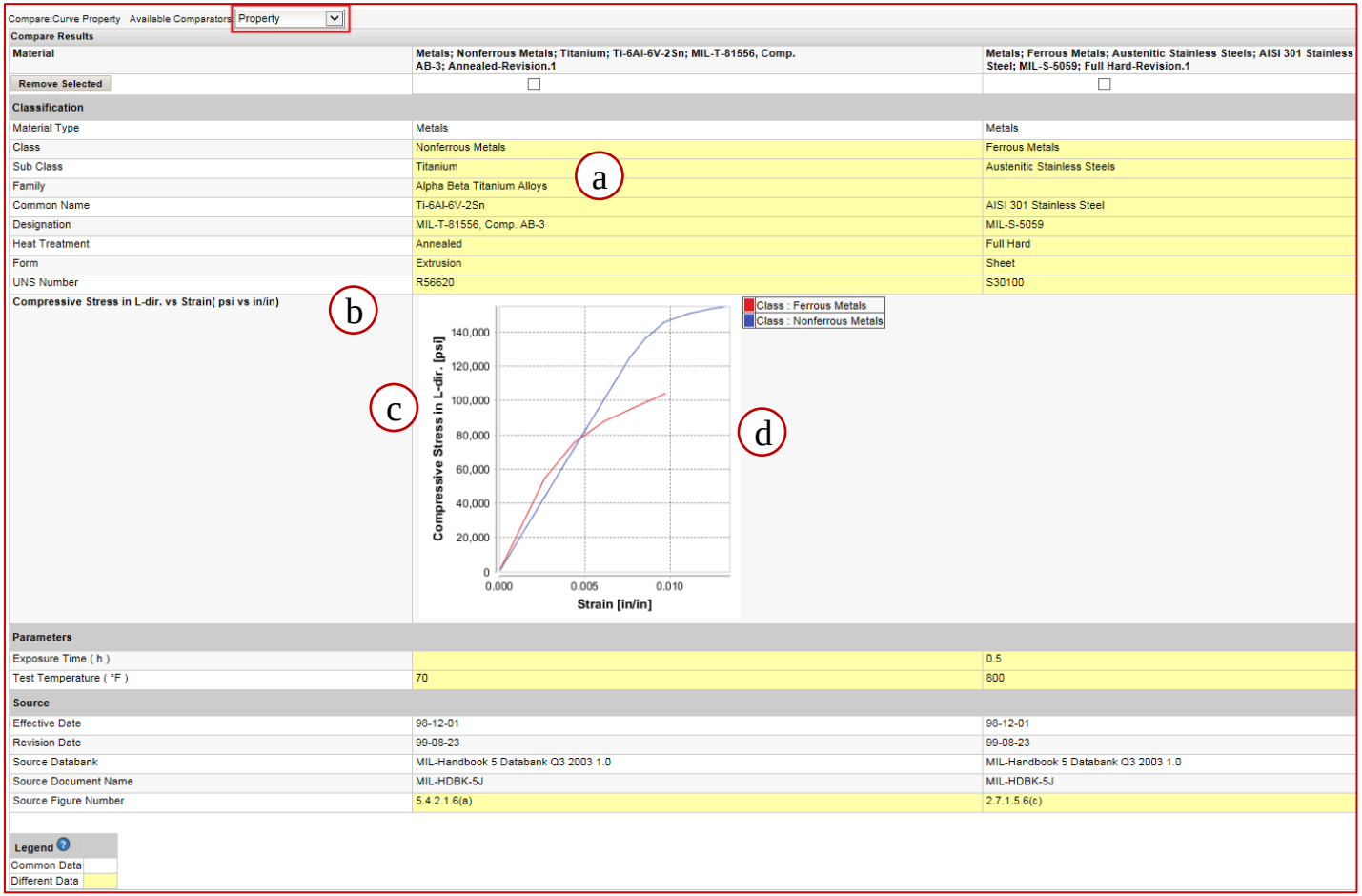
Step 14. Compare Two Curves

a. The comparison table for the two selected properties is displayed, with difference data highlighted in yellow.

b. Click the **curve icon** for Compressive Stress in L-dir Vs Strain.

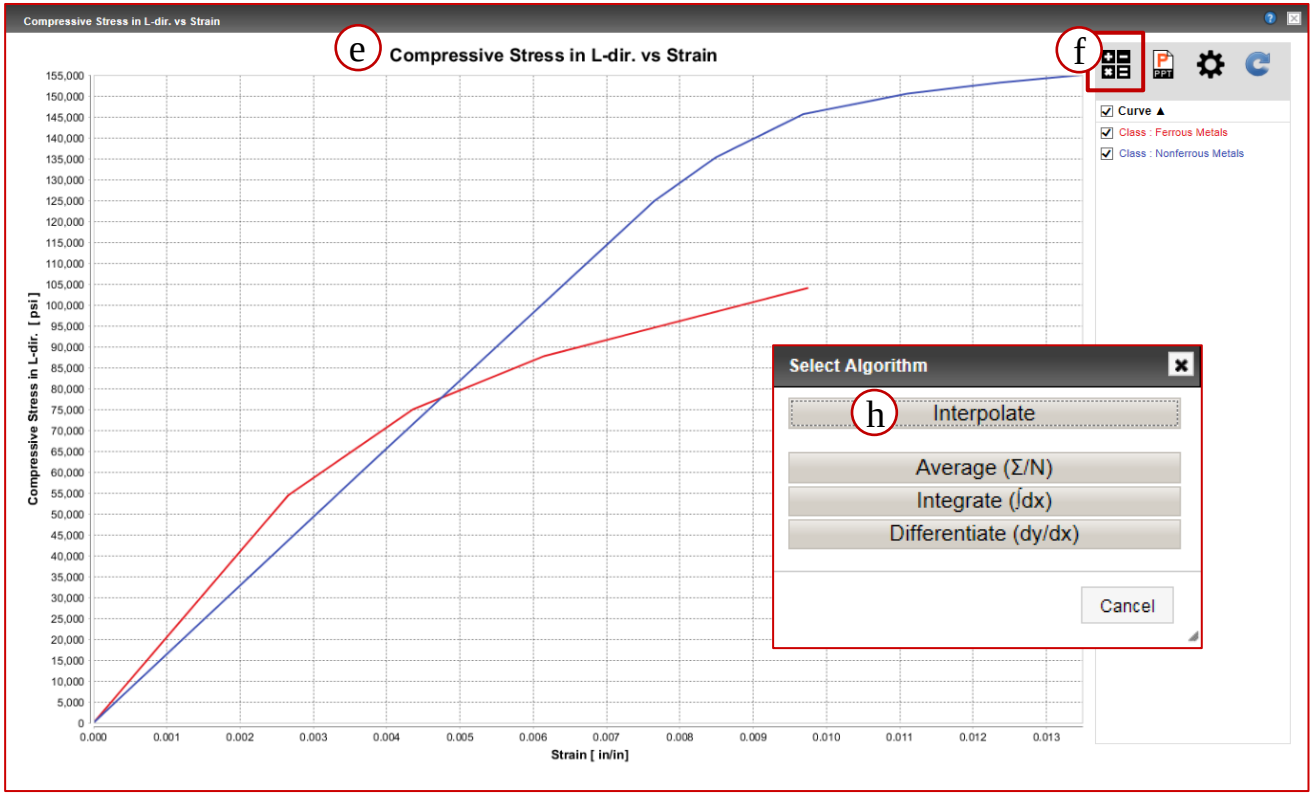
c. The icon is changed to a large thumbnail image with the curves superimposed and color-coordinated.

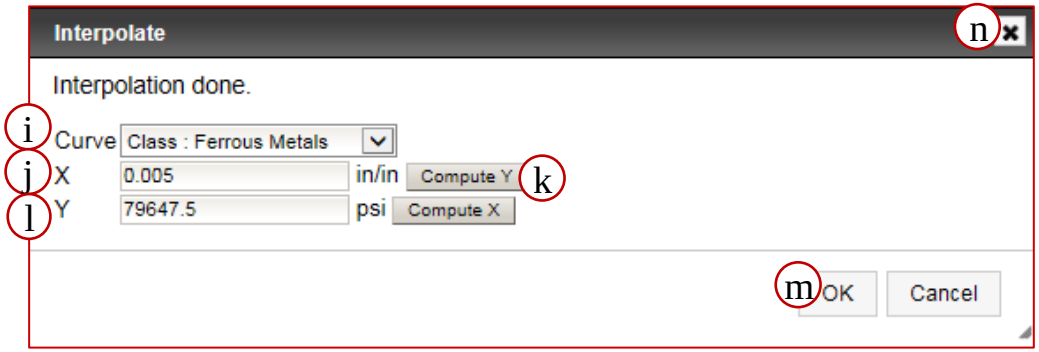
d. Click on the expanded **thumbnail** to launch the Curve Viewer.



Step 14. Compare Two Curves (Cont.)

e. The two curves are opened in a large viewer window.
f. Click the **Calculator** to open a context menu.
g. Try out the various options for viewing the curves.
h. For example, select **Interpolate**.
i. Select the first curve.
j. Enter **0.005** in the X in/in text box.
k. Click the **Compute Y** button.
l. The Y-value corresponding to the entered X-value is displayed.
m. Click **OK**.
n. Click **X** to close the curve viewer.

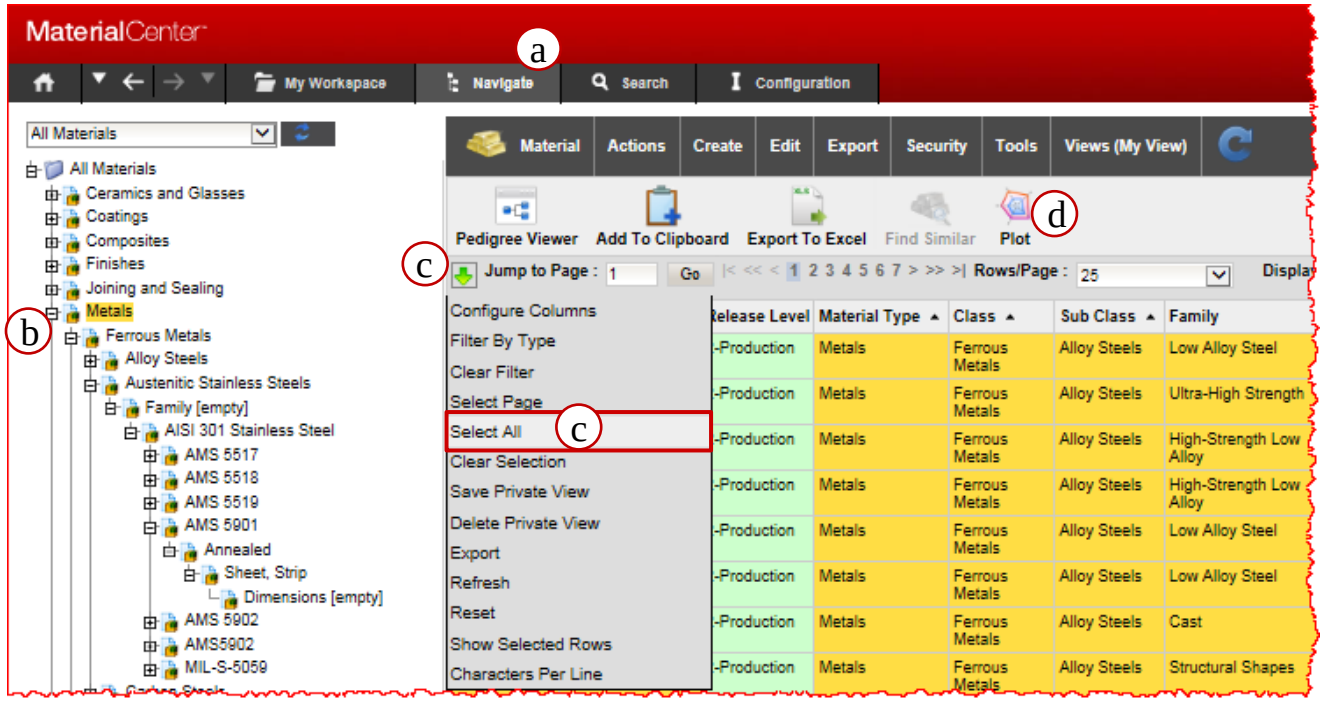


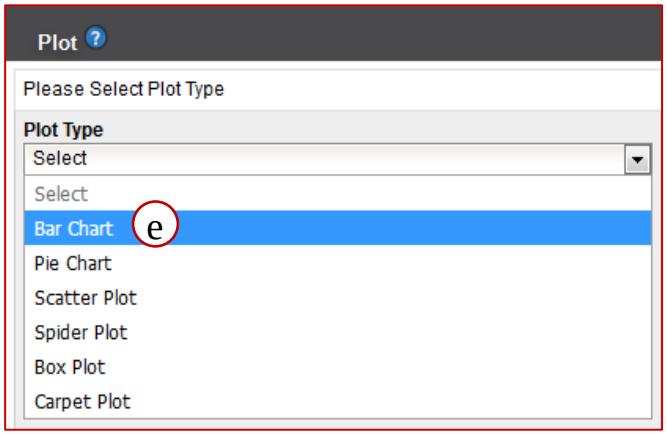


Step 15. Enhanced Plotting

In addition to the Curve Viewer for viewing predefined collections of data points, MaterialCenter's plotting feature allows users to select multiple records and graphically represent their property values in a variety of formats.

a. Click the **Navigate** tab.
b. Select the **Metals** node.
c. Click on the green arrow then **Select All**.
d. Click on the **Plot** icon.
e. Under the new workspace, click on the Plot Type dropdown and select Bar Chart.





Step 15. Enhanced Plotting – Bar Chart (Cont.)

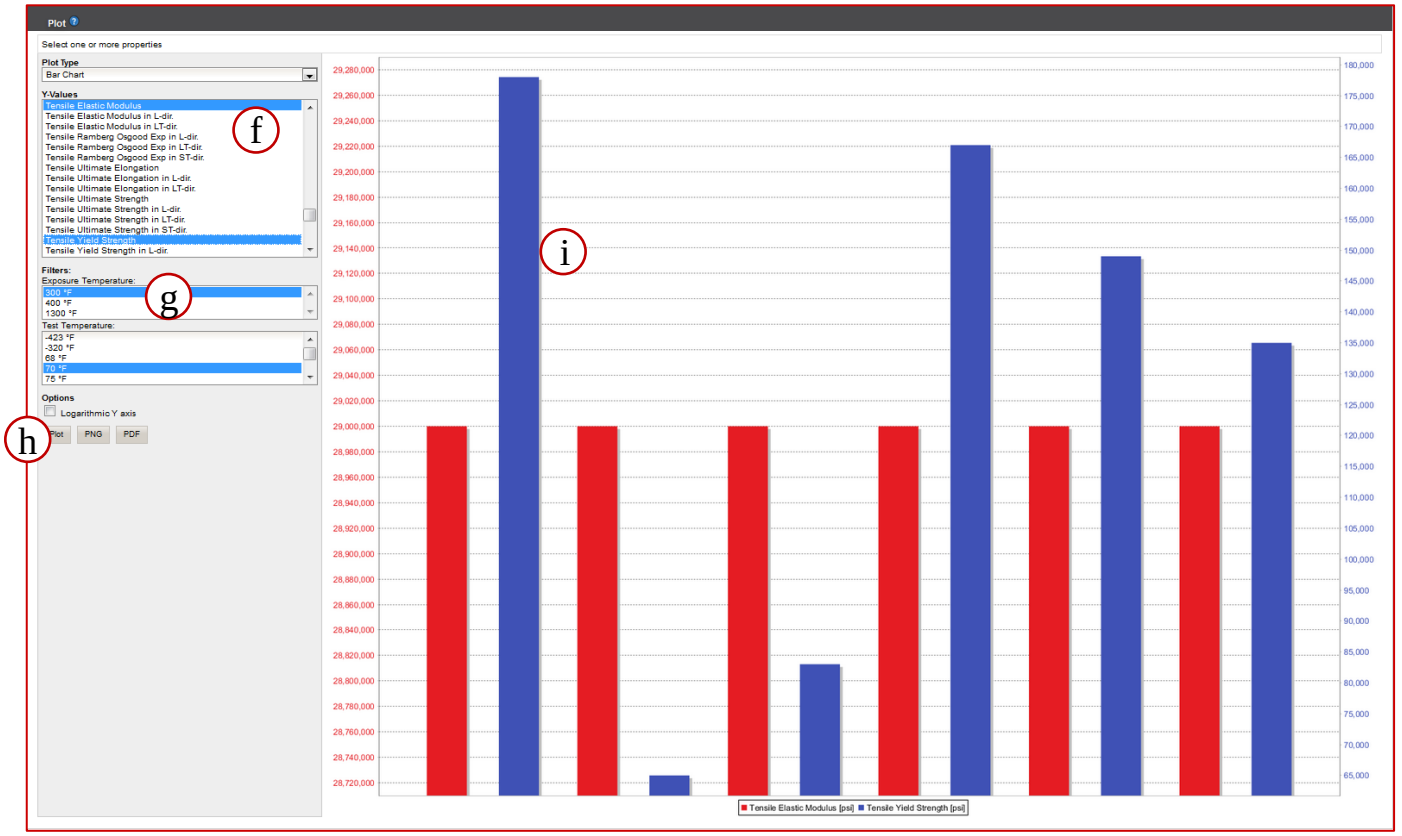
f. Under Y-Values, Ctrl select Tensile Elastic Modulus and Tensile Yield Strength.

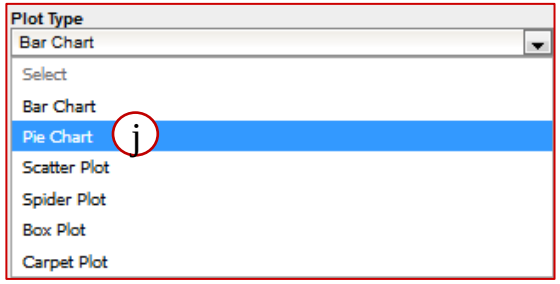
g. Select Exposure Temperature: 300 °F, and Test Temperature: 70 °F.

h. Click **Plot**.

i. A Bar Chart will appear with the property values on the Y-axis, material record names on the X-axis, and a legend below that provides property units and distinguishes each of the selected properties by color.

j. Under **Plot Type**, select **Pie Chart**.





Click on a bar to navigate to the material record's **Detailed View**.

Step 15. Enhanced Plotting – Pie Chart (Cont.)

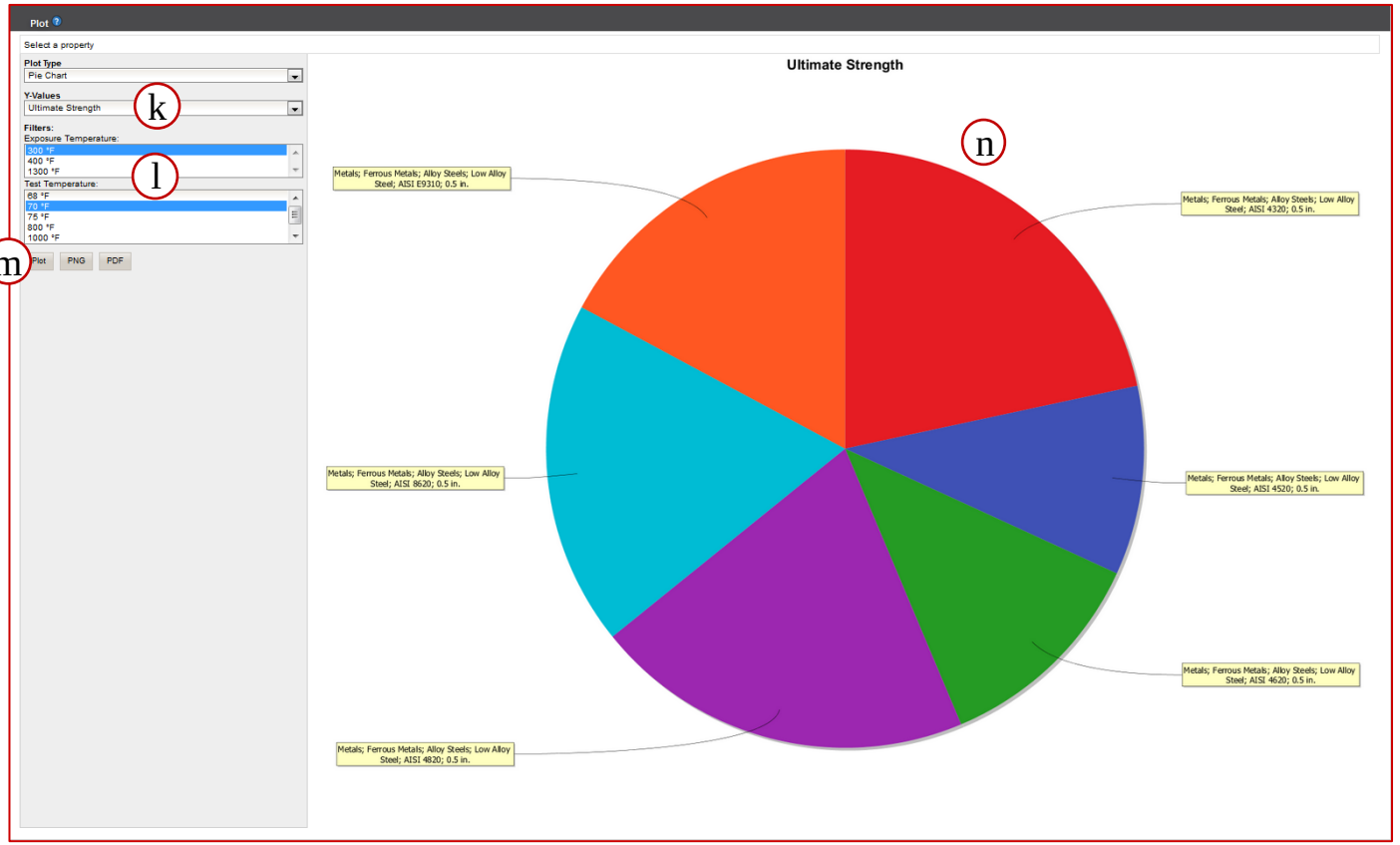
k. Under **Y-Values**, select **Ultimate Strength**.

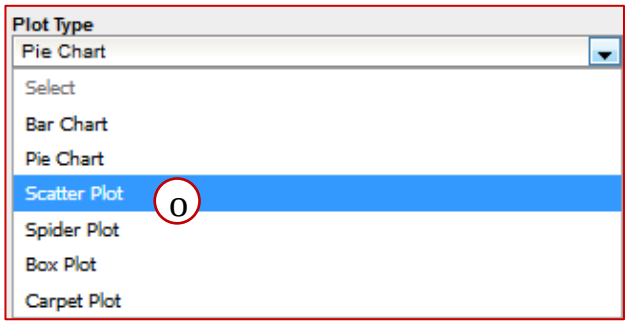
l. Under Filters, select Exposure Temperature: 300 °F and Test Temperature: 70 °F.

m. Click **Plot**.

n. A Pie Chart will appear that displays a single property value for all applicable records. The material record names are individually labeled, and the distribution of the chart reflects the deviation of the property values that were selected.

o. Under **Plot Type**, select **Scatter Plot**.





Click on a section of the pie chart to navigate to the material record's **Detailed View**.

Step 15. Enhanced Plotting (Cont.)

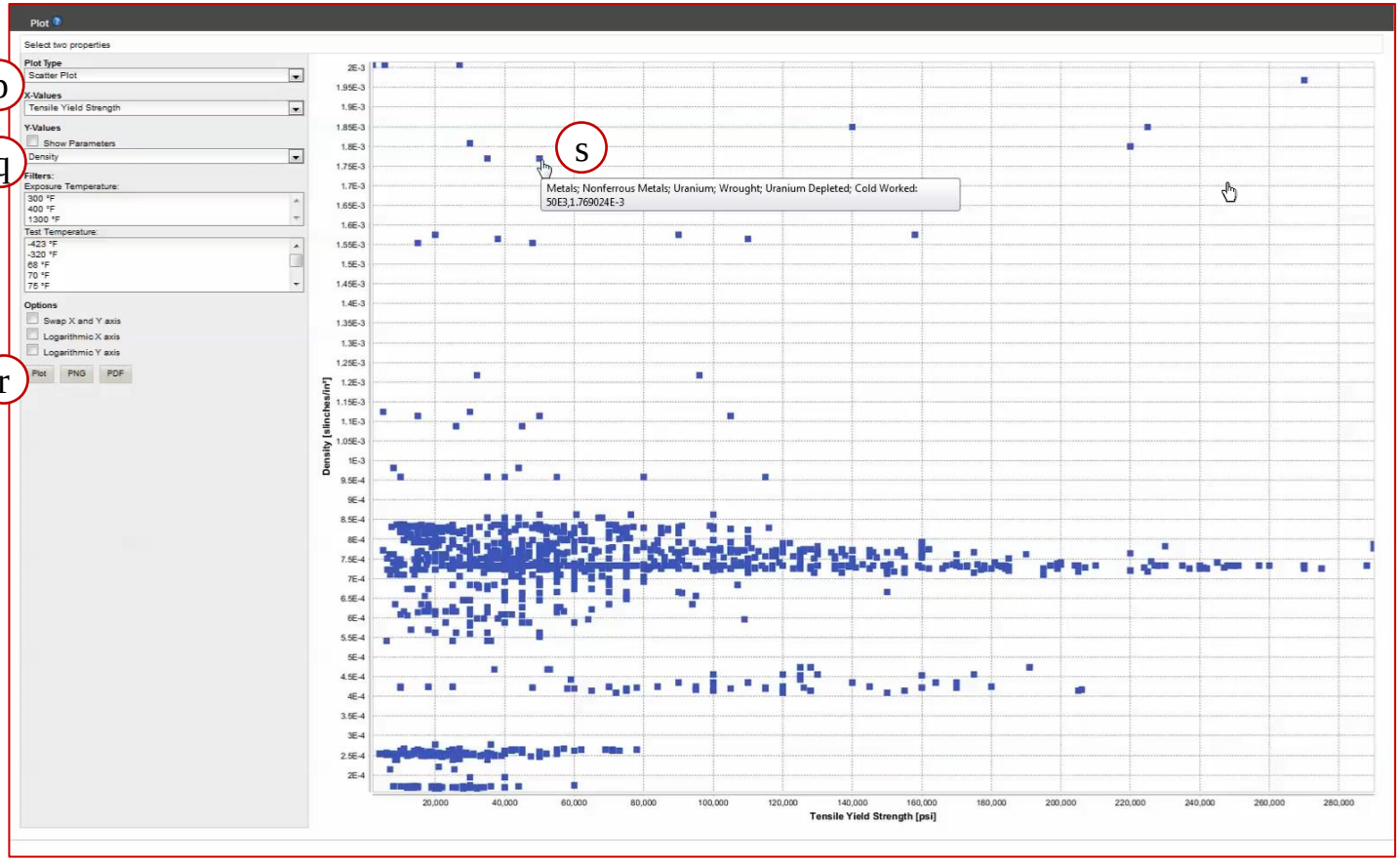
p. Under X-Values, select **Tensile Yield Strength**.

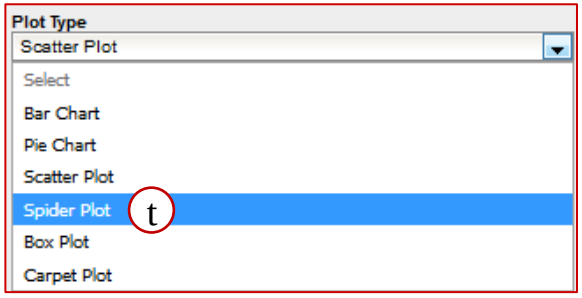
q. Under Y-Values, select Density.

r. Click **Plot**.

s. A Scatter Plot will appear that displays the selected properties and units on the X-axis and the Y-axis. Hovering the mouse over a point provides a tooltip with a description of the record name and its plot coordinate.

t. Under **Plot Type**, select **Spider Plot**.





Click on a point on the scatter plot to navigate to the material record's **Detailed View**.

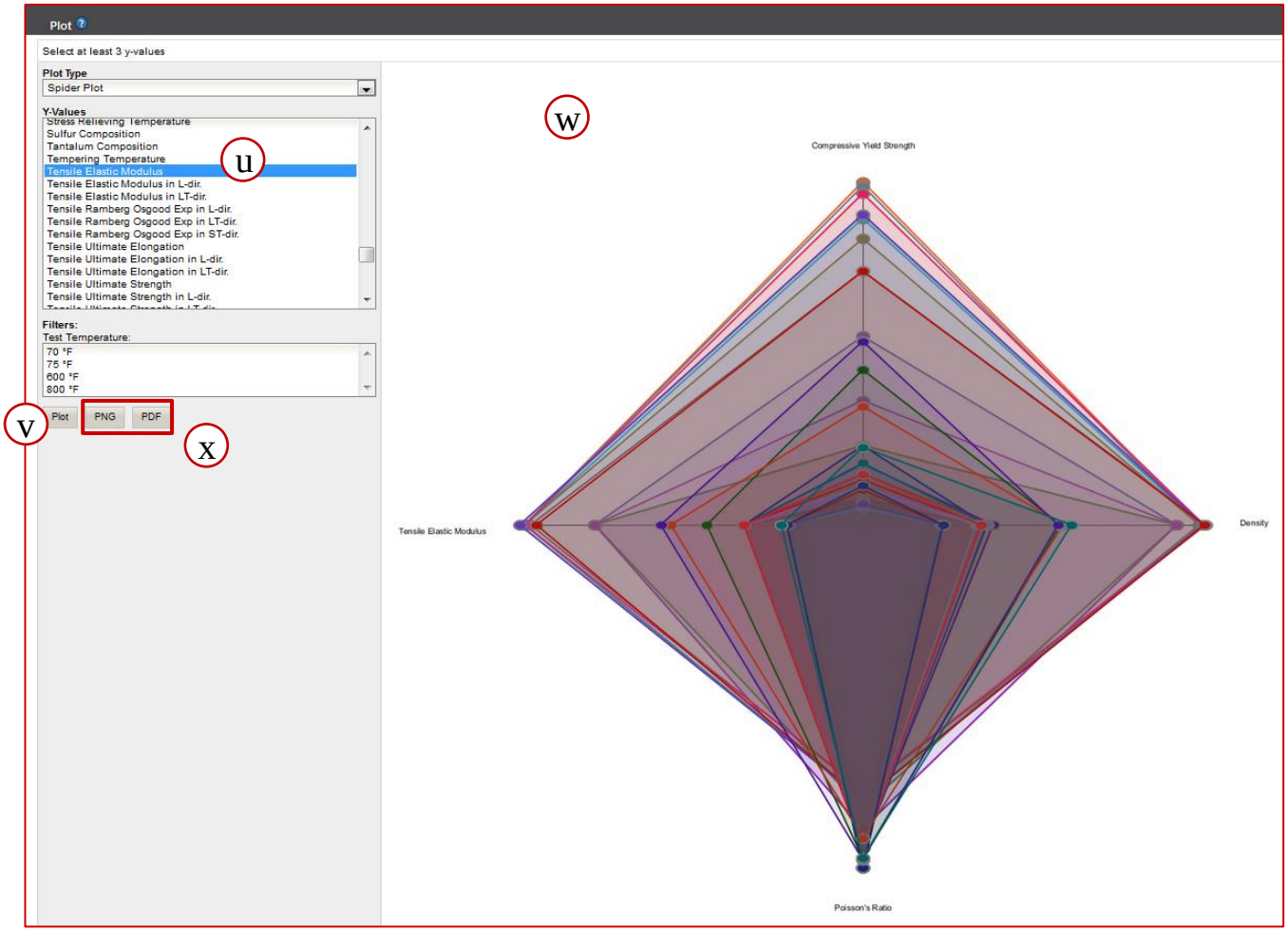
Step 15. Enhanced Plotting (Cont.)

u. Under Y-Values, select Compressive Yield Strength, Density, Poisson's Ratio and Tensile Elastic Modulus.

v. Click **Plot**.

w. A Spider Plot will appear that provides a radial view of the selected properties. Three or more properties can be selected for the Spider Plot. As with the Scatter Plot, hovering the mouse over a point provides a tooltip with a description of the record name and its plot coordinate.

x. On each type of plot, the PNG and PDF buttons are available on the lower right to convert the displayed plot into a printer-friendly format.



Click on a point on the spider plot to navigate to the material record's **Detailed View**.

End of Workshop 1