



# Materials Specifications Manager

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DatapointLabs

strengthening the materials core of manufacturing enterprises



matereality



**DatapointLabs**

technical center for materials

+

**matereality**  
a DatapointLabs affiliate

materialsphere

**Materials**

**Testing x Software x Data Infrastructure**

EST 1995

ISO  
17025  
Quality



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strengthening the materials core of manufacturing enterprises

**matereality**

# Heritage

- 1986 - Cornell Injection Molding Program (CIMP)
  - Research: Properties of molten plastics for CAE
- 1995 - Datapoint Testing Services
  - Commercialization: Properties of plastics for molding CAE
- 1998 - TestPaks Alliance Program
  - Partnerships with FEA companies – properties & modeling for FEA
- 2000 - Company rebranded as DatapointLabs
  - Supporting 8 simulation codes for plastics
- 2002 - Matereality started
  - R&D to create multivariate material database for plastics
- 2014 - Today
  - Testing any materials, any properties; supporting 34 CAE codes
  - Super-database+software to analyze and transform material data



# What are *Material Specifications*?

- Used by manufacturing enterprises to:
  - Define desired requirements and characteristics
    - Type of material
    - Composition
    - Method of manufacture (processing)
    - Required level of performance
      - Desired properties (Min-max, target)
    - Certifications
      - ROHS...
    - Pricing & Availability

# Performance criteria

Property	Units	Min	Max	Target
Modulus	MPa	2900		3000
Strength	MPa	80		100
Melt Flow Rate	g/10min	10	15	12
Thermal Expansion	/C		0.0001	
Izod Impact	J/m2	50000		60000

# How are they used?

- To evaluate candidate materials
  - Right kind of material?
  - Does it have the required certifications?
  - Does it meet the property acceptance criteria?
  - Is it available in the required locale?
- To assign a material to one or more components
  - Fuel pump housings
  - Fuel line connectors, etc.

# Stakeholders

- Corporate consumers
  - Design engineers
  - CAE engineers
  - Manufacturing engineers
  - Purchasing
- Materials engineers (gatekeepers)
- Material suppliers (sources)

# Material Specification Manager

- Used by materials engineer to
  - Create specifications
  - Evaluate candidate resins
  - Add materials that meet acceptance criteria



# Matereality Engineering Apps

Home - MyMatereality x

serverthree/test/Matereality/MyMatereality/

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Home Settings Logout  
Matereality Administrator

**Global Data Center**

**My Workgroup**

**My Database**

GridView All Properties Messages Activity Tracker Design Data CAE Modeler

Material Model Library Data Loader Free Databases My Materials All Materials Material Specifications Viewer

Material Specification Manager Manage Users MIRO Designer Experiment Designer

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# Creating a specification

The image displays two overlapping browser windows of the Matereality web application. The background window shows the home page with a navigation menu on the left containing 'Global Data Center', 'My Workgroup', and 'My Database'. The main content area features three large icons: 'GridView', 'Material Model Library', and 'Material Specification Manager'. The foreground window is open to the 'BoMMaterial' page, where a 'New Specification' button is highlighted under the 'Tools' tab. The application header includes the Matereality logo and user information: 'Home Settings Logout' and 'Matereality Administrator'.

# Defining the spec material

serverthree/test/Matereality/MyMatereality/BoMMaterial?manage=True

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Home Settings Logout  
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### Define New Material Specification

Name	<input type="text" value="MS-DB41"/>	Subclass	PA66
Class	Plastic		PA/PPPE
Manufacturer	Unknown		PA11
Specifications	<input type="text"/>	Keywords	PA12
Formula	<input type="text"/>	Color	PA46
Processing	<input type="text"/>		PA4T
Applications	<input type="text"/>		PA6
MSDS Url	<input type="text"/>		PA6/10
DataSheet Url	<input type="text"/>		PA66
Notes	<input type="text"/>		PA66/6
			PA66/6T
			PAA
			PAEK
			PAI
			PAN
			PARA
			PP

Save

Specification Name, Class, Subclass

# Adding compositional details

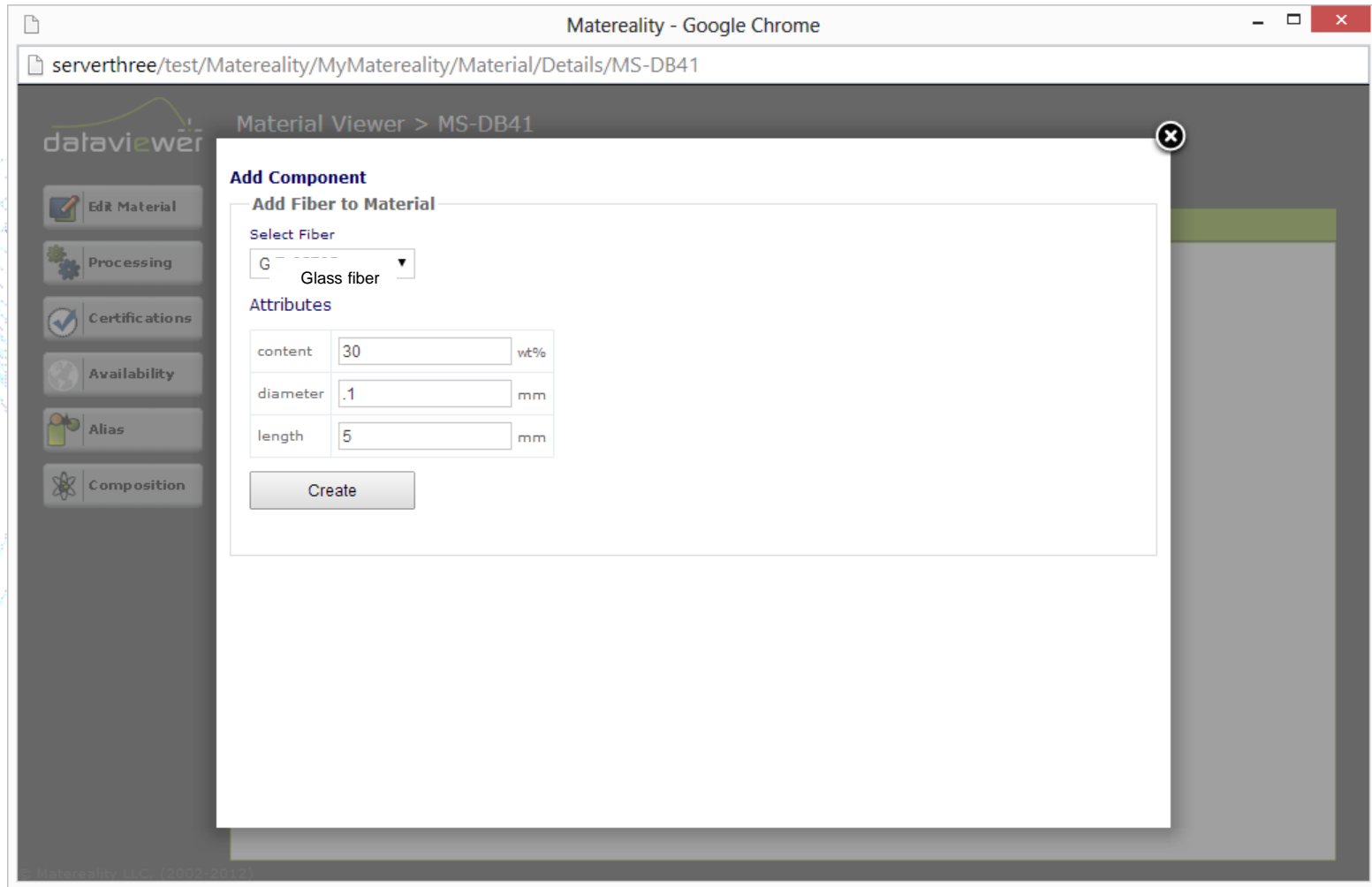
The image shows a web browser window displaying the Matereality application. The main interface is titled "Specification Manager" and includes a sidebar with material categories: Metal (1), Plastic (4), PA66 (3), MS-DB41, and PC (1). A yellow arrow points from the "Add Material" button in the sidebar to a modal window titled "Material Viewer > MS-DB41". This modal window contains a "Select Composition Type" dropdown menu with options: Filled Plastic (selected), Alloy, Blend, Filled Plastic, and Structured Composite. A "submit" button is visible next to the dropdown. The browser address bar shows the URL: serverthree/test/Matereality/MyMatereality/BoMMaterial/MaterialsForSpecification/MS-DB41?manage=True. The browser tabs include "Matereality" and "chrysler ms-db-41 - Goog". The browser title is "Matereality - Google Chrome". The browser address bar shows the URL: serverthree/test/Matereality/MyMatereality/Material/Details/MS-DB41. The browser title is "Matereality - Google Chrome". The browser address bar shows the URL: serverthree/test/Matereality/MyMatereality/Material/Details/MS-DB41. The browser title is "Matereality - Google Chrome".

# Declaring a fiber-filled plastic

The screenshot shows the Matereality Material Viewer interface for material MS-DB41. The 'Composition' section is expanded to show 'Filled Plastic' components. A yellow arrow points from the 'Add' button to the 'Fiber' component row.

Component	content (wt%)	diameter (mm)	length (mm)
Colorant			
Fiber			
Filler			
Flame Retardant			
Impact Modifier			
Matrix			

# Declaring fiber details



The screenshot shows a web browser window titled "Matereality - Google Chrome" with the URL "serverthree/test/Matereality/MyMatereality/Material/Details/MS-DB41". The application interface includes a sidebar with navigation options: "Edit Material", "Processing", "Certifications", "Availability", "Alias", and "Composition". The main content area displays "Material Viewer > MS-DB41". A modal dialog titled "Add Component" is open, with a sub-header "Add Fiber to Material". Inside the dialog, there is a "Select Fiber" dropdown menu currently set to "G Glass fiber". Below this, the "Attributes" section contains three input fields: "content" with the value "30" and unit "wt%", "diameter" with the value ".1" and unit "mm", and "length" with the value "5" and unit "mm". A "Create" button is located at the bottom of the dialog.

Attribute	Value	Unit
content	30	wt%
diameter	.1	mm
length	5	mm

# Adding processing steps

Material Viewer > MS-DB41

**Edit Processing Information** Update

Injection Molding

Drying Temperature	<input type="text" value="80"/>	C
Drying Time	<input type="text" value="4"/> - <input type="text" value="6"/>	hours
Drying Time Notes	<input type="text" value="hopper dryer"/>	
Barrel Temperature - Rear	<input type="text" value="270"/> - <input type="text" value="280"/>	C
Barrel Temperature - Middle	<input type="text" value="280"/> - <input type="text" value="285"/>	C
Barrel Temperature - Front	<input type="text" value="285"/> - <input type="text" value="295"/>	C
Barrel Temperature - Nozzle	<input type="text" value="295"/> - <input type="text" value="298"/>	C
Processing Temperature	<input type="text" value="280"/> - <input type="text" value="300"/>	C
Mold Temperature	<input type="text" value="80"/> - <input type="text" value="90"/>	C
Back Pressure	<input type="text"/> - <input type="text"/>	bar
Vent Depth	<input type="text"/> - <input type="text"/>	mm
Cushion	<input type="text"/> - <input type="text"/>	mm
Suggested Moisture	<input type="text" value=".1"/> - <input type="text" value=".2"/>	%wt

# Declaring availability

The screenshot shows a web browser window titled "Matereality - Google Chrome" with the URL "serverthree/test/Matereality/MyMatereality/Material/Details/MS-DB41". The main content area displays "Material Viewer > MS-DB41" and a modal dialog titled "Edit Availability for MS-DB41". The dialog has an "Update" button in the top right corner. Below the title is a dropdown menu labeled "Other". A table is shown with the following content:

	1 items selected	Remove all
<b>Add all</b>	↓ North America	-
Asia Pacific	+	
Europe	+	
Worldwide	+	

A sidebar on the left contains several menu items: "Edit Material", "Processing", "Certifications", "Availability", "Alias", and "Composition". A yellow arrow points to the "Availability" menu item. A blue dashed grid pattern is visible on the left side of the image.



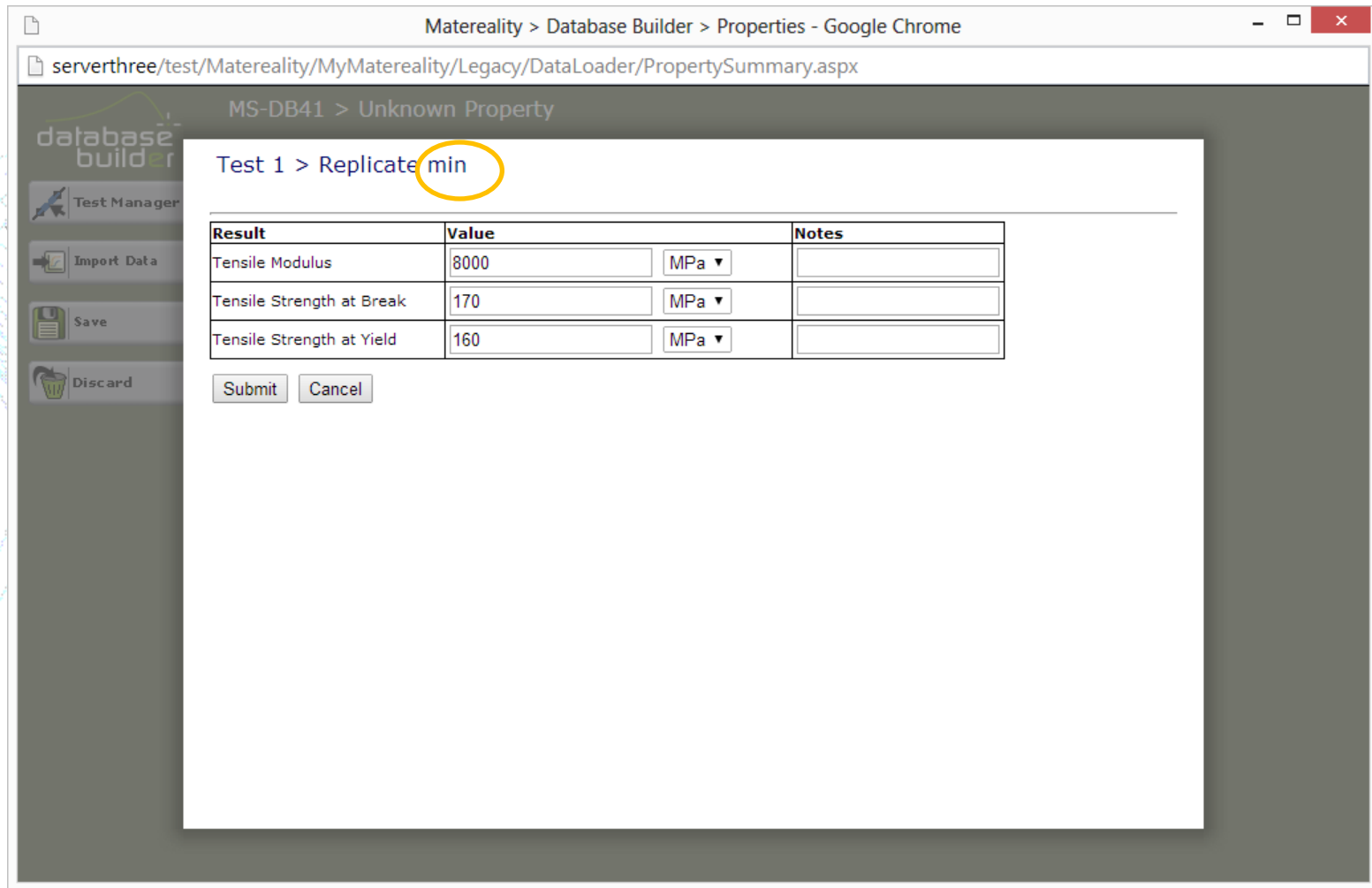
# Adding property ranges

The screenshot displays the Matereality web application interface. The main window shows the 'Specification Manager' with a list of materials: Metal (1), Plastic (4), PA66 (3), MS-DB400, and PC (1). A yellow arrow points from the 'Add Material' button to the 'Data Loading Wizard' dialog box. The dialog box is titled 'Data Loading Wizard' and 'Edit Test Details'. It contains a form with the following fields:

Project	*project id	Nylon Specification
	purpose	
Technique	*test method	ASTM D638
	technique notes (deviations from test method)	
	*date	April - 8 - 2014
Traceability	*instrument	Unspecified Instrument
	submitted by	confidential
	certified by	
	accredited	<input type="checkbox"/>

A 'Next' button is located at the bottom of the dialog box. The background shows the 'database builder' sidebar with options like Test Manager, Import Data, Save, and Discard.

# Entering min. strength details



The screenshot shows a web browser window with the address bar displaying 'serverthree/test/Matereality/MyMatereality/Legacy/DataLoader/PropertySummary.aspx'. The page title is 'MS-DB41 > Unknown Property'. The main content area shows 'Test 1 > Replicate min' with a yellow circle around the word 'min'. Below this is a table with three rows of material properties, each with a 'Value' input field and a unit dropdown menu set to 'MPa'. At the bottom of the table are 'Submit' and 'Cancel' buttons.

Result	Value	Notes
Tensile Modulus	<input type="text" value="8000"/> MPa ▾	<input type="text"/>
Tensile Strength at Break	<input type="text" value="170"/> MPa ▾	<input type="text"/>
Tensile Strength at Yield	<input type="text" value="160"/> MPa ▾	<input type="text"/>

# Density/Specific gravity

The screenshot shows the Matereality Database Builder interface. The main window is titled "Matereality > Database Builder > Properties - Google Chrome" and displays the URL "serverthree/test/Matereality/MyMatereality/Legacy/DataLoader/PropertySummary.aspx". The interface shows a sidebar with navigation options: Test Manager, Import Data, Save, and Discard. The main content area is titled "MS-DB41 > Unknown Property" and features a "Test Manager" window. This window has three tabs: "Edit Setup", "Parameters", and "Select Results". Under the "Test 1" section, there are two "Replicates" listed: "min" and "max". The "min" replicate is checked as "Representative" and has "Edit Data" and "Delete" buttons. A yellow arrow points from the "min" replicate to a dialog box titled "Test 1 > Replicate min". This dialog box contains a table with columns "Result", "Value", and "Notes". The "Result" is "Solid Density", the "Value" is "1.3", and the unit is "kg/m3". There are "Submit" and "Cancel" buttons at the bottom of the dialog.

Test Manager

Test 1

Variables

Replicates

Replicate min  Representative Edit Data Delete

Replicate max  Representative Edit Data Delete

Test 1 > Replicate min

Result	Value	Notes
Solid Density	1.3 kg/m3	

Submit Cancel

# Completed specification

The screenshot displays the Matereality web application interface. The browser address bar shows the URL: `serverthree/test/Matereality/MyMatereality/BoMMaterial/MaterialsForSpecification/MS-DB41?manage=True`. The page title is "Specification Manager > MS-DB41".

On the left side, there is a navigation menu with the following categories and counts:

- Explore Tools
- + Metal (1)
- Plastic (4)
- PA66 (3)
- MS-DB40UA
- MS-DB41
- + PC (1)

The main content area shows a horizontal timeline for the specification. The timeline is labeled "Specification" on the left and "+ Property" on the right. Four green dots are placed along the timeline, each corresponding to a property category: "Tensile Properties", "Solid Density", "Coefficient of Linear Thermal Expansion", and "Flexural Properties". Below the timeline, there is a "+ Add Material" button.

At the bottom left of the page, there is a copyright notice: "© Matereality LLC, (2002-2012)".

# Evaluating candidate materials

The screenshot displays the Matereality web application interface. The browser address bar shows the URL: `serverthree/test/Matereality/MyMatereality/BoMMaterial/MaterialsForSpecification/MS-DB41?manage=True`. The page title is "Matereality" and the navigation menu includes "Home", "Settings", and "Logout".

The main content area is titled "Specification" and shows a list of materials. A yellow arrow points from the "Add Material" button to the "Add Material to Specification" modal window. The modal window has the following structure:

Class	Subclass
Plastic	PA66

Material selection options:

- CELSTRAN PA66 (selected)
- New Material

Material list (CELSTRAN PA66-GF30-07 is highlighted):

- CELSTRAN PA66-AF35-02-US
- CELSTRAN PA66-CF40-01-US
- CELSTRAN PA66-GF30-02
- CELSTRAN PA66-GF30-07**
- CELSTRAN PA66-GF40-01
- CELSTRAN PA66-GF40-0101P10/11
- CELSTRAN PA66-GF40-02-US
- CELSTRAN PA66-GF40-02P11/15
- CELSTRAN PA66-GF40-07
- CELSTRAN PA66-GF50-0111P10/11
- CELSTRAN PA66-GF50-02-US
- CELSTRAN PA66-GF50-02P11/14
- CELSTRAN PA66-GF50-07
- CFI STRAN PA66-GF50-20

# Checking for acceptance

The screenshot shows the Matereality web application interface. The browser address bar displays the URL: `serverthree/test/Matereality/MyMatereality/BoMMaterial/MaterialsForSpecification/MS-DB41?manage=True`. The page title is "Specification Manager > MS-DB41".

The interface includes a sidebar with navigation options: "Explore" and "Tools". Under "Explore", there are categories: "Metal (1)", "Plastic (4)", "PA66 (3)", "MS-DB400A", "MS-DB41", and "PC (1)".

The main content area displays a comparison of material properties. The title is "Compare: CELSTRAN PA66-GF30-07 to Specification". The comparison is for "Tensile Properties".

The comparison results are shown in a table format:

Tensile Modulus	
CELSTRAN PA66-GF30-07	2.12E+03 MPa
MS-DB41 min	8E+03 MPa
MS-DB41 target	8.5E+03 MPa

Tensile Strength at Break	
MS-DB41 min	170 MPa
MS-DB41 target	180 MPa

Tensile Strength at Yield	
MS-DB41 min	160 MPa
MS-DB41 target	170 MPa

The interface also includes a "Tensile Properties" chart showing the comparison of the material (CELSTRAN PA66-GF30-07) against the specification (MS-DB41). The material's properties are shown as green dots on a vertical axis, and the specification's minimum and target values are shown as horizontal lines. The material's tensile modulus is significantly higher than the specification's minimum and target values.

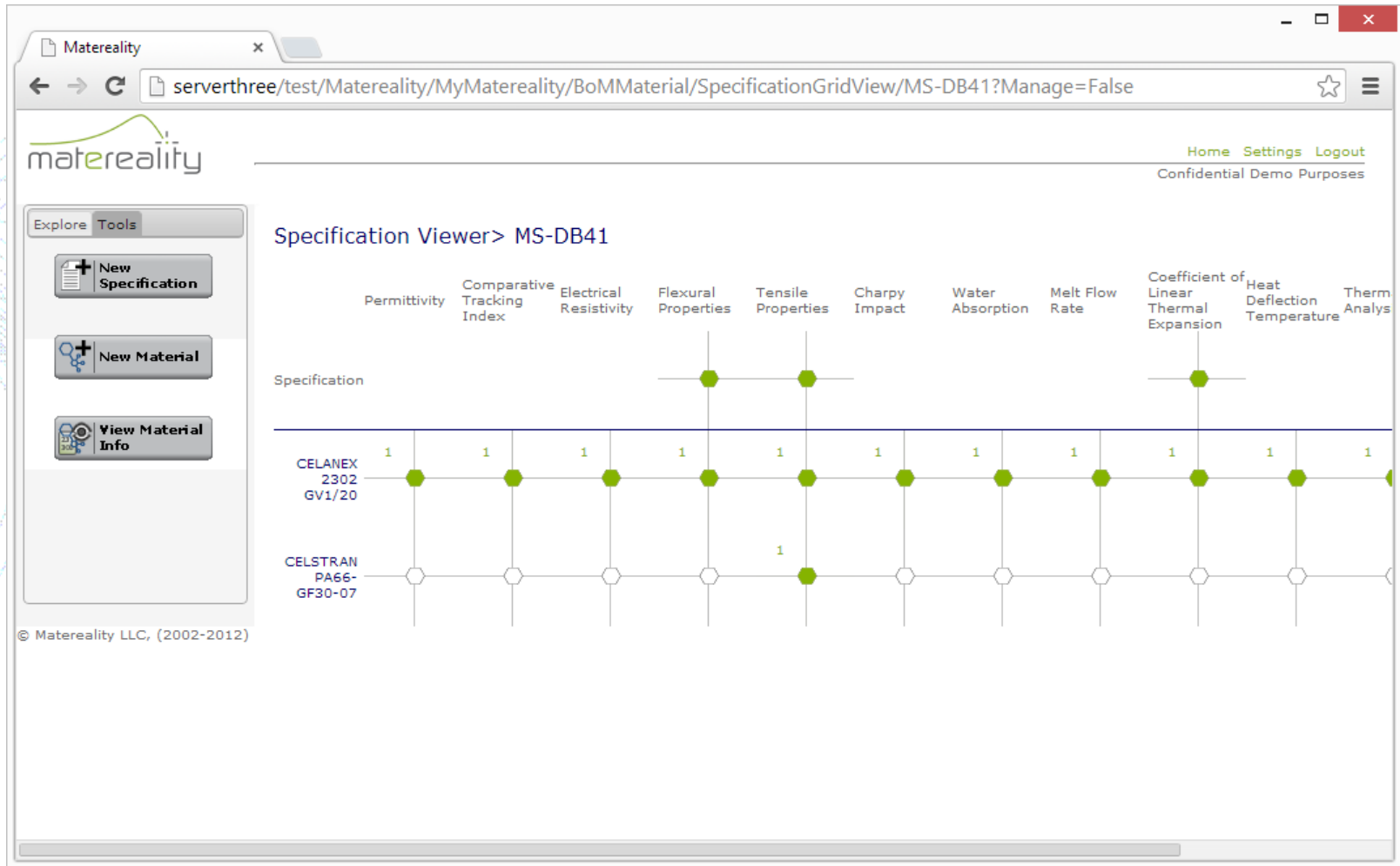
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serverthree/test/Matereality/MyMatereality/BoMMaterial/CompareMaterialToSpecification/MS-DB41?propName=Tensile Properties&propId=84595

# Material Specification Viewer

- Used by all engineers to
  - Find current material specifications and property ranges
  - Find accepted materials for a specification
  - Find properties of accepted materials
- Attach material specs to parts and components (BOM)

# Using the Specification Viewer





# The Material Info View

SpecificationMaterialInfo x

serverthree/test/Matereality/MyMatereality/BoMMaterial/SpecificationMaterialInfo/MS-DB41?manage=False

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Tools

View Material Properties

Specification: MS-DB41 > Material Information

Display 10 Search: [ ] First Previous 1 Next Last

Material Name	Class	Subclass	Subsubclass	Processing	Supplier	Composition	Color	Availability	Applications
<input type="checkbox"/> CELANEX 2302 GV1/20	Plastic	PBT			Ticona				"Chemical abbreviation according to ISO 1043-1: PBT Moulding compound ISO 7792- PBT/PET, MGHR, 08-08
<input type="checkbox"/> CELSTRAN PA66-GF30-07	Plastic	PA66			Ticona				

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# Conclusions

- Software for managing material specifications
- Useable by material suppliers and OEMs
- Captures workflows in digital format
- Manage app allows materials engineers to create and manage specifications
- Viewer app presents data and specifications to rest of the engineering community