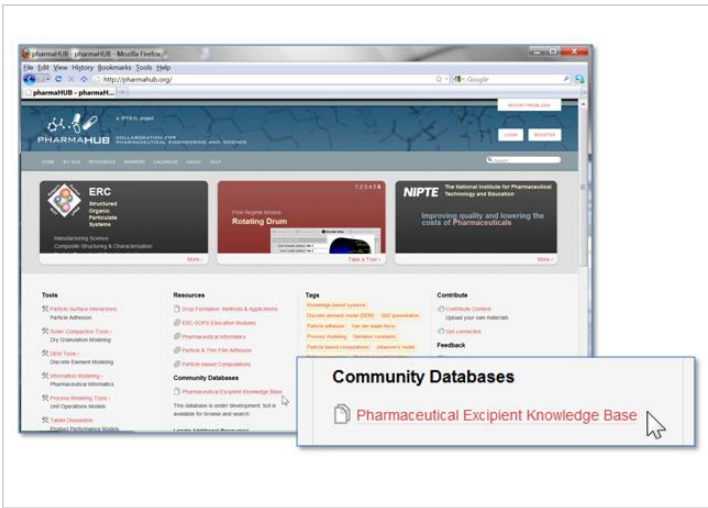
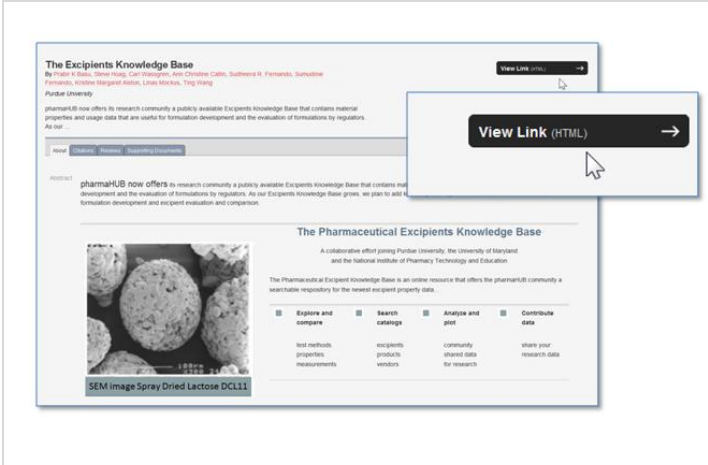


A Demonstration of the NIPTE Pharmaceutical Excipient Knowledge Base at pharmaHUB.org March 31, 2011

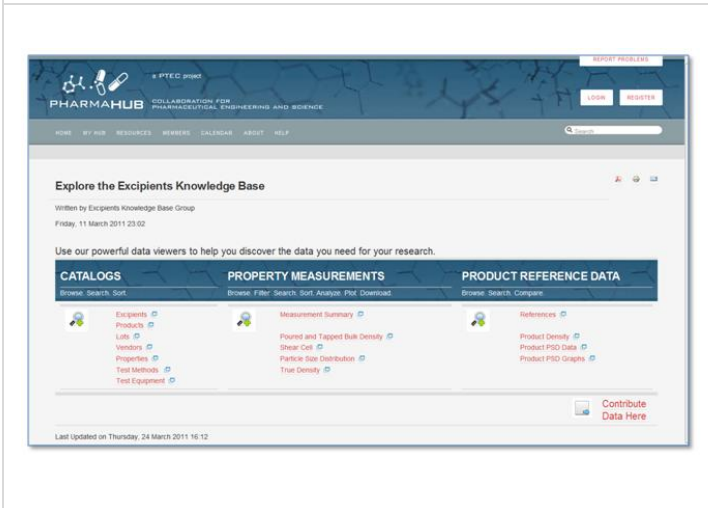


At the pharmaHUB.org web site, users can click the link to reach the Pharmaceutical Excipient Knowledge Base

Any pharmaHUB user can browse and search the Excipient Knowledge Base.



View Link takes users to the main page for exploring data in the Excipients Knowledge Base



Explore

- Catalogs
- Property Measurements
- Product Reference Data

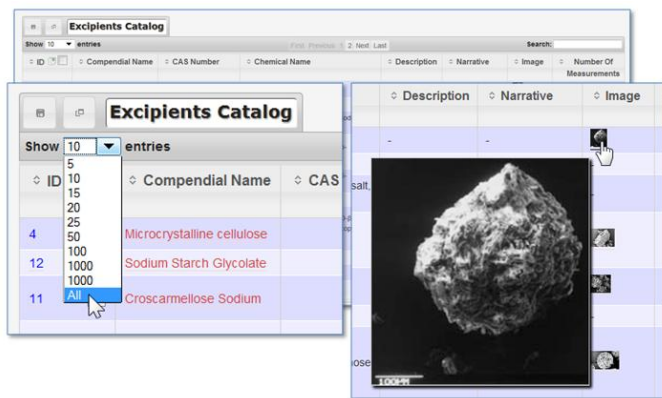
Authorized users can also click to contribute data.

Exploring the Catalog Data

ID	Compendial Name	CAS Number	Chemical Name	Description	Narrative	Image	Number Of Measurements
4	Microcrystalline cellulose	9004-34-6	Microcrystalline cellulose	-	-		63
12	Sodium Starch Glycolate	9063-38-1	Sodium carboxymethyl starch	-	-	-	8
11	Croscarmellose Sodium	74811-65-7	Cellulose, carboxymethyl ether, sodium salt, crosslinked	-	-	-	6
6	Lactose Monohydrate	5989-81-1, 10039-26-6, 64044-91-5	O-β-D-Galactopyranosyl-(1→4)-D-glucopyranose monohydrate	-	LactoseNarrative		5
7	Anhydrous Lactose	63-42-3	O-β-D-Galactopyranosyl-(1→4)-β-D-glucopyranose	-	LactoseNarrative		3
9	Maltodextrin	9050-36-6	Maltodextrin	-	-	-	2
8	Lactose, Spray-Dried	5989-81-1, 10039-26-6, 64044-91-5 and 63-42-3	mixture of α-and β-lactose, and O-β-D-galactopyranosyl-(1→4)-D-glucopyranose monohydrate	-	LactoseNarrative		1
10	Mannitol	69-65-8	D-Mannitol	-	-	-	1
1	β-Lactose Monohydrate	5989-81-1	Lactose	-	LactoseNarrative		1
2	Anhydrous α-Lactose	63-42-3	Lactose	-	LactoseNarrative		1

Viewing the Excipients Catalog

Excipient information includes the compendial name, CAS number, brief description, longer narrative report, image and count of number of measurements for each excipient.



Users can

- click to “show all”
- hover to view full description or click for ‘cut and paste’ display
- hover to see image thumbnail or click to view full image
- click for full narrative PDF report

Product	Compendial Name	Vendor	Molecular Formula	Molecular Weight	Melting Point	Degree of Crosslinking	Solubility	pKa	Crystallinity
Axcel PH101	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Decided at 260-270°C	None	Slightly solub.	5.0-7.5	Crystallinity varies by vendor
Axcel PH102	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Decided at 260-270°C	None	Slightly solub.	5.0-7.5	Crystallinity varies by vendor
Axcel PH103	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Decided at 260-270°C	None	Slightly solub.	5.0-7.5	Crystallinity varies by vendor
Axcel PH105	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Decided at 260-270°C	None	Slightly solub.	5.0-7.5	Crystallinity varies by vendor
Axcel PH112	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Decided at 260-270°C	None	Slightly solub.	5.0-7.5	Crystallinity varies by vendor
Axcel PH113	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Decided at 260-270°C	None	Slightly solub.	5.0-7.5	Crystallinity varies by vendor
Axcel PH200	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Decided at 260-270°C	None	Slightly solub.	5.0-7.5	Crystallinity varies by vendor
Axcel PH201	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Decided at 260-270°C	None	Slightly solub.	5.0-7.5	Crystallinity varies by vendor
Axcel PH202	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Decided at 260-270°C	None	Slightly solub.	5.0-7.5	Crystallinity varies by vendor
Excipient 10M	Microcrystalline cellulose	JRS Pharma GmbH & Co.KG	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Decided at 260-270°C	None	Slightly solub.	5.0-7.5	Crystallinity varies by vendor

Users can click on the excipient compendial name to search the knowledge base for all products for that excipient.

The Products Catalog includes the vendor name and chemical information about the product, such as molecular formula, molecular weight, melting point, solubility, pKa, and more.

ID	Compendial Name	CAS Number	Chemical Name	Description	Narrative	Image	Number Of Measurements
4	Microcrystalline cellulose	9004-34-6	Microcrystalline cellulose				63
12	Sodium starch glycolate	8003-38-4	Sodium carboxymethyl starch				9
11	Crosslinked Sodium	78211-60-7	Cellulose carboxymethyl ether sodium salt crosslinked				9
6	Lactose Monohydrate	9004-34-6	O-β-D-Galactopyranosyl (1→4)-D-Glucopyranose monohydrate				63

ID	Excipient	Product	Lot Number	Sample ID	Property Measurement	Humidity [%]	Temperature [°C]	Test Method
62	Lactose Monohydrate	DCL 15	0910222325	hams_tappedbulk_01	Poured/Tapped Bulk Density	26.00	21.50	Poured/Tapped Bulk Density
72	Lactose Monohydrate	DCL 15	10351215	hams_bulkdensity_01	Poured Bulk Density	22.00	22.00	Poured Bulk Density
73	Lactose Monohydrate	Pharmasee 200M	10215919	hams_bulkdensity_ph	Poured Bulk Density	22.00	22.00	Poured Bulk Density
75	Lactose Monohydrate	DCL 15	10351215	hams_tappeddensity_1	Tapped Bulk Density	34.00	22.00	Tapped Bulk Density
76	Lactose Monohydrate	Pharmasee 200M	10215919	hams_tappeddensity_2	Tapped Bulk Density	-	-	Tapped Bulk Density

The number of measurements in the database for each excipient is listed in the Excipients Catalog. Users can click on number of measurements to search the knowledge base for all property measurements for that excipient.

The Measurements view summarizes the data for each measurement, with links to experimental results and test methods.

Product	Compendial Name	Vendor	Molecular Formula	Molecular Weight	Melting Point	Degree of Crosslinking
Ac-Di-Sol SD-711	Crosscarmellose Sodium	FMC Corporation	-	-	Decomposes	-
Avicel PH101	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Oxidized at 260-270°C	None
Avicel PH102	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Oxidized at 260-270°C	None
Avicel PH103	Microcrystalline cellulose	FMC Corporation	-	-	-	-
Avicel PH105	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Oxidized at 260-270°C	None
Avicel PH112	Microcrystalline cellulose	FMC Corporation	-	-	-	-
Avicel PH113	Microcrystalline cellulose	FMC Corporation	-	36000	Oxidized at 260-270°C	None
Avicel PH200	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Oxidized at 260-270°C	None
Avicel PH301	Microcrystalline cellulose	FMC Corporation	(C ₆ H ₁₀ O ₅) _n , where n = 220	36000	Oxidized at 260-270°C	None

Viewing the Products Catalog

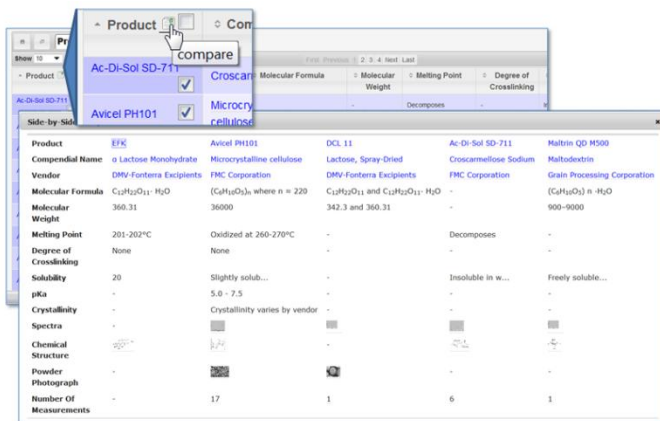
The Product Catalog lists the product name, its excipient compendial name and vendor. Chemical information includes molecular formula and weight, melting point, degree of crosslinking, solubility, pKa, crystallinity, images for spectra and chemical structure, power photographs and the number of measurements in the knowledge base for that product.

ID	Compendial Name	CAS Number	Chemical Name	Description	Narrative	Image	Number Of Measurements
4	Microcrystalline cellulose	9004-34-6	Microcrystalline cellulose				63

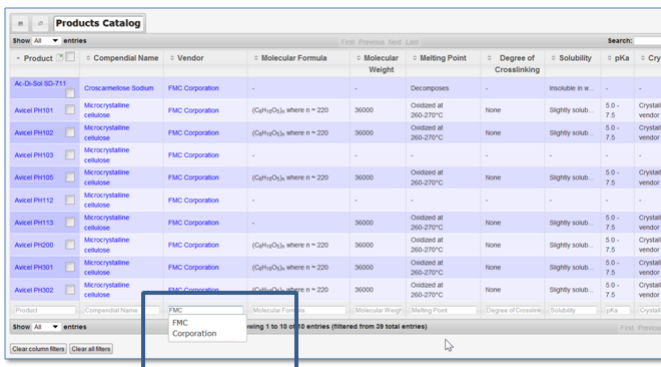
Users can

- click to “show all” or page through the products
- hover to see image thumbnail of spectra, chemical structure and power photograph – or click to view full image
- click on compendial name to display summary of excipient information
- download product catalog to a spreadsheet
- sort on number of measurements to see how many measurements made for each product.

Users can click on number of measurements to search the knowledge base for all property measurements for that product.



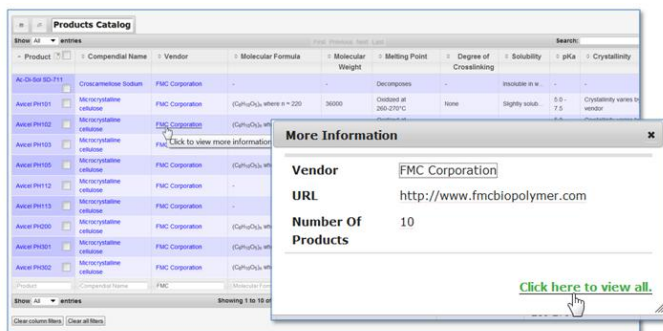
Users can compare products in a “side by side comparison” window – select the products to compare by clicking the product checkboxes and then click on the compare icon.



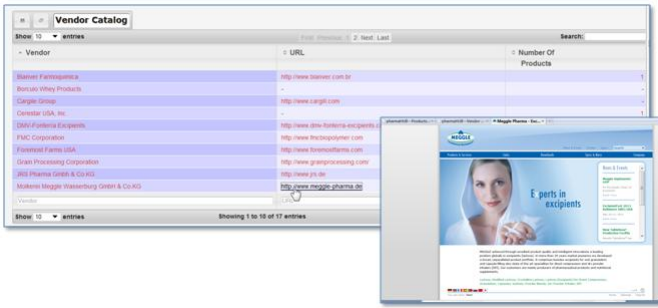
Users can search on data in any column using the column filters. Filter the product information for excipient and vendor by entering text in whole or in part.

Any text field can be filtered from the search box by selecting one of the entries or by typing text to search for. The filter returns matching text results as the user types the text characters.

In the example, the vendor column is filtered to find products manufactured by FMC. Users can select FMC Corporation from the menu list or type FMC in the column search box.



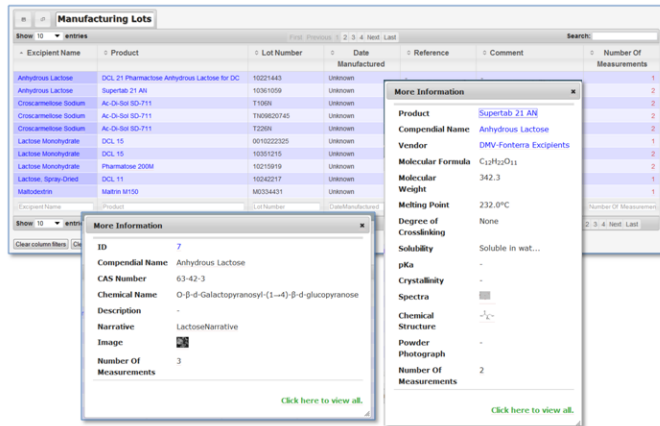
Users can click on the vendor name to display information about the vendor, and then go to the Vendor Catalog using the ‘Click here to view all’.



Viewing the Vendor Catalog

The Vendor Catalog lists the vendor name, URL, and the number of measurements in the knowledge base for products manufactured by that vendor.

Users can click on the vendor name to search the knowledge base for all products for that vendor. Users can also click on number of measurements to search the knowledge base for all property measurements that vendor's products.



Viewing the Manufacturing Lots

The Lots Catalog lists the lot number and date of manufacture, along with the excipient and product name. If the lot number is not known, a reference is given. The number of measurements in the knowledge base for each lot is listed.

Users can

- click to "show all" or page through the lots
- click on the excipient or product name to see more information
- use the column filters to search for an excipient, product or lot number, entering text in whole or in part
- sort on the number of measurements to see the measurements per lot in ascending or descending order.

Users can click on the number of measurements to search the knowledge base for all property measurements for that lot.

Property Name	Description	Category	Unit	Image	Number Of Measurements
Compact Elastic Modulus	The compact elastic modulus is a measure of the compact's...	Compact	Giga Pascal	-	-
Particle Emergent Density	The emergent density of a particle is its density in void.	Particle	Gram per cubic metre	-	-
Particle Shape	Due to the irregularity of most particles, particle shape...	Particle	-	-	-
Particle Size Distribution	The particle size distribution is a measure of the size a...	Particle	-	-	10
Particle True Density	The true density of a particle is its density excluding a...	Particle	Gram per cubic centimetre	-	8
Poured Bulk Density	Poured bulk density is the total mass of the powder samp...	Powder	Gram per cubic metre	-	24
Powdered/Tagged Bulk Density	The powder bulk density is the total mass of the powder...	Powder	Gram per cubic metre	-	6
Powder Compressibility	The compressibility of a powder is the ratio of the poured...	Powder	-	-	-
Shear Cell	Shear cell properties are a measure of the material's mech...	Shear Cell	-	-	12
Specific Surface Area	Specific surface area is a measure of the surface area of...	Specific Surface Area	-	-	-

Viewing the Properties Catalog

The Properties Catalog lists the property name, description, category, unit and number of measurements in the knowledge base for that property.

Users can

- click to “show all”
- hover to see the full description or click for ‘cut and paste’ display
- sort on number of measurements to see the measurements per property in ascending or descending order.
- in the category column search box, filter on the category to see all properties in that category

Users can click on the number of measurements to search the knowledge base for all measurements for that property.

The Test Methods and Test Equipment Catalogs will be explored as part of the measurements browsing demonstration

Exploring the Measurements in the Knowledge Base

ID	Excipient	Product	Lot Number	Sample ID	Property Measurements	Humidity [%]	Temperature [°C]	Test Method	Measured By
1	Microcrystalline cellulose	Avicel PH101	P10821003	astion_shearcell_ahc	Shear Cell	31.60	24.53	Schulze Shear Cell	Kristine Astion
2	Microcrystalline cellulose	Avicel PH101	P10821003	astion_shearcell_ahc	Shear Cell	32.58	24.89	Schulze Shear Cell	Kristine Astion
3	Microcrystalline cellulose	Avicel PH101	P10821003	astion_shearcell_ahc	Shear Cell	33.39	25.01	Schulze Shear Cell	Kristine Astion
4	Microcrystalline cellulose	Avicel PH102	P20819026	astion_shearcell_ahc	Shear Cell	16.90	23.88	Schulze Shear Cell	Kristine Astion
5	Microcrystalline cellulose	Avicel PH102	P20819026	astion_shearcell_ahc	Shear Cell	16.58	23.96	Schulze Shear Cell	Kristine Astion
6	Microcrystalline cellulose	Avicel PH102	P20819026	astion_shearcell_ahc	Shear Cell	16.41	23.96	Schulze Shear Cell	Kristine Astion
7	Microcrystalline cellulose	Avicel PH200	P108819160	astion_shearcell_ahc	Shear Cell	17.39	24.03	Schulze Shear Cell	Kristine Astion
8	Microcrystalline cellulose	Avicel PH200	P108819160	astion_shearcell_ahc	Shear Cell	17.41	24.24	Schulze Shear Cell	Kristine Astion
9	Microcrystalline cellulose	Avicel PH200	P108819160	astion_shearcell_ahc	Shear Cell	17.41	24.32	Schulze Shear Cell	Kristine Astion
10	Microcrystalline cellulose	Avicel PH101	P10821003	astion_bulk tapped_ahc	Powdered/Tagged Bulk Density	21.40	23.64	Powder/Tagged Bulk Density	Kristine Astion

Exploring the Measurements Data

The measurements viewers in the Excipients Knowledge Base are powerful and rich with features.

Experiments are fully documented, with lot number, sample name, test conditions, submitter, measurement date and annotations.

Users can view measurements data by property, with links to test methods and test information.

Users can view graphs of measurements data, with searchable data and graphs displayed together on the same page.

Users can

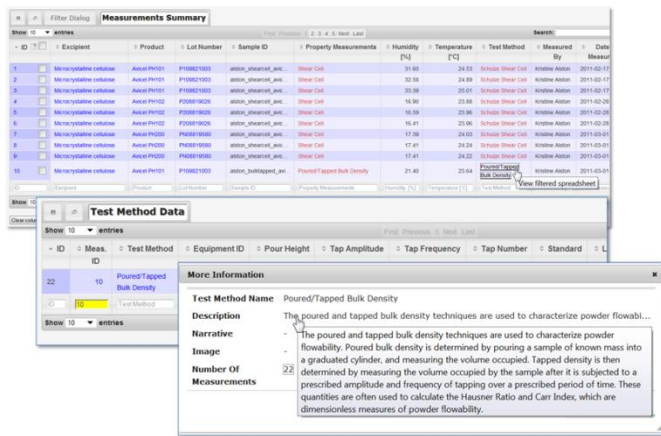
- click to “show all”
- click on excipient name, product name and lot number for more information
- hover for the full sample name
- view test conditions
- view the property measured
- view the test method
- view the measurement date and the name of the person who submitted the measurement
- view any additional annotations

Linking to the Test Methods Data

Users can click on the test method for any measurement to view detailed information about the test method.

In the Test Method Data viewer, users can click the method and hover over description for full text.

Users can go to the Test Methods Catalog using the ‘Click here to view all’.



Viewing the Test Methods Catalog

The Test Methods Catalog lists the test method name, brief description, narrative document, descriptive diagram, and number of measurements in the knowledge base for that test method.

Users can

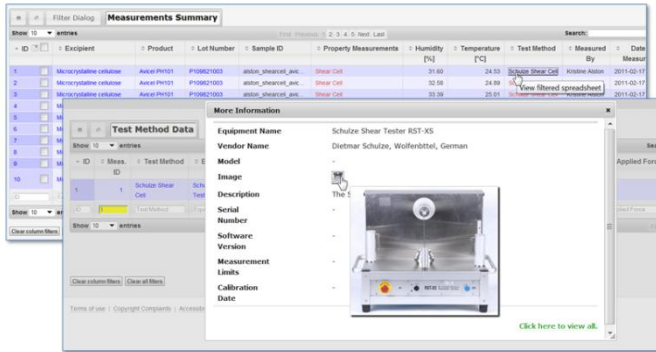
- click to “show all”
- hover to see the full description or click for ‘cut and paste’ display
- click to read the narrative PDF
- hover to see the diagram thumbnail or click to view the full size image
- sort on number of measurements to see the measurements per test method in ascending or descending order.

Users can click on the number of measurements to search the knowledge base for all measurement s using that test method.

Linking to the Test Equipment

Users can click on the test method for any measurement to view detailed information about the test equipment.

In the Test Method Data viewer, users can view the test equipment used by clicking on the equipment ID. In the information box, users can hover to see the full description and image of the equipment. Users can go to the Test Equipment Catalog using the 'Click here to view all'.



Viewing the Test Equipment Catalog

The Test Methods Catalog lists the equipment name, vendor name, model, image and other equipment specification parameters. The number of measurements in the knowledge base that were taken using that equipment is also listed.

Users can

- click to “show all”
- hover to see the full description or click for ‘cut and paste’ display
- hover to see the equipment thumbnail or click to view the full size image
- sort on number of measurements to see the measurements per equipment in ascending or descending order.

Users can click on the number of measurements to search the knowledge base for all measurement s using that test equipment.



The Poured and Tapped Bulk Density Viewer

This data view lets users explore the raw and derived values for the poured and tapped bulk density measurements.

Raw data includes poured and bulk densities and their standard deviations. Derived data includes Hausner Ratio, Carr Index and their standard deviations. Derived data is computed by the database from the raw data input by the user.

Excipient, product, lot number, sample name, test conditions, preparation mass, test method, submitter, measurement date, annotations and other information are listed directly in this view.

Users can

- click to “show all”
- click to see more information for excipient, product, lot number, property and test method
- sort on any measurement value column to see values in ascending or descending order
- use the filter or the column search boxes to explore the density data values

In the first filter example, the measurements with Hausner Ratio > 1.25 are displayed to identify powders with poor flowability.

In the second filter example, the measurements with Carr Index between 16 and 21 are displayed to identify powders with good to fair flow.

Meas. ID	Excipient	Product	Lot Number	Name of Property Measured	Sample ID	Poured Bulk Density (g/cm ³)	Poured Bulk Density StDev (g/cm ³)	Tapped Bulk Density (g/cm ³)	Tapped Bulk Density StDev (g/cm ³)	Hausner Ratio	Hausner Ratio StDev
10	Microcrystalline cellulose	Aspirin PR101	P10021003	Poured/Tapped Bulk Density	aspirin_tapped_bulk_me	0.319	0.002	0.433	0.002	1.357	0.001
11	Microcrystalline cellulose	Aspirin PR102	P200116026	Poured/Tapped Bulk Density	aspirin_tapped_bulk_me	0.324	0.002	0.433	0.004	1.336	0.001
12	Microcrystalline cellulose	Aspirin PR100	P100210040	Poured/Tapped Bulk Density	aspirin_tapped_bulk_me	0.340	0.002	0.455	0.001	1.351	0.001
25	Microcrystalline cellulose	Aspirin PR101	P10021003	Tapped Bulk Density	wang_tappeddensity_me	-	-	0.433	0.004	-	-
26	Microcrystalline cellulose	Aspirin PR101	P10021003	Tapped Bulk Density	wang_tappeddensity_me	-	-	0.433	0.007	-	-
27	Microcrystalline cellulose	Aspirin PR102	P200116026	Tapped Bulk Density	wang_tappeddensity_me	-	-	0.447	0.005	-	-
28	Microcrystalline cellulose	Aspirin PR102	P200116026	Tapped Bulk Density	wang_tappeddensity_me	-	-	0.449	0.005	-	-
29	Microcrystalline cellulose	Aspirin PR102	P100210040	Tapped Bulk Density	wang_tappeddensity_me	-	-	0.456	0.002	-	-
30	Microcrystalline cellulose	Aspirin PR102	30067C	Tapped Bulk Density	wang_tappeddensity_me	-	-	0.452	0.002	-	-
31	Microcrystalline cellulose	Aspirin PR102	30027C	Tapped Bulk Density	wang_tappeddensity_me	-	-	0.567	0.002	-	-

Filter Dialog: Poured and Tapped Bulk Density Measurements

Material: Measurement Values | Measurement Conditions

Poured Bulk Density [g/cm³]

Poured Bulk Density StDev [g/cm³]

Tapped Bulk Density [g/cm³]

Tapped Bulk Density StDev [g/cm³]

Hausner Ratio

Hausner Ratio StDev

Carr Index

Carr Index StDev

16 to 21

Done Filter

Filter Dialog: Poured and Tapped Bulk Density Measurements

Material: Measurement Values | Measurement Conditions

Poured Bulk Density [g/cm³]

Poured Bulk Density StDev [g/cm³]

Tapped Bulk Density [g/cm³]

Tapped Bulk Density StDev [g/cm³]

Hausner Ratio

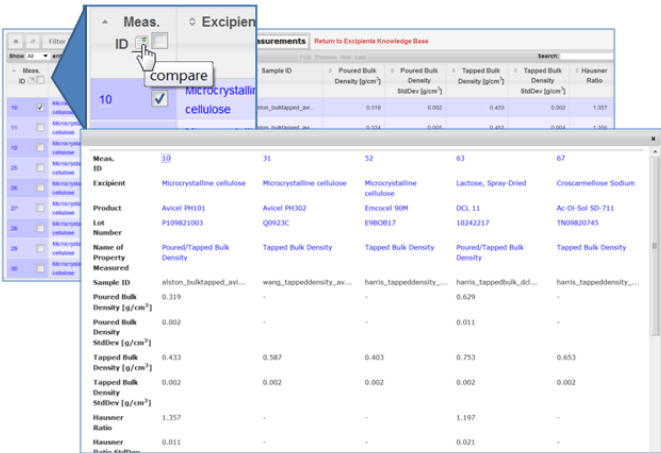
Hausner Ratio StDev

Carr Index

Carr Index StDev

> 1.25

Done Filter



Users can compare any number of poured and tapped bulk density raw and derived measurements side by side by selecting measurements with a click in the checkbox, and then clicking on the compare icon.



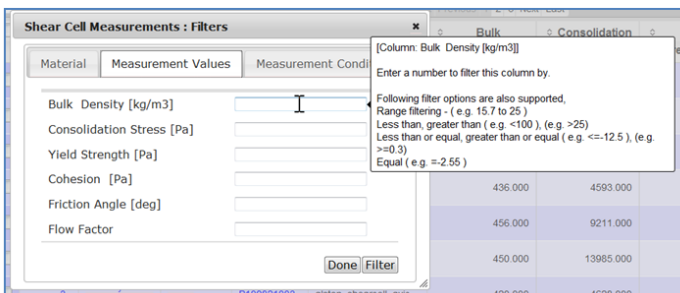
To explore the shear cell measurements, click on that view from the top level Explore web page.

ID	Meas. ID	Excipient	Product	Lot Number	Sample ID	Bulk Density [kg/m ³]	Consolidation Stress [Pa]	Yield Strength [Pa]	Cohesion [Pa]	Friction Angle [deg]	Flow Factor	Shear vs. No. Grid
1	1	Microcrystalline cellulose	Avicel PH101	P109821003	alston_shearcell_av...	432.000	4574.000	577.000	-	45.700	5.270	Yield L&L
2	1	Microcrystalline cellulose	Avicel PH101	P109821003	alston_shearcell_av...	443.000	9271.000	1486.000	-	45.100	6.220	Yield L&L
3	1	Microcrystalline cellulose	Avicel PH101	P109821003	alston_shearcell_av...	445.000	13781.000	2079.000	-	44.600	6.630	Yield L&L
4	2	Microcrystalline cellulose	Avicel PH101	P109821003	alston_shearcell_av...	436.000	4930.000	590.000	-	45.400	5.160	Yield L&L
5	2	Microcrystalline cellulose	Avicel PH101	P109821003	alston_shearcell_av...	436.000	9211.000	1489.000	-	45.100	6.220	Yield L&L
6	2	Microcrystalline cellulose	Avicel PH101	P109821003	alston_shearcell_av...	436.000	13965.000	2363.000	-	45.100	6.620	Yield L&L
7	3	Microcrystalline cellulose	Avicel PH101	P109821003	alston_shearcell_av...	420.000	4028.000	517.000	-	45.600	5.090	Yield L&L
8	3	Microcrystalline cellulose	Avicel PH101	P109821003	alston_shearcell_av...	443.000	9208.000	1503.000	-	45.000	6.570	Yield L&L
9	3	Microcrystalline cellulose	Avicel PH101	P109821003	alston_shearcell_av...	442.000	13768.000	2164.000	-	44.600	6.300	Yield L&L
11	4	Microcrystalline cellulose	Avicel PH102	P208110026	alston_shearcell_av...	448.000	4248.000	560.000	-	42.100	7.460	Yield L&L

The Shear Cell Viewer

This data view lets users explore the raw and derived values for the shear cell measurement values. Both raw and derived data values are input by the user.

Raw data includes bulk density and consolidation stress, with their associated normal and shear stress pairs. Derived data includes yield strength, cohesion, friction angle and flow factor.

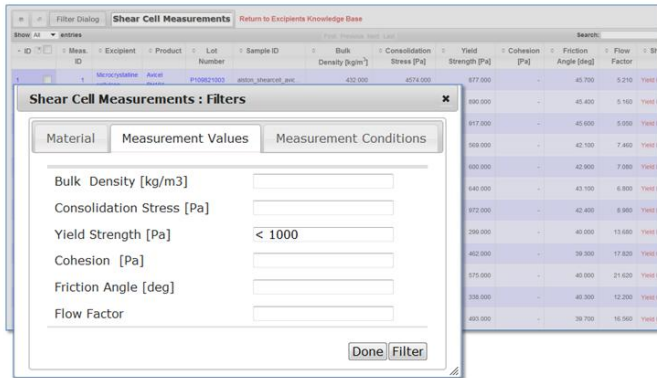


Excipient, product, lot number, sample name, test conditions, preparation mass, test method, submitter, measurement date, annotations and other information are listed directly in this view.

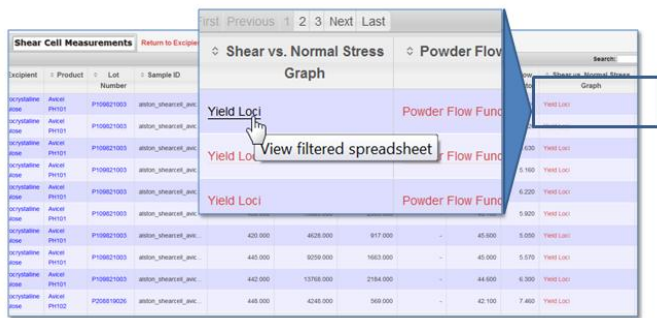
Users can

- click to "show all"
- click to see more information for excipient, product, lot number,

- property and test method
- sort on any measurement value column to see values in ascending or descending order
- use the filter or the column search boxes to explore the shear cell data values

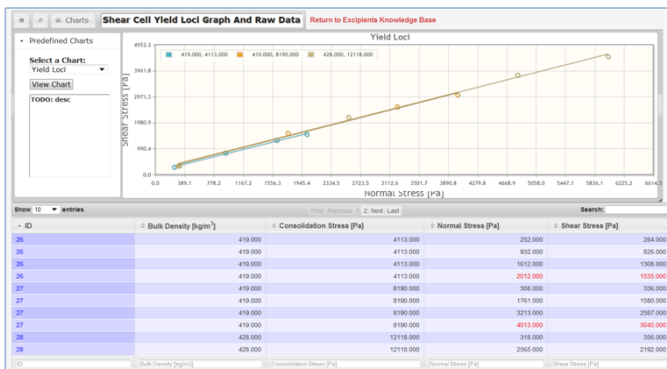


The filter dialog boxes can be used to search on any combination of material data, measurement values and measurement conditions. The filters are applied in the view when the Filter button is clicked so that users can immediately see the effect of the filter. Users should click done when satisfied with the filter, which returns them to the view where they can explore the full results of the filter.

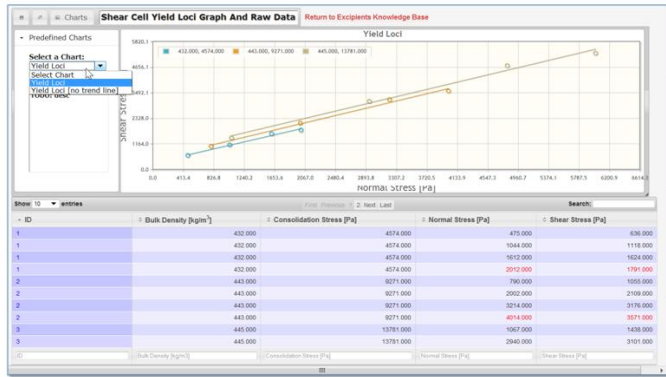


The shear cell measurements data view generates yield loci graphs for shear vs. normal stress data. Users can click on the yield loci link to create the graphs.

Graphs for the shear vs. normal stress data are available, both with and without the least squares trend line.

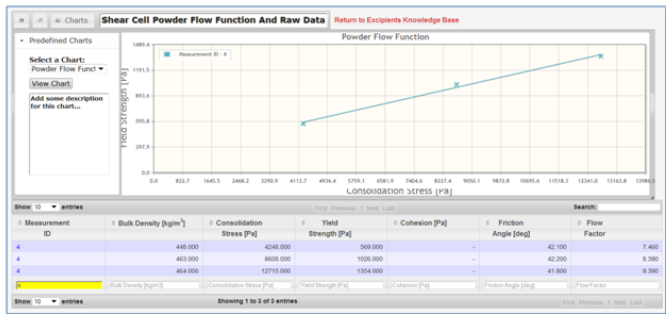


The raw data used to generate the graphs is shown directly beneath the graph – this includes the bulk density and consolidation stress, with their associated normal and shear stress pairs - and also the identification of the pre-shear point.



The powder flow function is determined for each of the yield loci which have a yield strength data value.

Users can click to view and compare the yield loci and powder flow functions for different sets of stress data.



To explore the particle size distribution measurements, click on that view from the top level Explore web page.



The Particle Size Distribution Viewer

Meas. ID	Excipient	Product	Lot Number	Sample ID	Frequency Distribution	Cumulative Distribution	Distribution Type	x10 [µm]	x50 [µm]	x90 [µm]	Sauter Mean Diameter [µm]	Mass Diameter
21	Microcrystalline cellulose	Ascor	PH151	P100621003	astm_psd_avevpt10	View Graph	Volume/Mass	22.957	57.436	123.273	42.341	
22	Microcrystalline cellulose	Ascor	PH151	P100621003	astm_psd_avevpt10	View Graph	Volume/Mass	25.112	57.569	123.135	42.487	
23	Microcrystalline cellulose	Ascor	PH151	P100621003	astm_psd_avevpt10	View Graph	Volume/Mass	22.642	56.779	120.918	41.855	
24	Microcrystalline cellulose	Ascor	PH152	P100619026	astm_psd_avevpt10	View Graph	Volume/Mass	35.451	108.202	225.404	69.949	
31	Microcrystalline cellulose	Ascor	PH151	P100621003	wang_psd1_avevpt10	View Graph	Volume/Mass	28.689	61.279	130.846	52.091	
42	Microcrystalline cellulose	Ascor	PH151	P100621003	wang_psd1_avevpt10	View Graph	Volume/Mass	30.755	58.484	133.793	31.554	
43	Microcrystalline cellulose	Ascor	PH150	P100619580	wang_psd1_avevpt05	View Graph	Volume/Mass	89.677	223.303	413.478	147.000	
44	Microcrystalline cellulose	Ascor	PH150	P100619580	wang_psd1_avevpt05	View Graph	Volume/Mass	102.405	237.206	416.197	147.406	
45	Microcrystalline cellulose	Ascor	PH150	P100619580	wang_psd1_avevpt05	View Graph	Volume/Mass	104.100	239.206	418.085	149.118	
46	Microcrystalline cellulose	Ascor	PH152	P100619026	astm_psd_avevpt10	View Graph	Volume/Mass	37.201	113.122	236.603	73.344	

This data view lets users explore the raw and derived values for particle size distribution.

When data input is specified with particle size distribution type volume/mass using the laser diffraction test method, then raw data is given for the range (lower or upper point of the interval) and the upper limit percentage value for volume, number, area or mass.

Excipient, product, lot number, sample name, test conditions, preparation mass, test method, submitter, measurement date, annotations and other information are listed directly in this view.

Distribution Type	x10 [µm]	x50 [µm]	x90 [µm]	Sauter Mean Diameter [µm]	Mass Mean Diameter [µm]	Span
Volume/Mass	22.957	57.438	123.273	42.341	66.612	1.747
Volume/Mass	23.112	57.569	123.135	42.487	66.721	1.737
Volume/Mass	22.642	56.770	120.918	41.855	65.507	1.731
Volume/Mass	35.461	108.262	229.404	69.949	122.161	1.791
Volume/Mass	28.689	61.278	126.846	52.091	70.670	1.602
Volume/Mass	20.755	59.404	133.793	31.554	70.052	1.903
Volume/Mass	99.677	233.393	413.478	147.600	245.765	1.345
Volume/Mass	102.405	237.208	416.197	147.456	248.860	1.323
Volume/Mass	104.102	239.506	418.085	149.118	250.761	1.311

Derived data includes the x10, x50 and x90 percentile values, the span, and the Sauter and mean mass diameters. The derived data is computed by the database.

Product	Lot Number	Sample ID	Frequency Distribution	Cumulative Distribution	Distribution Type	x10 [µm]	x50 [µm]	x90 [µm]	Sauter Mean Diameter [µm]	Mass Mean Diameter [µm]	Span	Humidity [%]
Avet	P10967003	wang_psd_ascexp10	View Graph	View Graph	Volume/Mass	11.913	52.615	116.429	35.276	59.510	1.886	19.00
Avet	P10967003	wang_psd_ascexp10	View Graph	View Graph	Volume/Mass	20.755	59.404	133.793	31.554	70.052	1.903	19.00
Avet	P10967003	astor_psd_ascexp10	View Graph	View Graph	Volume/Mass	22.642	56.770	120.918	41.855	65.507	1.731	21.50
Avet	P10967003	astor_psd_ascexp10	View Graph	View Graph	Volume/Mass	22.957	57.438	123.273	42.341	66.612	1.747	21.50
Avet	P10967003	astor_psd_ascexp10	View Graph	View Graph	Volume/Mass	23.112	57.569	123.135	42.487	66.721	1.737	21.00
Avet	P10967003	wang_psd_ascexp10	View Graph	View Graph	Volume/Mass	28.689	61.278	126.846	52.091	70.670	1.602	19.00
Avet	P10967003	wang_psd_ascexp10	View Graph	View Graph	Volume/Mass	34.284	116.409	241.113	53.417	129.894	1.871	19.00
Avet	P10967003	wang_psd_ascexp10	View Graph	View Graph	Volume/Mass	34.285	115.932	240.914	53.835	128.558	1.782	19.00
Avet	P10967003	wang_psd_ascexp10	View Graph	View Graph	Volume/Mass	33.430	116.166	244.130	45.387	129.286	1.814	19.00
Avet	P10967003	astor_psd_ascexp10	View Graph	View Graph	Volume/Mass	35.461	108.262	229.404	69.949	122.161	1.791	21.50

Users can

- click to “show all”
- click to see more information for excipient, product, lot number, property and test method
- sort on any measurement value column to see values in ascending or descending order
- use the filter or the column search boxes to explore the particle size distribution data values

Filter Dialog: Particle Size Distribution Measurements

Material: Measurement Values: Measurement Conditions

Distribution Type:

x10 [µm]:

x50 [µm]:

x90 [µm]:

Sauter Mean Diameter [µm]:

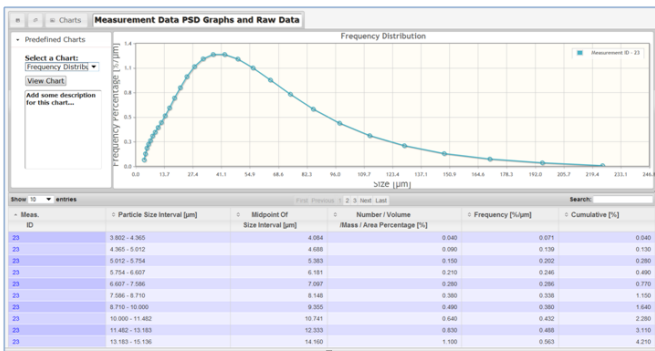
Mass Mean Diameter [µm]:

Span:

Done Filter

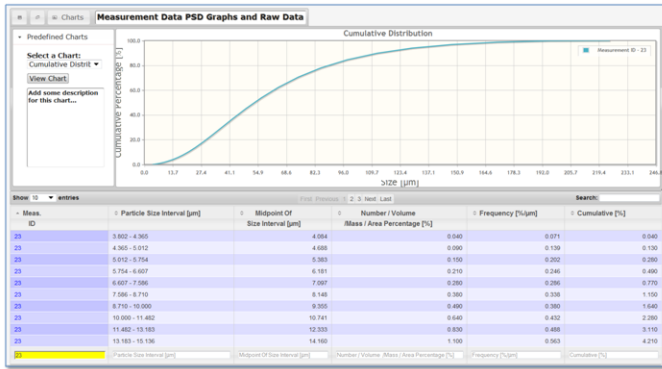
In the first example, the values for Sauter mean diameter are sorted in ascending order across all sample measurements.

In the second example, the x50 percentile value is filtered for particles of size < 100.

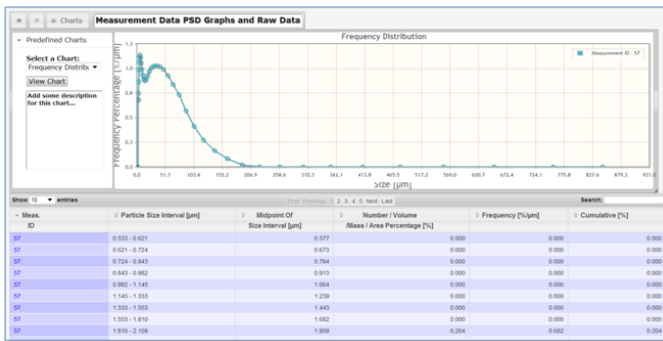


Users can click on View Graph in the Frequency Distribution column to generate the frequency distribution of the particle size measurements.

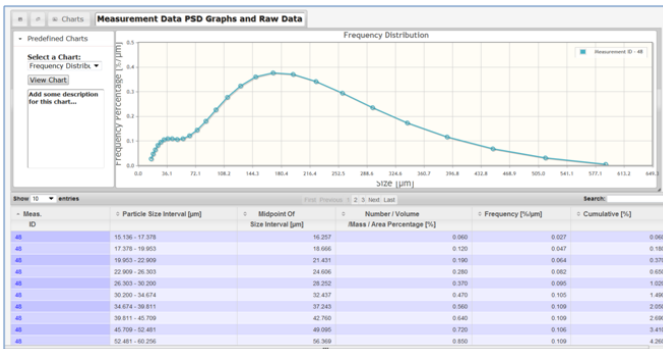
Below the graph, the raw and derived data values are displayed. For each particle size interval, the values are listed for interval midpoint, frequency %, number/volume/mass/area % and cumulative %.



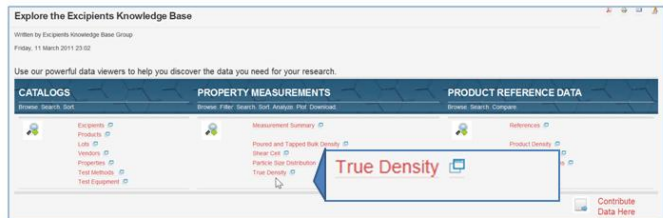
Users can click to view the cumulative distribution directly from the frequency distribution graph or from the main particle size distribution measurements view (from the Cumulative Distribution column).



Any number of frequency and cumulative distribution graphs can be generated and compared in the viewer.



To explore the true density measurements, click on that view from the top level Explore web page.



Blk	Excipient Name	Product	Lot Number	Sample ID	Particle True Density (g/cm ³)	Particle True Density Uncertainty (g/cm ³)	Particle True Density Standard Deviation (g/cm ³)	Humidity (%)	Temperature (°C)	Preparation Mass (g)	Test Me
13	Microcrystalline Cellulose	Acet	F10621003	wang_truedensity_anc	1.554	-	0.001	50.00	23.00	-	Heisen (p)
14	Microcrystalline Cellulose	Acet	F10621045	wang_truedensity_anc	1.556	-	0.001	50.00	23.00	-	Heisen (p)
15	Microcrystalline Cellulose	Acet	F20621006	wang_truedensity_anc	1.557	-	0.001	50.00	23.00	-	Heisen (p)
16	Microcrystalline Cellulose	Acet	F20621030	wang_truedensity_anc	1.555	-	0.001	50.00	23.00	-	Heisen (p)
17	Microcrystalline Cellulose	Acet	F40621050	wang_truedensity_anc	1.551	-	0.000	50.00	23.00	-	Heisen (p)
18	Microcrystalline Cellulose	Acet	5001C	wang_truedensity_anc	1.550	-	0.001	50.00	23.00	-	Heisen (p)
19	Microcrystalline Cellulose	Acet	CG07C	wang_truedensity_anc	1.554	-	0.001	50.00	23.00	-	Heisen (p)
20	Microcrystalline Cellulose	Acet	F613C	wang_truedensity_anc	1.550	-	0.000	50.00	23.00	-	Heisen (p)

The True Density Viewer

This data view lets users explore the values for true density and the standard deviation.

Excipient, product, lot number, sample name, test conditions, preparation mass, test method, submitter, measurement date, annotations and other information are listed directly in this view.

Users can

- click to “show all”
- click to see more information for excipient, product, lot number, property and test method
- sort on any measurement value column to see values in ascending or descending order
- use the filter or the column search boxes to explore the true density data values

Product	True Density	Bulk Density	Tapped Density	Carr Index	Hausner Ratio
Ac-D-50-00-711	-	-	-	-	-
Acet PR101	1.600	0.290 to 0.310	0.310	0.390	1.650
Acet PR102	1.600	0.290 to 0.330	0.330	0.400	1.670
Acet PR103	1.526	0.290 to 0.330	0.330	0.450	1.770
Acet PR112	-	-	-	-	-
Acet PR113	-	-	-	-	-
Acet PR200	1.640	0.290 to 0.300	-	0.200	1.250
Acet PR201	1.551	0.304	Vianna M. Ribeiro	0.259	1.349
Acet PR202	1.550	0.300 to 0.400	Vianna M. Ribeiro	0.349	1.520

For products in the Excipient Knowledge Base, “reference” data values taken from the literature are given for density and for particle size distribution.

A view of excipient database publications referenced by the product data measurements is available, and users can click to see the number of times a given publication has been used as a data value reference.

ID	Citation	True Density	Bulk Density	Tapped Density	PSD
DOE1	Dozier, E., Mawelle, D., Jha, H., and Humbert-Droz, P.	1	1	1	1
RAM1	Ramachandran, H., and Dozier, E., Mordor, D., Ben, H., and Humbert-Droz, P., “Comparative tableting properties of sixteen microcrystalline celluloses”, 1987, Drug Development and Industrial Pharmacy, Vol. 13, pp. 1847-1875	2	2	2	2
SOB1	Sob, J., Law, C., and Hsieh, Pharmacy, Vol. 13, pp. 1847-1875	2	2	2	2
VIA1	Vianna M. Ribeiro, F. and Dozier, E.	3	2	2	2
BAU1	Bauer Brandt, A., and Becker, D., “Evaluation of a concave”	1	1	1	1
ROD1	Rodrigues, V., Leiker, B., Forno, P., Frenkel, P., Clark	1	1	1	1
RAE1	Raigosa, V., Tolosa, P., Leiker, B., Heman, C. A.	1	1	1	1
KAC2	Kachemans, K., Nakagaki, I., and Matsubara, S., “T”	1	1	1	1
DOE1	Dozier, E., Mawelle, D., Vunjak, F., and Humbert-Droz, P.	1	1	1	1

Authorized users can contribute data to the pharmaHUB Excipient Knowledge Base.

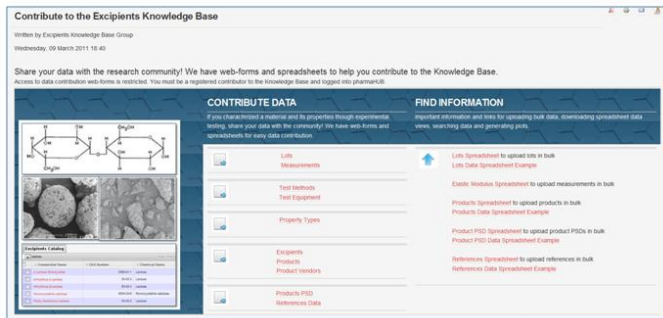
Explore the Excipients Knowledge Base
Written by Excipients Knowledge Base Group
Friday, 11 March 2014 23:02

Use our powerful data viewers to help you discover the data you need for your research.

CATALOGS **PROPERTY MEASUREMENTS** **PRODUCT REFERENCE DATA**

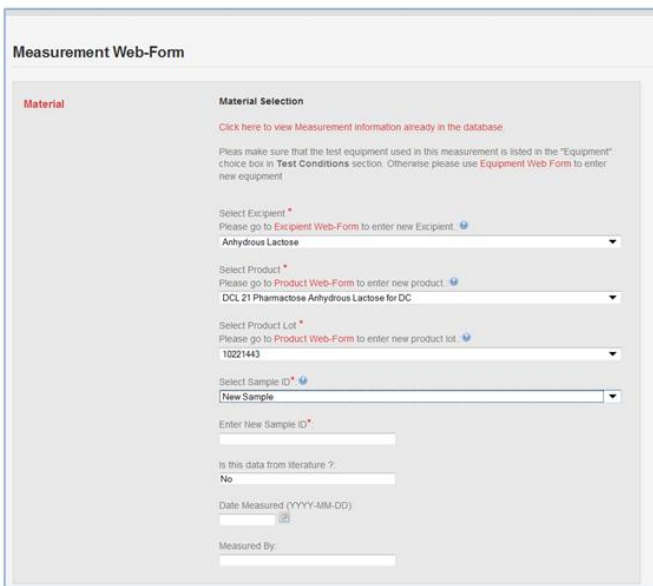
Contribute Data Here

Contributing Data to the Excipients Database



New lots and measurements can be added to the database using customized web-forms or spreadsheets.

New catalog information can also be contributed for test methods and equipment, property types, excipients, products and vendors.







The Measurement Web-Form

The Measurement Web-Form was used to enter the property measurements for the samples in the database. The web-form ensures that the entered data is valid and complete.

The Measurement Web-Form has direct links to the data viewers so that users contributing data can see what data is already in the database. Drop down menus cover the full range of measurement options.

Data sections in the Measurement Web-Form are

- Material specification
- Property specification
- Test Conditions and Test Methods
- Submitter information

<p>Property Measurement Values</p> <p>Property Selection</p> <p>Select Category*  Compact</p> <p>Select Property*  Compact Elastic Modulus</p> <p>Compact Elastic Modulus [Gpa]* _____</p> <p>Uncertainty [Gpa]: _____</p> <p>Standard Deviation [Gpa]: _____</p> <p>Is Curve Fit?  Yes</p> <p>Solid Fraction: _____</p> <p>Porosity [-]: 0</p> <p>Select Extrapolation Technique  Linear Fit</p> <p>Linear Fit Constant [-]: _____</p> <p>Linear Fit Constant Uncertainty [-]: _____</p> <p>Comment _____</p>	<p>Measurements for compact, powder and particle properties can be entered.</p> <p>Compact properties are Elastic Modulus and Tensile Strength.</p> <p>Powder properties are Poured and Tapped Bulk density, Powder Compressibility, Shear Cell, and Specific Surface Area.</p> <p>Particle properties are Particle Envelope Density, Particle Shape, Particle True Density and Particle Size Distribution.</p>
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The Excipients Knowledge Database was created by Sumudinie Fernando and Sudheera Fernando, with data measurements collected and contributed by Kristine Alston and Ting Wang.