

## Hound – Unchained Labs

### INTRODUCTION

---

The Lumetics LINK™ software platform scans network locations for new measurement data files, copies data directly to a centralized database, and provides a powerful user interface for rapid multi-measurement multi-technique data aggregation, visualization, analysis, and reporting. LINK employs a client/server-based architecture where the LINK server hardware is provided by the end user and resides on the end user's network. The LINK client is a portable web-based application that may be placed on any computer with network connectivity to the LINK server. For successful import, the LINK webserver requires read access to the folders where user data resides.

Particles screw up the quality of your drug and can even shut down production. Hound is the only tool out there that combines microscopy, Raman and Laser-Induced Breakdown Spectroscopy (LIBS) to forensically identify particles by their chemical and elemental fingerprints

### DETAILS

---

LINK requires LPE extension file format and one or both of 'All Analyzed Particle File.txt' and/or 'Global Particle File Final.txt' files. Optionally LIBS files can be imported. To separate the RAMAN/LIBS measurements as to not average its data with the regular Hound raw data, a RAMAN/LIBS "instrument" will automatically be generated in the filter panel.

The following raw curve data may be imported, in addition to all available instrument/analysis settings and parameters calculated by the instrument software:

- Particle Count Vs. Size/Shape
- Particle Concentration Vs. Size/Shape

Note:

- Particle size/shape include particle diameter, elongation, fibrosity, rectangularity, and width
- Only runs with values in 'substance' and 'spectrum' columns will be imported
- LINK automatically calculates the "measurement count" which correlates to the particle count imported from Hound. This value can be used on the y-axis.
- Sample Name is automatically populated with values of Time Stamp + X + Y +Level 0 Substance + Level 0 Rank + Size
- Particle and spectra images are imported for each particle and included in Hound dashboards to be used in Word reports.
- Particle count/concentration for each supported morphological parameter occurs at a pre-defined bin spacing and measurement range as per the table in the Users Manual.
- **Custom Particle Parameters** can be defined and be generated for each measurement during import (e.g. calculate particle mass assuming a density and volume) if it is first created/defined and then requested within an Import Method.

Import Method options can be defined and calculated each measurement during import if it is first created/defined and then requested within an Import Method. More information and instructions can be found in the Users Manual. The following is the default Hound-specific import method settings:

- Default Sub-Populations: **None**
- Custom Particle Parameters: **None**
- Dilution Factor: **1 (no dilution)**

### Subpopulations

In addition to the total particle population data set, sub-populations based morphological parameter filters may be generated



at the point of measurement import. An unlimited number of sub-populations may be specified for each measurement. For each sub-population, the particle count/concentration vs. morphological parameter will be available, as well as representative particle thumbnail images. The sub-populations do not count towards the measurement limit per project. Additional Sub-Populations will affect import speeds.

When creating as sub-population, select a Morphological Parameter from the pre-defined list and specify the filter criteria. Select the + to add the filter term to the Live Expression View. The Live Expression View can be edited directly. Brackets, mathematical operators/values, logical ANDs or ORs are valid operators. Syntax must be exact, for successful application.

### Custom Particle Parameters

Select from the available user-defined Custom Particle Parameters, those that shall be calculated for each individual particle within each measurement. This selection applies to the total particle population and all defined sub-populations.

### Automated Metadata Extraction

Specify criteria for automated metadata extraction from measurement file fields (e.g. Comments, File Name, Import Path etc...) utilizing specified delimiters. Both metadata name and value may be extracted or only the value only.

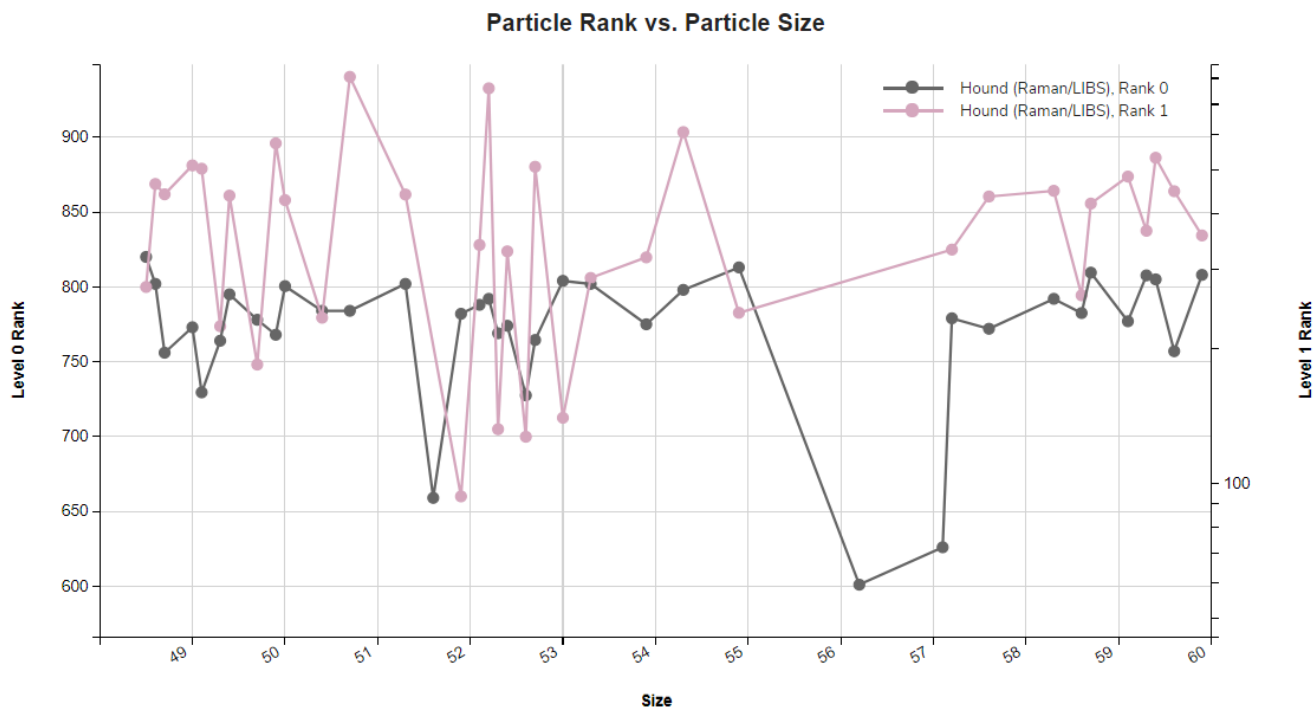
### Dilution Factor

Specify a dilution factor for automated particle count/concentration data adjustment. This selection applies to the total particle population and all defined sub-populations. A LNK\_Dilution\_Factor may also be applied after import, utilizing the Add/Edit LINKdb Fields feature.

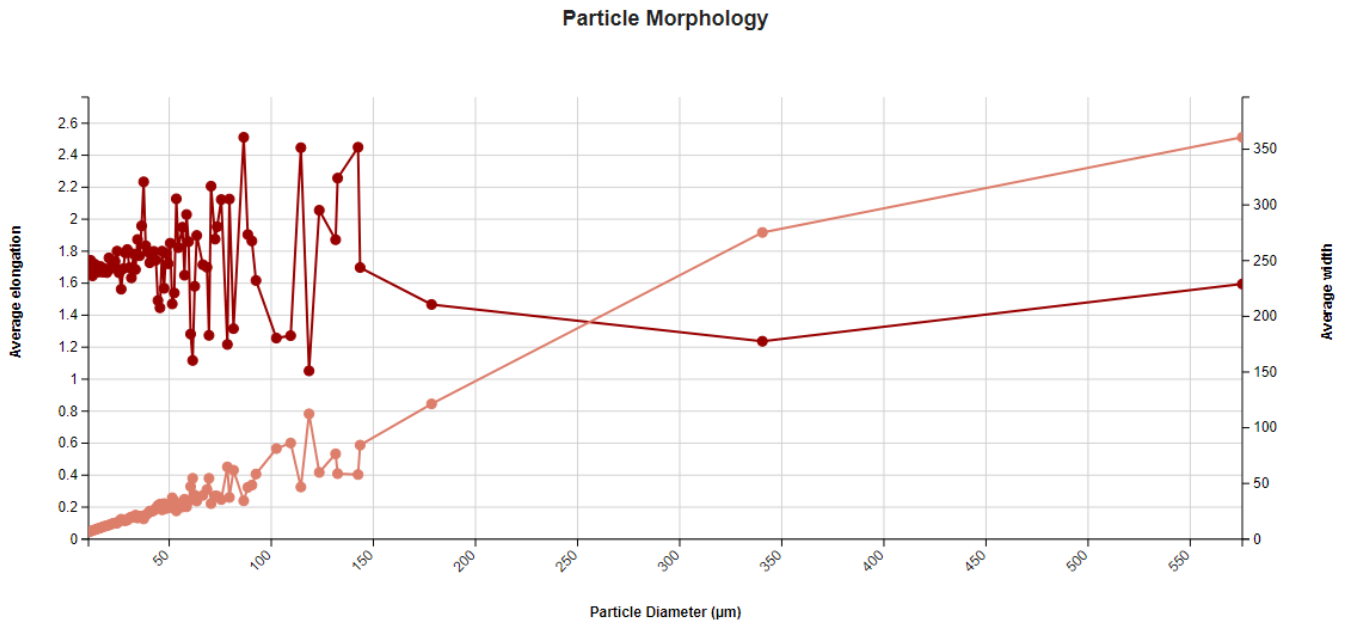
## EXAMPLES

Included below are example dashboards from Hound measurement files:

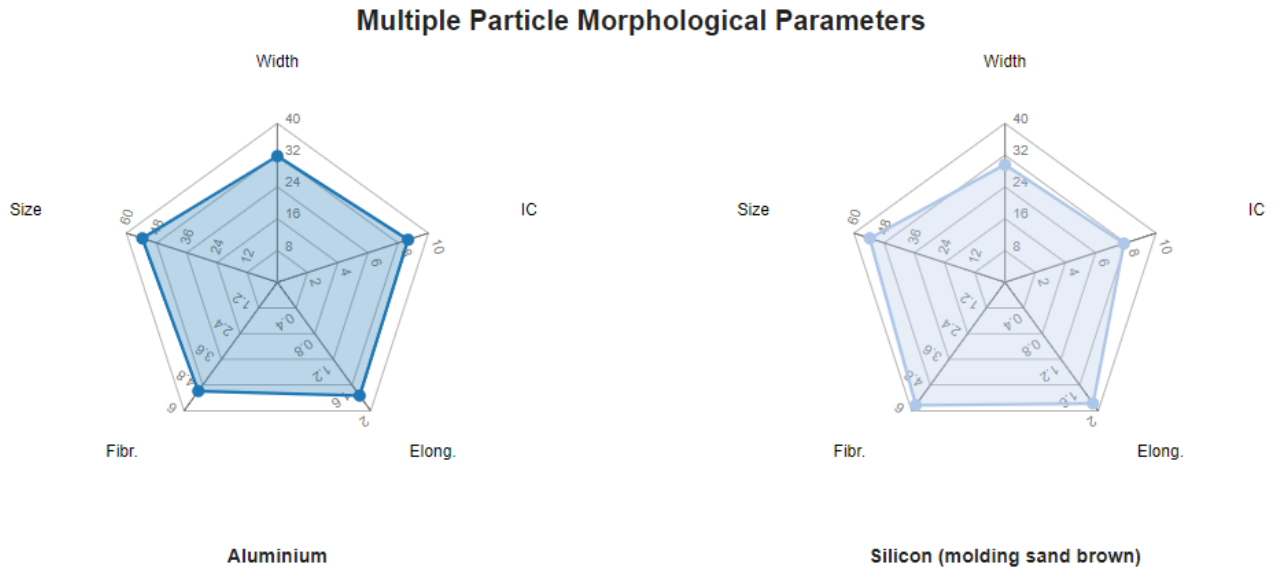
### 1. XY Line/Scatter chart plotting Rank vs. Size particle data



2. Line Chart plotting raw data based on particle morphology for Elongation & Width vs. Diameter



3. Radar Chart plotting multiple morphological parameters



5. Tabular Summary examples

Measurement Summary Table – Instrument Settings

LINK Record ID #	Analysis Date	S/N - AVG	Measurement Type	Measured Volume	Lens	Imaging Parameters	Exp.(s) - AVG	Device Serial
1	2019-03-29 15:5...	57.00	metal.ID (LIBS)	100.0 ml	10.0x	Exposure	1	Hound-0008
2	2019-03-29 15:5...	124.40	metal.ID (LIBS)	100.0 ml	10.0x	Exposure	1	Hound-0008
3	2019-03-29 15:5...	181.20	metal.ID (LIBS)	100.0 ml	10.0x	Exposure	1	Hound-0008
4	2019-03-29 15:5...	56.10	metal.ID (LIBS)	100.0 ml	10.0x	Exposure	1	Hound-0008
5	2019-03-29 15:5...	148.10	metal.ID (LIBS)	100.0 ml	10.0x	Exposure	1	Hound-0008
6	2019-03-29 15:5...	463.60	metal.ID (LIBS)	100.0 ml	10.0x	Exposure	1	Hound-0008
7	2019-03-29 15:5...	429.20	metal.ID (LIBS)	100.0 ml	10.0x	Exposure	1	Hound-0008

#### Measurement Summary Table – Measurement Results

LINK Record ID #	Level 0 Substance	Level 0 Rank - AVG	Level 1 Substance	Level 1 Rank - AVG	Size - AVG	Width - AVG	Fibr. - AVG	Elong. - AVG	F/P - AVG	IC - AVG	Rect. - AVG
14	Aluminium	798	Aluminium	556	52.70	40.70	4.67	1.30	18.60	9.10	0.28
15	Aluminium	804	Aluminium	140	53.00	25.00	5.39	2.11	21.70	8.40	0.39
16	Aluminium	808	Aluminium	175	57.20	36.80	4.54	1.56	17.20	11.20	0.34
17	Aluminium	769	Aluminium	132	52.30	35.90	5.06	1.46	17.24	7.70	0.29
18	Aluminium	802	Aluminium	287	53.30	22.10	6.69	2.40	21.60	6.30	0.36
19	Aluminium	808	Aluminium	357	59.90	28.10	6.71	2.13	17.15	7.70	0.32

#### DASHBOARD DOWNLOADS

Included below is a link to downloadable dashboards for Hound measurement files:

<http://lumetics.com/dashboards/Hound/Hound.zip>

#### CONTACT LUMETICS

For direct assistance, please contact Lumetics LINK™ Support:

**E-mail:** [support@lumetics.com](mailto:support@lumetics.com)

**Phone:** 1.613.614.874

**Website:** <http://lumetics.com/>

