

VROC Initium - RheoSense

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.

VROC Initium (**Viscometer-Rheometer-on-a-Chip**) combines microfluidic and MEMS (**Micro-Electro-Mechanical Systems**) technologies to measure dynamic viscosity over a wide dynamic range of operation.

VROC® Technology took the standard principles of rheometry and created a dynamic micro-sample viscometer by adding microfluidics while reducing the size of the device with MEMS (micro-electrical mechanical systems) manufacturing. The result was a new platform which offers capabilities that are well beyond the limits of conventional viscometers in not only the sample volumes required, but the measurement range and precision.

DETAILS

LINK requires XLSX workbooks for importing VROC Initium data. Files may need to be exported from the VROC Initium software.

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

- Chip Temp (°C) vs. Elapsed Time (s)
- Viscosity (mPa-s) vs. Elapsed Time (s)
- Pressure, S1 (Pa) vs. Elapsed Time (s)
- Pressure, S2 (Pa) vs. Elapsed Time (s)
- Pressure, S3 (Pa) vs. Elapsed Time (s)
- Pressure, S4 (Pa) vs. Elapsed Time (s)
- Raw Data Type Id vs Elapsed Time (s)
- Average Pressure (Pa) vs. Sensor Position (mm)

Notes:

- The Average Pressure (Pa) is calculated for each sensor (S1-S4) from the raw data by only averaging relevant measurement data (data points where RawDataTypeId = 1) and is available to be plotted as a function of Sensor position (mm).
- The y-axis parameter *Raw Data Type Id* is available to be plotted as a function of Elapsed Time and is useful to overlay this curve against Viscosity (mPa-s) data to verify where valid measurement data was recorded, vs where the priming sections of the data are located.

The VROC Initium XLSX data file example is as follows:

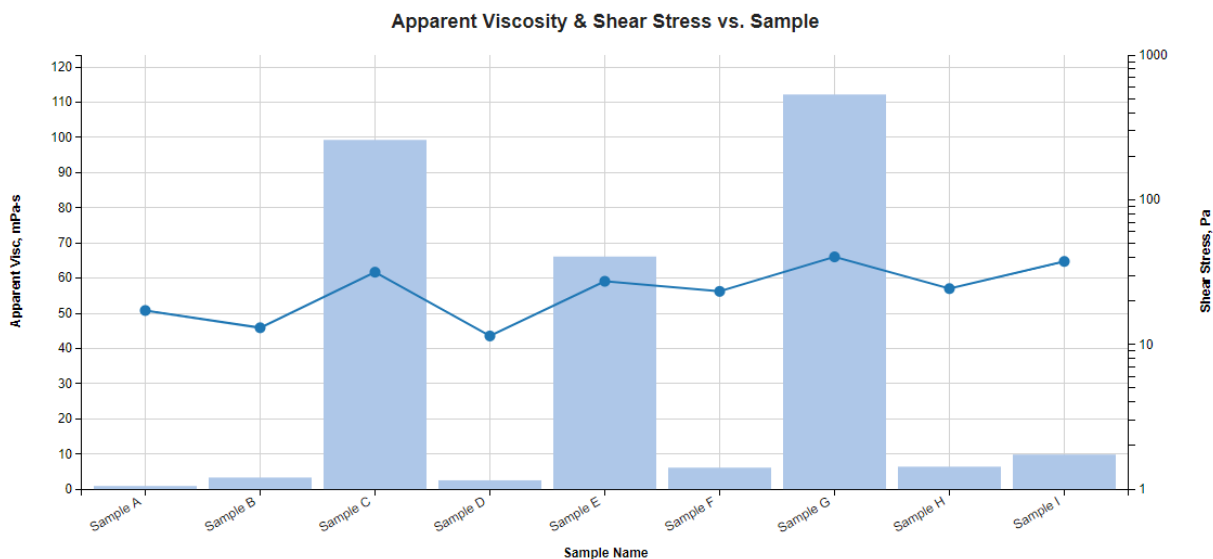
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2		Report Info																	
3		Report Name			Export Date and Time		User ID	User Type											
4		My Report			1/4/2018 9:44 AM		admin	Admin											
6		Job Info																	
7		Job ID & Name		RunID Range	Recipe	Loading Protocol	Measurement Protocol	Cleaning Protocol	Sensor ID	Syringe Size	Username	Initial Tray Temp °C	Run Start Date						
8		180104010023.685		1-10	None	A: [TH]80uL_200mPas_v1	[RS]1000uLmin_46uLretri eval_IntrinsicVisc	[BOSSTD]200mPas_v1	1711B05100462	100uL	admin	25	1/3/2018						
11		Job 1 Summary																	
12		Job ID	Sample ID	RunID	Vial No.	Segment	Chip Temp °C	Syringe Temp °C	Flow Rate, µL/min	Shear Stress, Pa	Appar. Shear Rate, 1/s	Apparent Visc, mPa-s	Slope R² Fit	True Shear Rate, 1/s	True Visc, mPa-s	WRM R² Fit	% Full Scale	Loaded Vol, µL	Time
13		180104010023.685	Water	1	1	1	25	25.02	1000	16.65	19322	0.862	1				19.2	68.6	5:12 PM
14		180104010023.685	Water	1	1	2	25.01	24.98	1000	17.16	19322	0.888	1				18.7	68.6	5:16 PM
15		180104010023.685	Water	1	1	3	25.01	25.05	1000	17.25	19322	0.893	1				18.7	68.6	5:17 PM



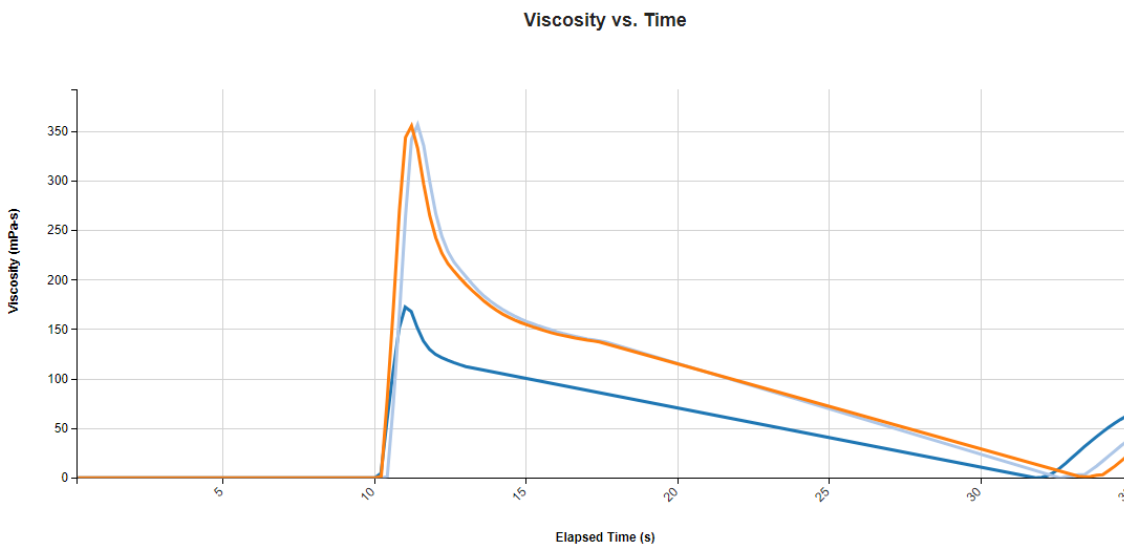
EXAMPLES

Included below are sample dashboards from VROC Initium measurement files:

1. Column Chart plotting measurement results for Apparent Viscosity & Shear Stress vs. Sample Name



2. Line Chart plotting raw data curves for Viscosity (mPa-s) vs. Elapsed Time (s)



3. Tabular Summary examples

Measurement Summary Table – Measurement Results

LINK Record ID #	Sample Name	Segment - AVG	Shear Stress, Pa - AVG	% Full Scale - AVG	Apparent Visc, mPa-s - AVG	Slope R ² Fit - AVG	Flow Rate, μ L/min - AVG	Appar. Shear Rate, 1/s - AVG	Viscosity (Raw Data)	S4 Pressure (Raw Data)	S3 Pressure (Raw Data)	S2 Pressure (Raw Data)	S1 Pressure (Raw Data)	RawDataTyped (Raw Data)
156	Sample C	1	29.88	34	94	1	16.69	318	0.0,0.0,0.0...	23.0,9.6,9....	69.6,4.6,9....	46.8,12.7,2...	0.0,0.0,0.0...	3,3,3,3,3,3...
171	Sample E	1	0.00	0	-1	0	0.00	0	0.0,0.0,0.0...	2.3,30.8,27...	-4.2,14.4,2...	5.7,26.1,22...	0.0,0.0,0.0...	3,3,3,3,3,3...
193	Sample G	1	0.00	0	-1	0	0.00	0	0.009,0.01...	-1.6,2.1,55...	16.6,-3.2,2...	-15.5,-7.3...	0.0,0.0,0.0...	3,3,3,3,3,3...



Measurement Summary Table – Instrument Settings

LINK Record ID #	Sample Name	Analysis Date	Chip Temp (°C) - AVG	Segment - AVG	Sensor Temp (Raw Data)	Vial No. - AVG	RunID - AVG	Run Start Date	Initial Tray Temp °C - AVG	Export Date and Time	Elapsed Time (Raw Data)	% Full Scale - AVG
156	Sample C	2016-10-2...	25	1	25.0,24.99,...	2	2	10/20/2016	19.99	10/28/2016...	0.0,0.2,0.4,0...	34
171	Sample E	2016-10-2...	0	1	25.0,25.0,2...	4	4	10/20/2016	19.99	10/28/2016...	0.0,0.21,0.4...	0
193	Sample G	2016-10-2...	0	1	25.01,25.0,...	6	6	10/20/2016	19.99	10/28/2016...	0.0,0.21,0.4...	0

VROC DASHBOARDS

LINK contains an extensive built-in dashboard library from LINK version 2.4.0.210401 and later. This function contains specific pre-created dashboards for all instruments and application groups.

CONTACT LUMETICS

For direct assistance, please contact Lumetics LINK™ Support:

E-mail: support@lumetics.com

Phone: 1.613.417.1839

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

