

# EXUM

## **~\$1M IN SIGNED PO'S**

Exum sold beta instruments to early adoption customers

## **HEALTHY MARGINS**

For unit sales, present margins are 30-40% but a direct path exists to 62%

## **INTELLECTUAL PROPERTY**

Technology protected by 2 domestic and 1 international broad patents

## **BEYOND THE TRADITIONAL \$5B MARKET**

Present domestic elemental analytical instrument market is ~\$5.5B, however, 9 out of 10 potential customers do not currently own these instruments

## **PATH TO HIGH MULTIPLIER EXIT**

100s of technology acquisitions have already occurred, and the cadence and value of these is increasing

## **FOCUS ON TOOL DEPLOYMENT & BUSINESS MODELS**

Before ramping up manufacturing capabilities, we will learn from early tool deployments and explore service business models

# THE TEAM



JEFF  
WILLIAMS  
CEO / CO-FOUNDER

Jeff realized the analytical world he loved so much was greatly lacking. This inspired him to pivot from research scientist to entrepreneur with a mission to redefine analytical instruments forever.



STEPHEN  
STRICKLAND  
CFO / CO-FOUNDER

Steve brings with him years of corporate management experience running teams responsible for closing multi-million dollar transactions.



JOSH  
ULLA  
CDO

With a proven track record of taking new technology to market, Josh is pioneering and forging a new analytical path for Exum's customers.

## PRESENTLY EXUM HAS

- 3 Analytical Chemists
- 3 Mechanical Engineers
- 3 Developers

## OFFICE LOCATIONS IN

- Denver
- Albuquerque

# PROBLEM SOLVED

**MASSBOX**



**VIDEO HERE**

- High-sensitivity, high-throughput solid material characterization
- Enables the next generation of manufacturing (Industry 4.0)
- Democratizing mass spectrometry
- Patented Laser Ablation Laser Ionization (LALI) technology

From manufacturing to resource extraction, numerous industries require chemical characterization of their solid materials, however, they lack in-house capabilities.

Until now, no single instrument offers:




































- High-sensitivity measurements of the full periodic table
- Ease-of-use for solid materials
- Low-cost operations

**CURRENT STATE-OF-THE-ART**



# HOW THE MASSBOX COMPARES

In order of importance to customers:

	Massbox	Laser Ablation + ICP-MS*	Alternative Methods		
			ICP-MS* (liquid intro)	LIBS	XRF
Ease of Use					
Elements Measured					
Sensitivity					
Price					
Speed					
Cloud Based					
Ruggedness					

\*Inductively Coupled Plasma Mass Spectrometers require liquid sample introduction unless combined with Laser Ablation

# LA-ICP-MS MASS SPEC

## DIFFICULT TO USE

Requiring a PhD Chemist as well as being finicky, present tools are never easy to use

## TECHNICALLY INSUFFICIENT

Existing tools require multiple sample runs, calibration, and corrections

## EXPENSIVE

For adequate characterization, tools cost an excess of **\$1M**

## FRAGILE

Tools require careful set up and regular tuning, often upset by subtle movements

## LACKING A SINGLE INTERFACE

Many poorly written software packages are stitched together to complete analytics

# THE MASSBOX

## EASY AS A SMARTPHONE

The user interface is simple, intuitive and can be operated by an entry level tech

## ANALYTICALLY SUPERIOR

Total characterization can be completed in a single analytical session

## AFFORDABLE

Starting at **\$390K**, aggressively undercuts the competition and runs samples at **1/10th the cost**

## RUGGED

Deployed in the labs, manufacturing floors and in the field, it's ready for work

## EXUM ECOSYSTEM (SaaS)

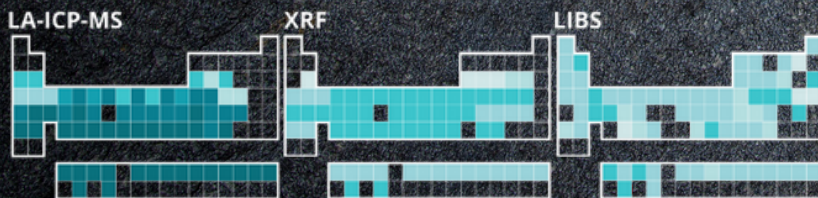
All software needed for data handling and analysis is available in a single environment



# ANALYTICALLY SUPERIOR

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba		Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra																

La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr



Parts Per Million Sensitivity Legend



THE MASSBOX CAN ANALYZE ALL THE CONSTITUENTS IN A SOLID SAMPLE IN ONE SESSION







TRADITIONAL TECHNOLOGY SUCH AS LA-ICP-MS, XRF OR LIBS ALL FALL SHORT IN EITHER BREADTH OF ELEMENTS MEASURED OR SENSITIVITY



# TRACTION

Penetrating 2 Markets

	Needs the Data?	Owns the Instruments?	Domestic Market	Customers	Example
			<b>~\$5B/ YEAR*</b>	<u>Research Scientists</u> at Fortune 500 Companies, Academia, Government & Independent Labs	<b>LOS ALAMOS NATIONAL LAB</b>
			<b>~\$19B/ YEAR**</b>	<u>Materials Engineers</u> in Additive Manufacturing, Aerospace, Recycling, Batteries & Natural Resources	<b>ELEMENTUM 3D</b>

## Exum's Sales Process:

- Demonstrate the Massbox's capabilities on their specific samples
  - Potential customers send up to 12 samples and we analyze them through a blind test
- When purchasing, customers have the choice of either:
  - Purchasing
  - Leasing (Hardware as a Service (HaaS))

\*Analytical Laboratory Instruments Global Market Opportunities and Strategies to 2030

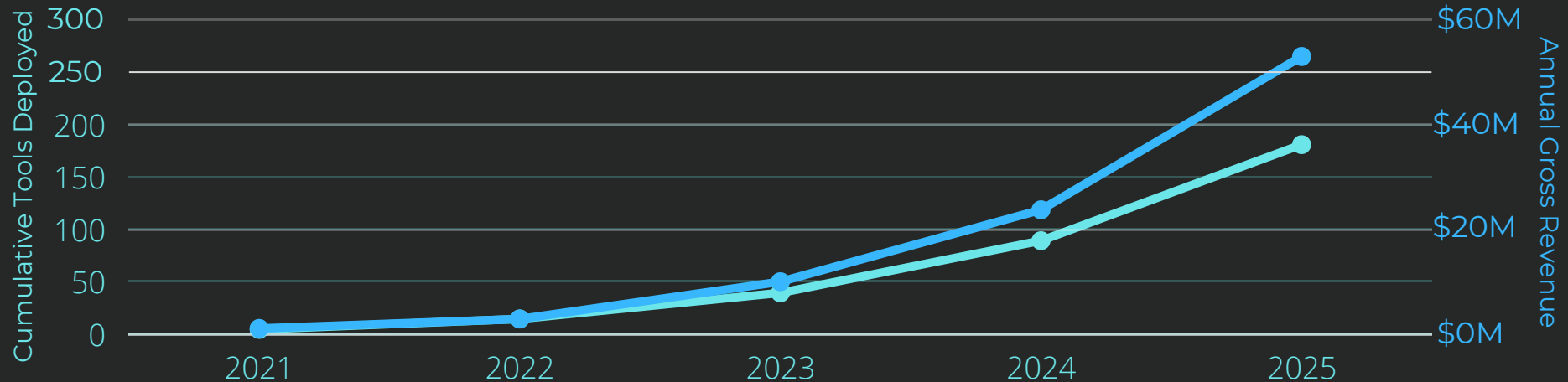
\*\*Testing, Inspection, and Certification Services Market Report

# TRACTION

## Noteworthy Sales Metrics:

- 88% of customers who meet with Exum request a demonstration
- 83% of those who get a demonstration request a proposal
- Exum presently has >50 high potential leads
- Exum presently has a sales pipeline of >\$10M customers who have requested a demonstration

Exums Instruments' financial model is previewed below (light blue is tools and dark blue is revenue):





# TOP 5 COMPANIES ACQUIRING ANALYTICAL TECHNOLOGY COMPANIES (2015-2021)

			Total	Average	No. of Acquisitions
			2015-2021	2015-2021	Lifetime
<b>Thermo Fisher</b>			<b>\$45.2B</b>	<b>\$4.5B</b>	<b>60</b>
PPD Mesa Biotech Henogen Advanced Scientifics	Qiagen Brammer Bio Pantheon	FEI Affymetrix AlfaAesar			
<b>Perkin Elmer</b>			<b>\$2.3B</b>	<b>\$758M</b>	<b>29</b>
Oxford Immunotec	Horizon Discovery	Eurolmmun AG			
<b>Danaher</b>			<b>\$37.9B</b>	<b>\$9.5B</b>	<b>55</b>
Cytiva Advanced Vision Tech	Cepheid	Pall			
<b>Agilent</b>			<b>\$2.6B</b>	<b>\$425M</b>	<b>48</b>
Resolution Bioscience BioTek Instruments	ACEA BIO Lasergen	Advanced Analytical Tech Cobalt Light Systems			
<b>Roche</b>			<b>\$15.5B</b>	<b>\$1.3B</b>	<b>49</b>
GenMark Diagnostics Inflazome Spark Therapeutics Tusk Therapeutics	Flatiron Health Ignyta mySugr Tensha Therapeutics	Adheron Therapeutics GeneWEAVE Trophos Foundation Medicine			

# WORDS OF INTENT

## CHEVRON TECHNICAL CENTER

- "We are convinced that the development of advanced Massbox has importance to the O & G business." - Francisco Lopez-Linares, Technical Team Leader

## UNIVERSITY OF PENNSYLVANIA

- "I intend to submit an NSF Major Research Instrumentation grant to purchase the Massbox for my University of Pennsylvania laboratory." - Dr. Jon Hawkings, current Research Fellow starting a new faculty position at University of Pennsylvania this fall

## UNIVERSITY OF WATERLOO MULTI-SCALE ADDITIVE MANUFACTURING LABORATORY

- "Upon receipt of funding through public sector grants targeted to support this equipment, we intend to purchase a Massbox for our laboratory" - Mihaela Vlasea, Assistant Professor, Department of Mechanical and Mechatronics Engineering

## UNIVERSITY OF IDAHO

- "Indeed, Massbox opens research opportunities that are currently unavailable at UI with the existing analytical instrumentation." - Inna Popova, PhD, Assistant Professor, Soil and Water Systems

## STANFORD UNIVERSITY / SLAC NATIONAL ACCELERATOR LABORATORY

- "Available to speak to potential investors as a reference" - William Chueh, Associate Professor of Materials Science & Engineering, Faculty Scientist, Stanford Institute for Materials & Energy Sciences

# EARLY ADOPTER TESTIMONIAL



## MATERIALS CHARACTERIZATION

Additive Manufacturing (3D Printing) Company developing proprietary ultra-materials

- Currently requires 3 different analytical instruments for full chemical characterization
- ~\$1,000 / sample at external lab
- Up to 1 month turnaround

### Exum's solution

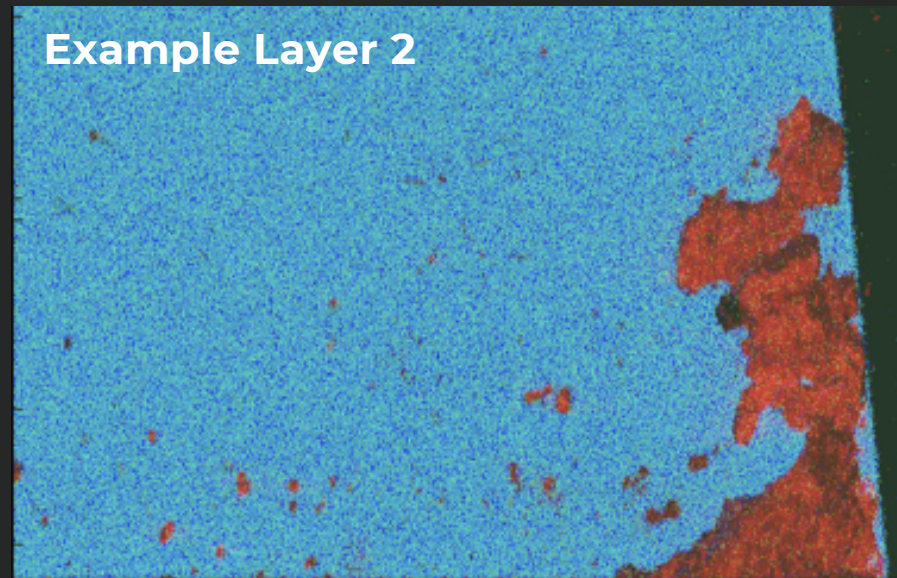
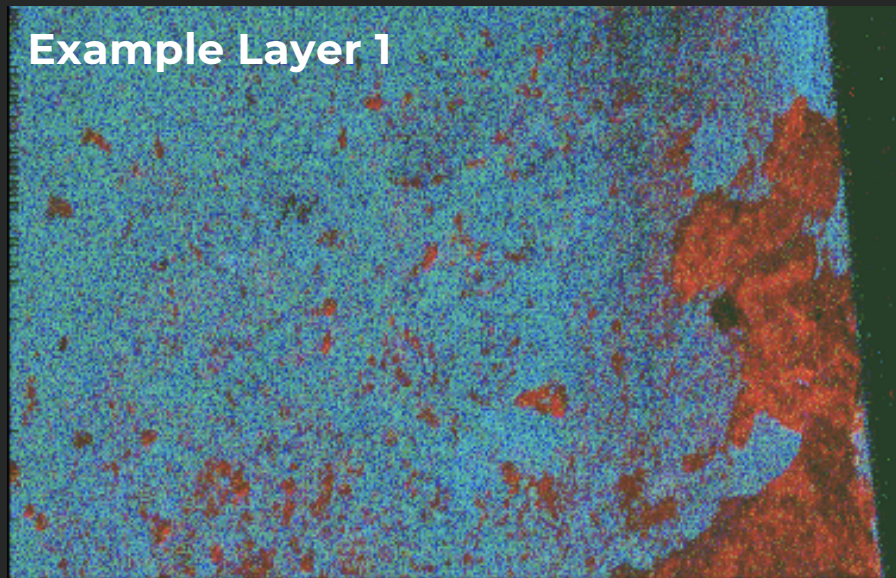
- **Full characterization in minutes with single analytical session**
- **In-house instrument operated by tech or engineer (no Chemistry PhD required)**
- **\$100,000+ in cost savings each year**

"Traditional analytical instruments were not cost and time effective to analyze our materials. Exum's tool enables high-throughput analysis of both our feedstock powder and printed parts to significantly boost our quality assurance and R&D turnaround"

Jeremy Iten, PhD, Chief Technology Officer  
Elementum3D



# A DEEPER LOOK AT ELEMENTAL MAPPING



Exum's **Massbox** (LALI) offers

- X and Y spatial resolution of 1-250  $\mu\text{m}$
- Z depth resolution of 10-100 nm
- Sensitivity across all required elements
- Sample rep rate of 50Hz
- Sample size up to 8.3 cm x 8.3 cm



