

nanozen
know the air you breathe.

Nanozen

Major Pharma Opportunity

July 2022

Contacts:

CEO Peter Briscoe peterb@nanozen.com

CTO Dr Winnie Chu winnie.chu@nanozen.ca



Real-Time *personal*
wearable Particulate Monitors

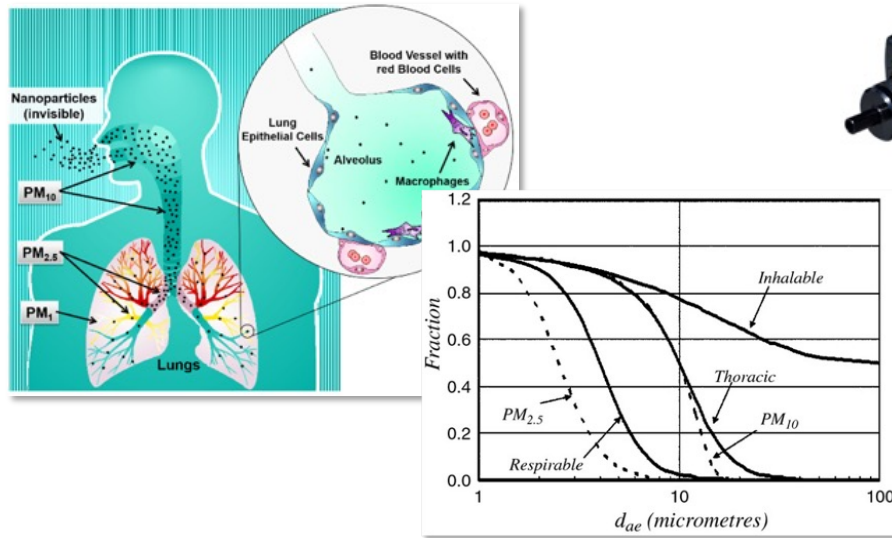
Executive Summary

Nanozen has developed a technique that allows detection of specific aerosols.
Huge initial opportunity in Pharma for Containment Verification application.
Large benefits in production efficiency for pharma customers.
Pharma Industry are driving Nanozen to accelerate our program.
Equipment Vendors are already lining up to partner with us.
Big business opportunity for Nanozen + Partners – opens up a new market segment.
Need \$3-5 M to grab this market segment within 1 year.

Result – An Exciting Opportunity for Investors.

Nanozen real-time DustCount Aerosol monitor

Real-time data – based on ISO aerosol Standards

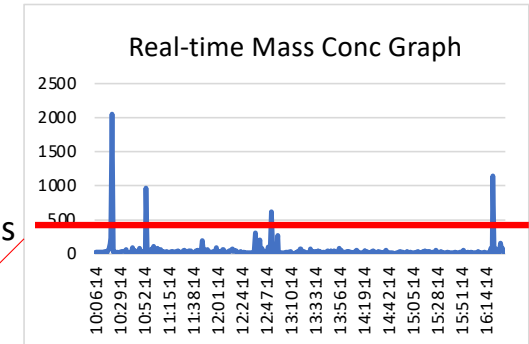


DustCount 9000

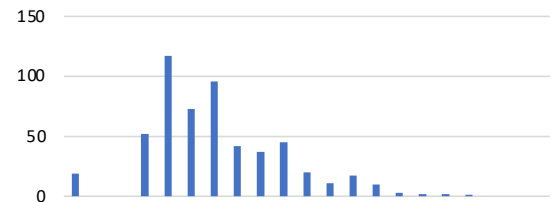


Multiple patents granted

wireless



Real-time Aerosol Size Distribution Graph



1. Occupational Health and Safety
2. Production monitoring

- Detects concentration of aerosols in a specific size range – Best product in the market today!
- Can NOT detect amount of a specific aerosol.

Market Success so Far

BHP

GLENCORE

Mining (top 5) – sold to 15 major mining companies,
1 just turned operational,
1 about to go operational,
1 more to go operational late 2022.

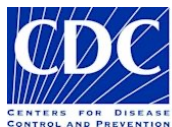
Teck



Pharma (top 4) – sold to 10 major Pharma companies
- OH&S tests, trials, operation
- new major application for Nanozen Products



Other Notables



Johns Hopkins



CAF



a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA



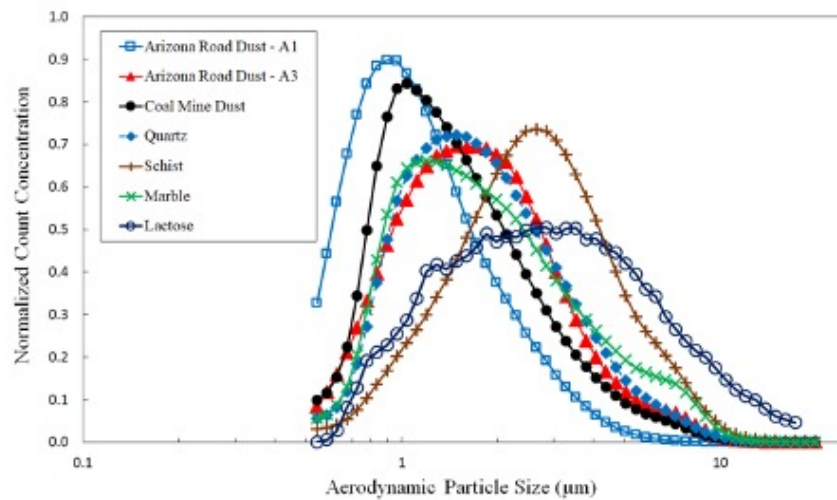
Market Opportunity

36,000 mines WW, 10 – 100 units per mine – 3.6M units @ \$5,000 USD each = \$18B

18,000 pharma factories WW – 10 – 50 units per factory – 1M units @ \$5,000 USD each - \$5B

New Nanozen Sensor Detects Specific Aerosols in real-time

Each Aerosol has a different profile!!

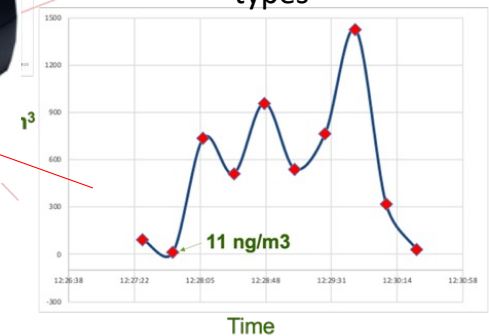


DustCount 9009



Multiple new Patents
in progress

Real-time Specific aerosol
types



- New DustCount sensor detects specific Aerosol out of the cloud of particles.
- Example: Will tell customer how much Active Pharmaceutical Ingredients is in a puff of powders.

This is a game changer according to Pharma Companies and Mining companies (silica, APIs)

Initial Major Application - Containment Verification

18,000 Pharma factories, each have 10 – 20 drug production lines. Change 3x per year.



Raw materials



Ingredient pours



Reactors



Pill production

Each and every step in the production line must be checked for leaks before start-up.

Each device test is \$30K. 30 to 50 devices per test = +\$1m

Total test time = month – each day of lost production = \$1M.

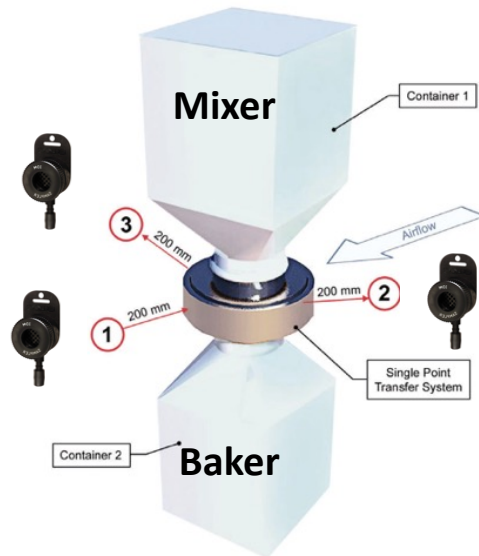
Real-time system can do this in a week.

Nanozen has been asked to create a real-time system to do this and imbed into Pharma stnds.

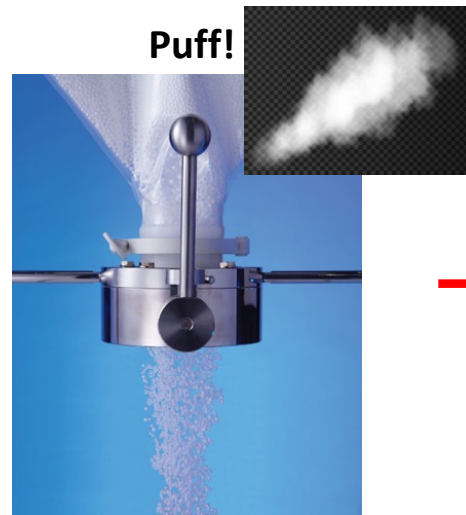
Present ISPE standard for Containment Verification

1. Setup per ISPE guidelines

Test Filters placed at strategic locations



2. Perform test



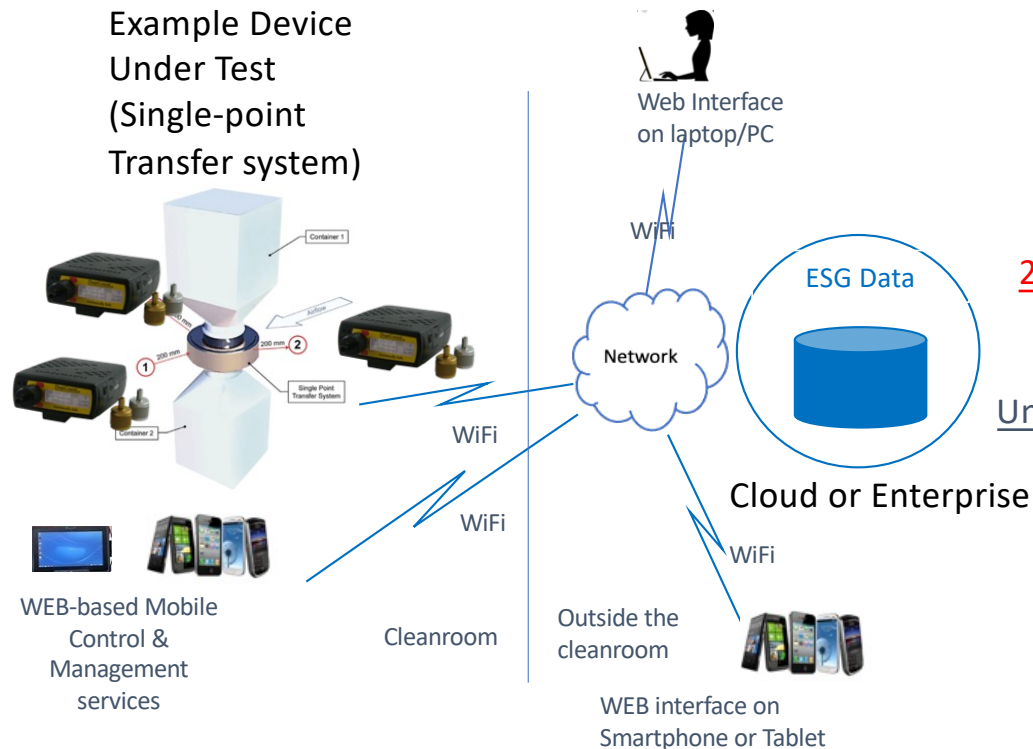
3. Send away for Lab Analysis



- ISPE Standards specify where to place filters and how much leakage is allowed.
- Material is transferred from mixing vessel to baking vessel.
- High quality butterfly valve used to minimize leakage.
- Test Filters sent to a lab for analysis – can take weeks
- Result is a number to compare to OEL for that material. Example: 84ug vs OEL of 50ug = fail

Nanozen real-time Containment Verification Service System

1. Nanozen Sensor
In ISPE standard test config
Instead of pump/filter

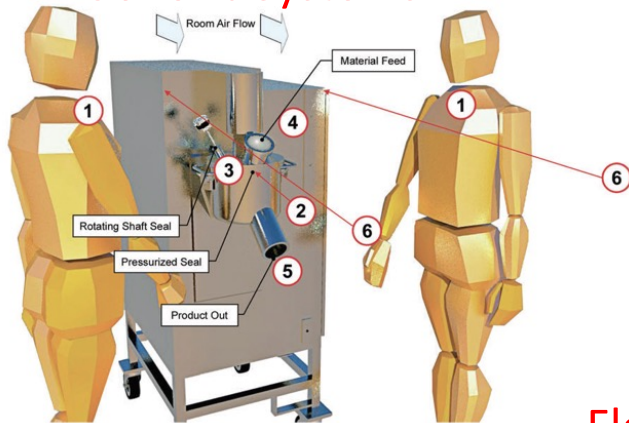


2. Nanozen Service Platform
To manage sensors
Control Data and alarms
Undertake analysis and reports

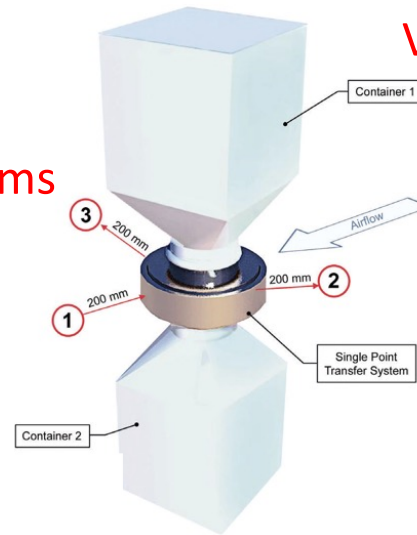
Sell the service/system to all pharma companies and pharma equip manufacturers.
Sensor development/patents and Service Platform development are in progress.

Many Devices must be tested For each Production Line

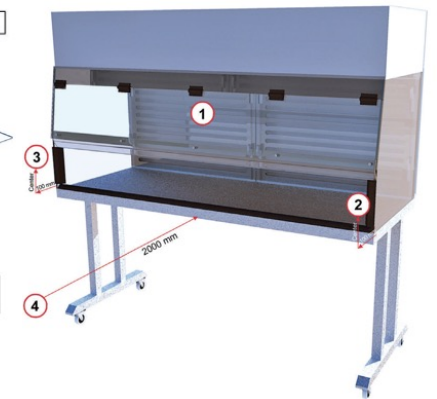
Generic Systems



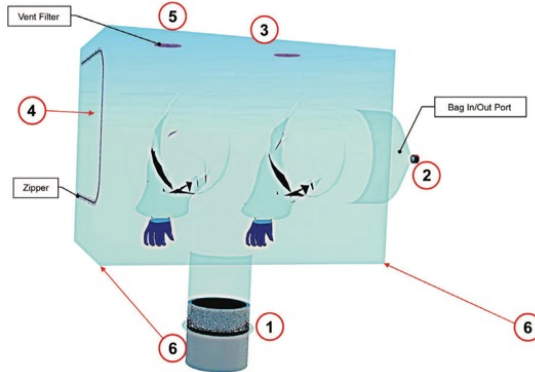
Single Point Transfer Systems



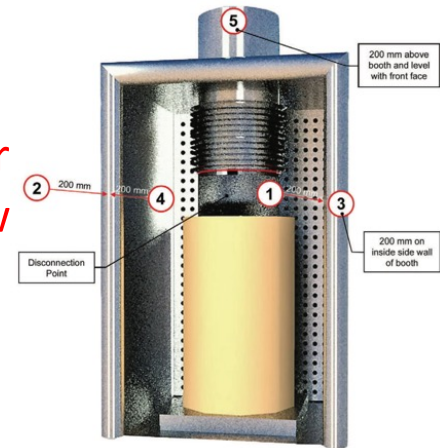
Ventilated Enclosures



Flexible Enclosure



Laminar Air Flow Booth



Isolator/Glovebox

1 2 3 4 5 6 Monitor locations

Pharma Coalition

4 of the top Pharma in the world.

Objective is to assist Nanozen to accelerate Real-time Containment Verification system.

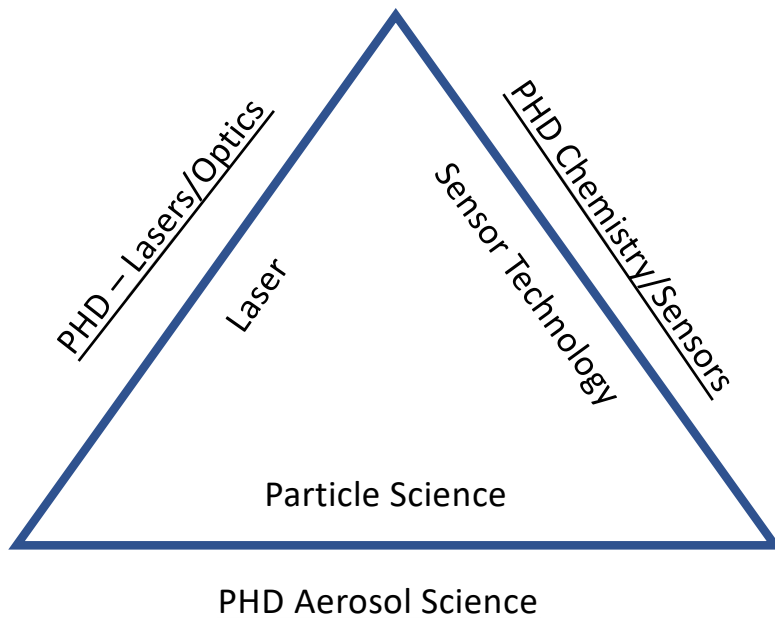
Letters of support, in-kind and cash = \$2M (target)

1 Major Pharma has given Nanozen an RFP for CV Project regardless of the consortia.

Containment Verification Service System Project

- Pharma consortia + VC funding + Gov \$\$ leverage - \$8M
- Target 1 year to create capability and imbed into Pharma Industry standards.
- 1 major Pharma company has sent RFP to provide solution within 1 year for \$\$.

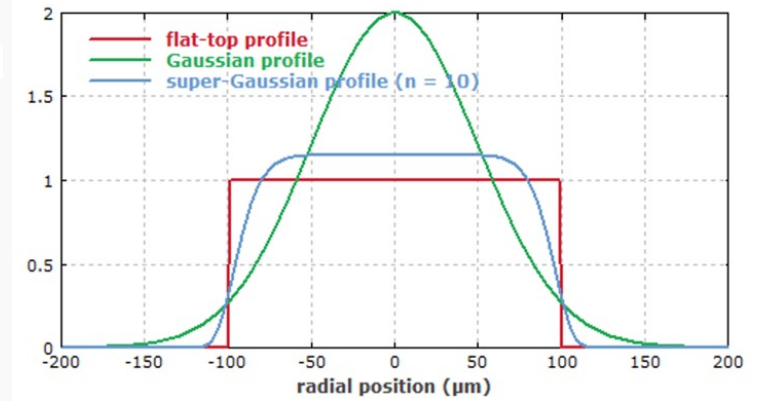
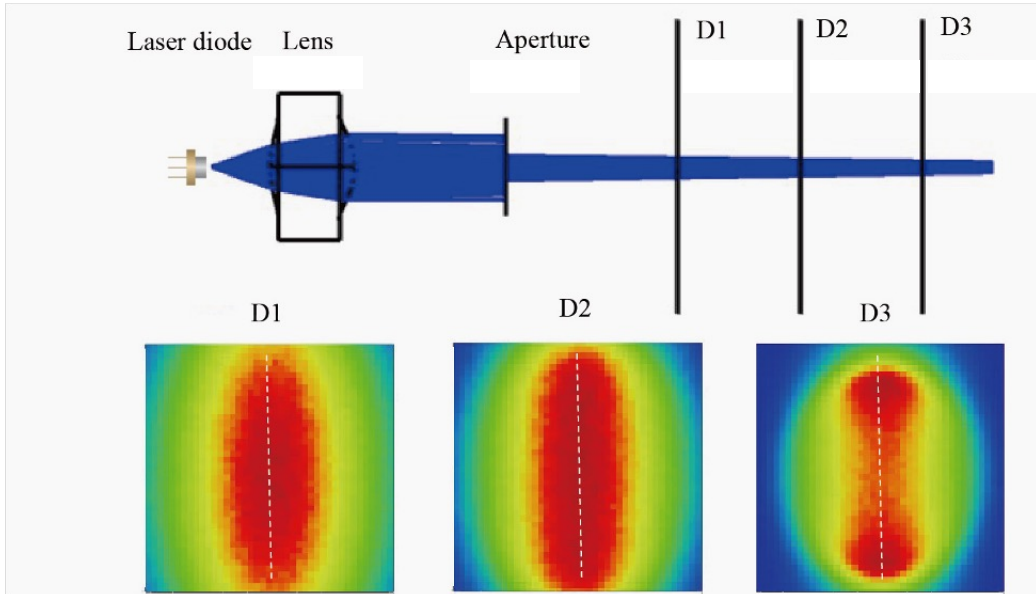
Expert Sensor Team



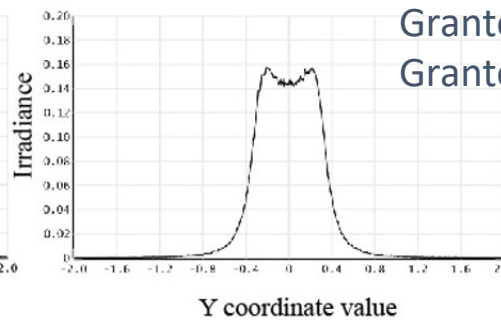
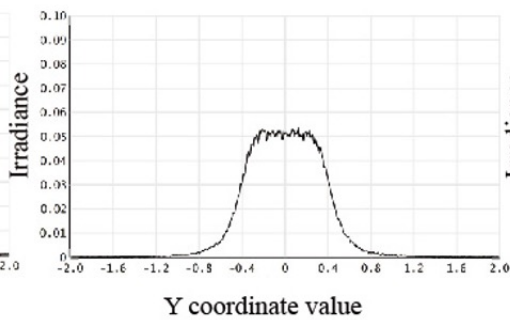
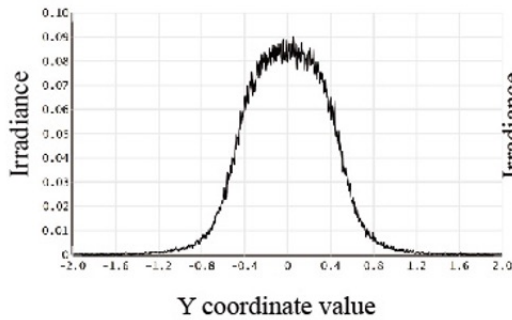
Designed real-time OPC aerosol sensor/special optics, DSP.
\$60K sensor for \$5K in a 1lb package.
Detects size distribution, calculates mass concentration.
Sample filter for speciation.
Wireless digital data, automatic operation.
Designed Aerosol analysis and calibration system.
BUT...
Industry needs real-time speciation.
Nanozen started dev in 2021.
Multiple Patents in progress.
Prototype in progress – target 1H 2023

Experts, experienced, diverse, inclusive

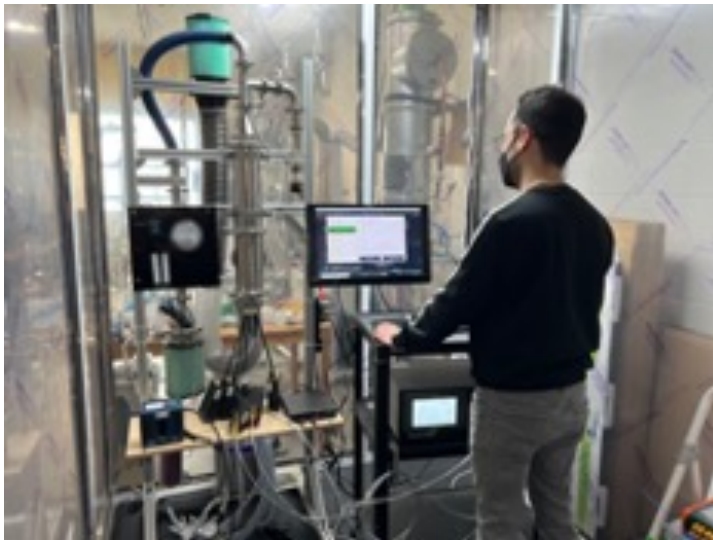
Example Design Expertise – Patented Laser lens design



Patents:
 Granted – Lens
 Granted (2) – microchannel
 Granted – hologram



Aerosol Analysis and Handling Lab



Automated Aerosol Analysis System



Isolator Glovebox



Cleanroom

Nanozen in-house Facility to process aerosols (toxic or not)

Competition

1. For Containment Application: These vendors are well established.
(note: these are also potential partners and acquirers)

- Established non-real-time Containment Service Companies – Example: Bureau Veritas, SGS, and ISS.

2. For Specific compound detection: These are existing sensor companies.
(Note; These are also potential acquirers)

- Trollex – for silica
- TSI/Thermo –possibly working on something like this.
- Agilent, Perkin Elmer, Thermo portable FTIR divisions

3. Pharma Equipment Manufacturers: These need this capability to augment their Product offerings.
(note; these are also potential partners and acquirers)

- Containment Verification Device Manufacturers. GEA, Telstar

Impact on Nanozen

Accelerate New Sensor to market. Multiple market applications.

NASA claims that they will need this on the moon and mars!!

Accelerate services platform to market. Help Nanozen complete its service offering.

Push Nanozen to cash positive and accelerated upward trajectory.

Make Nanozen an immediate target of acquisition in the Pharma industry and Sensor Industry and OHS industry.

Option to go IPO if revenue accelerates fast enough.

\$m

