

ID CUBE™

Enabling Near Instantaneous Characterization of
Chemicals using DART Technology



Fundamentals of the ID CUBE

- Stand alone source
- High current power supply
- Enables consumable: OpenSpot™ sample consumable card (OSSC)
- Designed for rapid vaporization of sample into the DART ionizing gas
- No method development required for different samples

ID Cube mounted on VAPUR inlet



Prototype

The OpenSpot Sample Card (OSSC)

- Consumable for ID Cube
- Business Card shape and size
- Sample applied to narrow cutout in metal screen
- Sample information can be written on the card
- Integral part of the thermal desorption process



Spotting the card

- Spot solution with pipettor, or place droplet of liquid containing analyte on center spot

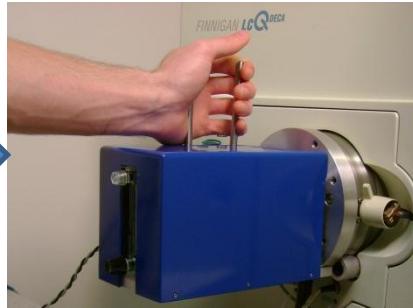


- Card is ready to analyze

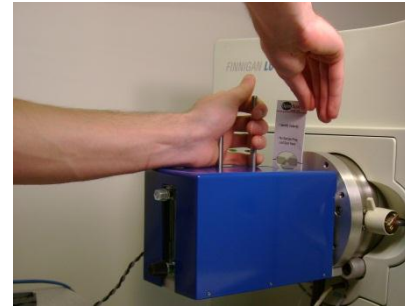


Actions

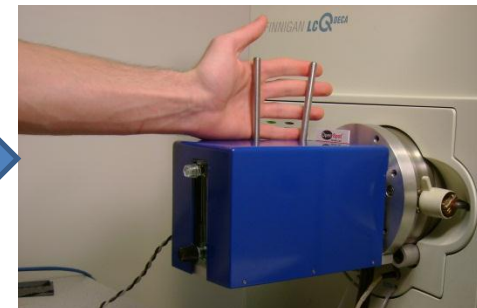
- Finger clamps are squeezed



- Sample card is inserted into the guide slot



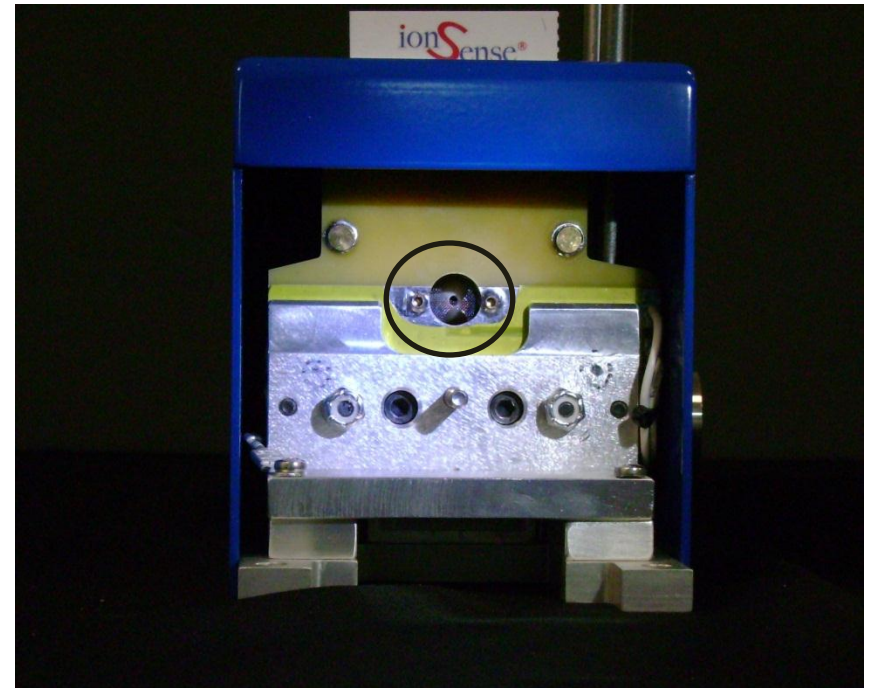
- User releases the clamps to complete the electrical circuit



Positioning

- The card carrying the sample positioned in the circuit
- Without current no desorption occurs unless the sample vapor pressure is high

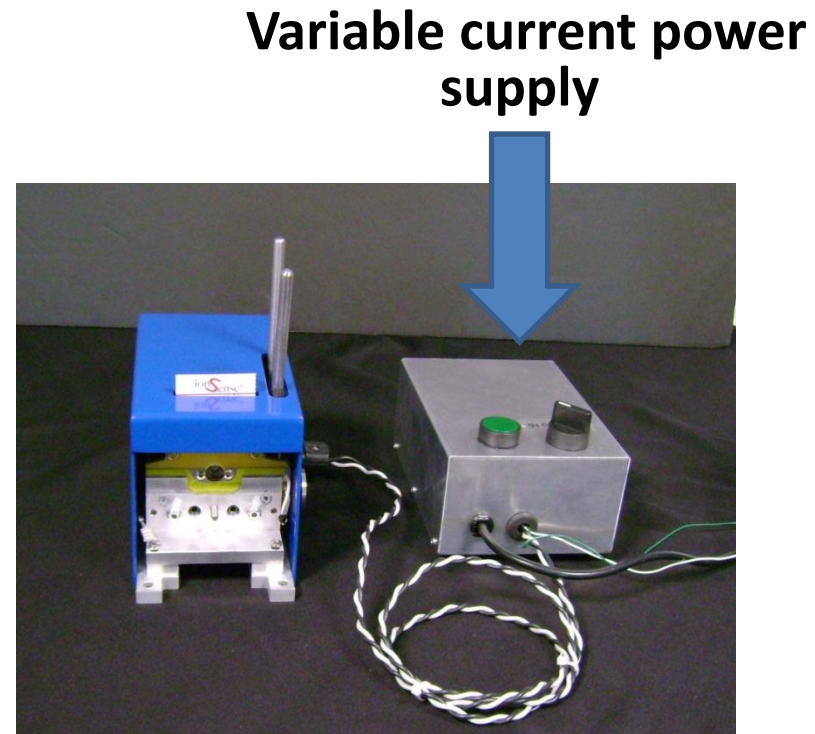
ID CUBE™ with sample in place



Vapur® interface removed for picture

The Power Supply

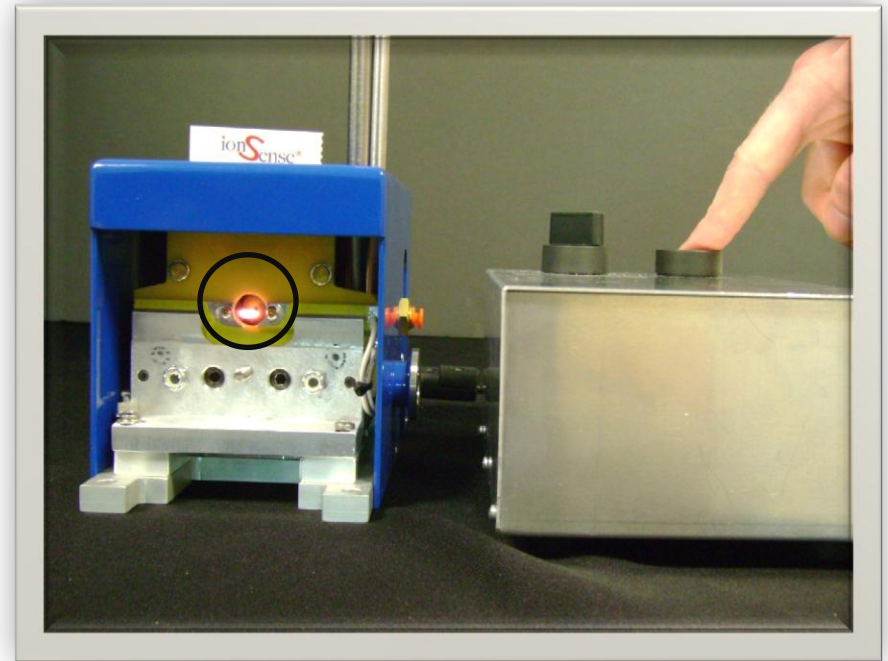
- A novel power supply provides high current through the circuit
- User selects heating rate (High-Med-Low)
- Push button to start and release to stop
- Resistance in the wire screen generates a localized heat



Simple and easy to use design!

Rapid Heating of the Sample

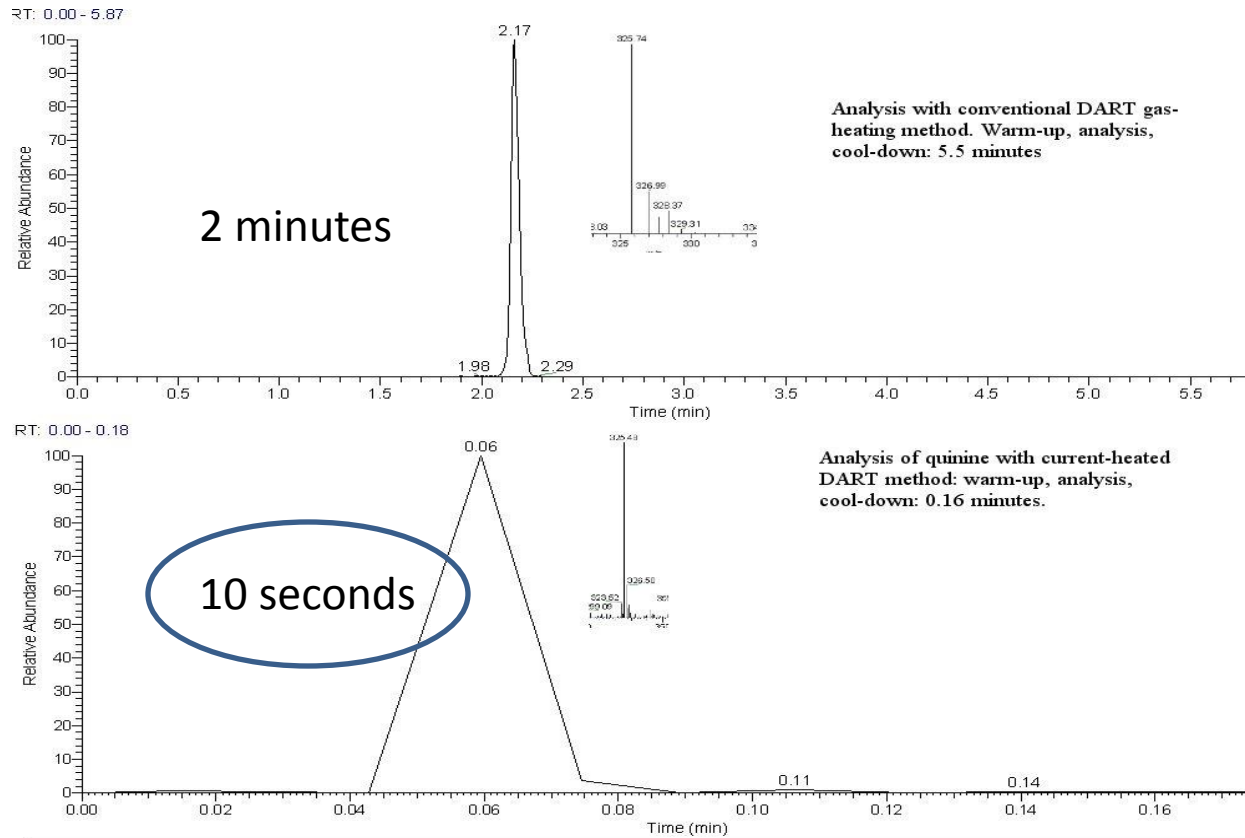
- Depressing the power supply on switch drives several amps through the mesh screen
- Vaporization is rapid as the screen becomes red hot in seconds
- Releasing the power supply switch stops the current and ion production as well



Sample Vaporized in 5-10 seconds!

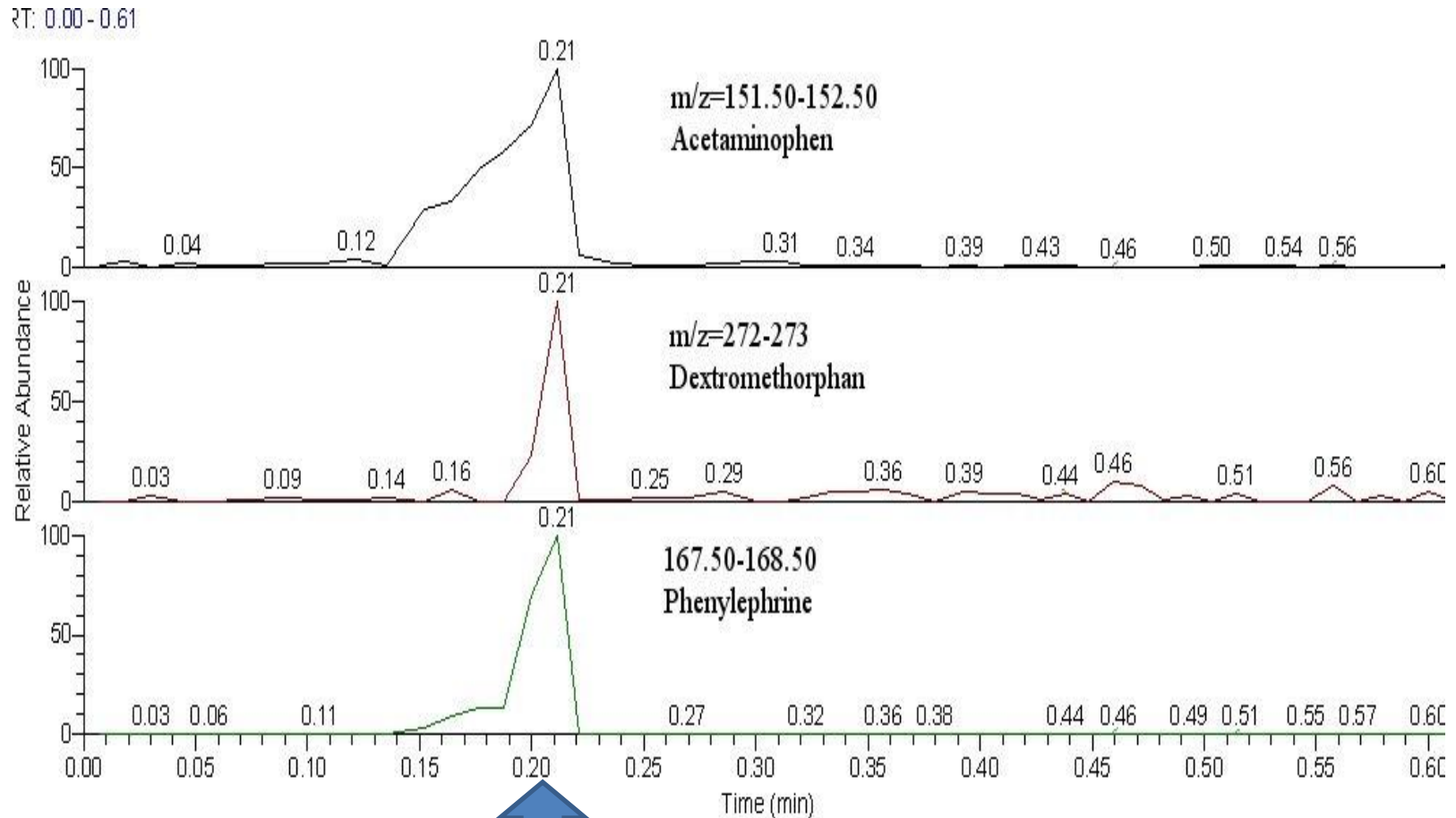
Thermal Assisted DART

Next Generation Open Access



Instantaneous Up and Run time!

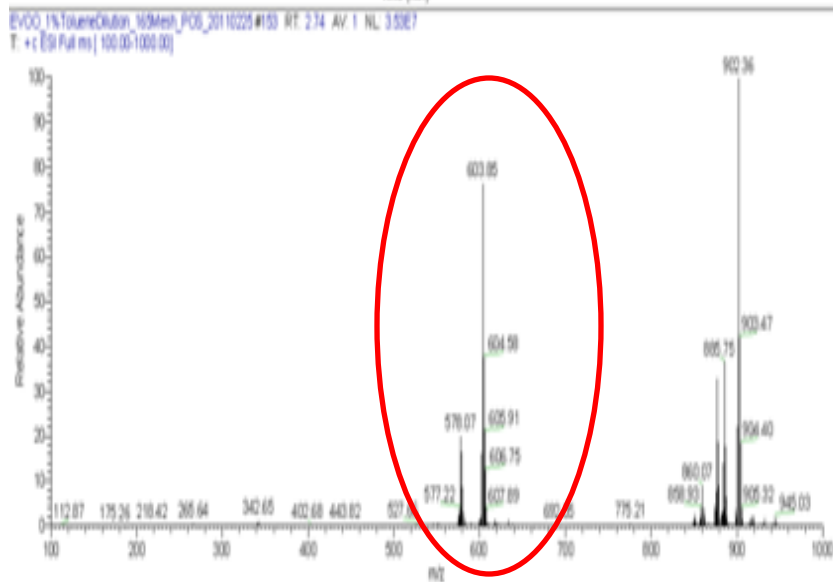
Analysis of Tylenol Tablet



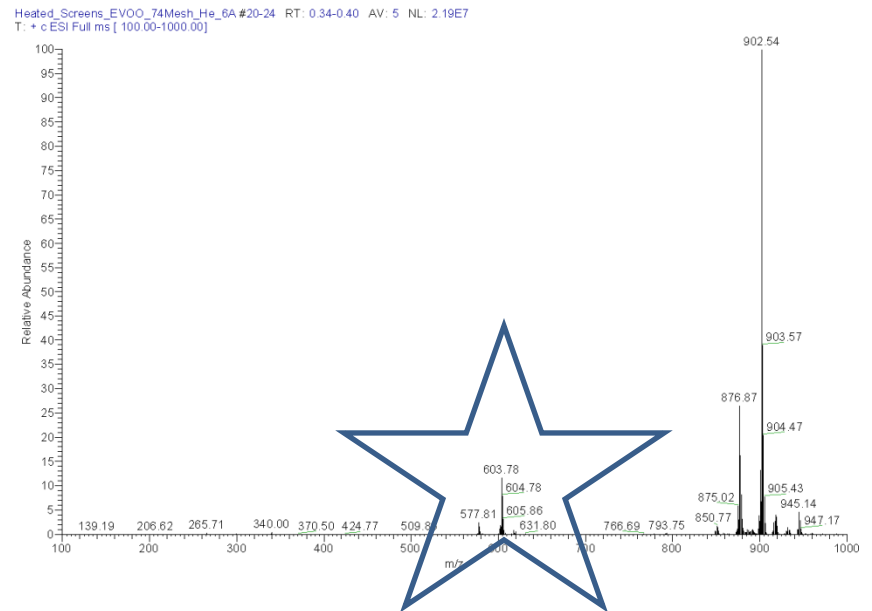
0.2 minutes

Effect on Thermal Degradation

Conventional DART 450° C

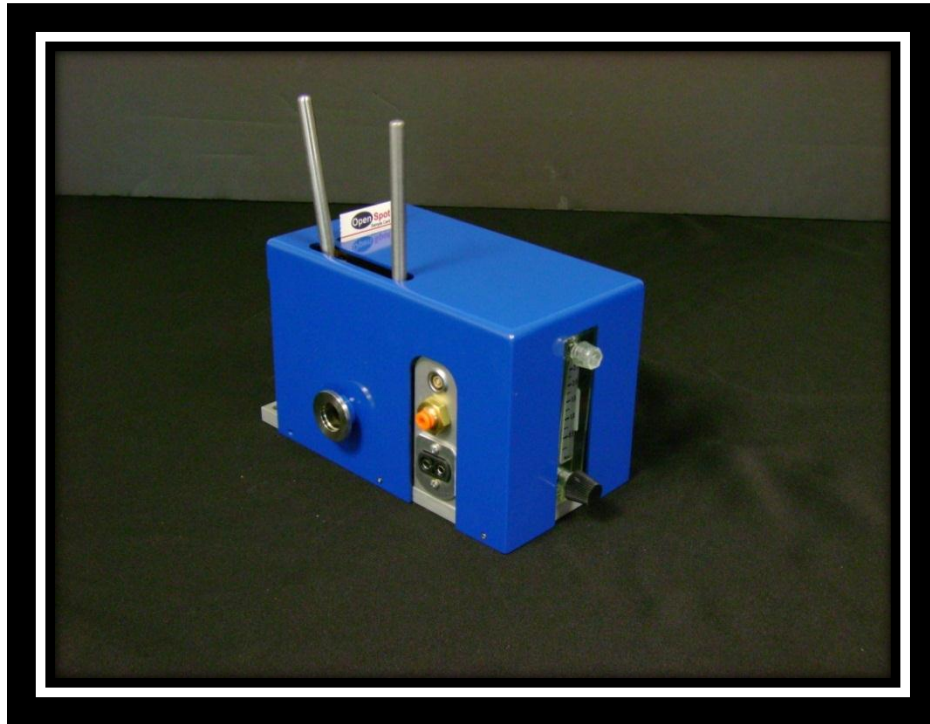


ID-CUBE Technology



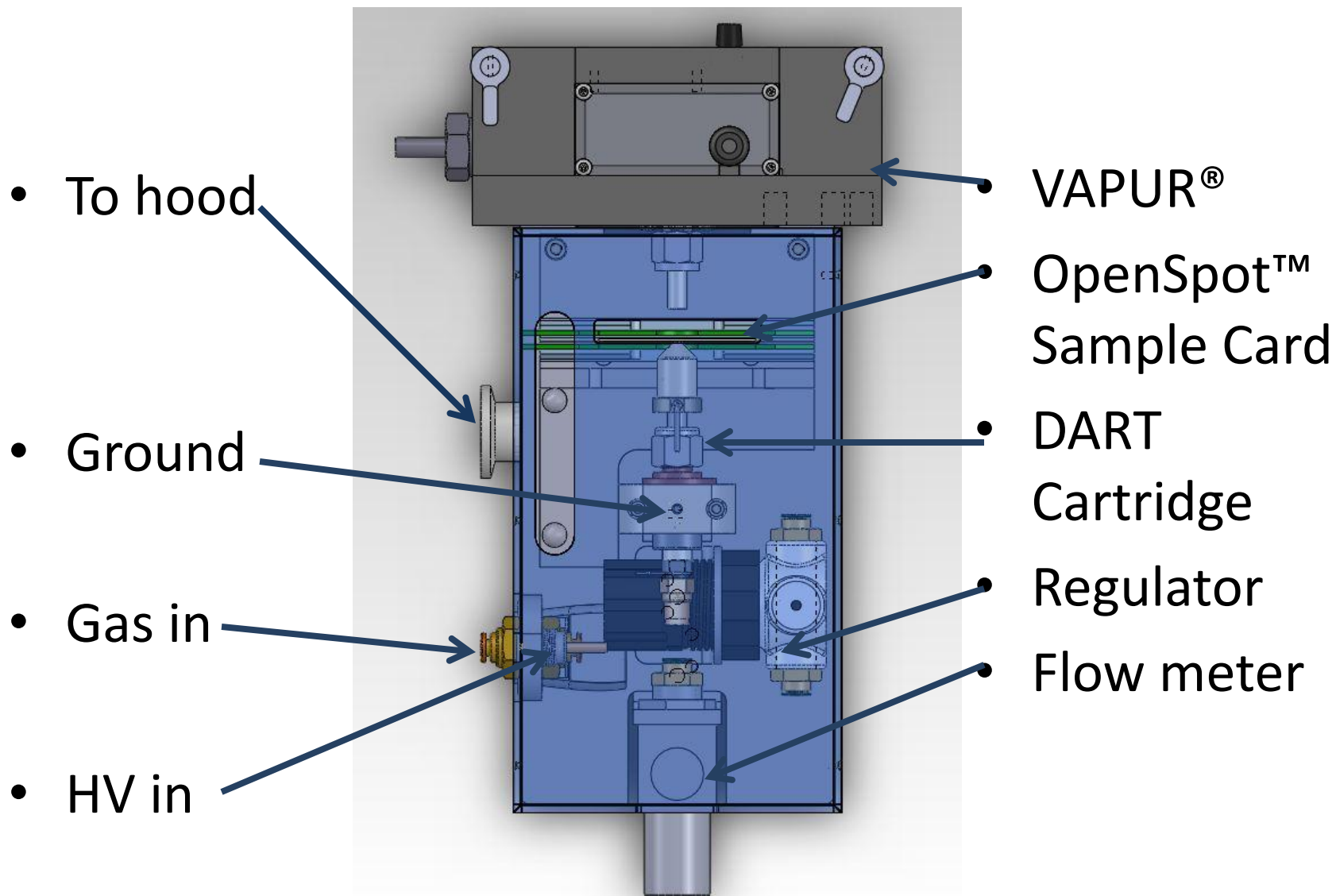
Reduced fragmentation!

The ID CUBE™



- Mounts via VAPUR® in seconds
- Contact closure
- Implementation required external HV from LC/MS instrument
- Integrated Safety interlock to LC/MS
- Manual gas control

Component Overview



Envisioned on AccuTOF

Depending on JEOL requirements



ID Cube Conclusions

- **A low cost, stand alone option targeting “open access” labs in university chemical synthesis labs and pharmaceutical environments**
 - **Easy and compact mount**
 - **Implementation requires HV from LC/MS instrument**
 - **Integrated safety interlock to LC/MS**
- **Near instant vaporization of sample and subsequent ionization without solvent**
 - **Rapid up and running time**
 - **NO wait for answers**
 - **Reduces effect of thermal degradation**
 - **Enables accurate mass analysis with high resolution LC/MS**
- **Initial release will support Thermo IonMax interfaces with other major mass spec interfaces to follow**