

**BOOTH No. 405**  
**TOWNSEND MEETING ROOM**

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# **AETHER INDUSTRIES LIMITED**

## ***COMPANY SHOWCASE***

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NASHVILLE, TN  
19<sup>TH</sup> FEB 2024

**J. W. RINGER, PHD**  
N. AMERICA BUSINESS LEADER

**aether**  
elementally innovative



# BUSINESS MODEL & PRODUCT SPECTRUM

## Founding Vision

Core competency based model of cutting edge chemistry and technology

## Advanced Intermediates / Speciality Chemicals across Industry Spectrum

Pharmaceuticals

Material Sciences

Flavours & Fragrances

Agrochemicals

Cosmetics

Electronic Chemicals

Specialty Polymers

Dyes & Pigments

## Services Offered (Lab → Pilot → Production)

Contract Research (Lab / Pilot)

Process Development / Scale-Up

Small / Mkt Dev Scale Mfg (kg to MTs)

Large Scale Manufacturing (1000's MT)

Early Stage Plant Design / Basic Engg.

Toll Manufacturing

# CORE COMPETENCIES (FROM R&D TO PRODUCTION)

## Core Chemistry Competencies

Grignard Chemistry

Ethylene / Propylene Oxide Chemistry

High Pressure / Hydrogenation

Catalysis  
(homogeneous / heterogeneous)

Hazardous Gas  
(isobutylene, H<sub>2</sub>, CO<sub>2</sub>, O<sub>2</sub>, Cl<sub>2</sub>, EO, PO, acetylene)

Coupling Reactions (Suzuki-Miyaura, Heck)

Air Sensitive Chemistry

Metathesis / Polymerization

Organolithiation Chemistry

## Core Technology Competencies

Batch Reaction

Continuous Reaction

Fixed Bed Reaction

High Pressure Reaction

Cryogenic Reaction

Continuous Downstream  
(extraction, separation, crystallisation)

Distillation  
(wiped film / short path / high vacuum / fractional)

Filtration / Drying

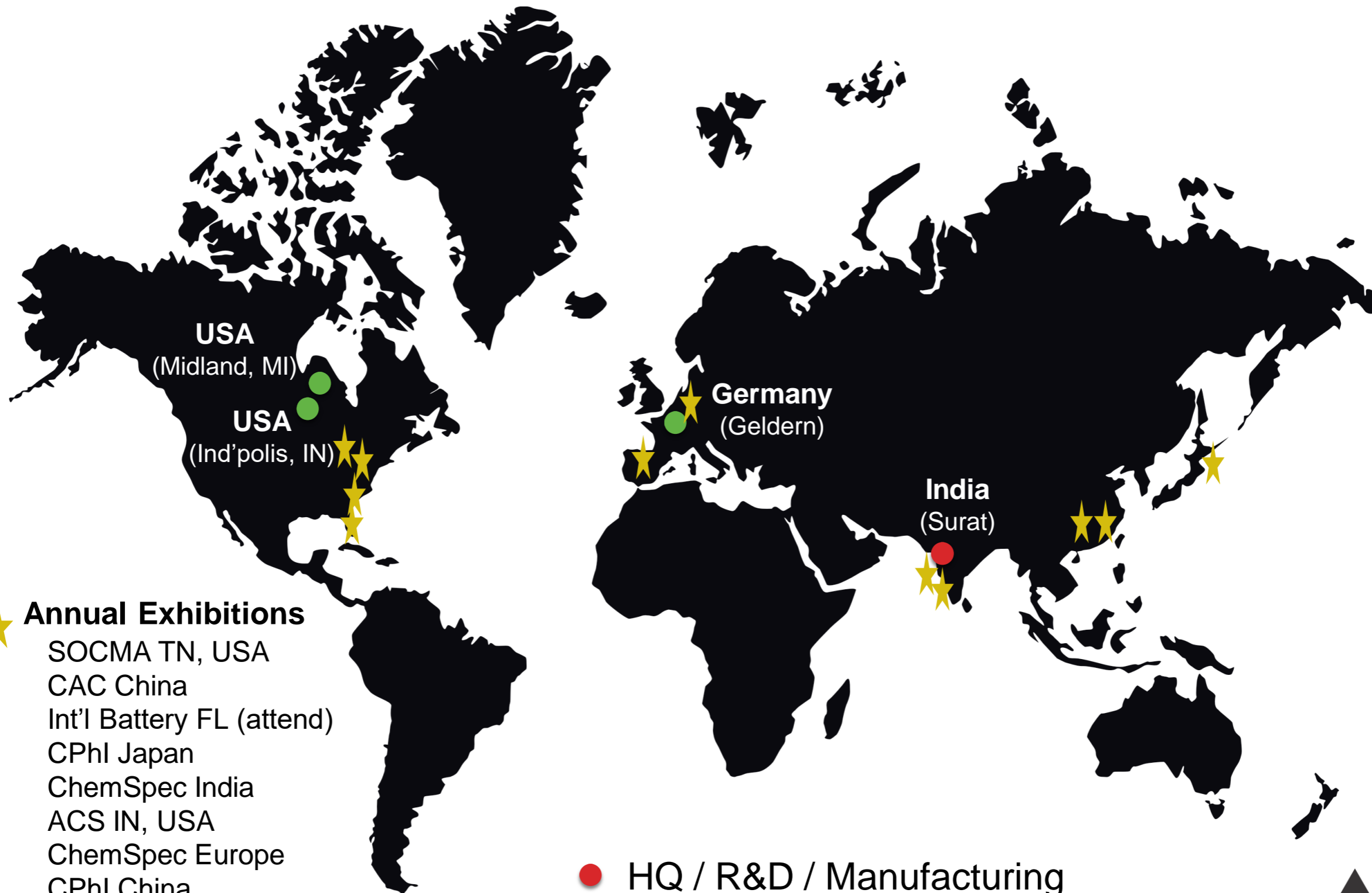
DCS Process Automation

***Open to new chemistry and process technology***

***Risk mitigation via extensive pilot capabilities***

***Funded by Aether, if strategic***

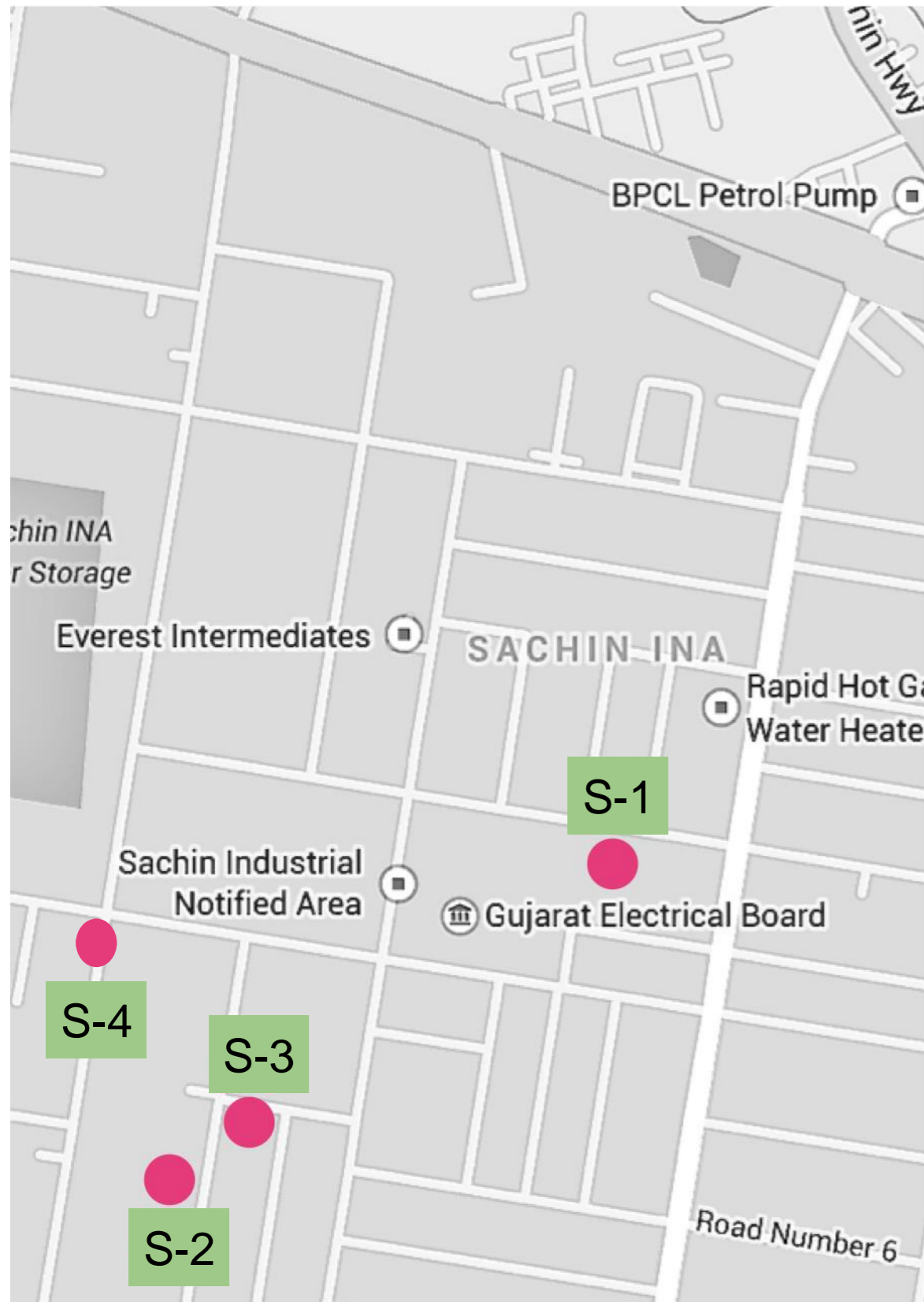
# AETHER'S GLOBAL PRESENCE



- ★ **Annual Exhibitions**
- Feb. SOCMA TN, USA
  - Mar. CAC China
  - Mar. Int'l Battery FL (attend)
  - Apr. CPhI Japan
  - Apr. ChemSpec India
  - Apr. ACS IN, USA
  - Jun. ChemSpec Europe
  - Jun. CPhI China
  - Jun. Chemicals America GA, USA
  - Oct. CPhI Europe
  - Nov. CPhI India

- HQ / R&D / Manufacturing
- Business Development Office

# AETHER SITES (CHEMICAL ZONES, GUJARAT, INDIA)



## Presently operational in S-1 (9,000 sq. m.)

- Research & development
- Analytical sciences
- Pilot plant / CRAMS facility (kg to MTs)
- Aggressive expansion in R&D and pilot plant in S-1

## Presently operational in S-2 (10,500 sq. m.)

- 3 production blocks, 9 process trains, 8000 MT

## New green-field production sites:

- **S-3** (10,500 sq. m.)
  - Launch in Q1 2023
  - Final commissioning ongoing
  - 3 production blocks, 8 process trains, 7000 MT
- **S-4** (20,000 sq. m.)
  - Launch in Q1 2024
  - Civil construction started
  - 4 production blocks, 12 process trains, 12,000 MT
- **S-5** (126,000 sq. m. / 31 acres)
  - Partial launch in Q4 2024
  - Civil construction started
  - 16 production blocks, >65,000 MT
  - 12 times current production site (S-2)

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# AETHER NOW A PUBLICLY LISTED COMPANY

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Aether's Initial Public Offering (IPO) launched in June 2022

Listed on Indian NSE (National Stock Exchange) and BSE (Bombay Stock Exchange)

Listed on 10% premium, trading > 40% since listing

Listing valuation / current market cap of company : > \$ 1.3 billion

Capital raise of \$ 140 MM by 13% equity dilution (87% equity promoter held on date)

Proceeds towards zeroing debt of company and financing new greenfield production sites

Additional dilution of 12% within 3 years as per statutory guidelines

Transparent financials and corporate governance

Ability to quickly raise funds to aid rapid expansion

**Tremendous potential for client guided plant design and targeted large projects**

# STATE-OF-ART EHS SYSTEMS

**> 100 KLPD in-house ZLD (zero liquid discharge) plant at each production site**

Chemical neutralisation plant

Triple stage multiple effect evaporator (MEE)

Agitated thin film evaporator (15 / 25 m<sup>2</sup>)

Reverse osmosis (RO) / biological oxidation

Mechanical vapour recompression (MVR)

Soil biotechnology platform with ozonation

## **Comprehensive fire fighting and safety systems**

> 2000 m<sup>3</sup> fire hydrant water storage

Comprehensive fire hydrant system

Foam monitors / water sprinklers / fire curtains

PPM detection for gas / solvent leakage

Synchronisation with plant wide DCS automation platform

Dedicated process safety team (chem. Engineers / HazOps / safety rev. / worst case)

Fully trained extensive team (firemen / safety marshals / safety engineers)

**Regular off-site and on-site mock drills**

# LARGE SCALE PRODUCTION BLOCKS





# EXTENSIVE REACTION CAPABILITIES FOR GRIGNARDS



# CONTINUOUS L-L REACTION AND DISTILLATION : 2 MT / DAY



# R&D AND ANALYTICAL SCIENCES

AETHER  
CRAMS FACILITY

## **New R&D centre inaugurated October 2022**

7 Synthesis labs / 55 fume hoods (triple expansion)

Fully equipped high pressure lab / Multiple glove boxes / Schlenk systems

Full suite of electronic resources (Scifinder / Row 2 / ACS / Wiley / ELN beta)

## **R&D spend = 7% of company revenues**

Further double expansion in 2024

Extension R&D building, 100 fume hoods, 13-15 synthesis labs

## **Analytical Sciences**

LCMS

GC (25+ no., with headspace)

ICP-OES

TSU (Thermal Stability Unit, similar to ARC, process safety)

All other standard analytical / titration tools

## **New procurement budgeted in 2023 - 2024**

NMR (400 MHz) + DSC / TGA + preparative HPLC

GCMS

HPLC (25+ no., PDA, UV, RI, GPC)

UV-VIS / FT-IR

# NEW R&D CENTRE : LABS

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CRAMS FACILITY

7 Synthesis labs

55 Fume hoods



# NEW R&D CENTRE : ANALYTICAL SCIENCES

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# WORLD'S LARGEST PILOT PLANT!

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Stand-alone manufacturing facility for high value, low volume products (kg to MTs)

## Batch Reaction Technology

SS-316 | GLR | Hast-C | PFA lined | -80 °C to 350 °C  
Cylindrical 5, 30, 50, 100, 250, 500, 1000, 2000, 4000, 6000 L

## High Pressure Reaction Technology

SS-316 | Hast-C | GLR | Ti clad | up to 500 °C & 200 bar  
20, 200, 500, 750 mL | 2, 5, 25, 250, 1000, 3000 L | Batch /  
Cont.

## Continuous Reaction Technology

Plug Flow / Tubular | CSTR | Rotary Disc Contactor | Skid  
Mounted | SS-316, Hast-C, GLR, MS-PTFE | >30 Pilot Systems!

## Continuous Fixed Bed Reaction Technology

Lab Scale (6 no.) | Pilot Scale (8 no.) | SS-316 | Hast-C  
Up to 500 °C & 200 bar | Skid Mounted | In-House Catalyst Prep.

## Cryogenic Reaction Technology

-40 °C (2000 L)  
-80 °C (500 L)

## High Vacuum Distillation Technology

17 Columns / 100 stages | SS, GLR, Hast-C | Batch /  
Continuous  
0.05 mm Hg, 350 °C | Thin Film & Short Path (0.03, 0.1, 1, 2 m<sup>2</sup>)

## Filtration Technology

Centrifuges (24, 36, 48") | Sparkler / Candle Filter | Membrane  
Filter Press | ANFD (300, 2000, 5000 L) | SS-316, Hast-C, ETFE

## Drying Technology

ANFD | ATFE/D | FBD | VTD | Ribbon Dryer | RVPD  
SS-316, Hast-C, ETFE coated

## Automation & Instrumentation

Siemens PCS7 | Yokogawa Centum VP | Emerson Delta-V  
Complete DCS Automation | Monitor and Control | Hot Redundancy | Remote Access | State-of-Art Instrumentation

Tripling pilot plant capacity : 3x expansion (completed in Mar. 2022)  
> 150 Reactors in pilot plant!



# PLUG FLOW TUBULAR REACTOR

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# CUSTOM-BUILT SKID-MOUNTED CONTI. PILOTS

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# CONTRACT RESEARCH AND MANUFACTURING SERVICES

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## **CRAMS is a major Aether business model**

**Projects on-going with clients from Europe, USA, Japan, Israel, Saudi Arabia, India**

Contract Research

FTE Services

Pilot Scale-Up Services

Technology Development

Contract Manufacturing (kg to MT)

Process Development / Optimization

## **Complete access to Aether's state-of-art CRAMS facility**

6 day work week

24 h R&D and pilot plant (3 + G shifts)

Detailed proposals / Gantt chart timelines

Milestones / deliverables based research

Result sharing via video conferencing

Comprehensive interim / final reports

Complete DCS data during scale-up

Dedicated lab notebooks (paper/electronic)

## **Straightforward intellectual property (IP) terms**

All IP belongs to client

Any IP generated in program belongs to client, Aether waives off all IP rights

# SUSTAINABILITY @ AETHER: CLIMATE NEUTRALITY



16 MW Solar plant installed and operational in Gujarat since July 2022

Supplies 50% of electrical load of Aether sites S1, S2, and S3

Offsets 24,000 MT of CO<sub>2</sub> emission per year

Currently evaluating hybrid wind / solar energy for 100% renewable electricity

Aether will seek carbon neutral alternatives for electricity, heat, and energy for all upcoming investments and sites



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