

PSRI Membership



For over 45 years, PSRI has been a research consortium for companies seeking solutions to their granular-fluid problems. Our members come from varying industrial sectors and from all over the world, but all have a common interest in understanding why particles do what they do and how to engineer around that understanding to meet business needs. In short, PSRI understands what the challenges are because they know the fundamentals and how to apply those fundamental to commercially relevant solutions and we have been doing it for over 45 years.



Applying the Fundamentals

PSRI Members Benefits

1. Membership research currently valued at more than \$600,000 per year,
2. Access to advanced technology in fluidization including L-valves, loop seals, cyclone design, standpipe design and operation, stripper design, wavelet decomposition, fiber optic probes, acoustic probes, high-speed video particle tracking and computational fluid dynamics,
3. Access to more than \$6,000,000 worth of assets with large-scale equipment ranging from fluidized beds, circulating fluidized beds, pneumatic conveying lines, and cyclones,
4. Access to thousands of pages of reports, briefs, state-of-the-art papers, and, papers,
5. Access to PSRI tutorials on all aspects of fluidization and particle technology topics including the understanding of particle size distributions, the role of particle shapes, particle attrition, erosion, interparticle forces, pressure balances, standpipes and diplegs, hoppers, cyclones, segregation, pneumatic conveying, etc.
6. Access to PSRI design guides for fluidized bed and circulating fluidized bed designs including fluidized bed concepts, grid and sparger design, entrainment rate calculations, cyclone design, heat and mass transfer, dilute- and dense-phase pneumatic conveying, etc.
7. Access to in-depth webinars on fluidization concepts, design and operation of diplegs and standpipes, cyclone design and grade efficiencies, modeling, riser hydrodynamics, strippers and fluidized bed internals, pneumatic conveying, hopper, etc.,
8. Access to PSRI technical meetings with one, two-day annual meeting and two one-day interim meetings per year,
9. Online software tools for cyclones, fluidized beds and basic particle parameters with more tools on the way,
10. Instructional videos, including high-speed videos on particle behavior in your unit operations such as fluidized beds, risers, cyclones, and jets,
11. Consulting, with the first eight hours free per project, from leading experts in the field with a combined experience in fluidization of more than 150 years, and
12. Reduced prices on other services such as a 50% discount on



PSRI Membership Rates

PSRI membership is divided into non- processing and processing companies. Membership fees are currently

- \$69,810 USD for processing companies
- \$47,318 USD for non-processing companies

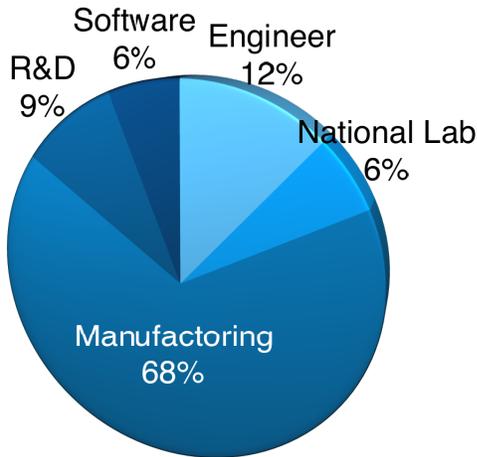
A one-time initiation fee is required for new members which covers past PSRI technology.

Applying the Fundamentals

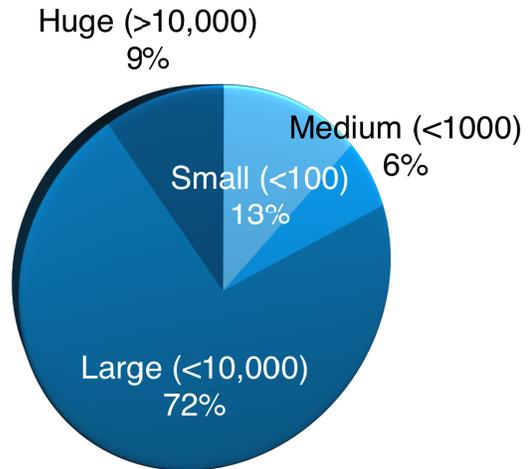
- contract research and analytical services,
- 13. Reduced registration fees of 25% for the PSRI Fluidization Seminar and Workshop. The registration fee is a one time charge, and member company employees can attend the seminar and workshop as many times as they wish without additional registration fees.
- 14. Access to 30+ other engineers from different companies but similar engineering challenges, and
- 15. Access to PSRI talent with over a 150 years of experience in fluidization and particle technology with commercial applications.



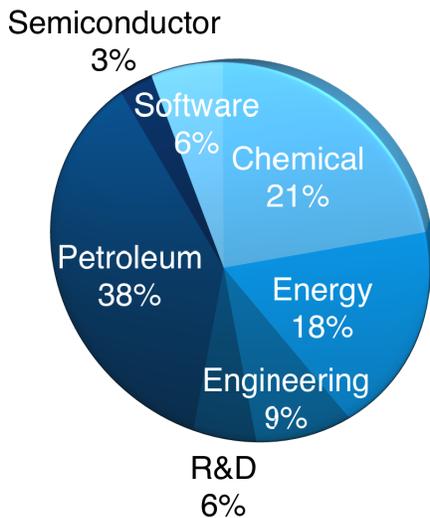
Who are the Members of PSRI?



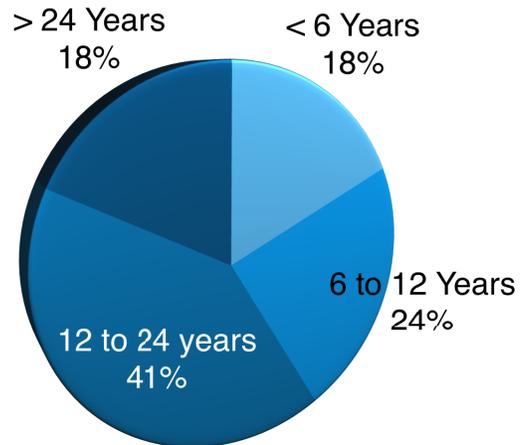
PSRI Members' Primary Business Model



PSRI Member Company Staffing Sizes



PSRI Members Industrial Sectors



PSRI Membership Retention

Applying the Fundamentals

PSRI Available Utilities

- 10,000 SCFM (18,000 NCMH) blower/compressor capacity
- 500 psig (34 barg) high pressure compressor capacity
- 4160 VAC three phase electrical service
- 90 psig (6.2 barg) natural gas service
- LN₂ service on site
- 64 CPU cluster server
- 3 Titan GPU server
- 80 TB file server with redundant backup
- Gigabyte network



PSRI's Research Facility

The PSRI research facility in Chicago, Illinois, USA consists of eleven structures on 3.5 acres (1.4 hectares) close to Midway and O'Hare Airports. Experimental space includes a 55 and 135 foot (16.8 and 41 m) tall tower, several high bay facilities including our newest 55,000 sq. ft (5100 sq. m.) high bay space, a 2000 sq. ft. (186 sq. m) fully equipped laboratory space, and a 5000 sq ft. (465 sq m) office complex. In short, space limitation for our large-scale experiments is not an issue.

Within the PSRI complex resides world-class cold-flow test units including,

- Four 12-inch (0.3-m) diameter by 70 feet (21-m) tall risers,
- An 18-inch (0.46 m) diameter by 82-feet (25-m) tall riser,
- A 36-inch (0.9-m) by 90-feet (27-m) tall riser with 8-ft (2.4-m) diameter core-annulus stripper section,
- Six fluidized beds up to 6-ft (1.6-m) in diameter,
- Two high-temperature fluidized beds up to 1500°F (815°C),
- A high-pressure fluidized bed up to 85 psig (6 barg),
- A 5-ft (1.5-m) diameter semi-circular fluidized bed,
- A 3-ft (0.9-m) diameter modular stripper unit with solids flux capabilities up to 25 lb_m/ft²-sec (125 kg/m²-s),
- A 3-ft (0.9-m) diameter fluidized bed unit with varying bed internals,
- Two 5-ft (1.5-m) diameter conical fluidized bed,
- A vacuum fluidized bed,
- Cyclones up to 36-inches (0.9-m) in barrel diameter and an assortment of cyclone trains, and
- Several dilute and dense phase conveying loops.



PSRI Current Membership-Based Research

- Cyclone operation, efficiency and reliability
- Cyclone termination with L-valves, trickle valves and flapper valves
- Fluidized bed gas-solid hydrodynamics with bed internals
- Solids feeding into fluidized beds
- Particle attrition, testing and models
- Particle drag in fluidized beds with application to CFD modeling