



Particulate Solid Research, Inc.

FLUIDIZATION SEMINAR AND WORKSHOP CHICAGO, ILLINOIS, USA SEPTEMBER 16TH – 19TH 2019

(ALL TIMES CDT)

MONDAY, SEPTEMBER 16TH 2019

7:15 AM	BREAKFAST (PROVIDED)
8:00 AM	REGISTRATION
8:20 AM	INTRODUCTION TO PSRI AND ITS TECHNICAL PROGRAMS
8:30 AM	A. INTRODUCTION AND OVERVIEW
	1. INTRODUCTION, TERMINOLOGY, AND PARTICULATE PROPERTIES
	2. FLUIDIZATION REGIMES AND TRANSITIONS
10:30 AM	BREAK
10:45 AM	3. HYDRODYNAMICS OF FLUIDIZED BEDS
	▪ EFFECTS OF TEMPERATURE AND PRESSURE
12:00 PM	LUNCH (PROVIDED)
12:45 PM	4. GAS AND SOLIDS MIXING
2:45 PM	BREAK
3:00 PM	5. GAS SOLIDS CONTACTING, REACTION, MODELLING AND SCALE-UP
	6. HEAT AND MASS TRANSFER
5:00 PM	ADJOURN

- 7:15 AM BREAKFAST (PROVIDED)**
- 8:00 AM B. OVERVIEW OF INDUSTRIAL APPLICATIONS**
- 9:00 AM C. GRIDS AND PARTICLE ATTRITION**
- INTRODUCTION TO GRIDS (PRESSURE DROP ACROSS GRID)
 - DESIGN OF VARIOUS TYPES OF GRIDS
 - PERFORATED PLATE
 - PIPE/SPARGER
 - EFFECT OF SHROUDS
 - JET PENETRATION
 - EFFECTS OF TEMPERATURE AND PRESSURE
- 10:00 AM BREAK**
- 10:15 AM C. GRIDS AND PARTICLE ATTRITION (CONTINUED)**
- SOURCES OF ATTRITION
 - PARTICLE ATTRITION AT SUBMERGED JETS
 - GRID DESIGN
 - EFFECTS OF TEMPERATURE AND PRESSURE
 - PARTICLE ATTRITION IN CYCLONES
- 11:30 AM D. WORKSHOP ON GRID DESIGN**
- 12:00 PM LUNCH (PROVIDED)**
- 12:45 PM E. PARTICLE ENTRAINMENT & ELUTRIATION**
- INTRODUCTION
 - MECHANISMS OF EJECTION INTO FREEBOARD
 - SOLID FLUX PROFILE AND TDH
 - ENTRAINMENT CORRELATION FOR BUBBLING & TURBULENT BEDS
- 2:45 PM BREAK**
- 3:00 PM E. PARTICLE ENTRAINMENT & ELUTRIATION (CONTINUED)**
- EFFECTS OF GEOMETRY
 - ENTRAINMENT FROM RISERS
 - EFFECTS OF TEMPERATURE AND PRESSURE
- 3:30 PM F. WORKSHOP ON ENTRAINMENT**
- FCC/POLYETHYLENE EXAMPLES
- 4:00 PM G. CYCLONE DESIGN**
- PRINCIPLE OF OPERATION
 - NON-UNIFORM CYCLONES
- 5:00 PM ADJOURN**

- 7:15 AM BREAKFAST (PROVIDED)**
- 8:00 AM G. CYCLONE DESIGN (CONTINUED)**
- **DIPLEG PRESSURE BALANCE**
 - **FLAPPER & TRICKLE VALVES**
 - **EFFECT OF DIFFERENT CONFIGURATIONS**
 - **EFFECTS OF TEMPERATURE AND PRESSURE**
- 10:00 AM BREAK**
- 10:15 AM G. CYCLONE DESIGN (CONTINUED)**
- **DESIGN PROCEDURE**
 - **COLLECTION EFFICIENCY**
- 11:15 AM H. WORKSHOP ON CYCLONES**
- **CYCLONE DESIGN CALCULATIONS**
 - **CYCLONE VIDEOS**
- 11:45 AM LUNCH (PROVIDED)**
- 12:30 PM TOUR OF PSRI RESEARCH FACILITIES**
- 2:30 PM I. STANDPIPES**
- **THEORY OF OPERATION**
 - **TYPES OF STANDPIPES**
 - **AERATION EFFECTS**
 - **STANDPIPE CAPACITY**
 - **ANGLED STANDPIPES**
 - **STRIPPING**
 - **NON-MECHANICAL VALVES**
 - **STANDPIPE CALCULATIONS**
- 5:00 PM ADJOURN**

7:15 AM	BREAKFAST (PROVIDED)
8:00 AM	J. DILUTE-PHASE PNEUMATIC CONVEYING AND CIRCULATING FLUIDIZED BEDS <ul style="list-style-type: none">▪ VERTICAL & HORIZONTAL FLOW PHASE DIAGRAMS▪ PRESSURE DROP CALCULATIONS▪ CALCULATION OF CHOKING, SALTATION, AND SLIP VELOCITIES▪ FAST FLUIDIZATION, CIRCULATING FLUIDIZED BEDS▪ BENDS▪ EFFECT OF DIAMETER▪ EFFECT OF PRESSURE▪ FEEDING CONSIDERATIONS
10:00 AM	BREAK
10:15 AM	K. DENSE-PHASE PNEUMATIC CONVEYING <ul style="list-style-type: none">▪ PACKED BED, FLUIDIZED-BED FLOW▪ SLUG FLOW▪ SELECTION OF EQUIPMENT TYPE
11:00 AM	L. PARTICLE ATTRITION <ul style="list-style-type: none">▪ TYPES OF ATTRITION▪ ATTRITION TESTING AND MODELING
12:00 PM	LUNCH AND LEARN WITH CPFD SOFTWARE
2:00 PM	M. MODELING GRANULAR-FLUID SYSTEMS <ul style="list-style-type: none">▪ TYPES OF MODELS▪ COMMON PITFALLS
3:00 PM	BREAK
3:15 PM	M. MODELING GRANULAR-FLUID SYSTEMS (CONTINUED)
5:00 PM	CONCLUSION OF SEMINAR