



Particulate Solid Research, Inc.

FLUIDIZATION SEMINAR AND WORKSHOP

HEIDELBERG, GERMANY

MARCH 5TH – 9TH, 2024

TUESDAY

8:00 AM	REGISTRATION
8:15 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 TRANSFER
5:00 PM	ADJOURN

WEDNESDAY

8:00 AM	B.	OVERVIEW OF INDUSTRIAL APPLICATIONS
9:00 AM	C.	GRIDS – GAS DISTRIBUTORS <ul style="list-style-type: none">▪ INTRODUCTION TO GRIDS (PRESSURE DROP ACROSS GRID)▪ DESIGN OF VARIOUS TYPES OF GRIDS<ul style="list-style-type: none">○ PERFORATED PLATE○ PIPE/SPARGER○ EFFECT OF SHROUDS
10:00 AM		BREAK
10:15 AM	C.	GRIDS – GAS DISTRIBUTORS (CONTINUED) <ul style="list-style-type: none">▪ JET PENETRATION<ul style="list-style-type: none">○ EFFECTS OF TEMPERATURE AND PRESSURE
11:30 AM	D.	WORKSHOP ON GRID DESIGN
12:00 PM		LUNCH (PROVIDED)
1:00 PM	E.	PARTICLE ENTRAINMENT & ELUTRIATION <ul style="list-style-type: none">▪ INTRODUCTION▪ MECHANISMS OF EJECTION INTO FREEBOARD▪ SOLID FLUX PROFILE AND TDH▪ ENTRAINMENT CORRELATION FOR BUBBLING & TURBULENT BEDS
2:00 PM		BREAK
2:15 PM	E.	PARTICLE ENTRAINMENT & ELUTRIATION (CONTINUED) <ul style="list-style-type: none">▪ EFFECTS OF GEOMETRY▪ ENTRAINMENT FROM RISERS▪ EFFECTS OF TEMPERATURE AND PRESSURE
2:45 PM	F.	WORKSHOP ON ENTRAINMENT <ul style="list-style-type: none">▪ FCC/POLYETHYLENE EXAMPLES
3:15 PM	G.	CYCLONE DESIGN <ul style="list-style-type: none">▪ PRINCIPLE OF OPERATION▪ NON-UNIFORM CYCLONES
5:00 PM		ADJOURN

THURSDAY

8:00 AM	G.	CYCLONE DESIGN (CONTINUED) <ul style="list-style-type: none">▪ DIPLEG PRESSURE BALANCE▪ FLAPPER & TRICKLE VALVES▪ EFFECT OF DIFFERENT CONFIGURATIONS▪ EFFECTS OF TEMPERATURE AND PRESSURE▪ DESIGN PROCEDURE▪ COLLECTION EFFICIENCY
9:30 AM		BREAK
9:45 AM	H.	WORKSHOP ON CYCLONES <ul style="list-style-type: none">▪ CYCLONE DESIGN CALCULATIONS▪ CYCLONE VIDEOS
10:30 AM	I.	STANDPIPES <ul style="list-style-type: none">▪ THEORY OF OPERATION▪ TYPES OF STANDPIPES▪ AERATION EFFECTS▪ STANDPIPE CAPACITY▪ ANGLED STANDPIPES
12:00 PM		LUNCH (PROVIDED)
1:00 PM		MODELING EXPANDED WITH CFPD SOFTWARE
2:15 PM		BREAK
2:30 PM	I.	STANDPIPES (CONTINUED) <ul style="list-style-type: none">▪ STRIPPING▪ NON-MECHANICAL VALVES▪ STANDPIPE CALCULATIONS
5:00 PM		ADJOURN

FRIDAY

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
12:00 PM		LUNCH (PROVIDED)
1:00 PM	L.	PARTICLE ATTRITION <ul style="list-style-type: none">▪ TYPES OF ATTRITION▪ ATTRITION TESTING AND MODELING
2:00 PM	M.	MODELING GRANULAR-FLUID SYSTEMS <ul style="list-style-type: none">▪ TYPES OF MODELS▪ COMMON PITFALLS
2:45 PM		BREAK
3:00 PM	M.	MODELING GRANULAR-FLUID SYSTEMS (CONTINUED)
4:00 PM		CONCLUSION OF SEMINAR