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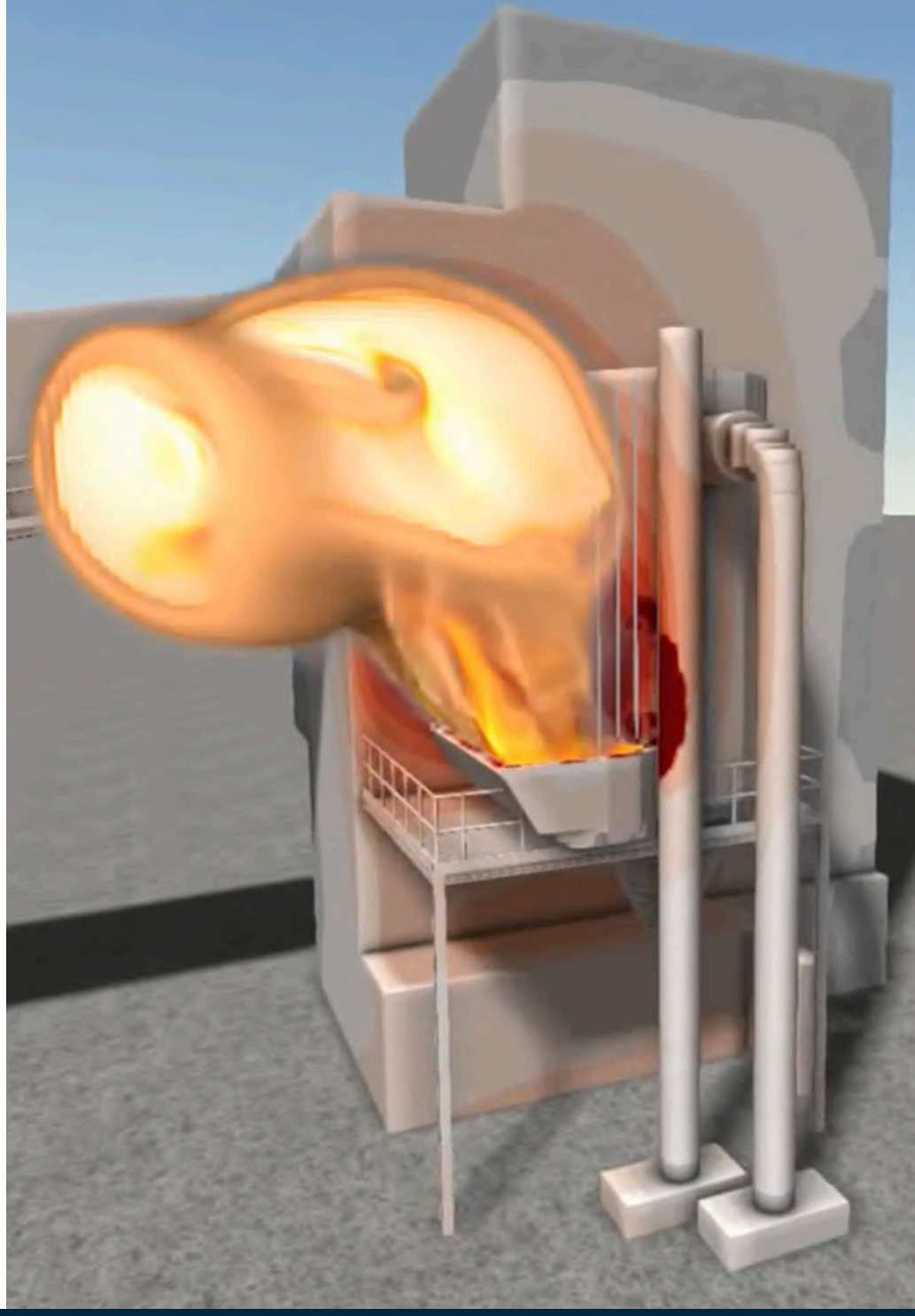
For a safer world



Singapore,
4–6 May 2026

Dust Explosion Hazards & CFD Training Course

Safety and risk management for the world's leading industries

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Introduction

Dust Explosion Hazards & CFD Training Course

Level
Beginner–Intermediate

Duration
3 Days (4–6 May 2026)

Price per participant
EUR 1,845

Practical training in dust explosion prevention and mitigation using advanced Computational Fluid Dynamics modelling tool.

Overview

Dust explosions are a common occurrence in various industries. Practically every day, there is a dust explosion at some facility around the world.

Fortunately, most of these events have negligible or minor consequences. However, severe accidents that result in fatalities and serious losses to infrastructure do occur periodically.

To prevent and mitigate the consequences of these events, it is required to have a thorough understanding of the conditions that lead to dust explosions and also to design facilities that incorporate mitigation and protection measures.

About the course

This course helps participants build a solid understanding of the physics behind dust explosions, how to implement preventive and protective measures, and how to use the advanced CFD tool FLACS-DustEx to assess explosion consequences and evaluate mitigation strategies.

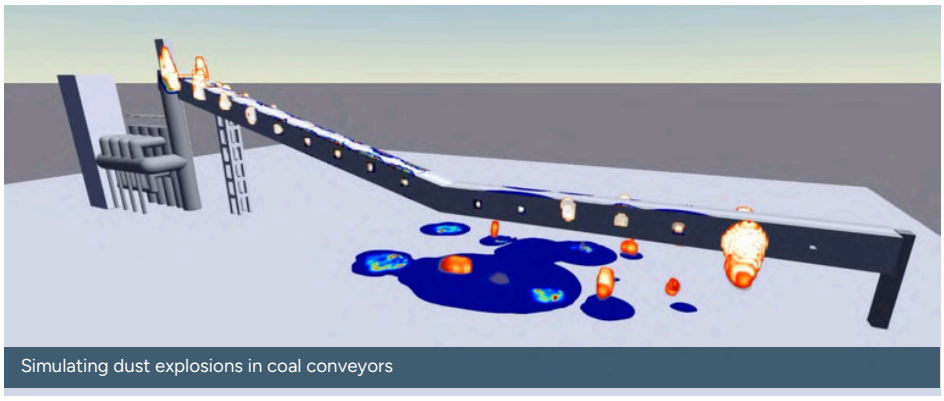
A mix of theory, demonstrations, and practical exercises will be used to explore key factors in dust explosion safety, including geometrical characteristics of the facilities, pressure relief vents, physical barriers and inerting. It also includes practical information on day-to-day operational procedures, preventive and protective measures, and hazard analysis.

Course objectives

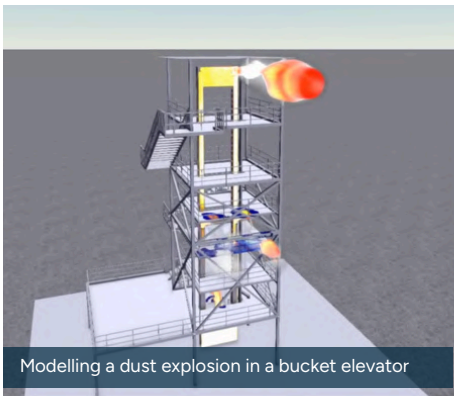
The course provides participants with the knowledge necessary to:

- Learn about dust explosion physics, how and why they occur, including preventive and protective measures.
- Understand the basics of dust explosion hazard analysis.
- Learn how to use the FLACS-DustEx tool to simulate and calculate the consequences of dust explosions, as well as to evaluate the effectiveness of mitigation and protection strategies.

Participants will use FLACS-DustEx to run practical exercises and gain hands-on experience in dust explosion simulations during the course.



Simulating dust explosions in coal conveyors



Modelling a dust explosion in a bucket elevator

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Target group

- Flammable dust operators.
- Engineers, managers, project management team, inspectors, legislators, designers, etc.
- HSE engineers from the agriculture, food processing, woodworking, metalworking, chemical, textiles, plastics, rubber, wastewater treatment, recycling and pharmaceutical manufacturing industries, as well as any other businesses that deal with flammable dusts.
- Professionals dealing with risk and safety in industry in general.

Professional benefits for attendees

Participants will be able to enhance process safety competency, which includes:

- Development of new skills and knowledge.
- Development of competency to carry out various process safety-related studies.
- Ability to come up with recommendations on safety-related studies.
- Ability to practice risk planning and mitigation.

Benefits for organisations

In addition to the professional skill development of staff, the organisation will have the capability to utilise the knowledge related to comprehensive consequence modelling for effective risk management.

This knowledge will assist in engineering design and carrying out safety-related studies effectively and accurately, including:

- Process hazard analysis (HAZID, HAZOP, etc.)
- Risk management (hazardous area classification, facility siting etc.)
- Regulatory compliance (ATEX/DSEAR, compliance audit etc.)
- Engineering design such as firewall, blast wall, ventilation capacity, detector mapping and optimisation, etc.

Prerequisites

This course is suitable for both newcomers to dust explosion safety and those looking to refresh their knowledge. No specific prerequisites are required, but prior experience in consequence modelling, CFD models, or 3D modelling can be beneficial.

Modelling a dust explosion in a silo

Meet the instructor

Franz Zdravistch, Ph.D.
Principal Engineer – Chief Training Officer at Gexcon

Franz is a Principal Mechanical Engineer specialising in CFD software, with over 30 years of experience in consulting, training, and technical support for industries including oil and gas, process safety, energy, chemical, mining, power generation, and homeland security.

Since joining Gexcon, he has served as an instructor and mentor for FLACS, FRED, and EFFECTS software, delivering training to companies and universities worldwide. He has also led and contributed to numerous process safety consequence and risk studies, covering gas explosions, ventilation, dispersion, fires, gas detection systems, and helideck operability analysis. His work has been published in journals and presented at conferences.

Earlier in his career, Franz held roles in CFD software support, consulting engineering, product management, and business development. In his early professional years, he served as a Senior Field Geophysical Engineer in offshore and onshore oil and gas exploration.

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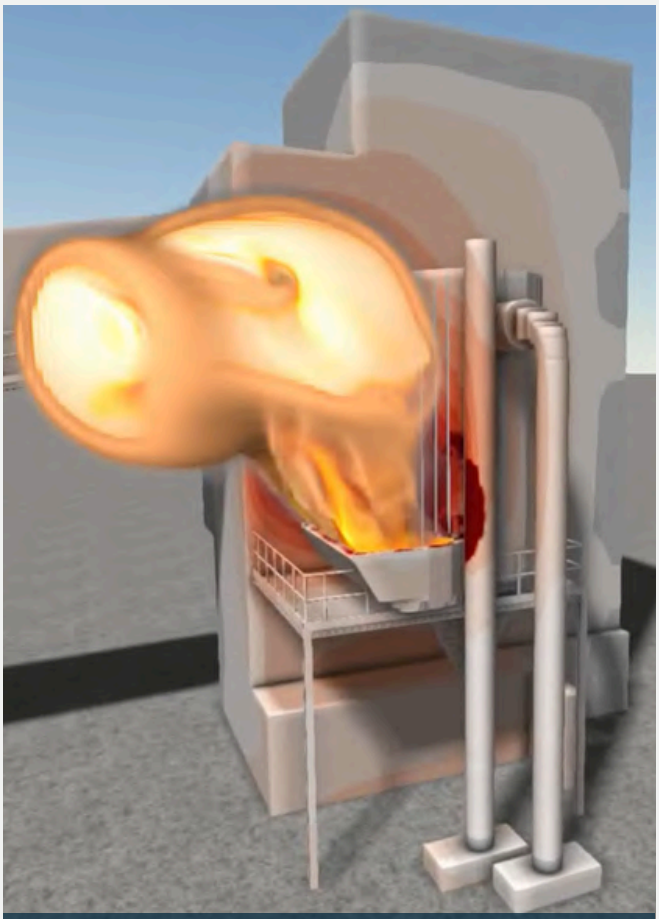
Agenda

Day 1

08:45	Coffee – Q&A
09:00	Introduction and Recent Major Accidents
09:30	Dust Explosion Basics and Dust Explosion Characteristics
10:00	Coffee – Q&A
10:15	Ignition Sources
11:00	Preventive Measures 1: Introduction and Hazardous Area Classification
11:45	Preventive Measures 2: Avoidance of Ignition Sources and Housekeeping
12:30	Lunch
13:30	Preventive Measures 3: Avoidance of Ignition Sources
14:15	Protective Measures 1: Introduction
15:00	Coffee – Q&A
15:15	Protective Measures 2: Dust Explosion Venting Design
16:15	Protective Measures 3: Dust Explosion Suppression Design
17:00	End of Day 1



Simulating dust explosions in a dust filter

Day 2

08:45	Coffee – Q&A
09:00	Protective Measures 4: Dust Explosion Isolation
09:45	Dust Explosion Process Hazard Analysis
10:15	Coffee – Q&A
10:30	Introduction to FLACS-DustEx
10:45	Run Manager
11:15	CASD I: Defining Geometry, Grid & Porosity
12:30	Lunch
13:30	Exercise I: Defining Geometry, Grid & Porosity (Cont.)
15:15	Coffee – Q&A
15:30	CASD II: Defining Scenario
17:00	End of Day Two

Day 3

08:30	Coffee – Q&A
09:00	Exercise II: Defining Scenario and Running Simulations
10:30	Coffee – Q&A
10:45	FLACS Post-processor FLOWVIS
11:15	Exercise III: Using FLOWVIS
12:30	Lunch
13:30	How to Use the DustEx Spreadsheet
13:45	Quality Assurance of FLACS Simulations
14:30	FLACS-DustEx Validations
15:15	Coffee – Q&A
15:30	How to Run a FLACS-DustEx Project
16:15	Example – Realistic Job
16:45	Final Comments
17:00	End of Day Three

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Important information

To maintain a high standard of delivery, the maximum number of participants per course is limited to 20.

We reserve the right to cancel training 4 weeks prior to the start date where there are less than 8 delegate registrations.

How to register

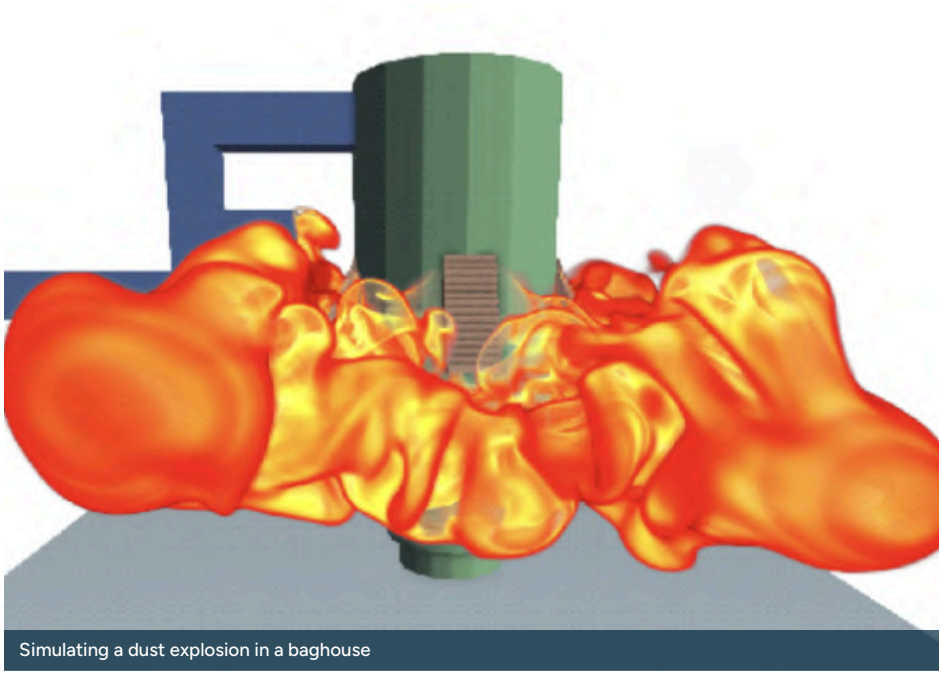
Please register on our website via this QR code (scan or click)

About FLACS

FLACS is a comprehensive, yet easy to use, software tool for modelling (dispersion, fire and explosion) consequences in full 3D for all typical flammable & toxic release scenarios.

It is used extensively in the oil and gas, chemical, energy, utilities, manufacturing, transportation, as well as in facilities with dust explosion potential.

By modelling with CFD in full 3D, it is possible to predict consequences with a higher level of detail and to include the impact of all contributing and mitigating effects (such as confinement and congestion due to the real geometry, ventilation and mitigation strategies).



Simulating a dust explosion in a baghouse

A preview of a past training course

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