Method for measuring the electrostatic charge in laminar and turbulent flows, looking for licensees

Summary

Profile type	Company's country	POD reference
Technology offer	**Germany**	**TODE20250319005**
Profile status	**Type of partnership**	**Targeted countries**
PUBLISHED	**Commercial agreement with technical assistance**	**• World**
Contact Person	**Term of validity**	**Last update**
Enrico FRANZIN	**19 Mar 2025** **19 Mar 2026**	**19 Mar 2025**

General Information

Short summary

A German research institute has developed a new technique which enables measuring the electrostatic charge of both laminar and turbulent flows of powders or liquids online and non-invasively. In conventional measurements using a Faraday cage, however, only the sum of the charge of all particles can be recorded. The measurement method therefore helps to improve the safety of many transportation processes. The institute is looking for licensees.

Full description

The new technology is based on two-dimensional measurements using particle image velocimetry (PIV). Between two measuring sections, an electrostatic field is applied to a testing channel. The differently charged particles are deflected by this field. By observing the dynamics of the individual particles in these measurement areas, the novel technique detects the change in charge in the flow direction. Thus, it is possible to spatially resolve the charge and not just measuring the absolute charge as done in established methods. Furthermore, the new technique enables to measure the electrostatic charge of both laminar and turbulent flows of powders or liquids online and non-invasively. This measurement method therefore helps to improve the safety of many transportation processes.
From the point of view of explosion protection, it is essential to understand precisely how powders or liquids charge during transport in industrial plants. During the pneumatic transport of powders, individual particles can become electrostatically charged. Due to the triboelectric effect, the electrostatic charging of flows can trigger explosions. In conventional measurements using a Faraday cage, however, only the sum of the charge of all particles can be

measured. The proposed PTB invention allows for the first time to measure the charge of turbulent flows and is in principle suitable for powder and liquid flows.
Economic significance:
The method is suitable for applications in all sectors that transport liquids or powders, e.g. in the pharmaceutical, food and mineral industries. In addition, future use is conceivable by companies whose products are based on the electrostatic charging of flows, such as triboelectric sorting or powder coating.

The institute is looking for licensees.

Advantages and innovations

Innovations & Advantages:
- Spatially resolved and non-invasive measurement of electrostatic charges in flows
- Extended application range for turbulent flows
- Suitable for powders and liquids

Technical specification or expertise sought

Stage of development

Available for demonstration

Sustainable Development goals

• Goal 9: Industry, Innovation and Infrastructure

IPR Status

IPR granted

IPR Notes

Partner Sought

Expected role of the partner

The research institute is looking for licensees who develop solutions for the transport liquids or powders, e.g. in the pharmaceutical, food and mineral industries. In addition, future use is conceivable by companies whose products are based on the electrostatic charging of flows, such as triboelectric sorting or powder coating.

Type of partnership

Type and size of the partner

Commercial agreement with technical assistance

- **SME 11-49**
- **SME <=10**
- **R&D Institution**
- **Big company**
- **SME 50 - 249**

Dissemination

Technology keywords

- **02004 - Plant Design and Maintenance**
- **02008007 - Transhipment Systems**
- **02002012 - Mixing (powder, etc.), separation (sorting, filtering)**
- **02007009 - Materials Handling Technology (solids, fluids, gases)**
- **02002002 - Coatings**

Market keywords

- **08001023 - Other chemicals and materials (not elsewhere classified)**
- **08002002 - Industrial measurement and sensing equipment**
- **09001007 - Other transportation**
- **08002003 - Process control equipment and systems**
- **08002007 - Other industrial automation**

Targeted countries

- **World**

Sector groups involved

- **Maritime Industries and Services**

Media

Images

PTV Camera