

New Standard on Handling and Storage of Combustible Dust

Chemical Standards Exchange 2017

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WG Convenor

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Outline

- Objective & Scope of New Standard
- Working Group Composition
- Why this New Standard is needed
- Focus Areas of New Standard
- Potential Issues to be addressed

Objective of Standard

- To provide **manufacturers, industry users and institutes of higher learning (IHL)** handling combustible dust a comprehensive guideline on the handling and storage of powder to **prevent fire/dust explosions and mitigate fires** in facilities handling such materials;
- This standard will be useful for manufacturers, industry users and institutes of higher learning (IHL) in the **assessment of dust hazards** (safety, health, environment) and mitigation of those hazards through **control measures, elimination of ignition sources** and **minimising damage**

Working Group (WG) Composition

WG Members	Representation	Nominated by
Dr Shaik Salim (WG Convenor)	Individual Capacity	Institute of Chemical and Engineering Sciences (A*STAR)
Dr Niaz Khan	Individual Capacity	Advanced Remanufacturing and Technology Centre
Mr Zaw Maung	Individual Capacity	Nanyang Polytechnic
Mr Premkumar Srinivasan	Individual Capacity	ExxonMobil Chemical Operations Pte Ltd
Mr. Balakrishnan	Individual Capacity	UL International Singapore
Dr. Zhang Danqing	Individual Capacity	UCT Additive Manufacturing Center Pte Ltd
Mr Charles Schiavinoto	Individual Capacity	Givaudan
Mr Wee Hooi Leong	Individual Capacity	Glaxo Wellcome Manufacturing Pte Ltd (GSK)
Mr Oh Hong Jia	Individual Capacity	Ministry of Manpower
CPT Matthew Goh	Individual Capacity	Singapore Civil Defence Force
Mr Eden Jang	Individual Capacity	Evonik Methionine SEA Pte Ltd
Mr Foo Chee Pok	Individual Capacity	The Polyolefin Company
Mr Khor Kheng Guan	Individual Capacity	Sis'88 Pte Ltd

Scope of Standard

- Specify the requirements for **material handling and storage**, and provide guidance on **control measures** such as ventilation, **fire protection and emergency action response**.
- Applicable to manufacturers, industry users and institutes of higher learning (IHL) handling combustible dust (e.g. food processing, woodworking factories, pharmaceutical, additive manufacturer/user, and logistics industry)

Projected Timeline

- WG formed in Jul 2017
- 1st WG Meeting: 31 Jul 2017
- Ongoing WG meetings to develop the standard
- Expected completion : FY 2019



Why this New Standard is needed

- The handling & usage of combustible dust in Singapore's context of an urban, high density as well as high-rise setting has not been adequately addressed by standards available internationally.
- Many overseas standards on handling combustible dust such as NFPA 652 & 654 are available but there is a need to adapt them for local use by :
 - consolidating & simplifying information from existing standards,
 - localising them for Singapore 's needs to facilitate implementation in large-scale and SME manufacturing facilities as well as multi-tenanted, high rise factory buildings.
- There are no current international standards that will help to address upcoming manufacturing trends such as the expected increase in use of combustible dust in new technologies e.g. additive manufacturing.

Areas of Focus for the New Standard

1. Storage requirements
2. Hazard identification, Dust Hazard Analysis
3. Performance-based design
4. Hazard management: mitigation and prevention
 - Fugitive dust control and housekeeping
 - Ignition sources
 - Fire protection
 - Measurement and monitoring
5. Management systems
 - Training and procedures
 - Inspection and maintenance
6. Facility and systems design
 - Zoning requirements
7. Process Equipment

References

- NFPA 652: Standard on Fundamentals of Combustible Dust
- NFPA 654: Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids
- NFPA 484: Standard for Combustible Metals
- NFPA 61: Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities

Potential Issues to be addressed

- Does the Singapore standard need to consider storage in high-rise buildings and in populated offices?
- Do we need to deviate from NFPA 652/654 and consider:
 - Storage of particulate solids?
 - ATEX 99/92/EC directive for Zoning Classification (Zone 20, 21, 22)?
- Alignment required to SCDF's Fire Safety Engineering Guideline (SFEG) 2015 for performance-based design
- Do we need to consider how we store metallic powders and whether NFPA 484: Standard for Combustible Metals is applicable and to what extent?

Potential Issues to be addressed

- Combustible dust testing capability
 - Who is a “Qualified person” in the context of dust hazard analysis?
- Who can prepare the performance-based design-- Professional Engineer (Chemical) with understanding of process safety? Versus roles of FSE (Fire Safety Engineer) and Peer Reviewer (another independent FSE) stated in SCDF’s Fire Safety Engineering Guideline (SFEG)
- Smaller SMEs may have issues related to process equipment compliance which could require major capital investment for implementation of the standard.

Thank You

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