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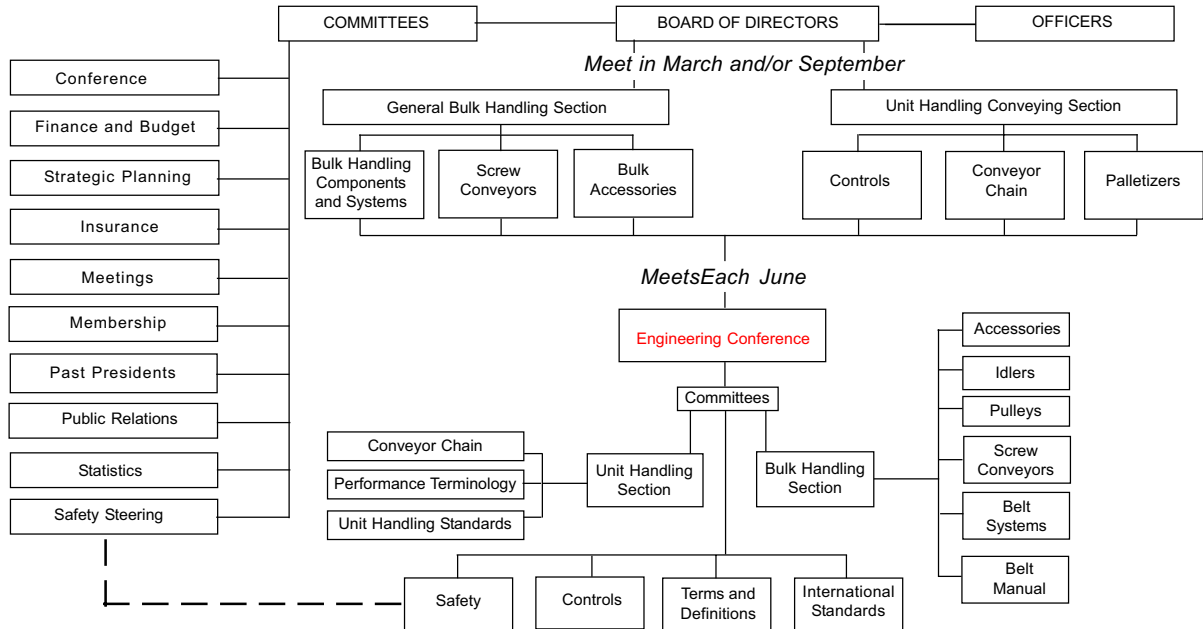
**Glossary
of
Pneumatic
Conveying
Terms**



**Conveyor Equipment
Manufacturers Association**

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CEMA ORGANIZATIONAL CHART



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SAFETY NOTICE

The Conveyor Equipment Manufacturers Association has developed Industry Standard Safety Labels for use on the conveying equipment of its member companies.

The purpose of the labels is to identify common and uncommon hazards, conditions, and unsafe practices which can injure, or cause the death of, the unwary or inattentive person who is working at or around conveying equipment.

The labels are available for sale to member companies and non-member companies.

A full description of the labels, their purpose, and guidelines on where to place the labels on typical equipment, has been published in CEMA's *Safety Label Brochure* No. 201. The Brochure is available for purchase by members and non-members of the Association. Safety Labels and Safety Label Placement Guidelines, originally published in the Brochure, are also available free on the CEMA Web Site at http://www.cemanet.org/CEMA_Safety_Pg.htm

PLEASE NOTE: Should any of the safety labels supplied by the equipment manufacturer become unreadable for any reason, the equipment USER is then responsible for replacement and location of these safety labels.

Replacement labels and placement guidelines can be obtained by contacting your equipment supplier or CEMA.

FOREWORD AND ACKNOWLEDGMENTS

This standard, Glossary of Pneumatic Conveying Terms, was prepared by the Pneumatic Conveying Section of the Conveyor Equipment Manufacturers Association. The objectives and purposes for publishing this standard include:

A. Encourage uniform usage and understanding of performance terminology used in the conveying field.

B. Assist in providing appropriate information for the selection and application of proper engineering practice in the field of materials handling as accomplished through usage of conveyor equipment.

C. Provide a source or basis of information related to characteristics, features and conditions inherent to the practices of materials handling through usage of conveying equipment.

Throughout this standard, preferred terms are followed by their definitions. Alternate terms in common usage are listed and cross-indexed back to the preferred term in each case.

Utilization of this Glossary of Pneumatic Conveying Terms, as published herein, is completely voluntary. This publication may be adhered to in its entirety, in part, or not at all, depending upon agreement of the parties involved.

For definitions of terminology which are not included herein, review the following references:

A. CEMA Terms and Definitions (Standard No. 102).

B. CEMA Classification and Definitions of Bulk Materials (Book No. 550).

C. ANSI/ASME B20.1, Safety Standard for Conveyors and Related Equipment.

Legal terms and definitions are not within the scope of this publication.

The Conveyor Equipment Manufacturers Association gratefully acknowledges the advice, assistance, and constructive criticisms afforded by the members of the committee and their companies. Without their respective contributions, preparation of this standard would not have been possible.

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Glossary of Pneumatic Conveying Terms

Prepared by

The Pneumatic Conveying Section

of the

CEMA Engineering Conference

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PNEUMATIC CONVEYING TERMS AND DEFINITIONS

These terms and definitions were prepared by the Pneumatic Conveying Section of the Conveyor Equipment Manufacturers Association as a service to users, designers, and specifiers of pneumatic conveying equipment and were published in paper as CEMA Standard 805: Pocket Glossary of Pneumatic Conveying Terms.

List of Pneumatic Conveying Terms

- Abrasiveness
- Actual Gas Velocity
- Adhesiveness
- Aeration
- Air Retention
- Angle of Repose
- Average Gas Velocity
- Bulk Material Composition
- Choking Velocity
- Cohesiveness
- Conveying Pressure
- Corrosiveness
- Dense Phase Conveying
- Dilute Phase Conveying
- Explosiveness
- Flotation Velocity
- Flowability
- Fluidized
- Fluidized Bulk Density
- Friability
- Hardness
- Hygroscopicity
- Loose Bulk Density
- Material Mass Flow Rate
- Material Temperature
- Material Temperature Sensitivity
- Material To Air Ratio
- Material Velocity
- Maximum Particle Size
- Median Particle Size
- Minimum Conveying Velocity
- Packed Bulk Density
- Particle Density
- Particle Shape
- Particle Size Distribution
- Permeability
- Saltation Velocity
- Terminal Gas Velocity
- Two-Phase Flow
- Volumetric Gas Flow

The terms have been grouped into two sections:

I. Material Characterization

II. Basic Terms and Definitions

I. MATERIAL CHARACTERIZATION

Fluidized Bulk Density - is the apparent bulk density of a material in its fluidized state. It is generally lower than either the packed or loose bulk density due to the air absorbed into the voids.

Loose Bulk Density - (sometimes called the poured bulk density) of a bulk material is the weight per unit of volume (usually pounds per cubic foot) that has been measured when the sample is in a loose, non-compacted or poured condition. The loose bulk density may be close to the “as conveyed” bulk density and is preferred for the purposes of pneumatic conveying system design.

Maximum Particle Size - is the maximum dimension in inches (in the case of lumpy materials) or the maximum sieve size (in the case of powders and granules) of the largest lump or particle in the bulk material. Maximum particle size can be critical in the design of pneumatic conveying systems.

Median Particle Size - is the median size or mid-point of the particle size distribution.

Packed Bulk Density - of a bulk material is the weight per unit volume (usually pounds per cubic foot) that has been measured when the sample has been packed or compacted in, for instance, a silo or bin or after containerized transportation. The packed bulk density does not compare to the conditions that would be found in a pneumatic conveying system. It is for this reason that the loose bulk density is preferred for the purposes of conveying system design.

Particle Density - is the mass of a particle divided by its volume. For a bulk material, average particle density is used, found by dividing the mass of the material by its volume, excluding the voids.

Particle Shape - The shape and form of the particles of a bulk material can vary considerably. The following table specifically describes the individual particle shape only and not the bulk material as a whole.

Term	Definition
Agglomerated	Several individual particles bonded together.
Angular	Sharp-edged or having a multi-faced, irregular shape.
Crystalline	Of geometric shape or multi-faced regular shape.
Cylindrical	Cylinder-shaped.
Dendritic	Having a branched, crystalline shape with the branches extending from the faces of the body.
Fibrous	Regularly or irregularly thread like with a flexible structure.
Flaky	Plate-like.
Needle-like	Long, thin, rigid, straight, and pointed.
Out-of-Round	Similar to spherical but being somewhat deformed or elongated.
Spherical	Globe-like.

Particle Size Distribution - of a bulk material is a tabulation of the percentage of particles by mass in each particle size range. The percentage described is either that passing or being retained on a specific screen size. In the United States, the screens used are "U.S. Standard Screens" or "Tyler Test Screens". Other methods of size analysis may be used, particularly in the case of very fine and/or cohesive powders. These methods include photo sedimentation, optical microscopy, electrical sensing zone techniques (such as the Coulter counter), and laser diffraction spectrometry.

Bulk Material Composition

The following table describes the general compositions that may be found in a bulk material.

Term	Definition
Uniform	A single bulk material whose particles possess the same size and shape.
Non-Uniform	A single bulk material whose particle size and shape may vary.
Granular	A bulk material comprised of individual particles which can be visibly discerned.
Powder	A bulk material comprised of individual particles which cannot be visibly discerned
Mixed	Two or more different bulk materials which have been combined.