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Design Loads for Bunker (Horizontal) Silos

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Developed by the ASAE Horizontal Silo Loads Subcommittee of the Structures Group; approved by the Structures and Environment Division Standards Committee; adopted by ASAE December 1996; reaffirmed December 2001, January 2007; revised editorially January 2007; revised December 2007, October 2008; reaffirmed November 2013.

Keywords: Bunker, Design, Loads, Silos

1 Purpose and Scope

1.1 This Standard is intended to provide design loads for the walls of bunker (horizontal) silos for storing whole plant silages.

1.2 The design loads in this Standard do not include hydrostatic pressures that may occur when the silage becomes saturated.

2 Terminology

2.1 bunker (horizontal) silo: A storage bunker for silage with a floor at ground level and walls on two or three sides to retain the silage material, which is compacted with a tractor or other heavy vehicle.

2.2 silage load: The load that the silage exerts on the silo wall after compaction of the silage is completed.

2.3 compaction load: The load transferred through the silage onto the silo wall from the compaction equipment operating on the surface of the silage.

3 Nomenclature

DM is dry matter fraction of silage

g is gravitational acceleration (9.81 m/s^2)

K is pressure factor

K_f is force factor

L is design line load normal to wall, N/m

L_t is load per unit length on one track, N/m

p is silage pressure normal to wall, Pa

P is design load normal to the wall, N

P_w is maximum wheel load, N

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