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Building construction machinery and equipment — Pedestrian-controlled vibratory plates — Terminology and commercial specifications

Machines et matériels pour la construction des bâtiments — Plaques vibrantes guidées à la main — Terminologie et spécifications commerciales

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Foreword

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ISO 19433 was prepared by Technical Committee ISO/TC 195, *Building construction machinery and equipment*.

Introduction

The purpose of this International Standard is to define the main terms and commercial specifications for pedestrian-controlled vibratory plates used for material (soil and asphalt) compaction. These machines are typically used in the building trades to improve material density characteristics.

Building construction machinery and equipment — Pedestrian-controlled vibratory plates — Terminology and commercial specifications

1 Scope

This International Standard provides a terminology and sets out the commercial specifications for pedestrian-controlled vibratory plates used in building construction. It is applicable to both forward- and reversible-type plates. These plate compactors are intended for the mechanical compaction of all disturbed soil, sand or aggregates used for load-bearing purposes — whether in new construction or repairs.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
pedestrian-controlled vibratory plate
direct- or remote-controlled machine designed for the purpose of improving material density and stiffness

NOTE The machine compacts material through vibration and impact force generated by the vibrator shaft to the base plate and transmitted to the material.

2.1.1
forward-type vibratory plate
machine designed to move in only one direction, forward

See Figure 1 a).

2.1.2
reversible-type vibratory plate
machine designed to move in two directions, both forward (away from the operator) and reverse (towards the operator)

See Figure 1 b).

2.2
prime mover
driving energy source for vibrator mechanism

2.3
transmission
system of components that translates the prime mover energy to the vibrator mechanism

2.4
base plate
machine element that locates the vibrator mechanism and comes in contact with the material being compacted

See Figure 1.

2.5
vibrator shaft
shaft with an eccentric mass that generates vibration when rotated

2.6
vibrator mechanism
system of components, utilizing the vibrator shaft, affixed to the base plate

2.7
vibration frequency
number of vibrator cycles per second

2.8
eccentric radius
distance, offset from the radius of rotation, at which the eccentric mass is considered concentrated

2.9
eccentric mass
vibrator shaft element whose mass is radially offset from the shaft centre line

2.10
eccentric moment
static moment
product of the eccentric mass and the eccentric radius

2.11
centrifugal force
calculated value which considers the vibrator shaft eccentric moment and vibrator shaft frequency

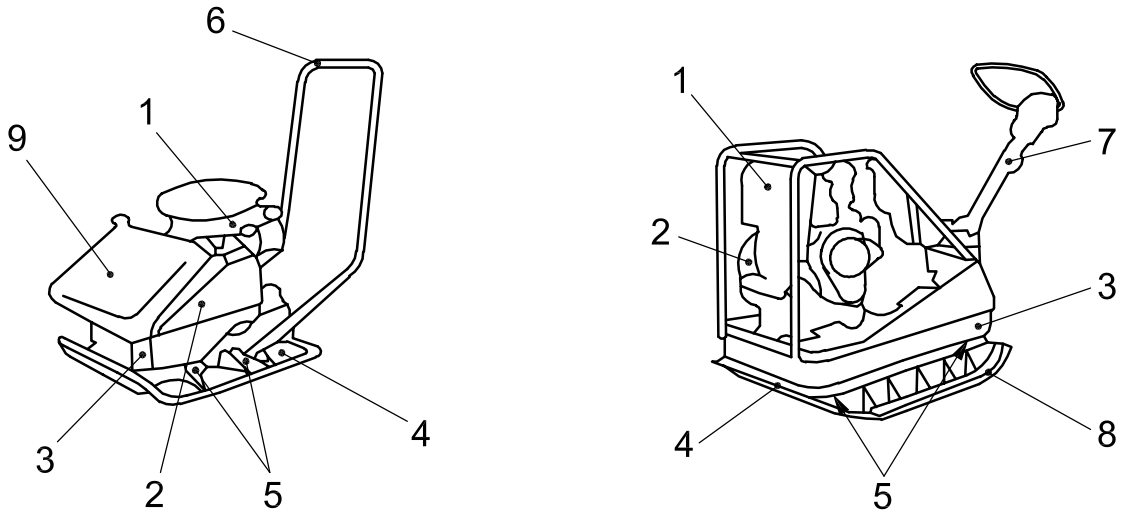
NOTE This value can be calculated using the equation given in Annex A.

2.12
operating mass
machine mass with equipment, attachments and all fluid systems (i.e. hydraulic oil, engine oil, lubrication oil, transmission oil) at the levels specified by the manufacturer, and — when applicable — with the fuel and water tanks half-full

2.13
shipping mass
machine mass as configured for shipping

2.14
water system
container and delivery system used to lubricate the base plate for asphalt applications

2.15
maximum travel speed
maximum horizontal distance the vibratory plate travels over material being compacted in a given unit of time, measured in both forward and reverse directions

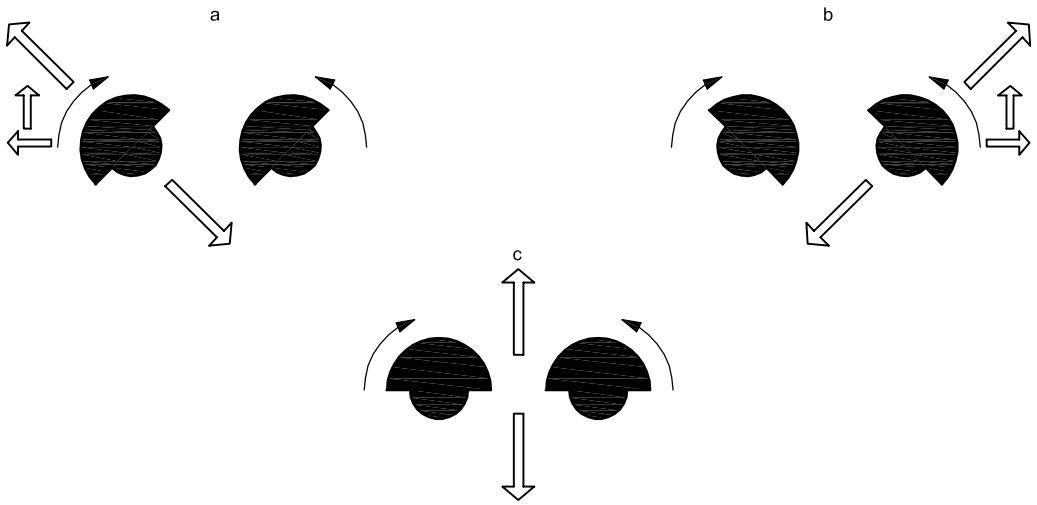


a) Forward-type vibratory plate **b) Reversible-type vibratory plate**

Key

1 prime mover
2 transmission
3 vibrator mechanism
4 base plate
5 dampers
6 guide handle
7 operator control assembly
8 expanders
9 water system

Figure 1 — Structure of pedestrian-controlled vibratory plates

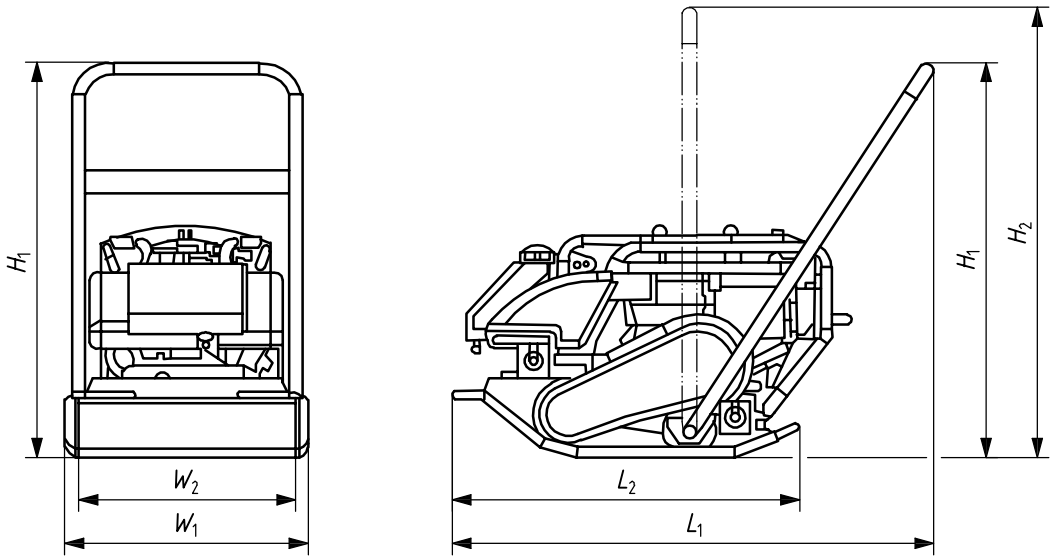


a Position of eccentric mass for forward movement.

b Position of eccentric mass for reverse movement.

c Position of eccentric mass for in-place vibration.

Figure 2 — Double vibrator's eccentric mass positions for vibratory plate directional control



Key

H_1 overall height in operating position
H_2 overall height
L_1 overall length with handle in operating position
L_2 base plate length
W_1 overall width
W_2 base plate width

Figure 3 — Machine dimensions

3 Commercial specifications

3.1 General

The following general data shall be presented:

a) model and type;

b) manufacturer;

c) serial number;

d) prime mover type (internal combustion engine, electric, pneumatic);

e) operating mass kg;

f) base plate size ($W_2 \times L_2$) mm (see Figure 3);

g) centrifugal force kN;

h) vibration frequency Hz;

i) maximum travel speed:

— forward m/min;

— reverse m/min;

j) overall dimensions in operating mode (see Figure 3):

— length, L_1 mm;

— width, W_1 mm;

— height, H_1 mm.

3.2 Prime mover

3.2.1 For internal combustion engine

The following combustion engine data shall be presented:

a) internal combustion engine type:

— with spark ignition or

— compression ignition;

b) model;

c) manufacturer;

d) swept capacity cm^3;

e) operating revolutions min^{-1};

f) engine net power kW (according to the standard specified by manufacturer);

g) fuel type;

h) fuel tank capacity l.

3.2.2 For electric motor

The following electric motor data shall be presented:

a) model and type;

b) rated current A;

c) voltage, phase, and frequency V/phase/Hz;

d) maximum operating revolutions min^{-1}.

3.2.3 For pneumatic drive

The following pneumatic drive data shall be presented:

a) maximum supply pressure MPa;

b) air consumption rate m^3/h;

c) cycle rate at stated pressure and flow Hz.

3.3 Other data

The following other data shall be presented (if applicable):

a) water tank (if any) capacity l;

b) mass of the machine equipped with expanders as an optional attachment

kg;

c) shipping mass kg.

Annex A
(informative)

Example of centrifugal force calculation — Single-shaft vibratory plate

The centrifugal force can be calculated from the formula:

$$F = \frac{m \cdot r \cdot \pi^2 \cdot n^2}{900\,000} = \frac{m \cdot r \cdot \pi^2 \cdot f^2}{250}$$

where

F is the centrifugal force, in kilonewtons;

m is the eccentric (unbalanced) mass, in kilograms;

r is the eccentric radius, in metres;

n is the shaft rotation, in min^{-1} or revolutions per minute;

f is the vibration frequency, in hertz.

Bibliography

[1] LEMB Standard No. 2, *Uniform method for rating vibratory plates (Hand-guided, walk behind)* [1)]

[2] EN 500-1, *Mobile road construction machinery — Safety — Part 1: Common requirements*

[3] EN 500-4, *Mobile road construction machinery — Safety — Part 4: Specific requirements for compaction machines*

1) The Light Equipment Manufacturers Bureau (LEMB) — a bureau of the Construction Industry Manufacturers Association, Milwaukee, Wisconsin (Association of Equipment Manufacturers).

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