
**Building construction machinery and
equipment — Mobile crushers —**

**Part 1:
Terminology and commercial
specifications**

*Machines et matériels pour la construction des bâtiments —
Concasseurs mobiles —*

Partie 1: Terminologie et spécifications commerciales



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 195, *Building construction machinery and equipment*.

This second edition cancels and replaces the first edition (ISO 21873-1:2008), which has been technically revised.

ISO 21873 consists of the following parts, under the general title *Building construction machinery and equipment — Mobile crushers*:

- *Part 1: Terminology and commercial specifications*
- *Part 2: Safety requirements*

Introduction

This part of ISO 21873 deals with mobile crushers which are used for crushing rocks or reprocessing construction materials.

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Building construction machinery and equipment — Mobile crushers —

Part 1: Terminology and commercial specifications

1 Scope

This part of ISO 21873 specifies terminology and commercial literature specifications for mobile crushers used for crushing rocks or reprocessing construction materials and capable of relocation between worksites.

It applies to mobile crushers that are either

- self-propelled (mounted on a chassis),
- lorry (truck) mounted, or
- semi-trailer mounted.

It does not apply to the following:

- fixed (stationary) crushers;
- large mining-type movable crushers.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 16754:2008, *Earth-moving machinery — Determination of average ground contact pressure for crawler machines*

3 Terms and definitions

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

3.1 mobile crusher

machine affixed to a chassis which is typically composed of a feed device, a crushing device, a control system, a prime mover, a transmitting device, and a travel device designed for reducing the size of mineral-based material to particles meeting a desired specification

3.1.1 self-propelled mobile crusher

machine mounted to a chassis capable of propelling itself to another location

3.1.2 lorry-[truck-] mounted mobile crusher

machine mounted on and capable of being relocated on a lorry [truck] chassis

3.1.3

semi-trailer mounted mobile crusher

machine mounted on and capable of being relocated on a semi-trailer chassis

3.2

feed hopper

receptacle that takes in feed material transitorily and charges it into the feed device

3.3

feed device

feeder

device that supplies feed material to the crushing device

EXAMPLE Vibrating (grizzly) feeder, belt feeder, apron feeder, reciprocating plate feeder, roller grizzly, push feeder, vibrating screen.

3.4

crushing device

crusher

mechanism that reduces the size of feed material by fracturing larger pieces into multiple smaller pieces

3.4.1

jaw-type crushing device

jaw-type crusher

device which reduces material size by compression forces consisting of a fixed jaw and a movable jaw which moves so as to increase and decrease the gap between the two jaws

3.4.2

horizontal shaft impact crushing device

HSI crushing device

HSI crusher

device in which material is fragmented by kinetic energy applied by a rotor or impeller disc mounted on a horizontal shaft which rotates at high speed to the feed material which is propelled against a fixed surface

3.4.3

cone-type crushing device

cone-type crusher

device which reduces material size by compression forces consisting of a moving member rotated eccentrically within the fixed member; both moving and fixed members are in a form of truncated cones

3.4.4

vertical shaft impact crushing device

VSI crushing device

VSI crusher

device in which material is fragmented by kinetic energy applied by a rotor or impeller disc mounted on a vertical shaft which rotates at high speed to the feed material which is propelled against a fixed surface

3.5

discharge device

mechanism that removes processed material

EXAMPLE Belt conveyor, screw conveyor, chute, vibrating feeder, reciprocating plate feeder.

3.6

control system

system for controlling the crushing operation

Note 1 to entry: This system includes an operator interface and mechanical or electronic systems for controlling the operation of the mobile crusher.

3.7

prime mover

engine, motor or other device which provides mechanical energy for linear or rotational movement

EXAMPLE Internal combustion engine, electric generator, electric motor, external power plant.

3.8

transmitting device

transmission

translates or controls power source energy to the feed device and/or crushing device

EXAMPLE Hydraulic system, fluid coupling, torque converter, clutch, v-belts and sheaves, drive shaft.

3.9

travel device

chassis used for re-locating the mobile crusher

3.10

feed material

charged material

material which has been loaded into the receiving hopper and/or the feed device

3.11

by-pass device

system that diverts material separated from the crusher feed directly to the discharge device

Note 1 to entry: Chute, belt conveyor, vibrating screen.

3.12

pre-screen side conveyor

device for discharging material separated from the crusher feed material

3.13

return conveyor

device used to transfer oversized material back to the crushing device or feed device for additional processing

3.14

magnetic separator

device for removing ferrous contaminants from the material processed by the crusher using magnets e.g. permanent or electric

3.15

dust suppression system

device or set of components used to reduce the amount of fugitive dust emission from a mobile crusher

EXAMPLE Water spray system, suction filter system (e.g. bag filter).

3.16

machine mass in operating mode

mass of the machine without operator and without feed material with the feed device, crushing device and attachments designated by the manufacturer, full fuel tank, and full lubricating, hydraulic and cooling systems

Note 1 to entry: When specifying the mass of a machine where the operator is at an operator station on the machine, a mass representing the operator equal to 75 kg should be added.

3.17

machine mass in transporting mode

mass of the machine without an operator and without feed material with feed device, crushing device and attachments designated by the manufacturer, with half-full fuel tank, and full lubricating, hydraulic and cooling systems

Note 1 to entry: Where parts are removed or attached for transporting, their weights are deducted or included in the machine mass.

3.18

ground clearance in transporting mode

height of the lowest point of the machine from the ground

3.19

operating mode

configuration as defined by the manufacturer where the machine is ready to perform its intended functions

3.20

transporting mode

configuration of the machine as defined by the manufacturer where the machine is ready to be transported from one location to another

3.21

net feed opening

indication of the crushing device's ability to accept feed without bridging

Note 1 to entry: The net feed opening is not intended to define crushing device feed size (which is determined by the crusher manufacturer).

4 Commercial literature specifications

4.1 General data

The following general data shall be presented:

- a) manufacturer or importer (if imported);
- b) model;
- c) prime mover type (internal combustion engine, electric motor);
- d) power installed kW;
- e) overall dimensions in operating mode:
 - length (see L_0 in [Figures A.2, A.3 and A.4](#)) mm;
 - width (see W_0 in [Figures A.2, A.3 and A.4](#)) mm;
 - height (see H_0 in [Figures A.2, A.3 and A.4](#)) mm;
- f) machine mass in operating mode kg;
- g) overall dimensions in transporting mode:
 - length (see L_1 in [Figures A.2, A.3 and A.4](#)) mm;
 - width (see W_1 in [Figures A.2, A.3 and A.4](#)) mm;
 - height (see H_1 in [Figures A.2, A.3 and A.4](#)) mm;
- h) machine mass in transporting mode kg;
- i) ground clearance (see H_4 in [Figures A.2, A.3 and A.4](#)) mm;
- j) average ground contact pressure (crawler type only) (determined in accordance with ISO 16754:2008, 4.2) kPa.

4.2 Detailed data for mobile crusher components

4.2.1 Prime mover

4.2.1.1 Internal combustion engine

The following data shall be presented:

- a) manufacturer;
- b) model name;
- c) swept capacity cm³;
- d) net power (according to the standard specified by manufacturer) kW;
- d) rated revolutions r/min;
- e) fuel type;
- f) fuel tank capacity l.

4.2.1.2 Electric motor

The following data shall be presented:

- a) type (e.g. induction motor, direct current motor);
- b) power kW;
- c) rated current A;
- d) voltage and frequency V and Hz;
- e) revolutions r/min.

NOTE See IEC 60034-1 for the specification of electric motors.

4.2.2 Secondary power source

4.2.2.1 Electric generator

The following data shall be presented:

- a) type;
- b) power kVA;
- c) rated current A;
- d) voltage and frequency V and Hz.

4.2.3 Feed hopper

The following data shall be presented:

- a) type (fixed or foldable);
- b) size (charging width and length) (see $W_4 \times L_4$ in [Figures A.2](#) and [A.4](#)) mm × mm;
- c) capacity (struck capacity) (see [Annex B](#) for calculating hopper volume) m³;
- d) charging height (see H_2 in [Figures A.2](#), [A.3](#) and [A.4](#)) mm;

4.2.4 Feed device

The following data shall be presented:

- a) type (see [3.3](#) for examples);
- b) drive type (e.g. hydraulic, mechanical or electric);
- c) width x length (see $W_5 \times L_5$ in [Figures A.2](#) and [A.4](#)) mm × mm.

4.2.5 Crushing device

The following data shall be presented.

4.2.5.1 Jaw-type crushing device (see [C.2.1](#))

- a) net feed opening size mm × mm (specify whether peak-to-peak or peak-to-valley);
- b) revolutions operating r/min;

c) drive type (e.g. hydraulic, mechanical or electric).

4.2.5.2 Horizontal shaft impact (HSI) crushing device (see [C.2.2](#))

- a) net feed opening size mm × mm;
- b) revolutions operating r/min;
- c) drive type (e.g. hydraulic, mechanical or electric).

4.2.5.3 Cone-type crushing device (see [C.2.3](#))

- a) feed opening mm;
- b) size designation mm;
- c) countershaft speed r/min;
- d) drive type (e.g. hydraulic, mechanical or electric).

4.2.5.4 Vertical shaft impact (VSI) crushing device (see [C.2.4](#))

- a) net feed opening size mm × mm;
- b) revolutions operating r/min;
- c) drive type (e.g. hydraulic, mechanical or electric).

4.2.6 Discharge device

The following data shall be presented:

- a) type (see [3.5](#));
- b) size × length (e.g. for belt conveyors use width of belt × length between centres of head and tail pulleys) mm × mm;
- c) discharging height (distance between the ground and top of a head pulley (see H_3 in [Figures A.2, A.3 and A.4](#)) mm;
- d) drive type (e.g. hydraulic, mechanical or electric).

4.2.7 Travel device for self-propelled machines

4.2.7.1 For crawler-type chassis (see [Figure A.1](#))

The following data shall be presented:

- a) track gauge (see W_2 in [Figure A.2](#)) mm;
- b) track shoe width (see W_3 in [Figure A.2](#)) mm;
- c) track length on ground (see L_2 in [Figure A.2](#)) mm;
- d) ground contact pressure average (base unit) kPa;
- e) maximum travel speed km/h;
- f) drive type (e.g. hydraulic, mechanical or electric).

4.2.8 Travel device for lorry (truck) mounted machines

The following data shall be presented:

- a) manufacturer;
- b) wheelbase (see L_2 in [Figure A.3](#)) mm;
- c) axle loads (base unit):
 - rear kN;
 - front kN;
- d) axle track (see W_2 in [Figure A.3](#)) mm;
- e) travel speeds (maximum travel speed at each speed gear ratio) km/h;
- f) truck engine power kW;
- g) axle spacing (see L_3 in [Figure A.3](#)) mm.

4.2.9 Travel device for semi-trailer mounted machine

The following data shall be presented:

- a) number of axles;
- b) semi-trailer axle spacing (see L_3 in [Figure A.4](#)) mm;
- c) semi-trailer axle track (see W_2 in [Figure A.4](#)) mm;
- d) wheelbase (see L_2 in [Figure A.4](#)) mm;
- e) kingpin design height (see H_5 in [Figure A.4](#)) mm;
- f) kingpin load kN;
- g) axle load (at centre of axle group, see [Figure A.4](#)) kN;
- h) semi-trailer mass (base unit) kg.

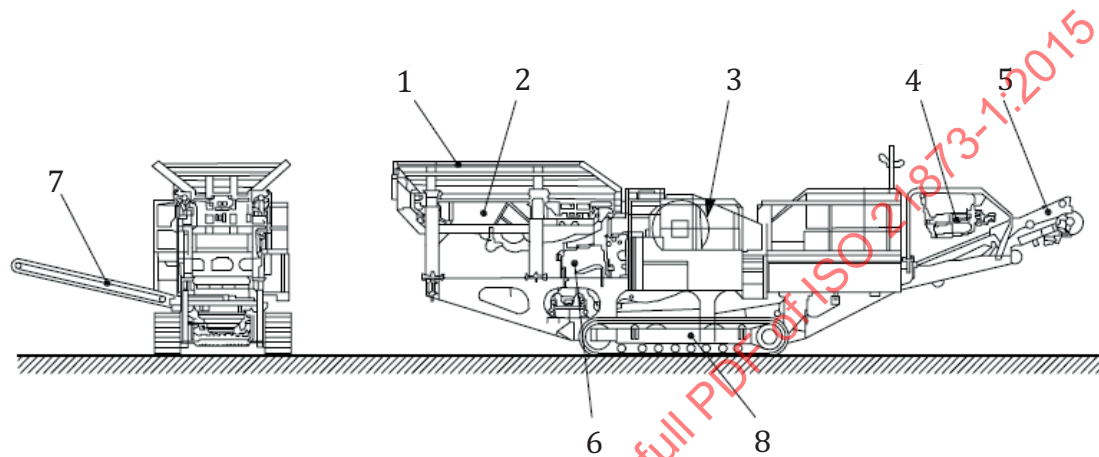
4.2.10 Tank capacity

The following capacity data shall be presented for the tanks listed below:

- a) fuel l;
- b) hydraulic oil l;
- c) engine oil l;
- d) crushing device oil (lubricating oil for crushing device) l;
- e) engine cooling water l;
- f) water for dust suppression l;
- g) diesel emission fluid tank, if equipped l.

Annex A (informative)

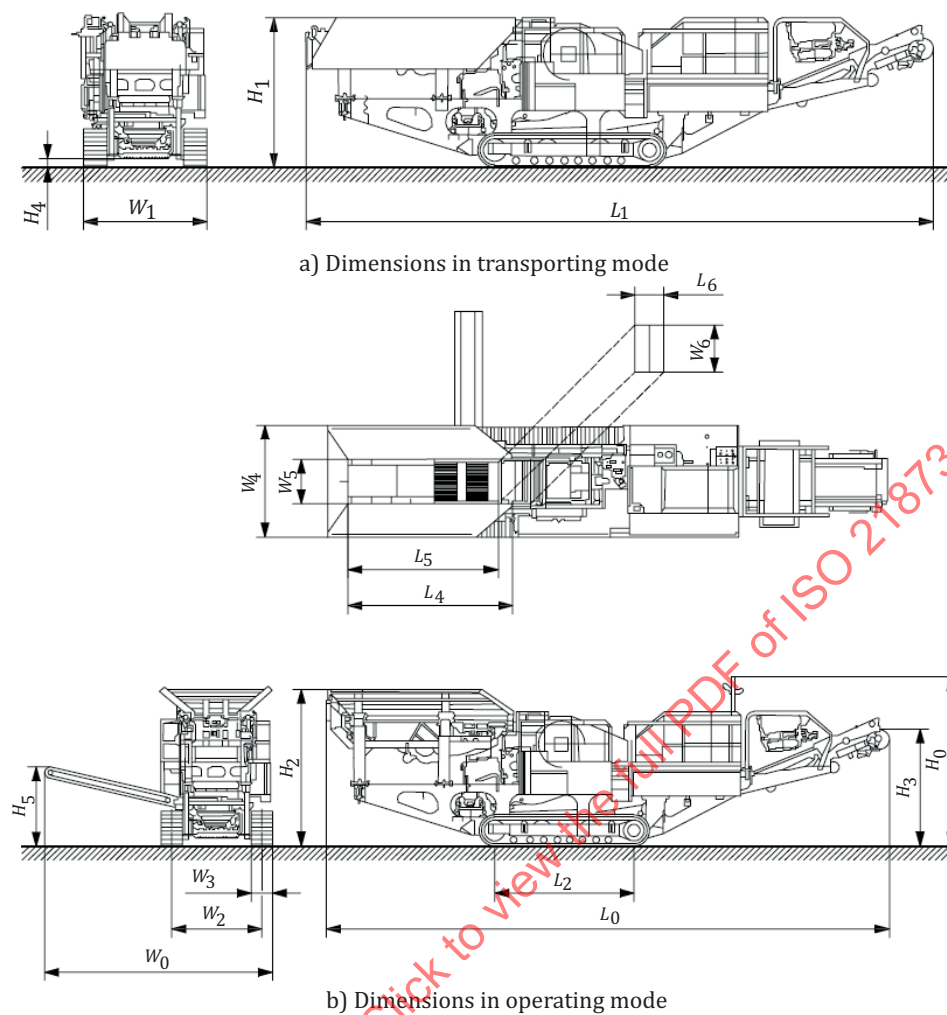
Structures and dimensional characteristics of mobile crushers — Examples



Key

- 1 feed hopper
- 2 feed device
- 3 crushing device
- 4 magnetic separator
- 5 discharge device (belt conveyor)
- 6 by-pass device
- 7 pre-screen side conveyor
- 8 travel device

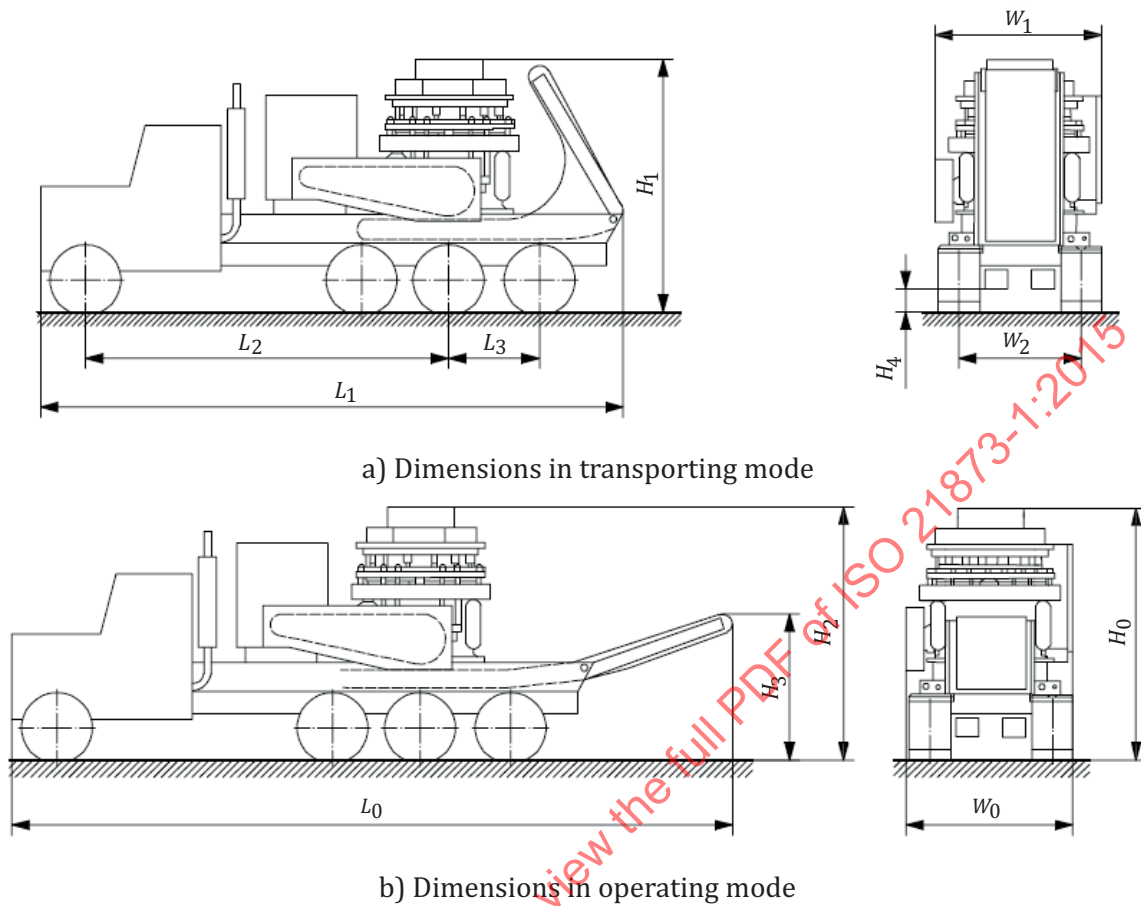
Figure A.1 — Structure of self-propelled mobile crusher with crawler chassis



Key

H_0	overall height (operating mode)	L_5	feeder length
H_1	overall height (transporting mode)	L_6	length of crusher feed opening
H_2	charging height	W_0	overall width (operating mode)
H_3	discharging height (top of conveyor)	W_1	overall width (transporting mode)
H_4	ground clearance (see 3.16)	W_2	track gauge
H_5	discharging height of the pre-screen side conveyor	W_3	track shoe width
L_0	overall length (operating mode)	W_4	feed hopper charging width
L_1	overall length (transporting mode)	W_5	feeder width
L_2	track length on ground	W_6	width of crusher feed opening
L_4	feed hopper charging length		

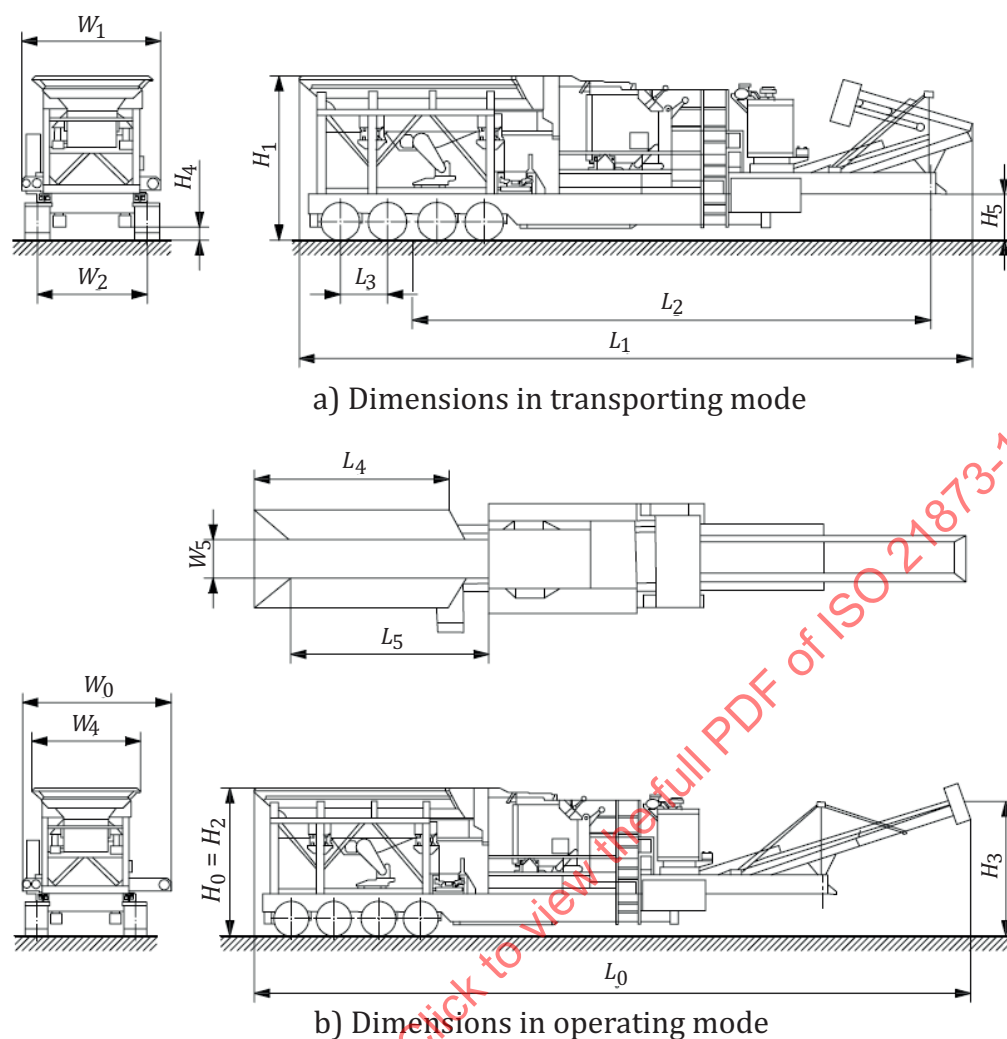
Figure A.2 — Dimensional characteristics of self-propelled mobile crusher on crawler chassis



Key

H_0 overall height (operating mode)	L_1 overall length (transporting mode)
H_1 overall height (transporting mode)	L_2 truck wheelbase
H_2 charging height of the feed hopper	L_3 truck axle spacing
H_3 discharging height (top of the conveyor)	W_0 overall width (operating mode)
H_4 ground clearance (see 3.19)	W_1 overall width (transporting mode)
L_0 overall length (operating mode)	W_2 truck axle track

Figure A.3 — Dimensional characteristics of lorry (truck)-mounted mobile crusher



Key

H_0	overall height (operating mode)	L_3	semi-trailer axle spacing
H_1	overall height (transporting mode)	L_4	feed hopper length
H_2	charging height of the feed hopper	L_5	feeder length
H_3	discharge height (top of the conveyor)	W_0	overall width (operating mode)
H_4	ground clearance (transporting mode)	W_1	overall width (transporting mode)
H_5	kingpin design height	W_2	semi-trailer axle track
L_0	overall length (operating mode)	W_4	feed hopper width
L_1	overall length (transporting mode)	W_5	feeder width
L_2	semi-trailer wheelbase		

Figure A.4 — Dimensional characteristics of semi-trailer-mounted mobile crusher

Annex B

(informative)

Simplified method for calculating feed hopper volume

For comparison of the feed hopper capacities for different machines, its struck volume has been selected. An example of a simplified method for calculating the feed hopper struck volume, for one type of hopper, is presented.

Feeder and feed hopper form a volume, V , presented in [Figure B.1](#). For simplified calculation of the feed hopper volume, the following assumptions are made:

- the volume, V_1 , is equal to V_2 (see [Figure B.2](#));
- the area of the cross-section of the feed hopper volume is constant and reduced to the rectangle of the side lengths $H \times W_w$ (see [Figure B.2](#)).

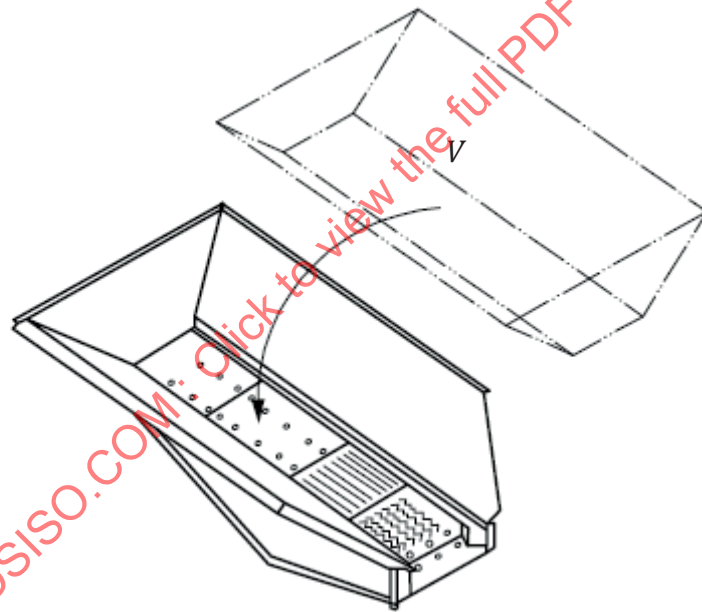
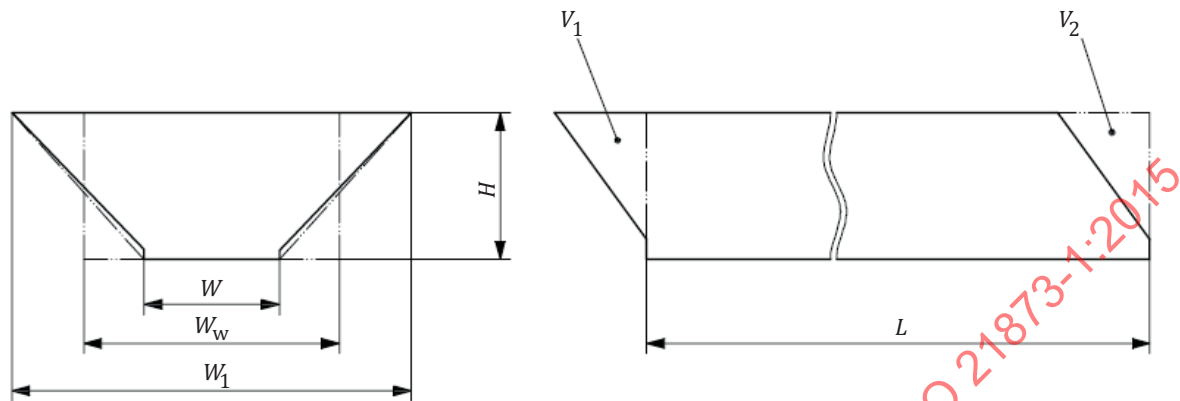


Figure B.1 — Graphical presentation of feed hopper volumetric capacity V



Key

L	length of the feed hopper (including grizzly)	(mm)
H	height	(mm)
W	feeder width	(mm)
W_1	feed hopper width	(mm)
W_w	feed hopper width reduced to the rectangle's side and calculated from Formula (B.1):	(mm)

$$W_w = \left(\frac{W_1 - W}{2} + W \right) \quad (\text{mm}) \quad (\text{B.1})$$

Figure B.2 — Graphical presentation of the feed hopper volumetric capacity reduced to cuboid (assumption $V_1 = V_2$)

The feed hopper volume, V , is calculated from Formula (B.2):

$$V = L \times H \times \left(\frac{W_1 - W}{2} + W \right) \times 10^{-9} \quad (\text{m}^3) \quad (\text{B.2})$$

NOTE For definitions of L , H , W and W_1 , see [Figure B.2](#).

Annex C

(normative)

Methods for defining crushing device net feed opening size

C.1 General

The purpose of this information is to define the net feed opening size for common types of mobile crushers.

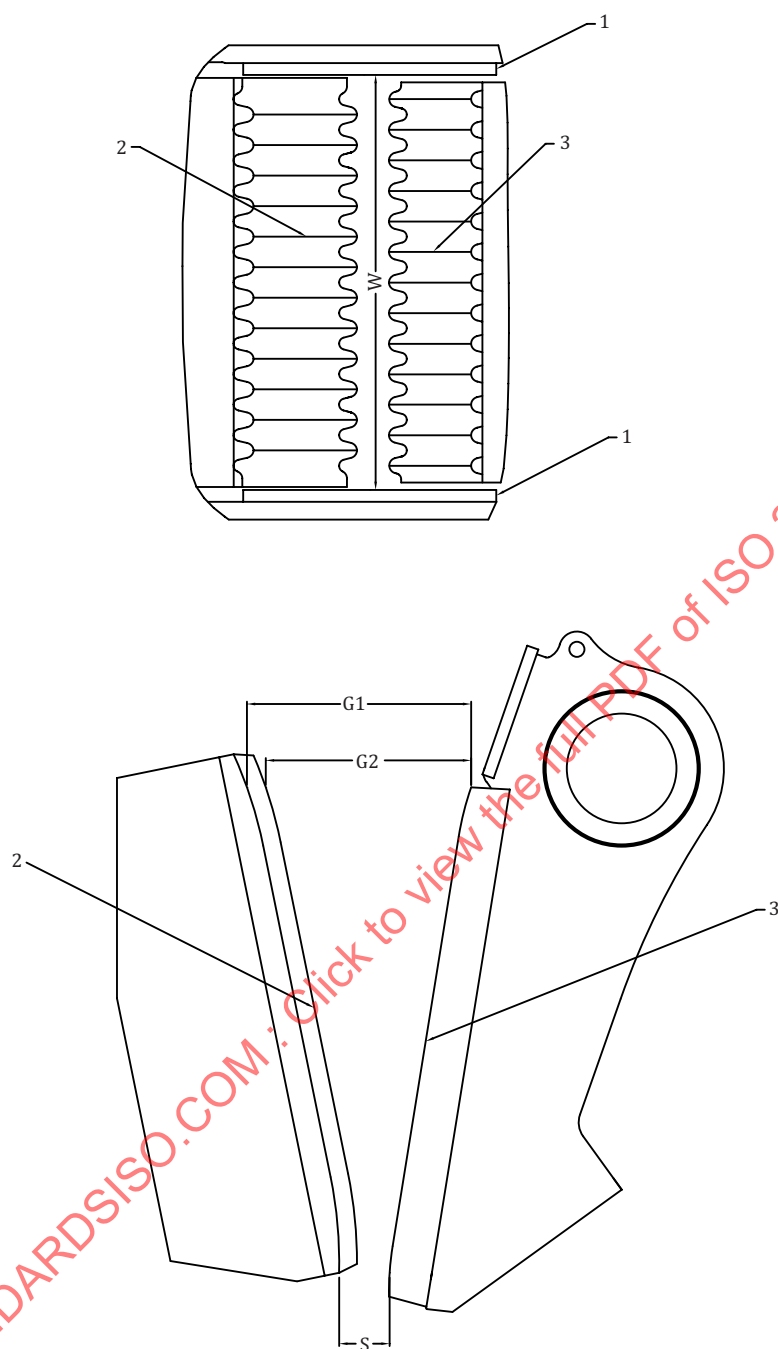
C.2 Measuring methods

C.2.1 For jaw-type crushing device

The gape opening shall be measured from either peak-to-peak (tip to tip) or peak-to-valley (tip to trough) at the top of the jaw dies with the swing jaw (pitman) in its most open position. The gape shall be measured with the closed side setting at its minimum recommended opening.

The gape shall be measured with new jaw dies installed.

The width opening shall be measured as the minimum distance between side liners in the crushing chamber with new liners installed.



Key

- 1 cheek plate/side liner
- 2 fixed jaw die
- 3 moving jaw/swing jaw die
- G_1 gape – Peak to valley
- G_2 gape – Peak to peak
- S crushing device setting/clearance
- W chamber width

Figure C.1 — Example of jaw-type crushing device feed opening measurement