
Foundry machinery — Vocabulary —

Part 4:

**Abrasive blasting machines and other
equipment related to cleaning and
finishing for casting**

Machines de fonderie — Terminologie —

*Partie 4: Machines de grenailage abrasif et autres équipements liés
au nettoyage et à la finition pour le moulage*

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 306, *Foundry machinery*.

A list of all parts in the ISO 23472 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Documentation gives rise to numerous international exchanges of both intellectual and material nature. These exchanges often become difficult, either because of the great variety of terms used in various fields or languages to express the same concept, or because of the absence, or imprecision, of useful concepts.

To avoid misunderstandings due to this situation and to facilitate such exchanges, it is advisable to select terms to be used in various languages or in various countries to express the same concept, and to establish definitions providing satisfactory equivalents for the various terms in different languages.

The objects involved in the ISO 23472 series are foundry machines used in foundry production.

The purpose of the ISO 23472 series is to provide definitions in English that are rigorous, uncomplicated and which can be understood by all concerned. The scope of each concept defined has been chosen to provide a definition that is suitable for general application within foundry machinery, which includes machines and equipment adapted at each stage of the processes within different casting processes.

As a metal thermoforming method that fills molten metal into the mold to produce machine parts or rough parts after solidification, casting has a long history and various processes, and its technology is constantly developing and changing. According to the differences in the mold used, or different ways of molten metal filling or solidification, casting processes are usually divided into sand casting, permanent casting and other casting processes. According to different casting processes and different stages of production, casting equipment covered by foundry machinery is divided into the following major categories:

- molding and coremaking machines and other equipment related to non-permanent mold casting process;
- die casting machines and other equipment related to permanent mold casting process;
- abrasive blasting machines and other equipment related to cleaning and finishing for casting;
- cupola furnaces and pouring devices and ladles.

This document only involves terms and definitions of abrasive blasting machines and other equipment related to cleaning and finishing for casting, including basic concepts specifically concerning structural characteristics and functions, important mechanisms and parts, main technological processes and parameters of various abrasive blasting machines, degating devices, decorating machines, grind fettling machines and other related equipment (see [Figure 1](#)).

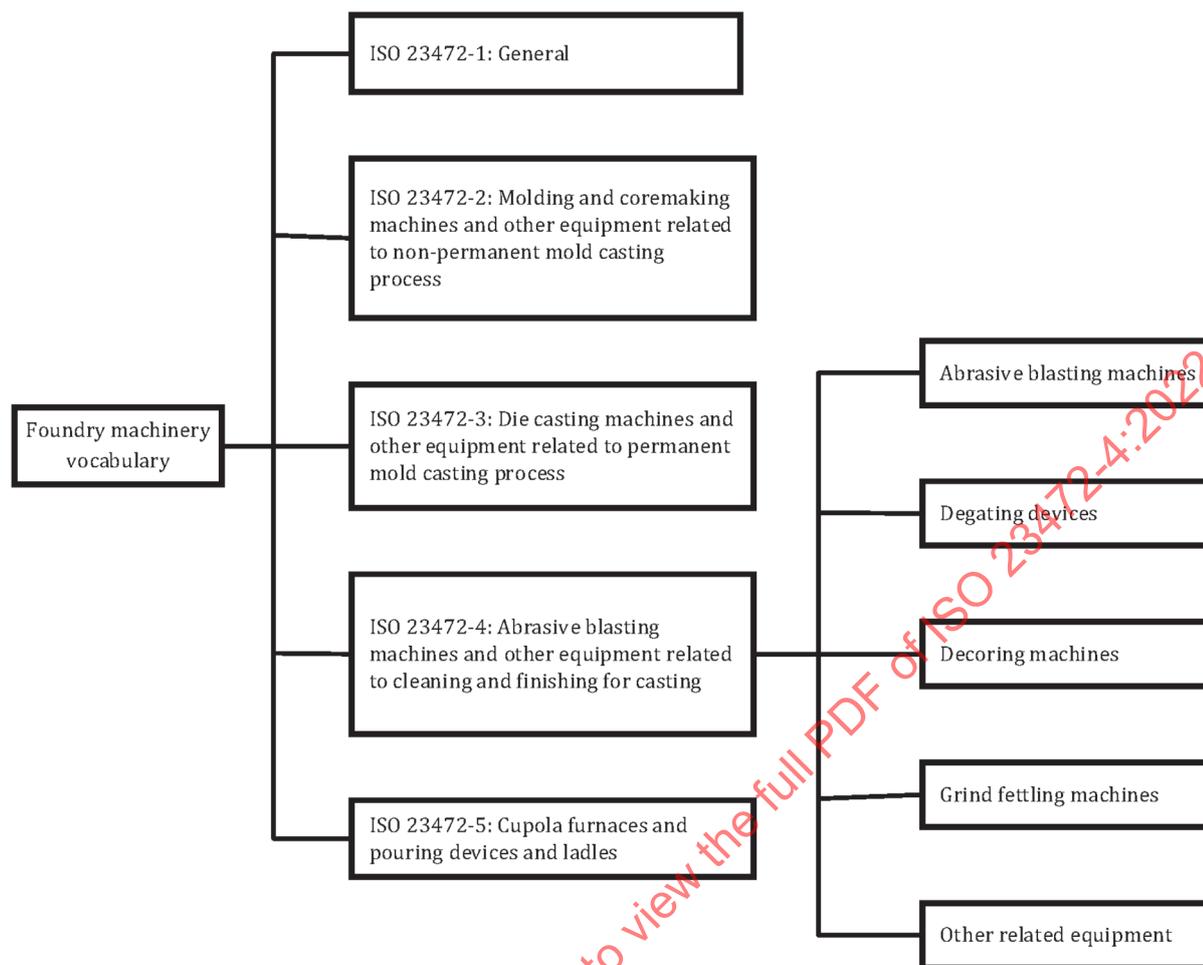


Figure 1 — Structure of vocabulary on abrasive blasting machines and other equipment related to cleaning and finishing for casting

Foundry machinery — Vocabulary —

Part 4:

Abrasive blasting machines and other equipment related to cleaning and finishing for casting

1 Scope

This document defines a set of terms and definitions of abrasive blasting machines and other equipment related to cleaning and finishing for casting in foundry machinery.

It applies to standard development in the foundry machinery field, technical documentation, related scientific and technical publications, etc.

2 Normative reference

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

abrasive blasting

shot blasting

process in which workpiece to be cleaned or surface to be treated is subjected to continuous attack by *abrasive media* (3.4) to achieve a desired result

[SOURCE: ISO 23472-1:2020, 3.1]

3.2

abrasive blasting machine

shot blasting machine

machine used for *abrasive blasting* (3.1) by either centrifugal force or compressed air to accelerate *abrasive media* (3.4)

Note 1 to entry: Terms “abrasive blasting machinery”, “shot blasting machinery” are used to address the same assembly of machines.

3.3

abrasive cut-off machine

grinding cutter

device for cutting gate and riser of castings or other metal materials with a high-speed rotating grinding wheel (3.84)

3.4

abrasive media
shot blasting media

granular metallic or non-metallic material to be forcibly applied to a surface to achieve a desired result

Note 1 to entry: Classification of metallic abrasives is provided in ISO 11124-1, and of non-metallic abrasives in ISO 11126-1.

[SOURCE: ISO 23472-1:2020, 3.3]

3.5

abrasive media recirculating system

system in *abrasive blasting machine* (3.2) that collects the mixture of *abrasive media* (3.4) and abraded material, separates the *abrasive media* (3.4) from this mixture, and supplies it to the blasting process

Note 1 to entry: This system usually consists of *bucket elevator* (3.25), screw conveyor, *abrasive media separator* (3.6), vibrating screen, storage hopper, *switch valve* (3.72), pipe, etc.

3.6

abrasive media separator

device that removes impurities from used *abrasive media* (3.4) and separates reusable *abrasive media* (3.4) by means of gravity, air stream, mesh screen and/or magnetic force

3.7

abrasive media throughput rate

abrasive media flow rate

amount of *abrasive media* (3.4) blasted by the *wheel blaster* (3.86) or *air blaster* (3.8) in unit time during *abrasive blasting* (3.1)

Note 1 to entry: Usually in minutes as unit time.

3.8

air blaster

assembly consisting of blast *nozzle(s)* (3.16), *blast pot(s)* (3.17) and connected hose(s) or tube(s), which accelerates *abrasive media* (3.14) by pressurized air

3.9

air blasting machine

abrasive blasting machine (3.2) that uses *air blaster* (3.8)

3.10

air chipper

hand-held pneumatic tool for removing flashes, burrs and raised defects of castings

3.11

automatic cleaning cell

system that automatically completes the cleaning process of castings by robots, manipulators, machine tools, etc.

Note 1 to entry: It is equipped with a tool library, and the robot can automatically replace cleaning tools according to the requirements of the program.

3.12

band cutting machine

band saw

device for cutting gate and riser of castings with ring endless band

Note 1 to entry: It is usually used to cut gate and riser of castings made of light weight metal.

3.13**blade
vane**

component of *wheel blaster* (3.86) that receives and blasts *abrasive media* (3.4)

3.14**blast gun**

rod-shaped component connected to the outlet end of *blast hose* (3.15) of *air blaster* (3.8) for holding or clamping, holding the *blast nozzle* (3.16) at the outlet

3.15**blast hose****blast tube**

hose or tube connecting a nozzle to the *blast pot* (3.17)

3.16**blast nozzle**

component connected at the outlet of the *blast gun* (3.14) with the desired shape, size and abrasive resistance which determines the *abrasive media* (3.4) flow and angle

3.17**blast pot****blast hopper**

container of *air blaster* (3.8) for storing *abrasive media* (3.4)

3.18**blasting angle**

angle between the centre line of the abrasive beam ejected from the nozzle and the surface of the workpiece being blasted during *abrasive blasting* (3.1)

3.19**blasting chamber**

chamber of *abrasive blasting machine* (3.2) which contains the workpiece and also prevents the *abrasive media* (3.4) from escaping to the environment after impacting on the workpiece

3.20**blasting density**

amount of *abrasive media* (3.4) blasted per unit area within the surface that has been impacted by the *abrasive media* (3.4)

3.21**blasting distance**

distance between the nozzle and the surface of workpiece to be blasted during *abrasive blasting* (3.1)

3.22**blasting pattern**

effective area of workpiece surface covered by abrasive beam blasted by *wheel blaster* (3.86)

3.23**blasting pressure**

working pressure of compressed air fed into nozzle or in *blast pot* (3.17) during *compressed-air abrasive blasting* (3.29)

3.24**bogie decorating machine**

decorating machine (3.36) that uses bogie to transport workpieces

3.25**bucket elevator**

continuous conveyor that uses a series of bucket shaped hoppers uniformly fixed on the endless circular traction component to vertically lift *abrasive media* (3.4), foundry sand and impurities

3.26

carbon-arc-gouging torch

device for purging molten metal and oxides with compressed air while melting flash and burr by arc heat generated between graphite rod or carbon rod and castings

3.27

casting cooling and transferring system

system used for recooling of casting after demolding

Note 1 to entry: It uses continuous conveyor, such as vibrating conveyor or overhead chain conveyor, and can be equipped with ventilating and spray cooling system.

[SOURCE: ISO 23472-1:2020, 3.14]

3.28

centrifugal abrasive blasting

wheel blasting

abrasive blasting (3.1) using *wheel blasting machine* (3.87)

3.29

compressed-air abrasive blasting

air blasting

abrasive blasting (3.1) using *air blasting machine* (3.9)

Note 1 to entry: The *abrasive media* (3.4) may be injected into the air stream from a pressurized container or may be drawn into the air stream by suction from an unpressurized container.

3.30

continuous grind fettling machine

grind fettling machine (3.46) with automatic workpiece conveying and clamping mechanism which is capable of continuous grinding operation

3.31

conveyor type blasting machine

abrasive blasting machine (3.2) that uses conveyor to carry the workpiece into and out of the *blasting chamber* (3.19)

Note 1 to entry: The machines are further differentiated by conveyor type, i.e. rollers, rubber belt, wire mesh, chain.

3.32

coverage

percentage of a surface that has been impacted by *abrasive media* (3.4) to the surface area required for treatment

3.33

deburring

removal of flashes and burrs from castings

3.34

decoring

core knock-out

process in which sand core is removed from the inner cavity of the casting by hammering or any other way

[SOURCE: ISO 23472-1:2020, 3.38]

3.35**decoring cell**

complete set of *decoring* (3.34) equipment that consists of a *decoring machine* (3.36), a robot for loading and unloading workpieces, an exhaust system, etc.

[SOURCE: ISO 23472-1:2020, 3.39]

3.36**decoring machine**

machine that removes the sand core from the inner cavity of the casting by pneumatic or hydraulic *impact hammer* (3.52)

Note 1 to entry: It is usually composed of a hammering mechanism, a conveying mechanism for workpiece and a chamber which prevents dust from escaping. Among them, the conveying of the workpiece can adopt motorized roller(s), mobile car(s), turntable(s), manipulator(s) or robot(s).

[SOURCE: ISO 23472-1:2020, 3.40]

3.37**degating device**

equipment and device used to remove gate and riser of castings, such as gate hydraulic cutting machine and riser impacting hammer

[SOURCE: ISO 23472-1:2020, 3.43]

3.38**derusting**

removal of rust on the surface of castings

3.39**descaling**

removal of oxide scale on the surface of castings

3.40**direct pressurized air blaster**

one type of *air blaster* (3.8) that injects compressed air in the *blast pot* (3.17) to transport the *abrasive media* (3.4) to the *blast gun* (3.14)

3.41**electro-hydraulic cleaning device**

complete set of devices used to remove adhering sand on the surface of castings and sand core in the inner cavity of castings by means of electro-hydraulic cleaning process

3.42**fettling**

removal of surface adhering sand and core residues, gate and riser, and other excess metals (e.g., flash, burr, oxide scale) from castings after knock-out

3.43**finishing**

fine cleaning process with the main purpose of improving the surface condition of castings by manual, mechanical or robotic means after initial cleaning of removing the adhering sand, core residues, gate and riser, including deflashing, *deburring* (3.33), repairing, etc.

3.44**finishing room**

room accessible to personnel for *finishing* (3.43) of castings, including workpiece conveying system and/or lifting appliances, and *finishing table* (3.45)

Note 1 to entry: The room is enclosed or semi-enclosed with sound insulation and dust escape prevention functions.

3.45

finishing table

worktable for manual *finishing* (3.43) of castings, carrying and clamping workpieces, as required, with lifting and turning functions of workpieces

3.46

grind fettling machine

machine used to remove flashes and burrs from castings by grinding

[SOURCE: ISO 23472-1:2020, 3.80]

3.47

grinder

mechanical device used to remove the flash, burr and raised defects of castings by grinding wheel (3.84)

3.48

grinding cell

complete set of grinding equipment that consists of *grind fettling machine* (3.46), automatic workpiece conveying mechanism and robots for loading and unloading workpieces, etc.

[SOURCE: ISO 23472-1:2020, 3.81]

3.49

hook type blasting machine

hanger type blasting machine

abrasive blasting machine (3.2) with hook (hanger) as *workpiece carrier* (3.90), in the process of blasting, workpiece can move and/or lift and/or rotate with hook (hanger)

3.50

hydraulic power tongs for degating

hydraulic tongs for rapid separation of gate and riser from castings

3.51

hydroblasting device

complete set of devices used to remove adhering sand on the surface and sand core in the inner cavity by spraying high-pressure water to the castings

3.52

impact hammer

decoring hammer

device that uses compressed air/hydraulic medium as power and produces vibration shock to remove sand cores from castings

3.53

injector type air blaster

one type of *air blaster* (3.8) that generates a negative pressure by a special nozzle arrangement to suck in *abrasive media* (3.4) into pressurized air stream

3.54

interior blasting machine

abrasive blasting machine (3.2) which cleans the interior of workpieces with *abrasive media* (3.4)

Note 1 to entry: To complete the full *abrasive blasting* (3.1) of the interior of workpiece, movement of workpiece and/or *blast gun* (3.14) is generally automated controlled.

3.55

manipulator/robot grind fettling machine

grind fettling machine (3.46) which clamps workpiece by manipulator/robot to complete grinding operation

3.56**multi-station grind fettling machine**

grind fettling machine (3.46) which completes loading, unloading and grinding of workpiece at different stations

Note 1 to entry: When the workpiece is loaded and unloaded at the same station and the grinding process is completed at another station, it is called double-station *grind fettling machine* (3.46).

3.57**plasma cutting machine**

device which uses heat energy of plasma arc to melt and cut off gate and riser of castings or other metal materials

3.58**portable grinder**

hand-held *grinder* (3.47) for *fettling* (3.42) castings

3.59**post-processing for casting**

whole process of castings from demolding to leaving the factory, including castings *secondary cooling* (3.66), cleaning, testing, repairing, heat treatment, rough machining, coating, coding, packing, storing, etc.

[SOURCE: ISO 23472-1:2020, 3.123]

3.60**pressurized-liquid blasting**

process in which *abrasive media* (3.4) (or a mixture of abrasive media) are introduced into a stream of liquid (usually clean fresh water) and the stream is directed through a nozzle on to the surface to be cleaned

Note 1 to entry: The stream is mainly pressurized liquid, and additions of solid abrasive media are normally less than for compressed-air *wet abrasive blasting* (3.80).

Note 2 to entry: The abrasive media may be introduced either dry (with or without air) or as a wet slurry.

3.61**riser impact hammer****power hammer**

device that uses impact force to removes gate and riser of castings by striking

3.62**robot gripper blasting machine****manipulator blasting machine**

abrasive blasting machine (3.2) with robot gripper as *workpiece carrier* (3.90), which uses claw type manipulator to hold workpiece

Note 1 to entry: In the process of blasting, workpiece can move and rotate with the movement of the claw.

3.63**robotic blasting machine**

machine that completes *abrasive blasting* (3.1) with a robot-holding nozzle and/or numerally controlled moving table

3.64**roller decoring machine**

decoring machine (3.36) that uses motorized roller to transport workpieces

3.65**rotary table decoring machine**

decoring machine (3.36) that uses rotary table to transport workpieces

3.66

secondary cooling

process of recooling after casting separated from the mold till reaching ambient temperature

3.67

secondary knock-out

process of removing surface adhering sand and residual sand core by knock-out equipment in cleaning workshop after knock-out and *secondary cooling* (3.66) of sand castings

3.68

single station grind fettling machine

grind fettling machine (3.46) which completes the loading, unloading and grinding of workpieces at the same station

3.69

slurry blasting

process in which the fine *abrasive media* (3.4) dispersed in water or another liquid is directed, with pumps or compressed air, onto the surface to be cleaned and/or finished

3.70

swing frame cut-off machine

device for cutting gate and riser of castings or other metal materials by suspension of cantilever, rope or other mechanical devices

3.71

swing frame grinder

movable *grinder* (3.47) that is suspended by a cantilever, rope or other mechanical devices

3.72

switch valve

device for closing/opening and adjusting *abrasive media* (3.4) flow during *abrasive blasting* (3.1)

3.73

table type blasting machine

abrasive blasting machine (3.2) with table as *workpiece carrier* (3.90), which moves back and forth or rotates, for workpiece(s) to be blasted in the *blasting chamber* (3.19)

Note 1 to entry: The machines are further differentiated by table type, i.e. rotary table, sliding table, wheel-guided table (referred to as bogie).

3.74

tumbling barrel

machine for cleaning and/or polishing the surface of castings by rotating the barrel so that the castings and *tumbling stars* (3.75)/*abrasive media* (3.4) in the barrel collide and friction during rolling

3.75

tumbling stars

jack stars

pyramid block made of white cast iron which is loaded into the *tumbling barrel* (3.74)/*vibrating finisher* (3.79) for surface cleaning and/or polishing of castings

3.76

tumbling type blasting machine

abrasive blasting machine (3.2) with tumbling device that tumbles workpieces while blasting them

Note 1 to entry: The machines are further differentiated by tumbling devices, i.e. endless belt, crawler belt, barrel, drum.

3.77**ultrasonic cleaning device**

complete set of devices used to remove adhering sand on the surface of castings and sand core in the inner cavity of castings by means of strong cavitation and vibration produced by ultrasonic in liquid

3.78**vacuum abrasive blasting
suction-head abrasive blasting**

process that is similar to *compressed-air abrasive blasting* (3.29) but with the *blast nozzle* (3.16) enclosed in a suction head sealed to the workpiece surface, collecting the spent *abrasive media* (3.4) and contaminants, alternatively, the air-abrasive stream may be sucked on to the surface by reduced pressure at the suction head

3.79**vibrating finisher
vibrating grinder**

machine for cleaning and/or polishing the surface of castings by vibrating the container so that the castings and *tumbling stars* (3.75)/*abrasive media* (3.4) in the container collide and friction during rolling

3.80**wet abrasive blasting
wet blasting**

process using *wet blasting machine* (3.81) or process including liquid or water in the injected stream consisting with *abrasive media* (3.4), and air stream, to improve the blasting effect, to reduce the explosion risk, and to avoid dust issue

Note 1 to entry: Water is used for avoiding dust, as well as removing sand and abrasive media stuck inside the casting cavity.

3.81**wet blasting machine**

abrasive blasting machine (3.2) that injects mixture of *abrasive media* (3.4) and liquid by compressed air, or by pressurized liquid itself

3.82**wet cleaning**

operation of cleaning castings by water or other liquid infiltration or water blasting

Note 1 to entry: There are a variety of wet cleaning methods, such as:

- hydraulic cleaning, hydroblasting (removing sand core and residual sand on the surface from castings by cutting and washing effect of high-pressure water jet);
- chemical cleaning (cleaning castings in basic or acidic solutions);
- electrolytic cleaning, electro-chemical cleaning (removing residual sand from the surface and inner cavity of castings by electrifying chemical solutions);
- electrohydraulic cleaning (using special electrodes to produce shock waves in water by EDM discharge, and then converted into water mechanical force to impact castings to remove residual sand from the surface and inner cavity of castings).

[SOURCE: ISO 23472-1:2020, 3.179]

3.83**wheel**

<blasting machine> component of *wheel blaster* (3.86) on which the *blades* (3.13) are mounted

3.84**wheel**

<grinding cutter (3.3)> rotating cutting disc with *abrasive media* (3.4)

3.85

wheel and air blasting combined process

process adopting a combination of *wheel blasting* (3.28) and *air blasting* (3.29), in which wheel blasting is used first, and then the inner cavity or part of the surface of the workpiece is cleaned again by air blasting

3.86

wheel blaster

device which accelerates *abrasive media* (3.4) by a rotating *wheel* (3.83) with *blades* (3.13)

3.87

wheel blasting machine

abrasive blasting machine (3.2) that uses *wheel blaster* (3.86) to accelerate *abrasive media* (3.4)

3.88

wheel blasting rate

abrasive media throughput rate (3.7) per unit power consumption of *wheel blaster* (3.86)

3.89

wheel blasting speed

initial speed of *abrasive media* (3.4) releasing from *blade* (3.13) of *wheel blaster* (3.86)

3.90

workpiece carrier

device of *abrasive blasting machine* (3.2) with independent drive system which is used to carry workpiece and make the workpiece move according to the set requirements

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