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Road surface treatment machines — Safety requirements

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National foreword

This British Standard is the UK implementation of EN 13020:2015. It supersedes BS EN 13020:2004+A1:2010 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/513, Construction equipment and plant and site safety.

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European foreword

This document (EN 13020:2015) has been prepared by Technical Committee CEN/TC 151 “Construction equipment and building material machines - Safety”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2016, and conflicting national standards shall be withdrawn at the latest by May 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13020:2004+A1:2010.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

1 Scope

This European Standard applies to road surface treatment machines, which are in particular:

— binder sprayers [or sprayers];

— chipping spreaders [or spreaders];

— machines for surface repairs (binder sprayer chipping spreader [or sprayer spreader]);

— mastics asphalt mixers;

— joint sealer;

— micro-surfacing machines/slurry machines;

— cold asphalt laying / micro-asphalt-paving machines

(see also Clause 3).

Road surface treatment machines can be mounted on a carrier vehicle, trailer or articulated truck, combining to form an integral unit. It is also possible to mount a road surface treatment machine on its own chassis construction and propulsion system (self-propelled or pedestrian-controlled). In all cases the machine and chassis form an integral unit.

Directives and standards for the vehicular truck chassis aspects, termed 'carrier vehicle' in this document, would be those relative to that equipment, even where specific modifications have been made to realize the road surface treatment application. The use in public road traffic is governed by the national regulations.

This European Standard deals with all significant hazards identified through a risk assessment relevant to road surface treatment machines when they are used as intended and under the conditions foreseen by the manufacturer (see Clause 4). This European Standard does not deal with significant hazards associated with pressurized tanks, and EMC. This European Standard specifies the appropriate technical measures to eliminate or reduce risks arising from the significant hazards associated with machine operation, setting and adjustments, load discharge and routine maintenance.

This European Standard does not include requirements for the carrier vehicles or special constructions. These are covered in directives related to the construction of vehicles. Demountable bodywork systems (e.g. demountable containers) are specified in other standards. Vibrations are not dealt with in the standard, because for all machines of this family vibration is not a relevant hazard due to the low working speed and special working conditions (e.g. flat surface).

This European Standard does not deal with the risks associated with the operation of the machines in potentially explosive atmospheres.

This European Standard does not include requirements of the 94/55/EC Directive related to transport of dangerous goods by road but contains additional specifications in link with these existing requirements.

This European Standard applies to machines which are manufactured after the date of approval of this standard by CEN.

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.

EN 500-1:2006+A1:2009, *Mobile road construction machinery — Safety — Part 1: Common requirements*

EN 12999:2011+A1:2012, *Cranes — Loader cranes*

EN ISO 2860:2008, *Earth-moving machinery — Minimum access dimensions (ISO 2860:1992)*

EN ISO 2867:2011, *Earth-moving machinery — Access systems (ISO 2867:2011)*

EN ISO 3457:2008, *Earth-moving machinery — Guards — Definitions and requirements (ISO 3457:2003)*

EN ISO 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

EN ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components (ISO 4413:2010)*

EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13732-1:2008, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1:2006)*

EN ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

EN ISO 14119:2013, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection (ISO 14119:2013)*

ISO 6750:2005, *Earth-moving machinery — Operator's manual — Content and format*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100 and the following apply.

3.1
binder sprayer [or sprayer]
machine intended to spray automatically or manually a film of binder (bitumen/emulsion) on the road surface at a predetermined rate. Storage of the binder is provided by tanks (tank type sprayers) mounted usually on a carrier vehicle (see informative Annex B, Figure B.1) or by barrels (barrels type sprayers)

Note 1 to entry: The machine can be mounted on a semi-trailer, a trailer (see informative Annex B, Figure B.2) or can be self-propelled.

Note 2 to entry: Bitumen is a dangerous good in regard to TDG (94/55/EC -Transport of dangerous goods) regulation.

Note 3 to entry: Bitumen emulsion is a product with a temperature below 100 °C and out of the scope of TDG (94/55/EC -Transport of dangerous goods) regulation.

3.2
chipping spreader [or spreader]
machine used to spread a layer of chippings on the pavement at a predetermined rate (see informative annex)

Note 1 to entry: Some of these machines can be equipped with a loading device (e.g. bucket, stick, boom).

Note 2 to entry: Several types of chippings spreaders may be identified e.g. mounted on a carrier vehicle (truck) or self- propelled.

3.3
binder sprayer chipping spreader [or sprayer spreader]
machine used for coating roads with binder (bitumen/emulsion) and with aggregates in a single operation

Note 1 to entry: Bitumen is a dangerous good in regard to TDG (94/55/EC -Transport of dangerous goods) regulation.

Note 2 to entry: Bitumen emulsion is a product with a temperature below 100 °C and out of the scope of TDG (94/55/EC -Transport of dangerous goods) regulation.

3.4
mastic asphalt mixer
machine consisting of a tank with horizontal or vertical mixer (agitating shaft and stirrer arms) for preparing transporting, heating (over 100 °C), mixing and discharging mastic asphalt

Note 1 to entry: This machine can be mounted on a carrier-vehicle, semi-trailer, trailer or can be self-propelled.

3.5
joint sealer
machine consisting of a tank with horizontal or vertical mixer and designed for melting and preparing mastics (over 100 °C) that are used in treating roadway joints and cracks

3.6
micro-surfacing machines/slurry machines
machine usually mounted on a truck (or a semi-trailer) designed for the production of slurries and micro-surfacing which contains all necessary components (e.g. emulsion, water, cement, additives) in separated tanks

3.7
demountable equipment
equipment intended to be demounted from and remounted to the carrier vehicle, e.g. chipping spreader or binder sprayer [or sprayer]

4 List of significant hazards

This clause contains all hazards and hazardous situations, as far as they are dealt with in this document, identified by risk assessments as significant for this type of machinery and which require action to eliminate or reduce the risk.

Table 1 — List of significant hazards

Hazards		Relevant clauses				
		Binder sprayer [or sprayer]	**Chipping spreader [or spreader]**	**Binder sprayer chipping spreader [or sprayer spreader]**	**Mastic asphalt mixer and joint sealer**	**Cold asphalt laying machine/ micro-asphalt paving machine**
1.1	Crushing hazard	5.2.6 5.2.7	5.2.6 5.2.7 5.4.2	5.2.6 5.2.7	5.2.6 5.2.7	5.2.6 5.2.7
1.2	Entanglement hazard	5.2.14.2	5.2.14.2	5.2.14.2	5.2.14.2 5.6.4 5.6.5	5.2.14.2 5.7.1 5.7.2
1.3	High pressure fluid ejection hazard	5.2.1 5.3.1 5.3.5 5.3.6 7.4	5.2.1	5.2.1 5.3.1 5.3.5	5.2.1	5.2.1
1.4	Loss of stability (of machinery and machine parts)	5.2.5 5.2.6	5.2.5 5.2.6		5.2.5 5.2.6	5.2.5 5.2.6
1.5	Slip, trip and fall hazards in relationship with machinery (because of their mechanical nature)	5.2.10 5.2.11 5.2.12 5.3.2 5.3.3	5.2.10 5.2.11 5.2.12 5.4.1	5.2.10 5.2.11 5.2.12 5.3.2 5.3.3 5.4.1	5.2.10 5.2.11 5.2.12 5.6.1	5.2.10 5.2.11 5.2.12 5.7.3
2.1	Burns and scalds, by a possible contact of persons, by flames or explosions and also by the radiation of heat sources	5.2.2 5.2.3 5.2.13 5.3.1 5.3.4 5.3.5 5.3.9 7.3	5.2.2 5.2.3	5.2.2 5.2.3 5.2.13 5.3.4 5.3.9 7.3	5.2.2 5.2.3 5.2.13 5.6.1 5.6.6	5.2.2 5.2.3

Hazards		Relevant clauses				
		Binder sprayer [or sprayer]	**Chipping spreader [or spreader]**	**Binder sprayer chipping spreader [or sprayer spreader]**	**Mastic asphalt mixer and joint sealer**	**Cold asphalt laying machine/ micro-asphalt paving machine**
3.1	Hazards resulting from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts.	5.2.4 7.3	5.2.4	5.2.4 7.3	5.2.4	5.2.4
3.2	Fire or explosion hazard	5.2.13.1 5.3.4 5.3.7 5.3.8		5.2.13.1 5.3.4 5.3.7 5.3.8	5.2.13.1 5.6.1	
4.1	Hazards generated by noise, resulting in: - Loss of hearing (deafness), and other physiological disorders (e.g. loss of balance, lowered vigilance) - Interference with oral communication, acoustic signals, etc.	5.2.18 Annex D	5.2.18 Annex D	5.2.18 Annex D	5.2.18 Annex D	5.2.18 Annex D
4.2	Unhealthy postures or excessive efforts		5.3.1	5.3.1		
4.3	Inadequate consideration of human hand-arm or foot-leg anatomy	5.2.8 5.2.9 5.2.14	5.2.8 5.2.9 5.2.14	5.2.8 5.2.9 5.2.14	5.2.8 5.2.9 5.2.14	5.2.8 5.2.9 5.2.14 5.7.1
4.4	Neglected use of personal protection equipment	7.2	7.2	7.2	7.2	7.2
4.5	Inadequate area lighting				5.6.2	
4.6	Human errors	7.2	7.2	7.2	7.2	7.2
5	Hazards combinations	7.2	7.2	7.2	7.2	7.2
6.1	Unexpected ejection of machine parts or fluids	5.3.7 7.3		5.3.7 7.3		
6.2	Failure, malfunction of control systems (unexpected start-up, unexpected overrun)	5.2.14	5.2.14	5.2.14	5.2.14 5.6.3 5.6.4	5.2.14 5.7.1
6.3	Errors of fitting	5.2.7	5.2.7	5.2.7	5.2.7	5.2.7
7.1	All kinds of guard				5.6.6	
7.2	All kinds of safety related (protection) devices				5.6.5 5.6.6	5.7.1 5.7.2

Hazards		Relevant clauses				
		Binder sprayer [or sprayer]	**Chipping spreader [or spreader]**	**Binder sprayer chipping spreader [or sprayer spreader]**	**Mastic asphalt mixer and joint sealer**	**Cold asphalt laying machine/ micro-asphalt paving machine**
7.3	Safety signs and signals	5.2.6 5.2.8	5.2.6 5.2.8	5.2.6 5.2.8	5.2.6 5.2.8	5.2.6 5.2.8
7.4	Essential equipment and accessories for safe adjusting and/or maintaining	7.2	7.2	7.2	7.2	7.2
7.5	Equipment for evacuating gases etc.	5.2.4	5.2.4	5.2.4	5.2.4	5.2.4
8	Hazards resulting from the machine mobility	5.2.9	5.2.9	5.2.9	5.2.9	5.2.9

5 Safety requirements and/or measures

5.1 General

The machines shall comply with the safety requirement and/or measures of this clause. In addition the machines shall be designed according to the principles of EN ISO 12100 for hazards relevant but not significant which are not dealt with in this document (e.g. sharp edges).

For the application of the type B standards EN ISO 4413 and EN ISO 13732-1 which are referred to in this document, the manufacturer shall carry out an adequate risk assessment relating to those requirements for which a special safety measure or -category is necessary.

This specific risk assessment should be part of the general risk assessment relating to the hazards not covered by this document.

5.2 General and common requirements

5.2.1 Hydraulic systems

Hydraulic systems shall comply with the requirements of EN ISO 4413.

5.2.2 Fire protection

All materials within the area of the operator's station shall be of fire-retardant material. The maximum allowed burning rate is 250 mm/min.

NOTE It is advised to test the material according to ISO 3795:1989.

5.2.3 Protective measures and devices

5.2.3.1 Hot parts

Temperatures of surfaces of machinery with which the operator may come into contact shall conform to EN ISO 13732-1. Where necessary this shall be achieved by the use of guards. Where guarding is impractical, e.g. spray bar, engine radiator caps, adequate warning signs shall be employed advising on the nature of the risk and avoidance measures described in information for use.

Temperatures of the contact surface, e.g. handle, grip of hot operating devices e.g. hand spray lances to be carried by operator shall conform to EN ISO 13732-1.

5.2.3.2 Moving parts

All moving parts which create a hazard shall be designed, constructed, positioned or provided with protection devices to minimize the risk of crushing, shearing and cutting.

The mobile parts shall be protected by protective devices or guards in accordance with EN ISO 13857.

Where guarding is impractical, e.g. spray bar, chips distributor extension, adequate warning signs shall be employed advising on the nature of the risk and avoidance measures described in information for use.

5.2.3.3 Guards

5.2.3.3.1 General

Guards shall be designed to be securely held in place and prevent access to dangerous areas and parts where a hazard exists.

Engine compartment panels are regarded as guards.

Guards shall comply with EN ISO 3457:2008.

5.2.3.3.2 Movable guards

Movable guards shall as far as possible remain attached to the machine when open.

Movable guards shall be fitted with a support system (e.g. springs, gas cylinders) to secure them in opened position up to a wind speed of 8 m/s.

5.2.3.3.3 Fixed guards

Fixed guards that are to be removed as a part of maintenance described in the operator's manual, shall be fixed by systems that can be opened or removed only with tools. These guards fixing systems shall remain attached to the guards or to the machinery when the guards are removed. Where possible, guards shall be incapable of remaining in place without their fixings.

5.2.4 Exhaust piping

Engine exhaust systems shall be designed, constructed and positioned to minimize health hazards from exhaust emissions to an absolute minimum. The flow of exhaust emission is to be directed away from the operator station.

5.2.5 Demountable equipment

Demountable equipment (swap bodies), which can be tipped, swivelled or lowered down shall be so designed, that the associated carrier vehicle together with the attached demountable equipment shall not tip up or roll over when used according to the manufacturer's intended use (see 7.2).

The carrier vehicle has to be accepted as suitable by the demountable equipment (swap body) manufacturer.

Verification of this stability requirement shall be derived from functional tests or calculation.

The coupling or connection of swap bodies with the carrier vehicles shall be safeguarded by way of positive interlocking. The devices for locking/unlocking shall be mounted captive to the swap body or carrier vehicle.

5.2.6 Supporting equipment

Means of support for demountable equipment shall be designed and positioned or be able to be positioned so that the machine can be safely supported on level, stable ground.

Where the supporting equipment cannot carry the gross overall weight of demountable equipment (e.g. swap body) in fully loaded condition (structural weight plus effective load) it shall be clearly and durably marked with the maximum load which can be supported. Warning signs shall be fixed visible to the operator drawing attention to the need to check that the load to be supported does not exceed the maximum load which can be supported.

Actuators for the supporting equipment (e.g. hydraulic controls for lifting cylinders) shall be located where the operator cannot be endangered during handling and where he has an unobstructed view of the working area.

5.2.7 Attachment fittings/trailers

Attachment fittings/trailers shall be designed so that during the actual coupling and de-coupling action nobody is required to be in the hazard zone between the components concerned.

NOTE 1 This requirement can be satisfied by attachment fittings designed in conformity with Annex A (for front fittings by adapter plates) or by attachment fittings in accordance with ISO 730 and ISO 8759-2 (for front and rear attachments respectively using three-point linkage).

There shall be an appropriate connection between a trailer and the machinery for the operation of signals.

NOTE 2 e.g. ISO 1724, ISO 1185, ISO 3731, ISO 12098 can be used as guidance.

5.2.8 Actuators

Actuators for initiating possibly dangerous movements shall be designed, arranged or safeguarded in such a way that any accidental actuation is prevented.

Actuators shall be easily accessible and fitted with instruction plates indicating the various switch positions.

Actuator movements shall relate to corresponding machine movements in order to avoid confusion.

From each control position, the operator shall be able to ensure that no-one is in the danger zones, or the control system shall be designed and constructed in such a way that starting is prevented while someone is in the danger zones.

If the visibility from the operator's station to the rear is obstructed due to the design requirements or the working application of the machine (e.g. spray spreaders, slurry machines, and mastic asphalt mixers with working conditions producing obstruction (e.g. airborne binder or soil particles, steam) and therefore adequate visibility in accordance to the first paragraph cannot be achieved, the machine shall be equipped with a visual and/or acoustic warning signal activated automatically when a reversing command is given, combined with a delay in starting the reverse movement, leaving sufficient time for an exposed person to leave the danger zone.

NOTE 1 When drafting this text it was not possible to define clear criteria for the necessary delay time as it depends on different parameters. It is the idea of the drafters that a delay of 3 s (that may be achieved completely or partially by the reaction time of the machine) will in general be appropriate.

NOTE 2 Obstructed view due to machine design is no sufficient reason for using visual or acoustic signal as a sole safety means.

5.2.9 Self-propelled machines

Self-propelled machines with ride-on operator shall satisfy the requirements of EN 500-1:2006+A1:2009 as regards:

— lighting (see 5.2 of EN 500-1:2006+A1:2009);

— steering devices (see 5.3.4 of EN 500-1:2006+A1:2009);

— driver's cab (see 5.4.2 of EN 500-1:2006+A1:2009);

— driver's position (see 5.4.1 and 5.5 of EN 500-1:2006+A1:2009);

— signalling equipment (see EN 500-1:2006+A1:2009, 5.14);

— starting/stopping (see EN 500-1:2006+A1:2009, 5.7).

Self-propelled pedestrian-controlled machines shall satisfy the requirements of 5.3.3 of EN 500-1:2006+A1:2009.

Where necessary, there shall be an appropriate connection between a trailer and the machinery for the operation of signals.

5.2.10 Operator's platforms and working positions

Operator's platforms and working positions shall be provided with protection against falling of persons see EN ISO 2867.

5.2.11 Skid protection

Access and walk ways and working platforms shall be permanently skidproof.

NOTE Button, tread or padded plate, for example, is considered to be skidproof material.

5.2.12 Access

Access ways shall be designed in accordance with EN ISO 2860 and EN ISO 2867 except that the lowest steps of access facilities to driver's positions shall not be higher than 650 mm above the ground.

5.2.13 Heating systems for road building materials

5.2.13.1 General

Heating systems shall be equipped with an automatic device to control the temperature of the road building material.

The following shall be provided both for direct and for indirect heating:

a) temperature gauge for the road building material;

b) heat transfer fluid (oil) temperature gauge shall be provided for indirect heating;

c) temperature control for the road building material up to a maximum permissible temperature;

d) devices which automatically shut down fuel supply on loss of flame.

The above requirements are not applicable to direct-from-barrel-type binder sprayers [or sprayers] without heating system.

NOTE If the heating system is intended for operation when the vehicle is underway in public traffic, it is advised to give due consideration to pertinent traffic regulations.

5.2.13.2 Short-form operating instructions

Short-form operating instructions for the heating system shall be provided in a prominent and protected position on machines having a heating facility for road building materials, and these shall at least include the following:

— starting;

— putting out of operation;

— behaviour in the event of failure.

5.2.13.3 Liquid gas units

Liquid gas units used on road surface treatment machines shall comply with EN 500-1:2006+A1:2009, Annex D.

5.2.14 Starting

5.2.14.1 Engine starting

Machines for road surface treatment having electric starters shall be provided with devices which prevent unauthorized engine starting and initiation of machine functions.

Unauthorized starting of the engine shall be prevented e.g. by:

— lockable cab;

— lockable starter cover;

— ignition switch with key;

— lockable battery insolating switches.

5.2.14.2 Crank handle used as starter devices

Crank handles shall comply with the requirements of Annex B of EN 500-1:2006+A1:2009. For crank handles, accessible means for storage, e.g. retaining brackets, shall be provided.

5.2.15 Controls

5.2.15.1 General

If mobile machines with a rear work platform (e.g. sprayer spreader) can create a hazard to the rear operator during working mode, the controls for these functions shall be only actuated from the rear work platform.

NOTE E.g. movement of the swap body, after starting the working process.

5.2.15.2 Emergency stop

An emergency stop shall be installed at each control position which provides the stopping of the hazardous process of the machine. The machine shall be designed in such a way that it shall not be able to re-start it automatically after deactivating the emergency stop.

The driver of the carrier-vehicle shall be informed by an appropriate device (e.g. audio or visual warning device) when the emergency stop has just been activated by the operator at rear of the machine.

5.2.16 Machines in lifting application

Machines which are designed to be used in lifting application shall be able (intended use as described by the manufacturer) to fulfil the requirements of EN 12999:2011+A1:2012.

5.2.17 Pipes and hoses

Hydraulic hoses shall be designed according to the specifications of EN ISO 4413.

Pipes and hoses shall be fitted and secured to avoid contact with hot surfaces, friction and other unintentional exterior damage. Visual inspection of hoses and fittings shall be possible.

Hydraulic hoses designed for an operating pressure of more than 5 MPa (50 bar) and/or a temperature of over 50 °C and which are located within 1,0 m of the operator shall have covers complying with EN ISO 3457:2008, Clause 9.

For pipes with an operating pressure of more than 5 MPa (50 bar) and/or a temperature of over 50 °C used for hand-lances, a protection (e.g. metallic helix) of at least 1 m is necessary. The protection shall be fitted on the end (hand-lance) of the pipe.

NOTE Requirements for the pipes used with binder are in preparation.

End fittings of hydraulic hoses intended to withstand a pressure of more than 15 MPa (150 bar) shall be set.

Reusable connections shall require the use of a special tool (such as a press tool) for fitting and removal, and shall be used only in conjunction with parts specified by the manufacturer.

5.2.18 Noise

5.2.18.1 Noise reduction at the source at the design stage

The main sources of noise are:

— sprayers [or binder sprayers]: hydraulic unit, internal combustion engine, air compressor, binder unit;

— spreaders [or chipping spreaders]: internal combustion engine, flow of materials;

— binder sprayer chipping spreaders [or sprayer spreaders]: hydraulic unit, internal combustion engine, air compressor, flow of materials, binder unit;

— mastic asphalt mixers: hydraulic unit, internal combustion engine;

— joint sealers: hydraulic unit, internal combustion engine, air compressor;

— micro-surfacing machines/slurry machines: hydraulic unit, internal combustion engine, air compressor, flow of materials, binder unit.

The noise at the work station(s) shall be minimized as much as possible by design (e.g. by using the measures given in Annex C).

NOTE 1 The noise of the carrier vehicle significantly contributes to the overall level of noise emission.

NOTE 2 EN ISO 11688-1:2009 gives general technical information on widely recognized technical rules and means to design low-noise machinery.

NOTE 3 EN ISO 11688-2:2000 gives useful information on noise generation mechanisms in machinery.

5.2.18.2 Noise reduction by protective measures

If it is not possible to reduce the noise at the source sufficiently, whenever possible, the manufacturer shall equip the machine with equipment such as enclosures or silencers.

NOTE EN ISO 15667 and EN ISO 14163 provide useful guidance on the reduction of noise using enclosures and silencers respectively. EN ISO 11546-1:2009 and EN ISO 11820:1996 give methods for measuring the sound insulation performance of enclosures and silencers respectively.

5.3 Specific requirements for binder sprayers [or sprayers]

5.3.1 Pipes and hoses

Requirements for pipes and hoses are described in 5.2.17.

5.3.2 Access

The decking of the spray bar operator's platform shall be made with full (e.g. metallic) material (without holes).

The operator platform shall be fitted with protection against falling according to 5.2.10.

Access and exit climbers shall not be arranged in the immediate vicinity of the operator's platform.

5.3.3 Filler openings

Filler openings having a diameter exceeding 240 mm shall be provided with guard bars which shall be demountable for maintenance by the use of tools. The permitted maximum spacing of the bars is 180 mm according to EN ISO 13857:2008, 4.3.

5.3.4 Heating systems for binder sprayers [or sprayers] with tanks

Tanks internal heating pipes shall be equipped with a level switch. The level switch shall ensure that the burner is only able to be in action, if the heating pipes are covered with bitumen.

Automatic restart of the heating system after the burner OFF level switch has been actuated shall not be possible.

Flame tubes shall be removable in the burner area when heating power exceeds 130 kW/h.

Automatic restart of the heating system after the burner OFF level switch has been actuated shall only be possible if the level of binder inside the tank is sufficient.

In case of heating system equipped with flame tube, for an easy replacement, the flame tubes in the burner area shall be removable.

5.3.5 Limiting devices

On binder sprayers [or sprayers], the bitumen circuit shall be regulated so that the designed maximum spraying pressure is not exceeded.

5.3.6 Shutoff valves

Every line connecting a binder sprayer [or sprayer] shall be provided with a shutoff valve at the pump end.

On manual operated spraying devices, an additional shutoff valve shall be mounted on the spray tube.

5.3.7 Fire protection

If the capacity of the liquefied gas tank exceeds 0,25 m^3 on binder sprayers [or sprayers] employing liquefied gas heating at least one fire extinguisher shall be provided at a directly accessible location.

5.3.8 Tank breathing

Non-pressure type bitumen tanks shall be provided with at least one permanently open breather vent. The minimum internal diameter shall be:

— 25 mm for tanks with a capacity less than 300 l and

— 50 mm for tanks with a capacity equal or above 300 l.

The breather shall be easy to check and located such that spillage of bitumen is minimized in the event of a roll over situation.

5.3.9 Transport safeguard

Devices for holding and locking shall be provided for the transport of:

— hand spray lances and associated hoses;

— devices for extending the spraybars;

— devices for lifting and transversing spraybars.

Means shall be provided to prevent operation of the spraybar nozzle when it is located in the transport position.

5.4 Specific requirements for chipping spreaders [or spreaders]

5.4.1 Operator's platforms

The standing surfaces of operator’s platforms fixed on the body shall be so designed, that the operator can manually adjust the platform horizontal in the working direction.

For mobile machines with a rear platform and working in the reverse mode, access to operator's platforms shall be located in such a way that access is only possible from the side (see EN ISO 2867).

5.4.2 Communication links

Drivers of carrier vehicles shall have a clear view of the strew area. If a direct view is not possible, the machine shall be fitted with mirrors or other indirect systems such as TV facilities, and communication facilities. For machines where an additional operator is required, communication facilities between the driver and this operator shall be provided.

To minimize interference from outside sources visual means of communication should be used. Appropriate hand signals should be described in the operating manual and fixed in abbreviated form on the operator's platform.

If intercoms are used for communication purposes they shall be appropriate in view of the noise level during operation.

For machines where an additional operator is required and the requirements in accordance to 5.2.8 (4th and 5th paragraphs) are not fulfilled, communication facilities (acoustic or visual) between the two operators shall be provided to ensure, that the 2nd operator (rear operators station) is on his position and nobody is in the danger zone.

This sequence related to the actuating of the reverse mode should be in the instructions handbook.

5.5 Specific requirements for binder sprayer chipping spreader [or sprayer spreader]

This type of machine shall comply with the requirements given in 5.3 and 5.4.

5.6 Specific requirements for mastic asphalt mixers and joint sealers

5.6.1 Filler openings

Where machines have operator walkways in the vicinity of the filler openings, its diameter shall be either

— ≤ 240 mm, or

— > 240 mm but provided with guard bars which shall be demountable for maintenance by the use of tools. The permitted maximum spacing of the bars is 180 mm according to EN ISO 13857:2008, 4.3.

The doors of the filler openings shall close tightly to prevent penetration of rainwater. They shall be capable of being operated from a safe location.

5.6.2 Lighting

In the area of the drain chute, electrical means shall be provided for connecting a work lamp.

5.6.3 Discharge opening

Pneumatic or hydraulic assisted controlled discharge openings shall be provided with an arrangement (e.g. mechanical device) to close them in the event of energy failure, preventing unintended discharge of material.

5.6.4 Reverse rotation of the agitator shaft (asphalt mixers only)

For agitator shafts in asphalt mixers the possibility of reversing the direction of rotation shall be provided.

5.6.5 Apertures over discharge augers and agitator shafts

Covers that can be removed/opened for loading or maintenance or freeing blockages, that allow access to the discharge auger or agitator shaft shall be equipped with a system to prevent the powered operation of the discharge auger, agitator shaft or other power discharge devices when open or the cover removed. These devices shall be designed so that they cannot be rendered ineffective by simple tools or expedients (see also EN ISO 14119).

5.6.6 Access to burner chamber

Where access to the inside of the burner chamber is possible for maintenance, an interlock shall prevent operation of the burner, while these covers are removed and the maintenance is being carried out (see also EN ISO 14119).

5.7 Specific requirements for micro-surfacing machines/slurry machines

5.7.1 Service doors for mixer

When the service doors are open, the mixer shall be automatically put out of order (see also EN ISO 14119).

5.7.2 Reverse rotation of mixer shaft

For mixer shafts the possibility of reversing the direction of rotation shall be provided.

5.7.3 Operator's platforms

Access to operator's platforms shall be located such that access and exit is only possible from the side.

6 Verification

The verification methods of the safety requirements are self-evident or are prescribed in the pertinent clauses in this document.

The verification methods of the safety requirements shall be based on

— checking documents;

— checking information for use;

— visual examination of the machine and

— functional checks and functional tests;

— the verification of information for use, particularly the provision of noise emission values measured according to Annex D.

7 Information for use

7.1 General

The written instructions shall be drawn up according to EN ISO 12100:2010, 6.4.

They shall specify when the need arises for the use of personal protection equipment.

7.2 Operating and maintenance instructions

Road surface treatment machines shall be delivered with operating instructions in accordance with ISO 6750.

The operating instructions shall include at least the following information:

Information on the intended use:

— indications on the qualification of the operating personnel and elements to be included in their training in safe working practices;

— indications that road surface treatment machines are only to be operated by specially trained personnel;

— information on transport, weight, location of centre of gravity;

— information on attachment points for lifting equipment;

— information on safe mounting and fixing of demountable equipment on the carrier vehicle;

— information on safe support of demountable equipment by supporting equipment (procedure, maximum permitted load);

— description of the controls and markings and meanings of visual signals;

— instructions for use of heating systems (if required);

— information on hazards which cannot be ruled out completely despite safety measures incorporated by the designer, e.g. hot surfaces;

— indications that maintenance work in hydraulic systems are only to be carried out by specially trained personnel;

— information on noise emissions:

  — the noise declaration(see D.8);

  — if relevant, warnings of underestimation of hazards due to noise in operating conditions that are typical but different from those prescribed in the noise test code (Annex D);

  — for Type 2 machines, the operators may occasionally be required to work at distances less than 4 m from the machine (e.g. to start the machine). In this case, noise levels are above those determined according to the noise test code and additional protection measures (wearing of personal protective equipment) may be required;

— recommendation/requirement of the wearing of personal hearing protector for machines equipped with a cab, the doors shall be maintained closed when in operation;

  — warning concerning reasonable foreseeable misuse;

  — if a blockage is likely to occur, information on the method to be followed for safely unblocking.

7.3 Spare parts list

The spare parts list shall contain all safety-related spare parts with an unambiguous identification and information of the location of the part to be replaced.

7.4 Specific instructions for tank binder sprayers [or sprayers] with spray bars

The operating instructions shall provide information about appropriate use of spraybars.

8 Marking

Each machine shall bear legibly and indelibly, the following minimal information:

a) the business name and full address of the manufacturer and, where applicable, his authorized representative;

b) mandatory marking[1)];

c) designation of machinery;

d) designation of series or type, if any;

e) year of construction[2)];

f) serial or identification number, if any;

g) operating mass in kg (as defined by the manufacturer);

h) rated power in kW, if relevant.

---

1) For machines and their related products intended to be put on the market in the EEA, CE-marking as defined in the applicable European Directive(s), e.g. Machinery.

2) It is prohibited to pre-date or post-date the machinery when affixing the CE marking.

Annex A
(informative)

Truck attachment plate

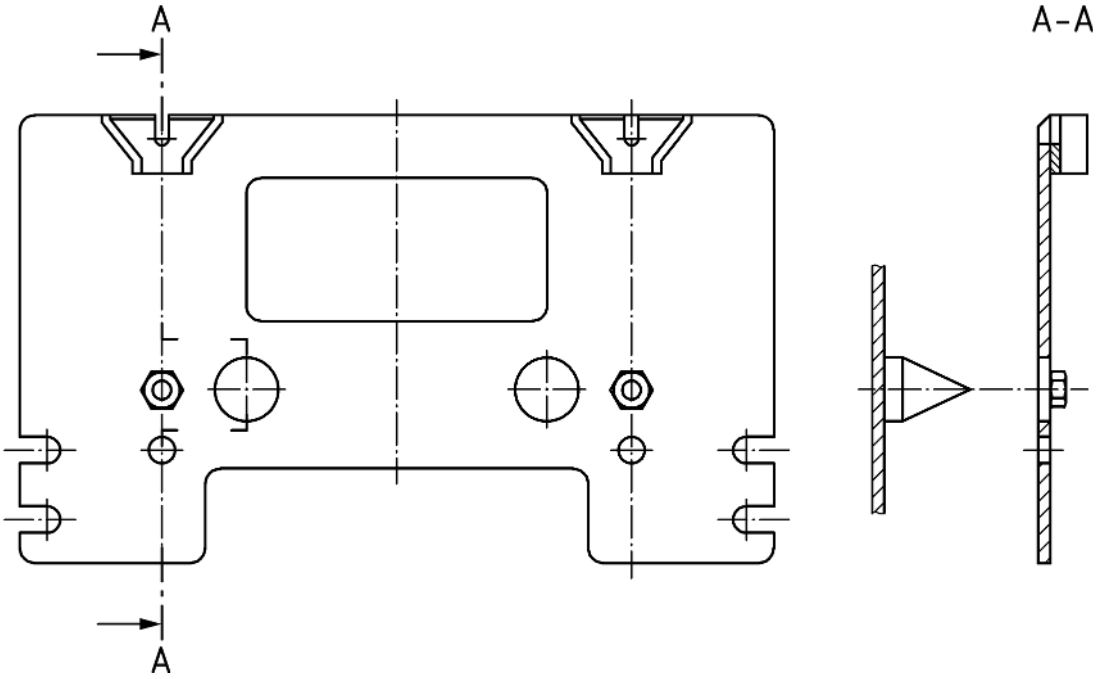


Figure A.1 — Truck attachment plate

The attachment plate for track as shown is only the possible example. It shows the combination of actually used systems in Europe. The dimensioning was renounced consciously. This attachment plate as shown here does not exist at present.

Annex B
(informative)

Terminology

Sprayer [or binder sprayer]:

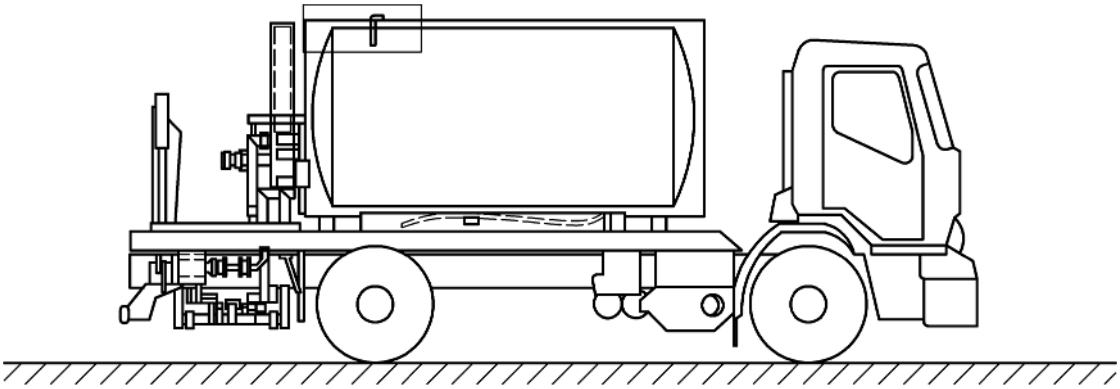


Figure B.1 — Sprayer [or binder sprayer]

Spreader [or chipping spreader]:

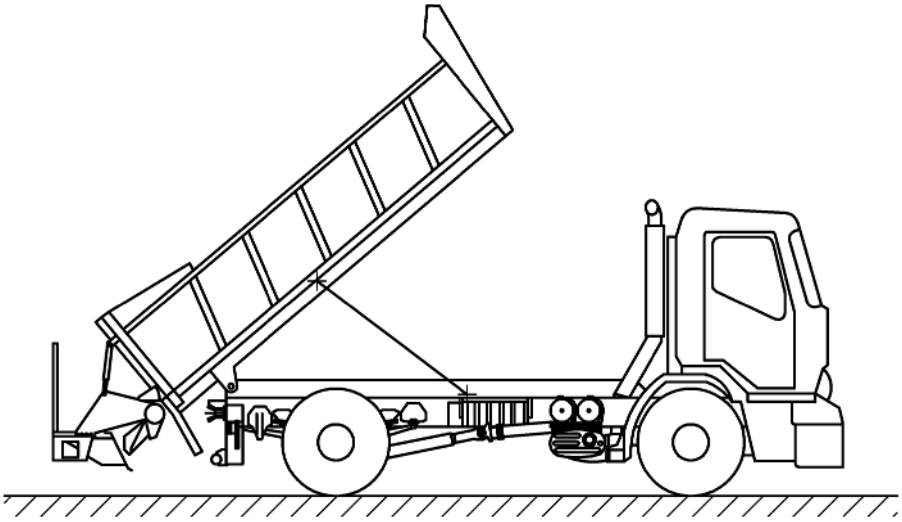


Figure B.2 — Spreader [or chipping spreader]

Sprayer spreader [or binder sprayer chipping spreader]:

Functioning in the front direction without a rear work platform

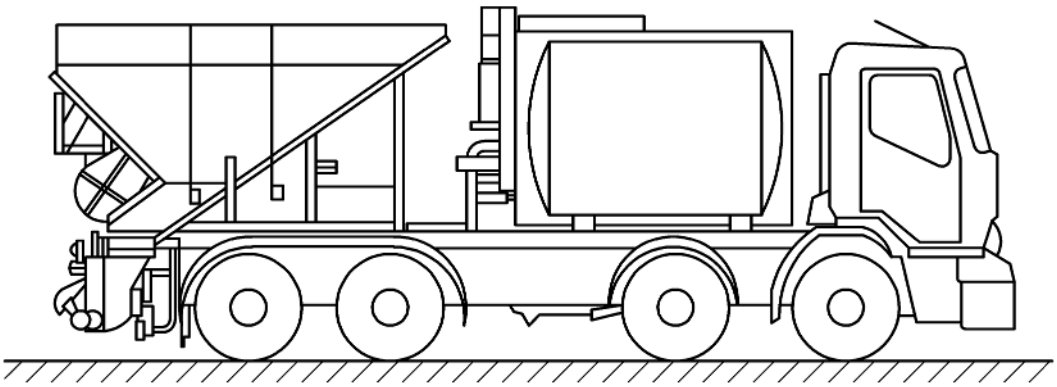


Figure B.3a — Sprayer spreader [or binder sprayer chipping spreader] (Functioning in the front direction without a rear work platform)

Sprayer spreader [or binder sprayer chipping spreader]:

Functioning in the reversing mode with a rear work platform

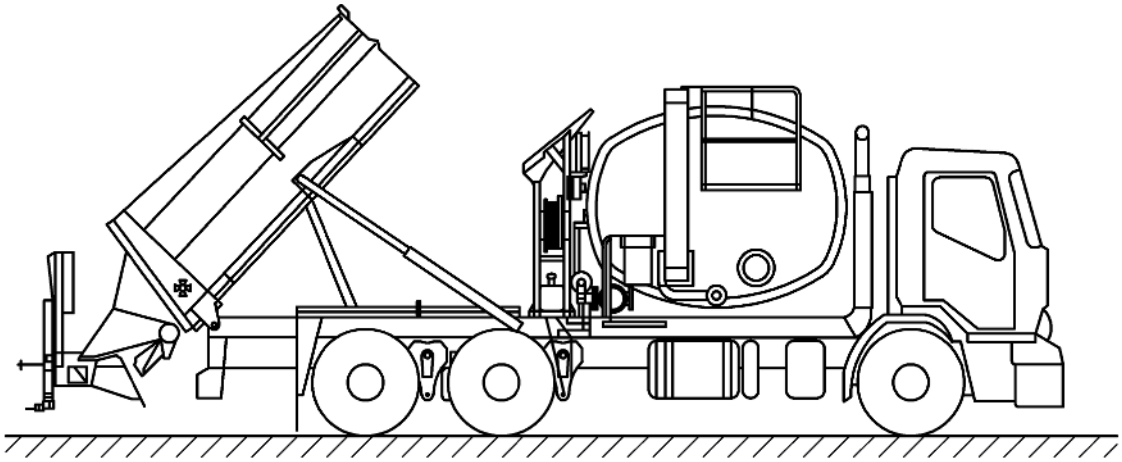


Figure B.3b — Sprayer spreader [or binder sprayer chipping spreader] (Functioning in the reversing mode with a rear work platform)

Joint sealer:

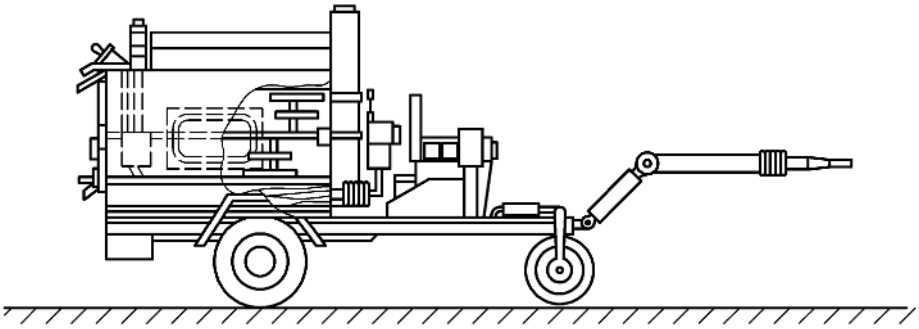


Figure B.4 — Joint sealer

Slurry machine:

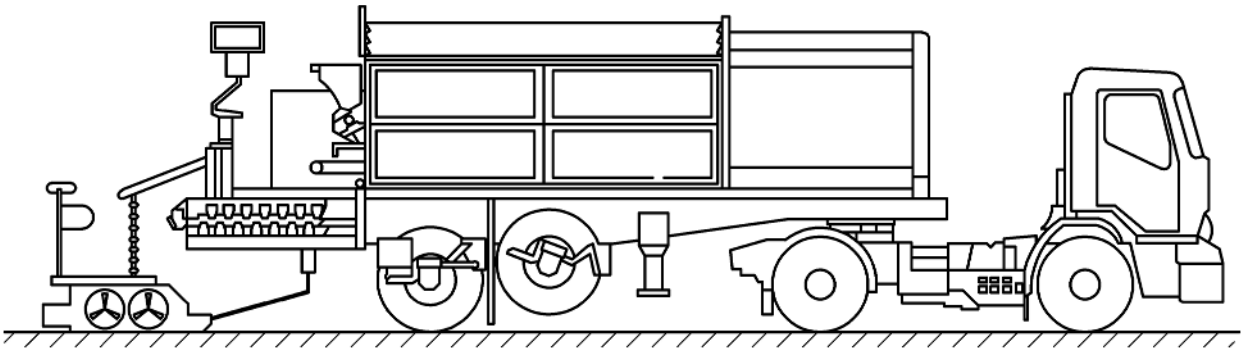


Figure B.5 — Slurry machine

Tank sprayer on a trailer:

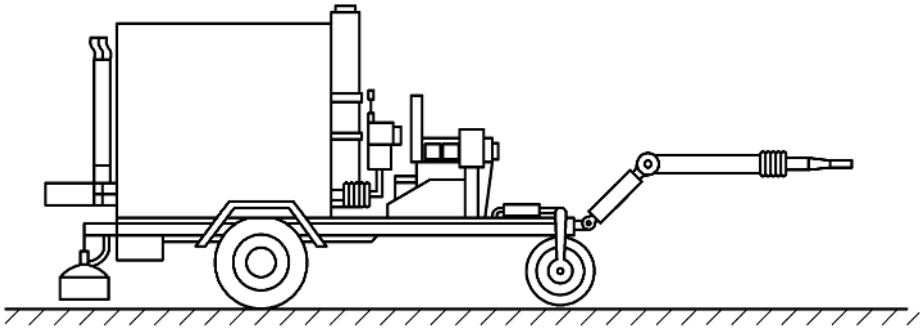


Figure B.6 — Tank sprayer on a trailer

Mastic asphalt mixer:

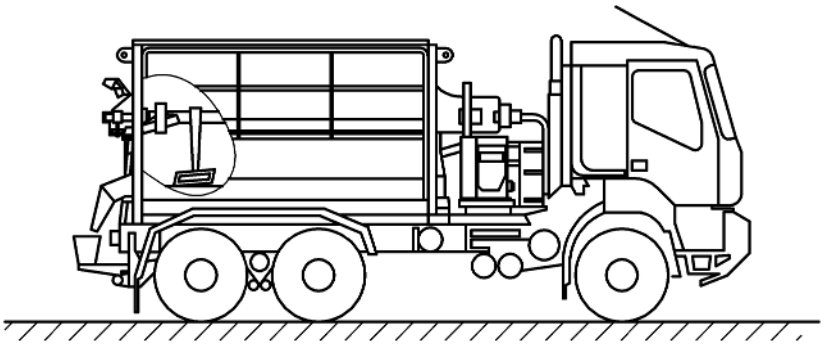


Figure B.7 — Mastic asphalt mixer

Annex C
(informative)

Examples of technical measures to reduce noise

This list of technical measures to reduce noise at the source only gives examples and is not exhaustive:

a) reduction of vibrations via the static and dynamic balancing of rotating parts;

b) reduction of vibrations inside the machine by reducing the weight of mobile parts and their acceleration;

c) choice of low-noise transmission components, e.g. gear assemblies, pulleys, belts, bearings;

d) design of machine structures, considering vibration damping and avoiding structural resonance phenomena;

e) choice of silencers and placement of exhausts away from work stations;

f) choice and design of engine supports;

g) choice of cooling fans with optimised clearances and possible integration of hydraulic or magnetic speed limiters;

h) reduction of noise from pneumatic exhausts, vibration damping of hydraulic systems;

i) enclosure of part(s) of the machine.

NOTE Other measures offering identical or superior noise reduction may be implemented.

Annex D
(normative)

Noise test code for the declaration of noise emission values (grade 2 of accuracy)

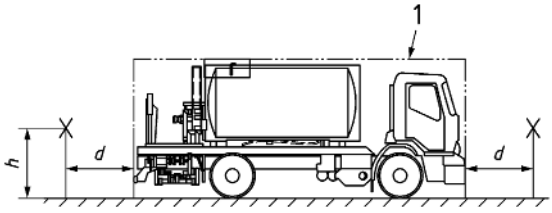
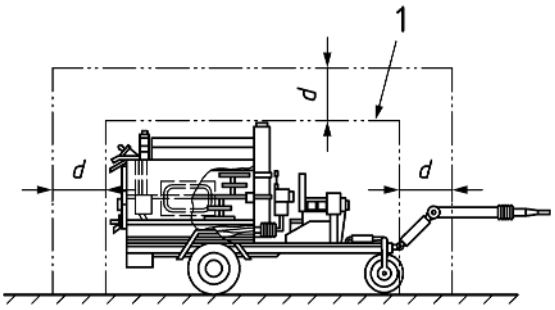
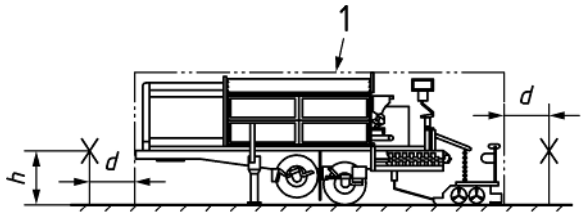
D.1 Scope

This annex provides all of the information required in order to efficiently perform, and in standardized conditions, the determination, the declaration and the verification of noise emission values of road surface treatment machines.

The use of this annex ensures the reproducibility of the determination of noise emission values within the limits established for the accuracy grade of the basic standard used to determine noise emission values. The methods used to determine these noise emission values, corresponding to this normative annex, are grade 2 accuracy measurement methods.

For the purpose of this test code, road surface treatment machines are divided up into three different types, see Table D.1

Table D.1 — Machine types

Type	Machine/machinery
Type 1 	Self-propelled machine, e.g. — sprayer [or binder sprayer]; — spreader [or chipping spreader]; — spray spreader [or binder sprayer chipping spreader]; — mastic asphalt mixer.
Type 2 	Machine on towed trailer and with a gross vehicle weight less than or equal to 3,5 t, e.g. — joint sealer; — mastic asphalt mixer; — sprayer [or binder sprayer].
Type 3 	Machine on towed trailer and with a gross vehicle weight in excess of 3,5 t, e.g. — micro-surfacing machine/slurry machine; — sprayer [or binder sprayer]; — spray spreader [or binder sprayer chipping spreader].

D.2 Determination of the A-weighted emission sound pressure level at workstation(s)

D.2.1 The A-weighted emission sound pressure level at workstation(s) shall be measured according to the method specified in EN ISO 11201:2010, accuracy grade 2.

D.2.2 The A-weighted emission sound pressure levels shall be determined at the operator work station.

For type 1 and 3 machines, the workstation is located at 0,5 m from the control panel and 0,5 m above the control panel and the A-weighted emission sound pressure levels shall be determined without the presence of the operator.

For type 2 machines, the work station is located at the spray lance, thus the microphone shall be placed 4 m from the machine on the side of the noisiest source of energy (engine) at ear level of the operator who shall hold the spray lance.

D.2.3 For type 1 machines, when several work stations exist, the A-weighted emission sound pressure level at each of the work stations (cab and platform) shall be measured and declared. The in-cab noise measurements shall be taken with the windows closed and open.

D.3 Determination of the A-weighted sound power level

D.3.1 General

If the machine is self-propelled (Type 1), measurements shall be taken as specified in D.3.2.

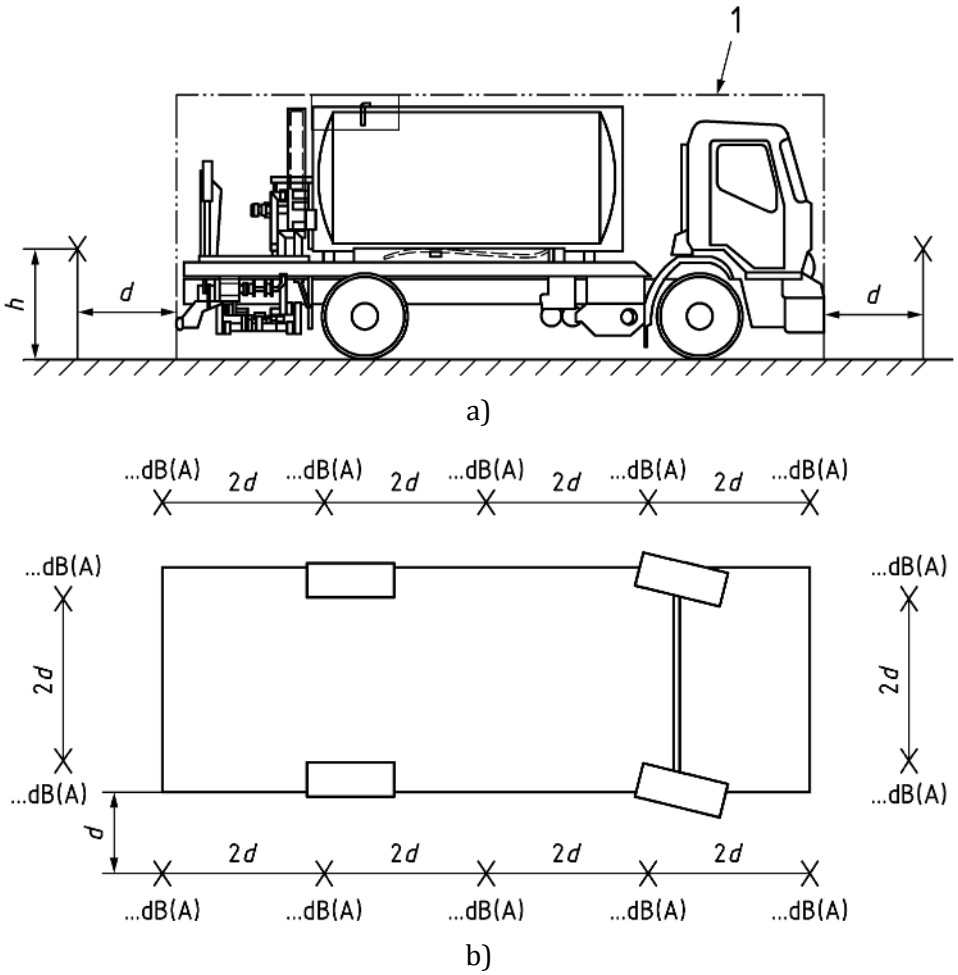
If the machine is mounted on a towed trailer and has a gross vehicle weight less than or equal to 3,5 t (Type 2), then sound pressure level measurements shall be taken according to D.3.3.

If the machine is mounted on a towed trailer and has a gross vehicle weight in excess of 3,5 t or on a semi-trailer (Type 3), then the sound pressure measurement shall be taken according to D.3.4.

For different types of machines, see Table D.1.

D.3.2 Type 1 machines

The determination of the sound power level is replaced by the determination of emission sound pressure levels on a contour around the machine according to EN ISO 11201 at a distance *d* of 1 m from the reference box, while disregarding non-noise generating accessories located beyond the vehicle's body elements, at a height of 1,6 m above the ground, while taking at least one measurement every 2 m (2 *d*).



Key

1 reference box

d = 1 m

h = 1,6 m

... place for the value to be declared

X measurement position

Figure D.1 — Reference box and measurement contour - Type 1 machines

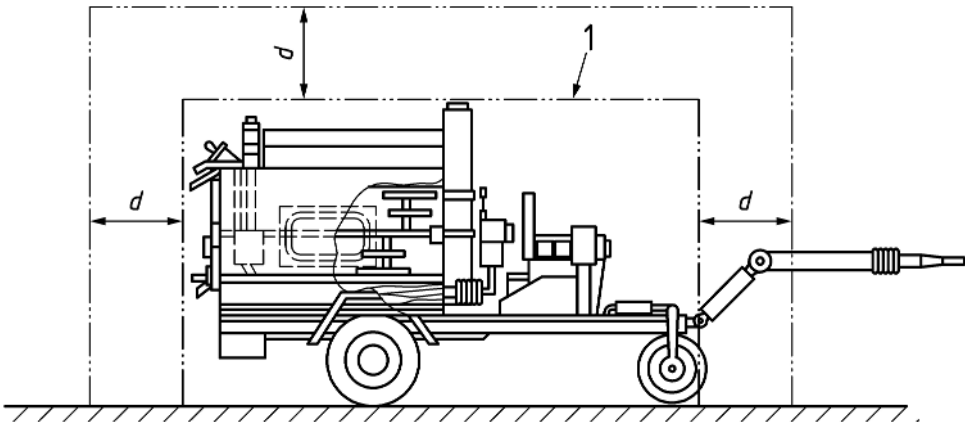
D.3.3 Type 2 machines

The sound power determination method given in EN ISO 3744 shall be used.

The reference box (see EN ISO 3744:2010, definition 3.10) shall be a parallelepiped that covers the machine, but which does not include accessories extending beyond the vehicle's body elements that do not generate noise

The parallelepipedic measurement surface (see EN ISO 3744:2010, 7.2.4) shall be used. The measurement distance d shall be 1 m in relation to the reference box.

NOTE In most cases, the positions of the microphones will be similar to EN ISO 3744:2010, Figure C.9.



Key

1 Reference box

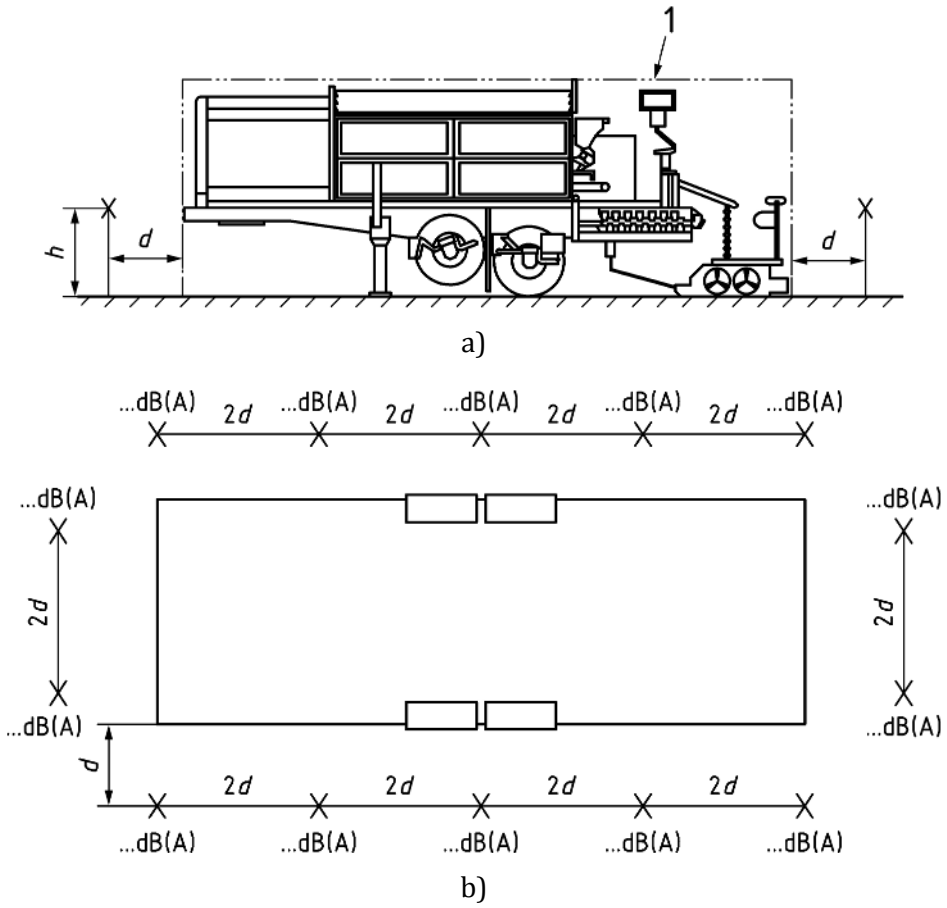
2 Measurement surface

d = 1 m

Figure D.2 — Reference box and measurement surface - Type 2 machines

D.3.4 Type 3 machines

The determination of the sound power level is replaced by the determination of emission sound pressure levels on a contour around the machine according to EN ISO 11201 at a distance d of 1 m from the reference box, while disregarding non-noise generating accessories located beyond the vehicle's body elements, at a height of 1,6 m above the ground, while taking at least one measurement every 2 m (2 d).



Key

1 reference box

d = 1 m

h = 1,6 m

Figure D.3 — Reference box and measurement contour - Type 3 machines

D.4 Installation and assembly conditions

D.4.1 The installation and assembly conditions shall be identical for the determination of the sound power level and the determination of emission sound pressure levels at the workstations.

D.4.2 Each machine undergoing testing shall be placed on a hard reflecting surface, e.g. asphalt or concrete.

D.4.3 The measurement area shall be dry and free of snow. Objects reflecting noise in a significant manner shall not be located within the area at a distance from the sound source less than three times the greatest distance from the centre of the source to the lowest measuring point.

The ambient air temperature shall be between + 5 °C and + 35 °C. The wind speed in the measurement area, at a height of approximately 1,6 m, shall not exceed 5 m/s.

D.5 Operating conditions

D.5.1 The operating conditions shall be identical for the determination of sound power levels and the determination of sound pressure levels at all work stations.

D.5.2 If the machine is equipped with an air-conditioning system, it shall operate at maximum operating conditions in recovery mode.

D.5.3 The vehicle shall be running, with its engine at normal operating temperature before testing begins. The machine shall be adequately warmed up and stabilized at the normal operating temperature before testing begins.

All audible warning devices shall be turned off.

The machine shall be stationary (static testing).

D.5.3.1 For sprayers [or binder sprayers], all accessories shall be in operation to ensure spraying of 1,5 kg/m^2 over a half-width. The test is performed without material.

D.5.3.2 For spreaders [or chipping spreaders], two tests shall be conducted:

— A test while spreading gravel: E1

The density of the gravel shall be 1,5 t/m^3 or kg/l

— A test without gravel: E2

The sound pressure level shall be calculated as the weighted average (30 % while spreading gravel, 70 % without gravel):

$$L_{pA} = 10\log(0{,}3\times10^{0{,}1L_{pA,E1}} + 0{,}7\times10^{0{,}1L_{pA,E2}})\ \text{dB} \qquad \text{(D.1)}$$

Where:

$L_{pA,E1}$ = A-weighted sound pressure level determined while spreading gravel

$L_{pA,E2}$ = A-weighted sound pressure level determined without gravel.

D.5.3.3 For binder sprayer chipping spreaders, all accessories shall be in operation to ensure spraying of 1,5 kg/m^2 over a half-width. The test is performed without binder.

The sound pressure level is calculated as the weighted average (30 % while spreading gravel, 70 % without gravel):

$$L_{pA} = 10\log(0{,}3\times10^{0{,}1L_{pA,E1}} + 0{,}7\times10^{0{,}1L_{pA,E2}})\ \text{dB} \qquad \text{(D.2)}$$

Where:

$L_{pA,E1}$ = A-weighted sound pressure level determined while spreading gravel

$L_{pA,E2}$ = A-weighted sound pressure level determined without gravel.

D.5.3.4 For mastic asphalt mixers, all accessories (heater, mixer) shall be in operation to ensure spraying of 1,5 kg/m^2 over a half-width. The test shall be performed without binder.

D.5.3.5 For joint sealers, the machine shall be operated in a static configuration and the test shall be performed for the three following operating conditions:

— Test 1 (E1): Thermal lance (in operation),

— Test 2 (E2): Sand lance (in operation),

— Test 3 (E3): Pouring lance (in operation).

The sound pressure level of the machine shall be calculated as the weighted average of the three tests:

$$L_{pA} = 10\log(0{,}34\times10^{0{,}1L_{pA,E1}} + 0{,}33\times10^{0{,}1L_{pA,E2}} + 0{,}33\times10^{0{,}1L_{pA,E3}})\ \text{dB} \quad \text{(D.3)}$$

Where:

$L_{pA,E1}$ = A-weighted sound pressure level determined for test 1

$L_{pA,E2}$ = A-weighted sound pressure level determined for test 2

$L_{pA,E3}$ = A-weighted sound pressure level determined for test 3

The sound power level of the machine shall be calculated as the weighted average of the three tests:

$$L_{WA} = 10\log(0{,}34\times10^{0{,}1L_{WA,E1}} + 0{,}33\times10^{0{,}1L_{WA,E2}} + 0{,}33\times10^{0{,}1L_{WA,E3}})\ \text{dB} \quad \text{(D.4)}$$

Where:

$L_{WA,E1}$ = A-weighted sound power level determined for test 1

$L_{WA,E2}$ = A-weighted sound power level determined for test 2

$L_{WA,E3}$ = A-weighted sound power level determined for test 3

D.5.3.6 For slurry machines, the test shall be performed in a static configuration without materials and all accessories shall be in operation to spray at the following rate:

— Sand: 800 kg/min,

— Emulsion: 100 l/min,

— Water: 80 l/min,

— Dope: 3 l/min,

— Cement: 1,5 kg/min.

D.6 Measurement uncertainties

D.6.1 Two measurements shall be taken at each measuring point. If the deviation of the A-weighted sound pressure level measurements, obtained in any measurement condition, is greater than 3 dB, another set of measurements is taken until two successive measurements differ by less than 3 dB.

D.6.2 The uncertainty due to the reproducibility of the method used for measuring the A-weighted sound power level, applied to road surface treatment machines is σ_{R0} = 1,5 dB(A) (accuracy grade 2) as

defined in EN ISO 3744, Clause 9. The measurement uncertainty K_{WA} shall be calculated with the following equation: $K_{WA} = 1{,}6 \cdot \sigma_{R0}$

NOTE The noise emission of these machines is stable. Therefore, the uncertainties due to fluctuation of operating and mounting conditions can be considered as negligible.

D.6.3 The uncertainty due to the reproducibility of the method used for measuring the A-weighted emission sound pressure level at the work station, applied to road surface treatment machines is $\sigma_{R0} = 1{,}5$ dB(A) (accuracy grade 2) as defined in EN ISO 11201:2010, Clause 11. The measurement uncertainty K_{pA} shall be calculated with the following equation: $K_{pA} = 1{,}6 \cdot \sigma_{R0}$

NOTE The noise emission of these machines is stable. Therefore, the uncertainties due to fluctuation of operating and mounting conditions can be considered as negligible.

D.7 Information to be recorded and reported

D.7.1 The information to be recorded is that requested by the basic standards used to determine noise emission values.

D.7.2 The information to be reported in the test report is that requested by the basic standards used to determine noise emission values.

D.7.3 The locations of the work stations, the installation and assembly conditions, the operating conditions and the noise emission values shall also be recorded and reported.

D.7.4 The test record and test report shall also confirm that all the requirements of this noise test code have been fulfilled or possibly identify any deviations and provide justification for these deviations

D.8 Declaration and verification of noise emission values

D.8.1 Noise emission values shall be declared as follows:

— A statement that “the A-weighted emission sound pressure level at the work station is less than 70 dB(A)”, if appropriate; or

— the value of the A-weighted emission sound pressure level at each work station, if it is greater than 70 dB(A);

— if the value of the A-weighted emission sound pressure level at the work station exceeds 80 dB, in this case, declaration of:

  — for type 1 machines: the set of A-weighted emission sound pressure levels, determined according to D.3.2;

  — for type 2 machines: the A-weighted sound power level, determined according to D.3.3;

  — for type 3 machines: the set of A-weighted emission sound pressure levels determined according to D.3.4.

— For type 1 machines, brand, model and power of the carrier.

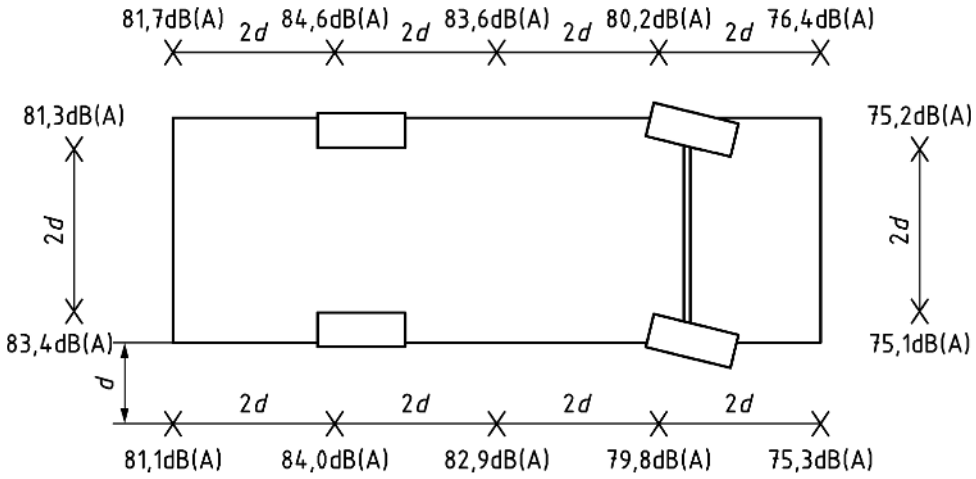
D.8.2 For each A-weighted noise emission value declared, the value from which the declared values shall be determined is the arithmetic mean obtained based on the procedure described in D.6.1.

D.8.3 The values shall be declared according to the dual-number declaration format as defined in EN ISO 4871 (see examples below, Tables D.2 to D.4).

D.8.4 The noise declaration shall indicate that the declared values were obtained according to this noise test code. If this statement is incorrect, the noise declaration shall clearly indicate the deviations in relation to the noise test code and/or in relation to the basic standard(s) used. The reference of the basic measurement standard used shall be indicated in the declaration.

Table D.2 —Example of a dual-number noise emission declaration (Type 1 machine)

Machine serial number, test conditions and other identification information: Type 990, Model 11 TC, 50 Hz, 230 V, rated load		
DECLARED DUAL-NUMBER NOISE EMISSION VALUES according to ISO 4871 • A-weighted emission sound pressure level:		
	Work station(s) (control panel(s))	
	Cab	Platform
L_{pA}, reference 20 µPa at the work station(dB)	82	n/a
Uncertainty, K_{pA}, (dB)	3	n/a
Uncertainty, K_{pA}, (dB).....		3

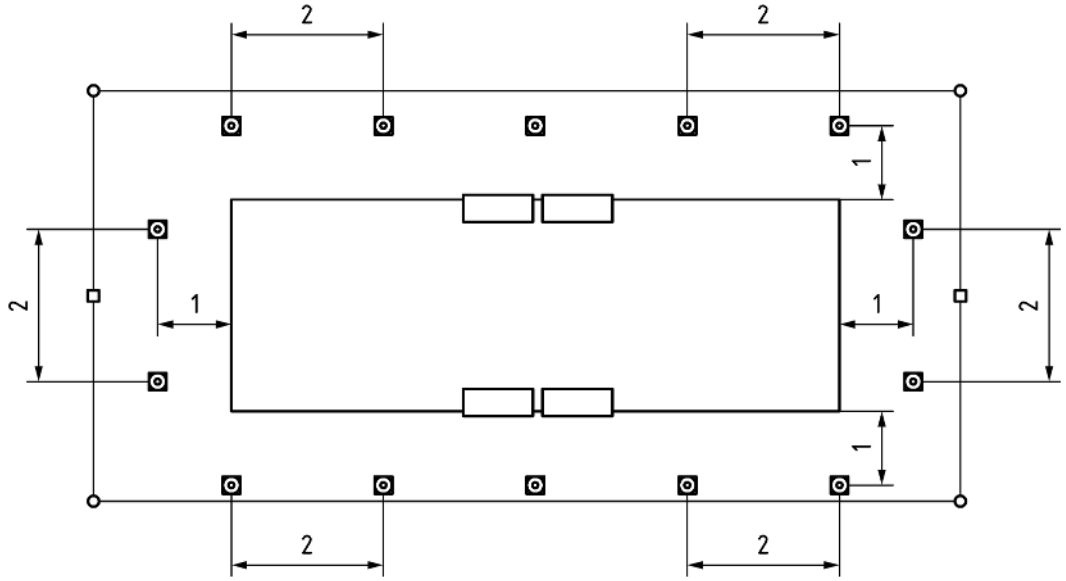


Values determined according to the test code of Annex D of EN 13020:2015, using the basic standard EN ISO 11201. These values include the emissions of the carrier vehicle: [Brand], [model], [power].

Table D.3 —Example of a dual-number noise declaration (Type 2 machine)

Machine serial number, test conditions and other identification information: Type 990, Model 11 TC, 50 Hz, 230 V, rated load
DECLARED DUAL-NUMBER NOISE EMISSION VALUES according to ISO 4871
• A-weighted emission sound pressure level:
L_{pA}, reference 20 µPa, at the work station (hand lance) (dB).....82
Uncertainty, K_{pA}, (dB)..... 3
• A-weighted sound power level:
L_{WA}, reference at 1 pW (dB) 95
Uncertainty, K_{WA}, (dB) 3
Values determined according to the test code of Annex D of EN 13020:2015, using the basic standards EN ISO 3744 and EN ISO 11201.

Table D.4 —Example of a dual-number noise emission declaration (Type 3 machine)

Machine serial number, test conditions and other identification information: Type 990, Model 11 TC, 50 Hz, 230 V, rated load
DECLARED DUAL-NUMBER NOISE EMISSION VALUES according to ISO 4871 • A-weighted emission sound pressure level: L_{pA}, reference 20 µPa, at the work station (control panel) (dB)..... 82 Uncertainty, K_{pA}, (dB)..... 3 L_{pA}, reference 20 µPa, around the machine (dB) ..... 87 Uncertainty, K_{pA}, (dB)..... 2    Values determined according to the test code of Annex D of EN 13020:2015, using the basic standard EN ISO 11201.

Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC on machinery.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements except Essential Requirements 1.5.10 and 1.5.11 of that Directive and associated EFTA regulations.

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

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