Revision of the Outdoor Noise Directive 2000/14/EC

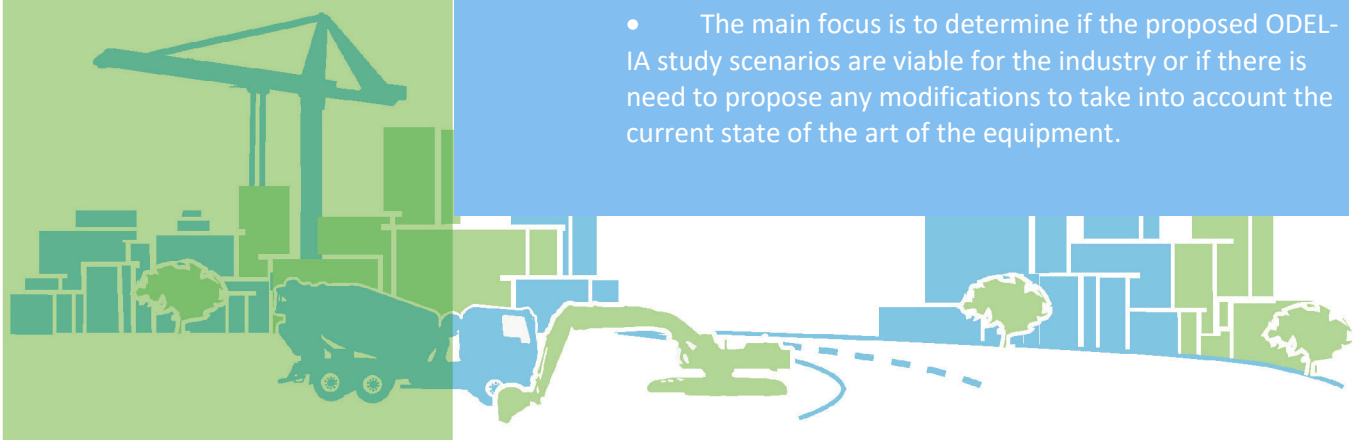
Position paper

ODELIA study and evaluation and impact assessment reports of Directive 2000/14/EC on noise emission by outdoor equipment

April 2019

EXECUTIVE SUMMARY

- In this document CECE presents the horizontal issues related to the ODELIA report and the supporting study for an evaluation and impact assessment of Directive 2000/14/EC on noise emission by outdoor equipment;
- It includes detailed overview sheets with specific proposals for 9 CECE related equipment types.
- The main focus is to determine if the proposed ODELIA study scenarios are viable for the industry or if there is need to propose any modifications to take into account the current state of the art of the equipment.



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Introduction

As a result of the first phase of the current potential revision process of directive 2000/14/EC, the ODELIA consortium has published a final report on 19 January 2016 indicating a list of equipment considered as candidates for improvements.

In this document CECE expresses its position on:

1. Horizontal issues related to the ODELIA report and the supporting study for an evaluation and impact assessment of Directive 2000/14/EC on noise emission by outdoor equipment;
2. Specific proposals for 9 CECE related equipment types.

To structure industry activity and evaluate the various scenarios, CECE set up dedicated task groups, representing more than 50 different construction equipment companies. The main focus is to determine if the proposed scenarios are viable for the industry or propose any necessary modifications to take into account the current state of the art of the equipment and, if appropriate, by considering additional technical constraints from other European Union legislations such as the Engine Exhaust Emission Directive and the Machinery Directive.

Each task group has prepared:

- An executive summary;
- An equipment sheet with a detailed overview of the position;
- Annexes, if needed.

For CECE the following equipment groups where there is a proposal for changes:

Equipment nr 8: Compaction machines
Equipment nr 11: Concrete or mortar mixers
Equipment nr 13: Conveying and spraying machines for concrete and mortar
Equipment nr 17: Drill rigs
Equipment nr 28: Hydraulic hammers
Equipment nr 42: Piling equipment
Equipment nr 55. Truck mixers
Equipment nr 102/103: Mobile sieve installations & Mobile waste breakers

About CECE:

CECE is the recognized organization representing and promoting the European construction equipment and related industries, co-ordinating the views of National Associations and their members by influencing the European/National Institutions and other organizations worldwide to achieve a fair competitive environment via harmonized standards and regulations.

CECE represents the interests of national construction equipment manufacturer associations in 13 European countries, including Germany, the UK, France, Italy, Russia and Turkey. The sector counts around 1200 companies that employ about 300,000 people directly and indirectly. Their annual revenues amount to ca. 40 billion euros. The sector's durable and innovative machinery are working tools to help to build the houses, offices, factories, roads, railways and bridges that serve citizens across the globe. Manufacturers invest and innovate continuously to deliver equipment with highest productivity and lowest environmental impact. Efficiency, safety and high-precision technologies are key.

1. Horizontal issues

- Carrying out calculations on the available databases (EU, NL, MARA and U.K) is sometimes an attempt to start assumptions on assumptions that may lead to unreliable conclusions. The access to the independent variables is obstructed and the Environmental Impact Indicator cannot be calculated or easily verified.
    - Ex. 1:
      The transmitting-function of noise in exterior has to be carried out in accordance with ISO 9613-1 / -2 (Acoustics – Attenuation of sound during propagation outdoors – Part 2 General method of calculation), anything else is not sufficiently justified and not scientifically evaluated.
    - Ex. 2:
      The Distribution Model (URBIS) of TNO has not been made publicly available. Thus, the access to the independent variables mentioned below is obstructed:
      $N_{equip,situ}$: number of equipment in use in specific situation;
      $L_{i\ sound}$: level class i (5 dB classes);
      $D_{equip,\ situ,i}$: distribution of inhabitants over sound level class i for each equipment type and in each situation
      $D_{situ,i:}$ distribution of inhabitants over sound level class i for all equipment and in each situation
    - Ex. 3:
      The comparison on those databases available and assessed by TNO have in some cases no statistical significance in accordance with ISO 7574-1 / -4, since the base-population is too low. Thus, many conclusions derived from this attempt are statistically unreliable.
    - Ex. 4:
      We have doubts about some correction factors for the equation calculating the $Lwa_{rated\ year\ eq.}$ ($C_{operational\ conditions}$, $C_{intermitant}$,…). According to us the adding of only 3 or 6 dB are not justified, these values can even be negative in some cases, which will lower the $L_{WA,rated,yeareq}$

- The decision procedures (flow charts) contain prerequisites being unclear, not transparent and which do not appear to reflect technical facts:
    - Ex. 1:
      The first decision box mentions: "Severe local noise problems in one Member State?". if yes, there is no environmental impact assessment required. We do not agree with this first decision box. One Member State can apparently decide to have immediately more stringent noise limits without the need to perform an environmental impact assessment. The decision tree should start with the “environmental impact”.
    - Ex. 2:
      There is also the decision box “Low relevance?” which is quite decisive yet very vague since there is no definition what “low relevance” is.

2. Equipment Executive Summary

You may find under point a summary of our main findings and CECE's position for each equipment:

Equipment nr 8: Compaction machines

- Simplify the number of categories from currently 9 to 4 categories according to their primary operation (this affects pedestrian controlled vibrating roller only, which should be treated like ride-on machines. This implies alignment of test-procedure for ped-contr. machines in accordance with the correlation as submitted to the European Commission already on 3 March 2010);
- Map these categories by integration of the new definitions in the amended Outdoor Noise Directive;
- Align test codes with current EN 500-4:2011;
- Give reference to the current EN 500-4 in the amended Directive thus following the "New Approach";
- Keep the exemptions as granted by Directive 2005/88/EC for vibratory plates and especially rammers.

Equipment nr 11: Concrete or mortar mixers
Equipment nr 13: Conveying and spraying machines for concrete and mortar

- Low population, no relevance to society;
- The period of emitting noise during operation is short in comparison to run time;
- Influence of the construction equipment manufacturer on engine manufacturers and truck-manufacturers very low due to little quantity;
- To make meaningful groups for limits it would be necessary to fracture of the products in many different categories with even lower quantities (electric vs. Combustion engine, power groups, other size categories);
- CECE believes there is both wrong and a lack of data to base a "curve" to decide;
- Concrete or mortar mixers should remain under the OND art. 13.

Equipment nr 17: Drill rigs

- We welcome the split in percussive and non-percussive drill rigs;
- Because of the splitting, the Environmental Impact Indicator should be recalculated and significantly adopted. It is evident that the percussive drill rigs will go from medium to low relevance and should by this should remain under the OND art. 13;
- According to us, the percussive drill rigs will remain "medium" in the flowchart but according to us "Low relevance" so they also remain under the OND art. 13. And even if they were "no low relevance", the process noise is predominant, and the process noise can not be suppressed with existing or conceivable technologies;
- Both drill rigs categories should remain under OND art. 13.

Equipment nr 28: Hydraulic hammers

- Process noise is predominant. Machine noise reduction will be insignificant, difficult and costly and reduces product usability;
- Urban use is representing a very small proportion of hydraulic hammer use and which causes minimal disturbance to public. In urban use is typically short in duration: 20 days/year and 1.7 hours/day per work site. Due to this fact, the environmental impact indicator should be lower;
- Change the technical parameter into "power" instead of "mass";
- Hydraulic hammers should remain under the OND art 13.

Equipment nr 42: Piling equipment

- CECE welcomes the split in categories "percussive" and "Vibrating + static" but in addition vibrators have to be split into free suspended vibrators and leader guided vibrators;
- Because of the splitting, the Environmental Impact Indicator has to be recalculated. Due to the low population, both piling equipment, percussive and vibrating+static, have to be considered as "low relevance" and have to be left in Art. 13. according to the ODELIA decision flow chart in the ODELIA report;
- The graph in the annex does not mention which data is from which kind of machine. Very little data available in the database (15). Further data collection and evaluation is required.
- The loudest piling equipment are not used in urban areas;
- Piling equipment are currently measured according to the C-type standard EN 16228, while the database is based on the test method of EN 996. As a result, the noise values are different. While equipment and pile combination determine the noise, this is not reflected in the test. Test code should still be improved;
- Process noise is predominant and dependant on some of the following requirements: material of the driving element, length of the driving element and its geometry, geological conditions (sand, rocks, …), experience of the operator and the chosen machine parameters and the selection of the piling process;
- Piling equipment should remain under the OND art. 13.

Equipment nr 55: Truck mixers

- Low population and no relevance to society during stationary use;
- The period of emitting noise during operation is short in comparison to road travelling time.
- Influence of the Construction equipment manufacturer on engine manufacturers and truck-manufacturers very low due to low quantities;
- To make meaningful groups for limits it would be necessary to split the products in two different categories with even lower quantities (PTO driven and auxiliary engine);
- Truck mixers should remain under the OND art. 13.

Equipment nr 102/103: Mobile sieve installations & Mobile waste breakers

- There are no definitions given in the ODELIA report, so it is difficult to judge population, etc;
- There is no test code available at the moment. Process noise is dominant and very dependent on the kind of material, the size of the material, the machine parameters, …;

- Reduction of process noise via rubber screens leads to other negative effects and to other environmental impacts (higher engine emissions,…);
- There are only a very small number of mobile sieve installations and mobile waste breakers (crushing and screening) plants located in urban areas;
- The operation period of mobile waste breaker (crusher) or a mobile sieve installation (screen) in urban areas is limited in time;
- Mobile sieve installations & Mobile waste breakers should be out of the scope of the future OND.

3. CECE Equipment Overview Sheets

These sheets give an overview of the current situation, the ODELIA proposal and the CECE position

CECE has the following 17 equipment sheets:

Equipment nr. 8: Compaction machines
- Vibrating rollers – Walk-behind
- Vibrating rollers - Ride-on
- Non-Vibrating rollers
- Vibratory rammers
- Vibratory plates
- Explosive rammers

Equipment nr. 11: Concrete or mortar mixers

Equipment nr. 13: Conveying and spraying machines for concrete and mortar

Equipment nr. 17: Drill rigs
- Percussive and rotary percussive drill rigs
- Non-Percussive and rotary drill rigs

Equipment nr. 28: Hydraulic hammers

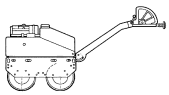
Equipment nr. 42: Piling equipment
- Impact drivers
- Free hanging vibrators
- Leader guide vibrator
- Sheet Pile Push-pull Equipment

Equipment nr. 55: Truck mixers

Equipment nr. 102/103: Mobile sieve installations & Mobile waste

Header

Picture:



Odelia Equipment No.:	8a1
Equipment Name:	Compaction machines; Vibrating Rollers, walk-behind
Equipment No. proposal:	8a (merging of 8a1 and 8a2)
Falls under article:	12
Stage:	II

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2019-02-08

Identification

Current definition:

8. Compaction machine: A machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping or vibrating action of the working tool. It may be self-propelled, towed, walk-behind or an attachment to a carrying machine. Compaction machines are subdivided as follows: - rollers for ride-on operators: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres; the operator's station is an integral part of the machine; - walk-behind rollers: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres in which the operation facilities for travelling, steering, braking and vibrating are disposed in such a way that the machines have to be operated by an attending operator or by remote control; - towed roller: compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres which do not possess an independent drive system and where the operator's station is to be found on a tractor unit; - vibratory plates and vibratory rammers: compactions machines with mainly flat base plates which are made to vibrate. They are operated by an attending operator or as an attachment to a carrier machine; - explosion rammers: compaction machines with mainly a flat pad as the compacting tool which is made to move in a predominantly vertical direction by explosion pressure. The machine is operated by an attending operator.

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	8,0	-	108	2000/14/EC Annex III; Part B; Chapter 8; Indent iii) / EN 500-4 Rev. 1:1998 Annex C / ISO 3744:1995	dynamic-mode on "gravel-track"	0
"	"	"	8,0	70,0	-	109	"	-	0
"	"	"	-	-	70,0	89 + 11·log(P)	"	-	0

ODELIA PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	8,0	-	105	EN 500-4:2011 / ISO 3744:1995	static-mode on "cushion"	tighten LV
"	"	"	8,0	70,0	-	106	"	"	tighten LV
"	"	"	-	-	70,0	86 + 11·log(P)	"	"	tighten LV

Data:

EI-Indicator:	Population (EU-28)	Typical operational mode	[days/month]	[min./day]	Typical area of usage:	Typical usage:
53	200000	[month/yea	10	10	60	urban/suburban/rural	intermittency: 0

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Proposal limit value [db	Proposal test-code:	Proposal test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	8,0	-	105	EN 500-4:2011 / ISO 3744:1995	static-mode on "cushion"	use correlation of CECE
"	"	"	8,0	70,0	-	106	"	"	use correlation of CECE
"	"	"	-	-	70,0	86 + 11·log(P)	"	"	use correlation of CECE

EI-Indicator:	Population (EU-28)	Typical operational mode	[days/month]	[min./day]	Typical area of usage:	Typical usage:
46	30000	[month/yea	8	15	60	urban/suburban/rural	intermittent

CECE New definition proposal

Equipment nr 8. Compaction machine:
A machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping or vibrating action of the working tool. It may be self-propelled, towed, ride-on, remote controlled, walk-behind or an attachment to a carrying machine. Compaction machines are subdivided as follows:
8a - vibrating rollers: self-propelled or towed compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres. The compaction of materials is performed through a rolling and vibrating action of the working tool.
8b - non-vibrating rollers: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres. The compaction of materials is performed through a rolling action of the working tool.
8c - vibratory plates: compactions machines with mainly flat base plates which are made to vibrate.
8d - vibratory rammers: compaction machines with mainly a flat foot-plate (shoe) as the compacting tool which is made to move in a predominantly vertical direction by displacement. The compaction of materials is performed through a tamping action of the working tool.

CECE Conclusion

Economical Impact:
Treatment like other vibrating rollers will decrease administrative burden and reduce efforts for measurements.

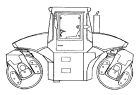
Environmental Impact:
Negligible

Other Impact:
For correlation between current limit values and those new limit values proposed here, see the research-result as presented in Annex VII of this document. This correlation is based on the integration of this equipment into the noise measurement-procedure for ride-on vibrating rollers. Correlation has been presented to European Commission services for the first time on March, 3rd 2010. The limit values proposed cannot be achieved if the current test mode persists.

Summary:
• Simplify the number of categories from currently 9 to 4 categories according to their primary operation (this affects pedestrian controlled vibrating roller only, which should be treated like ride-on machines. This implies alignment of test-procedure for ped-contr. machines in accordance with the correlation as submitted to the European Commission already on 3 March 2010)
• Map these categories by integration of the new definitions in the amended Outdoor Noise Directive
• Align test codes with current EN 500-4:2011
• Give reference to the current EN 500-4 in the amended Directive thus following the "New Approach"
• Keep the exemptions as granted by Directive 2005/88/EC for vibratory plates and especially rammers

Header

Picture:



Equipment No.:	8a2
Equipment Name:	Compaction machines; Vibrating Rollers, ride-on
Equipment No. proposal:	8a (merging of 8a1 and 8a2)
Falls under article:	12
Stage:	II

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2016-08-24

Identification

Current definition:

8. Compaction machine: A machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping or vibrating action of the working tool. It may be self-propelled, towed, walk-behind or an attachment to a carrying machine. Compaction machines are subdivided as follows: - rollers for ride-on operators: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres; the operator's station is an integral part of the machine; - walk-behind rollers: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres in which the operation facilities for travelling, steering, braking and vibrating are disposed in such a way that the machines have to be operated by an attending operator or by remote control; - towed roller: compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres which do not possess an independent drive system and where the operator's station is to be found on a tractor unit; - vibratory plates and vibratory rammers: compactions machines with mainly flat base plates which are made to vibrate. They are operated by an attending operator or as an attachment to a carrier machine; - explosion rammers: compaction machines with mainly a flat pad as the compacting tool which is made to move in a predominantly vertical direction by explosion pressure. The machine is operated by an attending operator.

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	8,0	-	105	2000/14/EC Annex III; Part B; Chapter 8; Indent ii) / ISO 3744:1995	stationary-mode on a "cushion"	Stage-II already
"	"	"	8,0	70,0	-	106	"	"	Stage-II already
"	"	"	-	-	70,0	86 + 11·log(P)	"	"	Stage-II already

ODELIA PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	8,0	-	105	EN 500-4:2011 / ISO 3744:1995	static-mode on "cushion"	Stage-II already
"	"	"	8,0	70,0	-	106	"	"	Stage-II already
"	"	"	-	-	70,0	86 + 11·log(P)	"	"	Stage-II already

Data:

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
53	200000	[month/yea	10	10	60	urban/suburban/rural		intermittency: 0	

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	8,0	-	105	EN 500-4:2011 / ISO 3744:1995	static-mode on "cushion"	Stage-II already
"	"	"	8,0	70,0	-	106	"	"	Stage-II already
"	"	"	-	-	70,0	86 + 11·log(P)	"	"	Stage-II already

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
40	30000	[month/yea	8	10	300	urban/suburban/rural		intermittent	

CECE New definition proposal

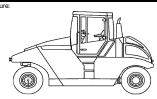
Equipment nr 8. Compaction machine:
A machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping or vibrating action of the working tool. It may be self-propelled, towed, ride-on, remote controlled, walk-behind or an attachment to a carrying machine. Compaction machines are subdivided as follows:
8a - vibrating rollers: self-propelled or towed compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres. The compaction of materials is performed through a rolling and vibrating action of the working tool.
8b - non-vibrating rollers: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres. The compaction of materials is performed through a rolling action of the working tool.
8c - vibratory plates: compactions machines with mainly flat base plates which are made to vibrate.
8d - vibratory rammers: compaction machines with mainly a flat foot-plate (shoe) as the compacting tool which is made to move in a predominantly vertical direction by displacement. The compaction of materials is performed through a tamping action of the working tool.

CECE Conclusion

Summary:
• Simplify the number of categories from currently 9 to 4 categories according to their primary operation (this affects pedestrian controlled vibrating roller only, which should be treated like ride-on machines. This implies alignment of test-procedure for ped-contr. machines in accordance with the correlation as submitted to the European Commission already on 3 March 2010)
• Map these categories by integration of the new definitions in the amended Outdoor Noise Directive
• Align test codes with current EN 500-4:2011
• Give reference to the current EN 500-4 in the amended Directive thus following the "New Approach"
• Keep the exemptions as granted by Directive 2005/88/EC for vibratory plates and especially rammers.

Header

Picture:



Equipment No.:	**8b2**
Equipment Name:	**Compaction machines; NON-Vibrating Rollers**
Equipment No. proposal:	**8b**
Falls under article:	**12**
Stage:	**II**

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2016-08-24

Identification

Current definition:

8. Compaction machine: A machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping or vibrating action of the working tool. It may be self-propelled, towed, walk-behind or an attachment to a carrying machine. Compaction machines are subdivided as follows: - rollers for ride-on operators: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres; the operator's station is an integral part of the machine; - walk-behind rollers: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres in which the operation facilities for travelling, steering, braking and vibrating are disposed in such a way that the machines have to be operated by an attending operator or by remote control; - towed roller: compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres which do not possess an independent drive system and where the operator's station is to be found on a tractor unit; - vibratory plates and vibratory rammers: compactions machines with mainly flat base plates which are made to vibrate. They are operated by an attending operator or as an attachment to a carrier machine; - explosion rammers: compaction machines with mainly a flat pad as the compacting tool which is made to move in a predominantly vertical direction by explosion pressure. The machine is operated by an attending operator.

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	55,0	-	101	2000/14/EC Annex III; Part B; Chapter 0 / ISO 3744:1995	stationary-mode on "hard surface"	Stage-II already
"	"	"	-	-	55,0	82 + 11·log(P)	2000/14/EC Annex III; Part B; Chapter 0 / ISO 3744:1995	stationary-mode on "hard surface"	Stage-II already

ODELIA PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	55,0	-	101	EN 500-4:2011 / ISO 3744:1995	stationary-mode on "hard surface"	Stage-II already
"	"	"	-	-	55,0	82 + 11·log(P)	EN 500-4:2011 / ISO 3744:1995	stationary-mode on "hard surface"	Stage-II already

Data:

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
53	200000	[month/yea	10	10	60	urban/suburban/rural		intermittency: 0	

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	55,0	-	101	EN 500-4:2011 / ISO 3744:1995	stationary-mode on "hard surface"	Stage-II already
"	"	"	-	-	55,0	82 + 11·log(P)	EN 500-4:2011 / ISO 3744:1995	stationary-mode on "hard surface"	Stage-II already

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
40	7500	[month/yea	8	5	360	urban/suburban/rural		intermittent	

CECE New definition proposal

Equipment nr 8. Compaction machine:
A machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping or vibrating action of the working tool. It may be self-propelled, towed, ride-on, remote controlled, walk-behind or an attachment to a carrying machine. Compaction machines are subdivided as follows:
8a - vibrating rollers: self-propelled or towed compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres. The compaction of materials is performed through a rolling and vibrating action of the working tool.
8b - non-vibrating rollers: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres. The compaction of materials is performed through a rolling action of the working tool.
8c - vibratory plates: compactions machines with mainly flat base plates which are made to vibrate.
8d - vibratory rammers: compaction machines with mainly a flat foot-plate (shoe) as the compacting tool which is made to move in a predominantly vertical direction by displacement. The compaction of materials is performed through a tamping action of the working tool.

CECE Conclusion

Summary:

- Simplify the number of categories from currently 9 to 4 categories according to their primary operation (this affects pedestrian controlled vibrating roller only, which should be treated like ride-on machines. This implies alignment of test-procedure for ped-contr. machines in accordance with the correlation as submitted to the European Commission already on 3 March 2010)
- Map these categories by integration of the new definitions in the amended Outdoor Noise Directive
- Align test codes with current EN 500-4:2011
- Give reference to the current EN 500-4 in the amended Directive thus following the "New Approach"
- Keep the exemptions as granted by Directive 2005/88/EC for vibratory plates and especially rammers.

Header

Picture:

Equipment No.:	8c
Equipment Name:	Compaction machines; Vibratory Rammers
Equipment No. proposal:	8c
Falls under article:	12
Stage:	I

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2019-02-08

Identification

Current definition:

8. Compaction machine: A machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping or vibrating action of the working tool. It may be self-propelled, towed, walk-behind or an attachment to a carrying machine. Compaction machines are subdivided as follows: - rollers for ride-on operators: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres; the operator's station is an integral part of the machine; - walk-behind rollers: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres in which the operation facilities for travelling, steering, braking and vibrating are disposed in such a way that the machines have to be operated by an attending operator or by remote control; - towed roller: compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres which do not possess an independent drive system and where the operator's station is to be found on a tractor unit; - vibratory plates and vibratory rammers: compactions machines with mainly flat base plates which are made to vibrate. They are operated by an attending operator or as an attachment to a carrier machine; - explosion rammers: compaction machines with mainly a flat pad as the compacting tool which is made to move in a predominantly vertical direction by explosion pressure. The machine is operated by an attending operator.

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A)]	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	8,0	-	108	2000/14/EC Annex III; Part B; Chapter 8; Indent iii) / EN 500-4 Rev. 1:1998 Annex C / ISO 3744:1995	dynamic-mode on "gravel-track"	0
"	"	"	8,0	70,0	-	109	"	-	0
"	"	"	-	-	70,0	89 + 11·log(P)	"	-	0

ODELIA PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A)]	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	8,0	-	107	EN 500-4:2011 / ISO 3744:1995	dynamic-mode on "gravel-track"	tighten LV
"	"	"	8,0	70,0	-	108	"	"	tighten LV
"	"	"	-	-	70,0	0	"	0	Currently not on the market

Data:

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
53	200000	[month/yea	10	10	60	urban/suburban/rural	intermittency: 0	

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Proposal limit value [db(A)]	Proposal test-code:	Proposal test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	8,0	-	108	EN 500-4:2011 / ISO 3744:1995	dynamic-mode on "gravel-track"	keep LV
"	"	"	8,0	70,0	-	109	"	"	keep LV

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
45	125000	[month/yea	8	15	35	urban/suburban/rural	intermittent	

CECE New definition proposal

Equipment nr 8. Compaction machine:
A machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping or vibrating action of the working tool. It may be self-propelled, towed, ride-on, remote controlled, walk-behind or an attachment to a carrying machine. Compaction machines are subdivided as follows:
8a - vibrating rollers: self-propelled or towed compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres. The compaction of materials is performed through a rolling and vibrating action of the working tool.
8b - non-vibrating rollers: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres. The compaction of materials is performed through a rolling action of the working tool.
8c - vibratory plates: compactions machines with mainly flat base plates which are made to vibrate.
8d - vibratory rammers: compaction machines with mainly a flat foot-plate (shoe) as the compacting tool which is made to move in a predominantly vertical direction by displacement. The compaction of materials is performed through a tamping action of the working tool.

CECE Conclusion

Economical Impact:

• The representation of rammers in the Commission's noise database is statistically inconsistent and negligible and as such, evaluations on this kind of machinery are not representative.
• Rammers in the higher power range (> 50 kg operating-mass) are close to the limit value and there is a market need for high power, high performance rammers.

Environmental Impact:

• Rammers are normally used during a very short period of time and therefore noise disturbing time is limited.
• For rammers in the higher power range the process-noise is predominant.

Other Impact:

• There is no known technology today to reduce the air-borne nosie emissions for rammers, which would be necessary for the rammers in the higher power range (> 50 kg operating mass).
• Noise reduction by adding more hoods or covers on a rammer would increase the weight, make the rammer more vulnerable (robustness of the system in handling and operating) and limit the manoeuvrability of the machine operating in confined areas and is therefore not a realistic neither viable solution.

Summary:

• Simplify the number of categories from currently 9 to 4 categories according to their primary operation (this affects pedestrian controlled vibrating roller only, which should be treated like ride-on machines. This implies alignment of test-procedure for ped-contr. machines in accordance with the correlation as submitted to the European Commission already on 3 March 2010)
• Map these categories by integration of the new definitions in the amended Outdoor Noise Directive
• Align test codes with current EN 500-4:2011
• Give reference to the current EN 500-4 in the amended Directive thus following the "New Approach"
• Keep the exemptions as granted by Directive 2005/88/EC for vibratory plates and especially rammers.

Header

Picture:

Equipment No.:	8d
Equipment Name:	Compaction machines; Vibratory Plates
Equipment No. proposal:	8d
Falls under article:	12
Stage:	I/ II

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2019-02-08

Identification

Current definition:

8. Compaction machine: A machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping or vibrating action of the working tool. It may be self-propelled, towed, walk-behind or an attachment to a carrying machine. Compaction machines are subdivided as follows: - rollers for ride-on operators: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres; the operator's station is an integral part of the machine; - walk-behind rollers: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres in which the operation facilities for travelling, steering, braking and vibrating are disposed in such a way that the machines have to be operated by an attending operator or by remote control; - towed roller: compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres which do not possess an independent drive system and where the operator's station is to be found on a tractor unit; - vibratory plates and vibratory rammers: compactions machines with mainly flat base plates which are made to vibrate. They are operated by an attending operator or as an attachment to a carrier machine; - explosion rammers: compaction machines with mainly a flat pad as the compacting tool which is made to move in a predominantly vertical direction by explosion pressure. The machine is operated by an attending operator.

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	3,0	-	105	2000/14/EC Annex III; Part B; Chapter 8; Indent iii) / EN 500-4 Rev. 1:1998 Annex C / ISO 3744:1995	dynamic-mode on "gravel-track"	Stage-II already
"	"	"	3,0	8,0	-	108	"	-	Stage-I
"	"	"	8,0	70,0	-	109	"	-	Stage-I
"	"	"	-	-	70,0	89 + 11·log(P)	"	-	Stage-I

ODELIA PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	3,0	-	105	EN 500-4:2011 / ISO 3744:1995	dynamic-mode on "gravel-track"	Stage-II already
"	"	"	3,0	8,0	-	107	"	"	tighten LV
"	"	"	8,0	70,0	-	108	"	"	tighten LV
"	"	"	-	-	70,0	88 + 11·log(P)	"	"	tighten LV

Data:

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
53	200000	[month/yea	10	10	60	urban/suburban/rural		intermittency: 0

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	0,0	3,0	-	105	EN 500-4:2011 / ISO 3744:1995	dynamic-mode on "gravel-track"	Stage-II already
"	"	"	3,0	8,0	-	108	"	"	keep current LV
"	"	"	8,0	70,0	-	109	"	"	keep current LV
"	"	"	-	-	70,0	obsolete	n.a.	n.a.	Currently not on the market

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
40	75000	[month/yea	8	15	45	urban/suburban/rural		intermittent

CECE New definition proposal

Equipment nr 8. Compaction machine:
A machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping or vibrating action of the working tool. It may be self-propelled, towed, ride-on, remote controlled, walk-behind or an attachment to a carrying machine. Compaction machines are subdivided as follows:
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8b - non-vibrating rollers: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres. The compaction of materials is performed through a rolling action of the working tool.
8c - vibratory plates: compactions machines with mainly flat base plates which are made to vibrate.
8d - vibratory rammers: compaction machines with mainly a flat foot-plate (shoe) as the compacting tool which is made to move in a predominantly vertical direction by displacement. The compaction of materials is performed through a tamping action of the working tool.

CECE Conclusion

Economical Impact:
• The representation of vibratory plates in the Commission's noise database is statistically inconsistent and negligible and as such, evaluations on this kind of machinery are not representative.
• 1 dB noise reduction cannot be physically perceived, but for some machine models a reduction of 1 dB can allocate extensive engineering resources and costs or result in less performance of the machine increasing operational time for the same compaction result.

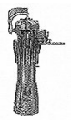
Environmental Impact:
• Vibratory plates are normally used during a very short period of time when in service and therefore noise disturbing time is marginal.
• For vibratory plates the process noise can be predominant.

Other Impact:
Noise reduction by adding more hoods or covers on a vibratory plate would increase the weight, make the machine more vulnerable (robustness of the system in handling and operating) and limit the manoeuvrability of the machine operating in confined areas and is therefore not a realistic neither viable solution.

Summary:
• Simplify the number of categories from currently 9 to 4 categories according to their primary operation (this affects pedestrian controlled vibrating roller only, which should be treated like ride-on machines. This implies alignment of test-procedure for ped-contr. machines in accordance with the correlation as submitted to the European Commission already on 3 March 2010)
• Map these categories by integration of the new definitions in the amended Outdoor Noise Directive
• Align test codes with current EN 500-4:2011
• Give reference to the current EN 500-4 in the amended Directive thus following the "New Approach"
• Keep the exemptions as granted by Directive 2005/88/EC for vibratory plates and especially rammers.

Header

Picture:



Equipment No.:	8e
Equipment Name:	Compaction machines; Explosive rammers only
Equipment No. proposal:	Remove from directive
Falls under article:	13
Stage:	0

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2019-02-08

Identification

Current definition:

8. Compaction machine: A machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping or vibrating action of the working tool. It may be self-propelled, towed, walk-behind or an attachment to a carrying machine. Compaction machines are subdivided as follows: - rollers for ride-on operators: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres; the operator's station is an integral part of the machine; - walk-behind rollers: self-propelled compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres in which the operation facilities for travelling, steering, braking and vibrating are disposed in such a way that the machines have to be operated by an attending operator or by remote control; - towed roller: compaction machines with one or more metallic cylindrical bodies (drums) or rubber tyres which do not possess an independent drive system and where the operator's station is to be found on a tractor unit; - vibratory plates and vibratory rammers: compactions machines with mainly flat base plates which are made to vibrate. They are operated by an attending operator or as an attachment to a carrier machine; - explosion rammers: compaction machines with mainly a flat pad as the compacting tool which is made to move in a predominantly vertical direction by explosion pressure. The machine is operated by an attending operator.

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	all	0,0	0,0	none	2000/14/EC Annex III; Part B; Chapter 8; Indent iii) / EN 500-4 Rev. 1:1998 Annex C / ISO 3744:1995	dynamic-mode on "gravel-track"	0

ODELIA PROPOSAL Data:

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
none	none	none	none	none	none	none	none	none	remove from Directive
EI-Indicator:	Population (EU-28)	Typical operational mode:		[days/month]	[min./day]	Typical area of usage:		Typical usage:	
very low	unknown	[month/yea	10	10	60	urban/suburban/rural		low cycle	

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	all	0,0	0,0	none	0	0	remove from Directive
EI-Indicator:	Population (EU-28)	Typical operational mode:		[days/month]	[min./day]	Typical area of usage:		Typical usage:	
34	1000	[month/yea	6	5	10	urban/suburban/rural		intermittent	

CECE Conclusion

Summary:

Remove from directive, not sold anymore

Header

Picture:

Equipment No.:	11
Equipment Name:	Concrete or mortar mixers
Equipment Characteristic:	0
Falls under article:	13
Stage:	0

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2019-02-08

Identification

Current definition:

11. Concrete or mortar mixer: A machine to prepare concrete or mortar, irrespective of the loading, mixing and emptying process. It may be operated intermittently or constantly. Concrete mixers on trucks are called truck mixers (see definition 55).

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to	< Range >	Current limit value [db(A)	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	Full	Full	Full	0	OND, Annex B, No. 55		

ODELIA PROPOSAL Data:

Technical Parameter:	of source:	Unit:	Range, from	Range, to	< Range >	Current limit value [db(A)	Current test-code:	Current test-mode:	Remark(s):
Net installed pow	Engine (+exhaust+intake), hydraulics, cooler	[kW]	0,0	2,0	-	95		0	0
"	"	"	2,0	Full	-	92+11lgP		0	0

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:	Typical usage:
48	210000	[month/yea	10	20	120	urban/suburban/rural	intermittent

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to	< Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
None	None	None	None	None	None	None	Use EN 12001:2012	None	None

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:	Typical usage:
48	14500	[month/yea	10	20	120	urban/suburban/rural	intermittent

CECE Conclusion

Economical Impact:

This type of machinery is offered from under 2,2 kW with electric motors to over 40 kW diesel combustion engines. The proposed 95, 92+11lgP (for >2kW) limit will cut off the complete production of some manufacturers (the biggest combustion engines driven self loading concrete mixers)

Environmental Impact:

Example - mixer pump for floor screed:
The noise emission is measured under maximum output of the machine. This does not reflect the noise load emitted to the environment. The machines function mainly 70% in mixing operation and 30% in pump operation.
Annual recorded function time is about 800 hours.
Example - floor screed:
For a single family house of 200m², about 10m³ of floor screed is needed. Mixing operation is about 4 hours at moderate revolutions per minute (rpm) and load. Building construction takes about 9 months or 1500 hours and laying the floor screed a single day.

Other Impact:

Remark: technical parameter for vehicles with power take-off (PTO) is installed engine power or auxiliary engine power

Summary:

- Low population, no relevance to society.
- The period of emitting noise during operation is short in comparison to run time.
- Influence of the construction equipment manufacturer on engine manufacturers and truck- manufacturers very low due to little quantity.
- To make meaningful groups for limits it would be necessary to fracture of the products in many different categories with even lower quantities (electric vs. Combustion engine, power groups, other size categories).
- CECE believes there is both wrong and a lack of data to base a “curve” to decide.
- CECE position: Concrete or mortar mixers should remain under the OND art. 13.

Header

Picture:

Equipment No.:	13
Equipment Name:	Conveying and spraying machines for concrete and mortar
Equipment Characteristic:	0
Falls under article:	13
Stage:	0

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2019-02-08

Identification

Current definition:

13. Conveying and spraying machine for concrete and mortar: Items of plant pumping and spraying concrete or mortar, with or without agitator, whereby the material to be transported is conveyed to the placing position through pipelines, distribution devices or distribution booms. Conveyance is carried out: - for concrete mechanically, by piston or rotor pumps; - for mortar mechanically by piston, worm, hose and rotor pumps or pneumatically by compressors with or without air chamber. These machines may be mounted on trucks, trailers or special vehicles.

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A)	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	Full	Full	Full	0	EN 12001:2012, Annex C		

ODELIA Data: PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A)	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	Full	Full	-	93+11lg*P		0	0
EI-Indicator:	Population (EU-28)	Typical operational mode:		[days/month]	[min./day]	Typical area of usage:		Typical usage:	
47	52000	[month/yea	10	20	120	urban/suburban/rural		intermittent	

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
None	None	None	None	None	None	None	Use EN ISO 12001:2012		
EI-Indicator:	Population (EU-28)	Typical operational mode:		[days/month]	[min./day]	Typical area of usage:		Typical usage:	
47	22500	[month/yea	10	20	120	urban/suburban/rural		intermittent	

CECE Conclusion

Economical Impact:

There are mainly 3 types of machines: Truck mounted concrete pumps, pneumatic conveyors and pumps for conveying and spraying concrete and plaster. It covers from truck mounted to tow behind trailer units and includes electric as well as combustion engine driven machines. Due to the small impact caused by the equipment, all are covered in one standard, EN 12001 - "Conveying, spraying and placing machines for concrete and mortar. Safety requirements".

Environmental Impact:

Example - concrete pump:
Distribution of the noise emission over time:
The noise emission is measured under maximum output of the machine. This does not reflect the noise load emitted to the environment. The machines are predominantly operated under a partial load.
In average 11 000m3 of concrete is pumped per year per machine. The average output is about 70 m3/hour which leads to a functioning time of the concrete pump of only 160 hours per year.
The actual noise exposure during a workday should be taken into account.
Example - floor screed pump:
Distribution of the noise emission over time:
The noise emission is measured under maximum output of the machine. The machines function mainly 70% of the time in mixing operation and 30% in pump operation.
Annual recorded functioning time is about 1000 hours. 30% is done at rated revolutions per minute (rpm) as the pumping function requires the rated power. Noise emissions are rated at full load to be comparable among manufacturers.
For a single family house of 200m², about 10m³ floor screed is needed. Mixing operation is about 2,5 hours at rated rpm and load. Building construction takes about 9 months or 1500 hours and laying the floor screed about a day. The duration of the discomfort caused by the pumping function is 2,5 hours.

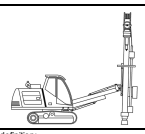
Other Impact:

Summary:

- Low population, no relevance to society.
- The period of emitting noise during operation is short in comparison to run time.
- Influence of the construction equipment manufacturer on engine manufacturers and truck- manufacturers very low due to little quantity.
- To make meaningful groups for limits it would be necessary to fracture of the products in many different categories with even lower quantities (electric vs. Combustion engine, power groups, other size categories).
- CECE believes there is both wrong and a lack of data to base a “curve” to decide.
- CECE position: Conveying and spraying machines for concrete or mortar should remain under the OND art. 13.

Header

Picture:



Equipment No.:	17
Equipment Name:	Drill rigs
Equipment No. proposal:	ODELIA and CECE: 17a: Percussive and rotary percussive drilling
Falls under article:	13
Stage:	0

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2016-08-24

Identificatio

Current definition:

17. Drill rig: A machine which is used for drilling holes on construction sites by: - percussive drilling; - rotary drilling; - rotary percussive drilling. Drill rigs are stationary during drilling. They may move from one place of work to another, under their own power. Self-propelled drill rigs include those mounted on lorries, wheeled chassis, tractors, crawlers, skid bases (pulled by winch). When drill rigs are mounted on lorries, tractors and trailers, or a wheel-based, transportation may be carried out at higher speeds and on public roads.

Current regulatio

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A)	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]					2000/14/EG Annex III;Part B; Typ 17 / ISO 3744:1995 / EN 791:1995 Anhang A	0	0

ODELIA PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A)	Current test-code:	Current test-mode:	Remark(s):
Net installed pow	Engine (+exhaust+intake), hydraulics, gears, drilling	[kW]				128	EN 791:1995	0	Sets limit value

Data:

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
50	30000	[month/yea	10	10	240	urban/suburban/rural	intermittent	

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
Net installed pow	Engine (+exhaust +intake +cooling system), hydraulics, gears, drilling, percussive apparatus, rods, drilling tools	[kW]				0	EN ISO 3744 according to EN16288-1 to 7	Minimum 15 second test in normal operating rates and temperatures	Keep in Art. 13.

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
0	4000	[month/yea	8	15	200	urban/suburban/rural	intermittent	

CECE New definition proposal

New definition:

A machine which is used for drilling holes on construction, mining and quarrying sites by percussive drilling or rotary percussive drilling. Drill rigs are stationary during drilling. They may move from one drilling point to another under their own carrier

CECE Conclusion

Economical Impact:

Manufacturing volumes of percussive drill rigs are small (hundreds per year globally). Setting a limit for percussive drill rigs requires a large R&D investment from manufacturers, without guarantee of reaching practical solutions. This will be reflected on the prices of the equipment which are already high in comparison to other types of construction equipment. Pricing is affected both within EU and lesser regulated non-EU markets and therefore reduces competitiveness of EU manufacturers. Increase in prices will also affect to profitability of drilling and quarying companies, many of which are SME's, and consequently all derived products.

Environmental Impact:

Number of percussive drill rigs is small. After the splitting in to percussive and non-percussive drill rigs, the percussive drill rigs will go from medium to low relevance. Therefore, they should be left in Art. 13. Process noise from drilling tools (rods, tubes, pipes) is dominant and cannot be suppressed with existing or conceivable technologies. A current trend for percussive drilling is to increase percussion power, which will not decrease the instantaneous noise, but reduces drilling time and therefore the total noise emission.

Other Impact:

The noise data in the NOISE database is based on an outdated C-type standard. These values are too low according to the current standard (in effect since 12/2014). Any assessments based on NOISE data reflect too low values in comparison to the current standard. Consequently, any limit proposals based on the NOISE data will yield limit values that cannot not be fullfilled according to the current standard and conceivable technologies.

Summary:

• We welcome the split in percussive and non-percussive drill rigs.
• Because of the splitting, the Environmental Impact Indicator should be recalculated and significantly adopted. It is evident that the percussive drill rigs will go from medium to low relevance and should by this be left in Art. 13.
• According to us, the percussive drill rigs will remain “medium” in the flowchart but according to us “Low relevance” so they also remain in Art 13. And even if they were “no low relevance”, the process noise is predominant and the process noise can not be suppressed with existing or conceivable technologies.
• CECE position: drill rigs should remain under OND art. 13.

Header

Picture:

Equipment No.:	17
Equipment Name:	Drill rigs
Equipment No. proposal:	ODELIA and CECE: 17b: Non-Percussive and rotary drilling
Falls under article:	13
Stage:	0

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2019-02-08

Identification

Current definition:

17. Drill rig: A machine which is used for drilling holes on construction sites by: - percussive drilling; - rotary drilling; - rotary percussive drilling. Drill rigs are stationary during drilling. They may move from one place of work to another, under their own power. Self-propelled drill rigs include those mounted on lorries, wheeled chassis, tractors, crawlers, skid bases (pulled by winch). When drill rigs are mounted on lorries, tractors and trailers, or a wheel-based, transportation may be carried out at higher speeds and on public roads.

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to	Range >	Current limit value [db(A)	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	full	full	n.a.	0	2000/14/EG Annex III;Part B; Typ 17 / ISO 3744:1995 / EN 791:1995 Anhang A	0	0

ODELIA PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to	Range >	Current limit value [db(A)	Current test-code:	Current test-mode:	Remark(s):
Net installed pow	Engine (+exhaust+intake),	[kW]	0,0	30,0	n.a.	107	EN 791:1995	0	Sets limit value
Net installed pow	Engine (+exhaust+intake), hydraulics, gears, drilling	[kW]	30,0	full	92,0	92+10*lg P	EN 791:1995	0	0

Data:

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:	Typical usage:
50	30000	[month/yea	10	10	240	urban/suburban/rural	intermittent

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to	Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
Net installed pow	Engine (+exhaust +intake + cooling system), hydraulics, gears	[kW]	full	full	n.a.	0	EN ISO 3744 according to EN16288-1 to 7	Minimum 15 second test in normal operating rates and temperatures	Keep in Art. 13.

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:	Typical usage:
0	10000	[month/yea	8	15	200	urban/suburban/rural	intermittent

CECE New definition proposal

New definition:

A machine which is used for drilling holes on construction, mining and quarrying sites by rotary drilling. Drill rigs are stationary during drilling but may move from one drilling point to another under their own carrier

CECE Conclusion

Economical Impact:

Manufacturing volumes of non-percussive drill rigs are small (hundreds per year globally). Setting a limit for non-percussive drill rigs requires a large R&D investment from manufacturers, without guarantee of reaching practical solutions. This will be reflected on the prices of the equipment which are already high in comparison to other types of construction equipment. Pricing is affected both within EU and lesser regulated non-EU markets and therefore reduces competitiveness of EU manufacturers. Increase in prices will also affect to profitability of drilling and quarying companies, many of which are SME's, and consequently all derived products.

Environmental Impact:

Number of non-percussive drill rigs is small. After the splitting in to percussive and non-percussive drill rigs, the non-percussive drill rigs will go from medium to low relevance. Therefore, they should be left in Art. 13. Process noise from drilling tools (rods, tubes, pipes) is dominant and cannot be suppressed with existing or conceivable technologies. A current trend for non-percussive drilling is to increase power, which will not decrease the instantaneous noise, but reduces drilling time and therefore the total noise emission.

Other Impact:

The noise data in the NOISE database is based on an outdated C-type standard. These values are too low according to the current standard (in effect since 12/2014). Any assessments based on NOISE data reflect too low values in comparison to the current standard. Consequently, any limit proposals based on the NOISE data will yield limit values that cannot not be fullfilled according to the current standard and conceivable technologies.

Summary:

• We welcome the split between percussive and non-percussive drill rigs.
• Because of the splitting, the Environmental Impact Indicator should be recalculated and significantly adopted. It is evident that the non-percussive drill rigs will go from medium to low relevance and should by this be left in Art. 13.
• According to us, the non-percussive drill rigs will remain “medium” in the flowchart but according to us “low relevance” so they also remain under the OND art 13. And even if they were “no low relevance”, the process noise is predominant and the process noise can not be suppressed with existing or conceivable technologies.
• CECE position: they should remain under the OND art. 13.

Header

Picture:

Equipment No.:	28
Equipment Name:	Hydraulic hammers
Equipment No. proposal:	0
Falls under article:	13
Stage:	0

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2019-02-20

Identification

Current definition:

28. Hydraulic hammer: Equipment which uses the hydraulic power source of the carrier machine to accelerate a piston (sometimes gasassisted), which then hits a tool. The stress wave generated by kinetic action flows through the tool into the material, which causes the material to break. Hydraulic hammers need a supply of pressurised oil to function. The complete carrier/hammer unit is controlled by an operator, usually seated in the cabin of the carrier.

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
m_operating	Operating mass	[kg]	-	-	-	n.a.	2000/14/EC Annex I item 28 and Annex III, Part B, item 28 / EN ISO 3744:1995	Dynamic noise test under defined test conditions	n.a.

ODELIA PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
Mass	n.a.	[kg]	Full	Full	Full	Stage I 120 + 3lg*m Stage II 117 + 3lg*m	No change: 2000/14/EC and EN ISO 3744:1995	No change: Dynamic noise test under defined test conditions	n.a.

Data:

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month	[min./day]	Typical area of usage:		Typical usage:	
78	200000	[month/yea	10	20	26	urban/suburban		n.a.	

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
0	0	0	Full	Full	Full	None	0	0	0

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month	[min./day]	Typical area of usage:		Typical usage:	
0	0	[month/yea	0	0	0	0		0	

CECE Conclusion

Economical Impact:

Today there is a technological barrier, the noise reduction is impossible because the noise of the process is predominant and depends on the material (hard rock and friable ground) that the user is breaking. For many years, all R&D efforts from competitors to reach this goal do not allow to improve noise emission.
CECE Position: Hydraulic hammers should remain under OND art. 13.

Environmental Impact:

Noise control remains an important element in new product development; nevertheless the research investments need to be balanced with both the environmental and economic benefits (taking into account technology, reliability and customer value).
Urban used breakers are typically the smallest range (from 4kW/50kg to 30kW/500kg) and there are used for a short period of time (20 days/year and 1.7 hour/day per work site). This category represent 50% of the whole population (approx. 100000pcs).
Only a few number of hydraulic hammers are continuously used during the whole day in urban areas: less than 5% of urban use breaker (approx. 5000pcs).
Due to this fact the environmental impact indicator should be significantly reduced.

Other Impact:

Summary:

- Change the technical parameter from "mass" to "power"
- CECE position: Hydraulic hammers should remain under the OND art. 13

Header

Picture:

Equipment No.:	42
Equipment Name:	ODELIA: 42a Piling equipment Impacting
Equipment No. proposal:	CECE new proposed name: 42a Impact driving piling equipment
Falls under article:	13
Stage:	0

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2019-02-08

Identification

Current definition:

42. Piling equipment: Pile installation and extraction equipment, e.g. impact hammers, extractors, vibrators or static pile pushing/pulling devices of an assembly of machines and components used for installation or extraction of piles, which also includes: - piling rig consisting of carrier machine (crawler, wheel or rail mounted, floating leader attachment, leader or guiding system); - accessories, e.g. pile caps, helmets, plates, followers, clamping devices, pile handling devices, pile guides, acoustic shrouds and shock/vibration absorbing devices, power packs/generators and personal lifting devices or platforms.

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
E_kin., impact	Working Tool	[kJ]					2000/14/EG Annex III; Part B; Typ 42 / ISO 3744:1995 / ISO 6395:1988		

ODELIA PROPOSAL Data:

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
impact entergy	diesel Hammer, hydraulic hammer	[kJ]	full	full	n.a.	132	EN 16228-1:2014, EN 16228-4:2014, EN 16228-7:2014	n.a.	The calculation of the EI factor is based on the total population, but the equipment is now divided into four subgroups
EI-Indicator:	Population (EU-28)	Typical operational mode:		[days/month]	[min./day]	Typical area of usage:		Typical usage:	
70	3000	[month/yea	10	20	60	urban/suburban/rural		intermittent	

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
impact entergy	diesel Hammer, hydraulic hammer	[kJ]	none	none	none	No Limit	EN 16228-1:2014, EN 16228-4:2014, EN 16228-7:2014	piling on a steel-pile	stay in article 13
EI-Indicator:	Population (EU-28)	Typical operational mode:		[days/month]	[min./day]	Typical area of usage:		Typical usage:	
0	600	[month/yea	8	15	45	urban/suburban/rural		intermittent	

CECE New definition proposal

Equipment nr 42a. Impact driving piling equipment according to DIN EN 16228-1 Annex A:
A.2.19 Cast-in-situ Pile Driving Rig
• Piling rig with leader equipped with diesel or hydraulic piling hammer or vibrator. For driving a casing with bottom cover. After driving, reinforcement and concrete will be poured in.
A.2.40 Diesel Hammer
• Piling hammer, driven by combustion of diesel fuel or other fuels, single or double acting. The impact occurs by striking the piston on an anvil at the bottom of the cylinder.
A.2.41 Hydraulic Hammer
Piling hammer, driven by hydraulic cylinder(s). The impact occurs by striking the impact body on pile cap directly on the pile.

Process:
Driving the pile (steel pipes /beams and concrete piles) by impact energy

CECE Conclusion

Economical Impact:

The proposed ODELIA study limit of 132 dB (A) for percussive piling equipment. In the database there are currently only 15 acoustic emission values. It will not be differentiated which pile driving method is used.
• Data amount is too low, a statistical analysis is not useful
• Setting a limit basis of the database is not traceable
Among the manufacturers are usually small and medium-sized businesses.
In a machine population out of <600 copies (in EU 300), this development work is not commercially viable, as it usually is customized individual pieces.

Environmental Impact:

The number of Sheet Pile Push-Pull Equipment in Europe is limited to less than 100 pieces.
This piling equipment can only working in a few geologial conditions. The enviromental impact is low, but the impairments is very long and the work output is also low.

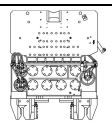
Field of application:
• possible only in a few geological conditions
• Low work output
• Mobile special heavy duty machine as a unit of hydraulic power pack and Sheet Pile Push-Pull or
• free stride sheet pile push-pull equipment with external stationary power

Summary:

1. The sound radiation is essentially determined by the process, the working process and on external parameters, in particular of:
a) The selection of the piling process – this is usually due to the structural requirements an the soil conditions, for example structural analysis, tender…..
b) The sound emission of the driving element is highly dependent on:
   - the material of the driving element (steel, plastic, concrete, wood…)
   - the length of the driving element (example: guitar string)
   - der geometry of the driving element (U-profile, Z-profile, AZ-profile, double-profile, hollow profile, double-T beam ...)
c) The Experience of the operator and the selection of machine parameters (strokes vibrator frequency, motor speed, rate of driving…)
d) The geological conditions (sandy soil, loam, rocky ground…)
e) The surroundings (reflecting surfaces), for example: adjacent buildings
2. Stricter exhaust gas regulations are counterproductive for sound reduction
3. Database is too imprecise: --> collection of data --> develop a uniform measurement standard
4. Type 42 should remain in Article 13, because there is still too little data. If limits are to be introduced after the data collection, this should depend on the process-relevant parameters!
5. By the product standard DIN EN 16228-1:2014, the comparison of different types of devices is not provided, therefore type 42 should be divided into four subcategories:
   42a Impact drivers
   42b Free hanging vibrators
   42c Leader guided vibrator
   42d Sheet Pile Push-Pull Equipment

Header

Picture:



Equipment No.:	42
Equipment Name:	ODELIA: 42b Piling equipment Vibrating + static
Equipment No. proposal:	CECE new proposed split: 42b Free suspended Vibratory driver piling equipment
Falls under article:	13
Stage:	0

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2019-02-08

Identification

Current definition:

42. Piling equipment: Pile installation and extraction equipment, e.g. impact hammers, extractors, vibrators or static pile pushing/pulling devices of an assembly of machines and components used for installation or extraction of piles, which also includes: - piling rig consisting of carrier machine (crawler, wheel or rail mounted, floating leader attachment, leader or guiding system); - accessories, e.g. pile caps, helmets, plates, followers, clamping devices, pile handling devices, pile guides, acoustic shrouds and shock/vibration absorbing devices, power packs/generators and personal lifting devices or platforms.

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A)	Current test-code:	Current test-mode:	Remark(s):
M_static	Working Tool	[kNm]					2000/14/EG Annex III; Part B; Typ 42 / ISO 3744:1995 / ISO 6395:1988		

ODELIA PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A)	Current test-code:	Current test-mode:	Remark(s):
static-moment	vibrator	[Nm]	-	-	n.a.	0	EN 16228-1:2014, EN 16228-4:2014, EN 16228-7:2014	n.a.	The calculation of the EI factor is based on the total population, but the equipment is now divided into four subgroups.

Data:

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
70	3000	[month/yea	10	20	60	urban/suburban/rural	intermittent	

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
static moment	free suspended vibratory driver	[kW]	none	none	none	none Limit	EN 16228-1:2014, EN 16228-4:2014, EN 16228-7:2014	vibrating on a tube	stay in article 13; calculation formula for Vibrator power: P = (2 * pi ^ 3 * M ^ 2 * f ^ 3) / mges P: vibratior power [kW] M: static Moment [kg m] f: rotations speed [min^-1] mges: dynamic mass [kg] [weight of vibrator plus weight of clamp]

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
0	500	[month/yea	8	15	45	urban/suburban/rural	intermittent	

CECE New definition proposal

Free Suspended Vibratory Driver according to EN 16228-1 Annex A: A.2.42.a

A.2.42.a Vibratory Driver
Vibrating system which will transmit a pulsating power to the pile, tube, sheet pile or beam.
Vibration is generated by a combination of rotating eccentric counterweights.
Vibrator is free suspended at a crawler crane or cable excavator or guided by a leader.

External stationary hydraulic power pack is required for the operation of the vibrator
- Hydraulic power pack / vibrator / cable dredger physical and acoustically separated
- Hydraulic power pack typ 29 OND 2000/14/EC
- Vibrator typ 42 OND 2000/14/EC
- Mobile crane type 38 OND 2000/14/EC

Process:
- soil is released by vibrations
- Jacking the pile by crowd forces of the leader
- Prevalent steel driving elements

CECE Conclusion

Economical Impact:

The proposed limit in the ODELIA study of 115 dB (A) for Pilling Equipment 42.b. Vibrating + Static bears no apparent relation to the average sound power level 128 dB (A) from the database.
A reduction of the sound power level from 128 dB (A) to 115 dB (A) means a reduction to 5%, not by 5% of the power level 128dB(A).
This is difficult to implement, perhaps even unviable. Among the manufacturers are usually small and medium-sized businesses.
In a machine population out of <500 copies in EU, this development work is not commercially viable, as it usually is customized individual pieces.

Environmental Impact:

The number of Free Suspended Vibratory Driver in Europe is limited to less than 500 pieces. Free Suspended Vibrator is driven from a Hydraulic power pack type 29 OND 2000/14/EC, which is physical and acoustically separated.
This vibrator typ is working in the urban / suburban and rural. The average operating time for a construction site is very low. Typically, these machines come at the beginning of a construction project for foundation work for use and spend in relation to the total construction very little work on this site.

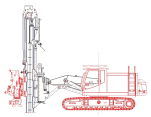
Field of application:
- Driving element with large dimensions
- mainly on large construction sites or on inaccessible conditions

Summary:

1. The sound radiation is essentially determined by the process, the working process and on external parameters, in particular of:
a) The selection of the piling process – this is usually due to the structural requirements an the soil conditions, for example structural analysis, tender…..
b) The sound emission of the driving element is highly dependent on:
   - the material of the driving element (steel, plastic, concrete, wood…)
   - the length of the driving element (example: guitar string)
   - der geometry of the driving element (U-profile, Z-profile, AZ-profile, double-profile, hollow profile, double-T beam ...)
c) The Experience of the operator and the selection of machine parameters (strokes vibrator frequency, motor speed, rate of driving…)
d) The geological conditions (sandy soil, loam, rocky ground…)
e) The surroundings (reflecting surfaces), for example: adjacent buildings
2. Stricter exhaust gas regulations are counterproductive for sound reduction
3. Database is too imprecise: --> collection of data --> develop a uniform measurement standard
4. Type 42 should remain in Article 13, because there is still too little data. If limits are to be introduced after the data collection, this should depend on the process-relevant parameters!
5. By the product standard DIN EN 16228-1:2014, the comparison of different types of devices is not provided, therefore type 42 should be divided into four subcategories:
   42a Impact drivers
   42b Free hanging vibrators
   42c Leader guided vibrator
   42d Sheet Pile Push-Pull Equipment

Header

Picture:



Equipment No.:	42
Equipment Name:	ODELIA: 42b Piling equipment Vibrating + static
Equipment No. proposal:	CECE new proposed split: 42c High frequency Vibrator driver
Falls under article:	13
Stage:	0

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2019-02-08

Identification

Current definition:

42. Piling equipment: Pile installation and extraction equipment, e.g. impact hammers, extractors, vibrators or static pile pushing/pulling devices of an assembly of machines and components used for installation or extraction of piles, which also includes: - piling rig consisting of carrier machine (crawler, wheel or rail mounted, floating leader attachment, leader or guiding system); - accessories, e.g. pile caps, helmets, plates, followers, clamping devices, pile handling devices, pile guides, acoustic shrouds and shock/vibration absorbing devices, power packs/generators and personal lifting devices or platforms.

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
M_static	Working Tool	[kNm]					2000/14/EG Annex III; Part B; Typ 42 / ISO 3744:1995 / ISO 6395:1988		

ODELIA PROPOSAL Data:

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
Pushing force	static pile devices	[kN]	-	-	n.a.	0	EN 16228-1:2014, EN 16228-4:2014, EN 16228-7:2014	n.a.	The calculation of the EI factor is based on the total population, but the equipment is now divided into four subgroups.

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
70	3000	[month/yea	10	20	60	urban/suburban/rural		intermittent	

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
power of vibrator	vibrator	[kW]	none	none	none	none Limit	EN 16228-1:2014, EN 16228-4:2014, EN 16228-7:2014	vibrating on a tube	stay in article 13; calculation formula for Vibrator power: P = (2 * pi ^ 3 * M ^ 2 * f ^ 3) / mges P: vibratior power [kW] M: static Moment [kg m] f: rotations speed [min^-1] mges: dynamic mass [kg] [weight of vibrator plus weight of clamp]

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
0	1000	[month/yea	8	15	45	urban/suburban/rural		intermittent	

CECE New definition proposal

A.2.42.b High Frequency Vibratory Driver
Vibrating system, this will transmit a pulsating power to the pile, tube, sheet pile or beam.
Vibration is generated by a combination of rotating eccentric counterweights.
Vibrator is guided by a leader of a piling rig.
Mobile special heavy construction machine
- A unit of hydraulic power pack and a vibrator
--> sound emission for total machine
- Compact transport dimensions of the entire machine is required
-->limited opportunities for noise to Vibrator and basic machine
Process:
- soil is released by vibrations
- Jacking the pile by crowd forces of the leader
- Prevalent steel driving elements
Typical machine parameters:
- frequency: 25 – 45 Hz
- Amplitude: determined by imbalance and oscillating mass
- application requires compact dimensions of the vibrator

CECE Conclusion

Economical Impact:

The proposed in the study Odelia limit 115 dB (A) for Pilling Equipment 42.b. Vibrating + Static bears no apparent relation to the average sound power level 128 dB (A) from the database.
A reduction of the sound power level from 128 dB (A) to 115 dB (A) means a reduction to 5%, not by 5% of the power level 128dB(A)!
This is difficult to implement, perhaps even impossible! Among the manufacturers are usually small and medium-sized businesses.
In a machine population out of <100 copies in EU, this development work is not commercially viable, as it usually is customized individual pieces.

Environmental Impact:

The number of Leader guided high frequency vibratory driver in Europe is limited to less than 1000 pieces.
This vibrator typ is working in the urban / suburban and rural. The average operating time for a construction site is very low. Typically, these machines come at the beginning of a construction project for foundation work for use and spend in relation to the total construction very little work on this site.

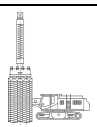
Field of application:
- Mainly on construction sites with limited space requirements
- High working efficiency / short piling period
- Mobile multifunction machine for different special heavy constructions / applications

Summary:

1. The sound radiation is essentially determined by the process, the working process and on external parameters, in particular of:
a) The selection of the piling process – this is usually due to the structural requirements an the soil conditions, for example structural analysis, tender…..
b) The sound emission of the driving element is highly dependent on:
   - the material of the driving element (steel, plastic, concrete, wood…)
   - the length of the driving element (example: guitar string)
   - der geometry of the driving element (U-profile, Z-profile, AZ-profile, double-profile, hollow profile, double-T beam ...)
c) The Experience of the operator and the selection of machine parameters (strokes vibrator frequency, motor speed, rate of driving…)
d) The geological conditions (sandy soil, loam, rocky ground…)
e) The surroundings (reflecting surfaces), for example: adjacent buildings
2. Stricter exhaust gas regulations are counterproductive for sound reduction
3. Database is too imprecise: --> collection of data --> develop a uniform measurement standard
4. Type 42 should remain in Article 13, because there is still too little data. If limits are to be introduced after the data collection, this should depend on the process-relevant parameters!
5. By the product standard DIN EN 16228-1:2014, the comparison of different types of devices is not provided, therefore type 42 should be divided into four subcategories:
   42a Impact drivers
   42b Free hanging vibrators
   42c Leader guided vibrator
   42d Sheet Pile Push-Pull Equipment

Header

Picture:



Equipment No.:	42
Equipment Name:	ODELIA: 42b Piling equipment Vibrating + static
Equipment No. proposal:	CECE new proposed split: 42d Sheet Pile Push-Pull Equipment
Falls under article:	0
Stage:	0

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2019-02-08

Identification

Current definition:
0,0

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
M_static	Working Tool	[kNm]					2000/14/EG Annex III; Part B; Typ 42 / ISO 3744:1995 / ISO 6395:1988		

ODELIA PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
Pushing force	static pile devices	[kN]	-	-	n.a.	0	EN 16228-1:2014, EN 16228-4:2014, EN 16228-7:2014	n.a.	The calculation of the EI factor is based on the total population, but the equipment is now divided into four subgroups.

Data:

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
70	3000	[month/yea	10	20	60	urban/suburban/rural	intermittent	

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to ≤	Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
pull-down load	sheet pile push-pull equipment	[kN]	none	none	none	none Limit	EN 16228-1:2014, EN 16228-4:2014, EN 16228-7:2014	pushing of a profile	stay in article 13

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
0	100	[month/yea	8	15	45	urban/suburban/rural	intermittent	

CECE New definition proposal

A.2.17 Sheet Pile Push-Pull Equipment
Equipment guided by a leader, or free riding at the top of a sheet pile wall. Sheet piles will be installed or pulled by force of hydraulic cylinders. Sheet piles are gripped by hydraulic clamps.

Process:
- Jacking the pile by pretension of the hydraulic cylinders
- exclusively steel sheet piles

Typical machine parameter:
- Extracting and pull-down load: 600/800 kN

CECE Conclusion

Economical Impact:
The proposed limit in the ODELIA study of 115 dB (A) for Pilling Equipment 42.b. Vibrating + Static bears no apparent relation to the average sound power level 128 dB (A) from the database.
A reduction of the sound power level from 128 dB (A) to 115 dB (A) means a reduction to 5%, not by 5% of the power level 128dB(A)!
This is difficult to implement, perhaps even unviable. Among the manufacturers are usually small and medium-sized businesses.
In a machine population out of <100 copies in EU, this development work is not commercially viable, as it usually is customized individual pieces.

Environmental Impact:

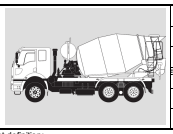
The number of Sheet Pile Push-Pull Equipment in Europe is limited to less than 100 pieces.
This piling equipment can only working in a few geologial conditions. The enviromental impact is low, but the impairments is very long and the work output is also low.

Field of application:
- possible only in a few geological conditions
- Low work output
- Mobile special heavy duty machine as a unit of hydraulic power pack and Sheet Pile Push-Pull or
- free stride sheet pile push-pull equipment with external stationary power

Summary:
1. The sound radiation is essentially determined by the process, the working process and on external parameters, in particular of:
a) The selection of the piling process – this is usually due to the structural requirements an the soil conditions, for example structural analysis, tender…..
b) The sound emission of the driving element is highly dependent on:
   - the material of the driving element (steel, plastic, concrete, wood…)
   - the length of the driving element (example: guitar string)
   - der geometry of the driving element (U-profile, Z-profile, AZ-profile, double-profile, hollow profile, double-T beam ...)
c) The Experience of the operator and the selection of machine parameters (strokes vibrator frequency, motor speed, rate of driving…)
d) The geological conditions (sandy soil, loam, rocky ground…)
e) The surroundings (reflecting surfaces), for example: adjacent buildings
2. Stricter exhaust gas regulations are counterproductive for sound reduction
3. Database is too imprecise: --> collection of data --> develop a uniform measurement standard
4. Type 42 should remain in Article 13, because there is still too little data. If limits are to be introduced after the data collection, this should depend on the process-relevant parameters!
5. By the product standard DIN EN 16228-1:2014, the comparison of different types of devices is not provided, therefore type 42 should be divided into four subcategories:
   42a Impact drivers
   42b Free hanging vibrators
   42c Leader guided vibrator
   42d Sheet Pile Push-Pull Equipment

Header

Picture:



Equipment No.:	55
Equipment Name:	Truck mixers
Equipment Characteristic:	0
Falls under article:	13
Stage:	0

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2019-02-08

Identification

Current definition:

55. Truck mixer: A vehicle which is equipped with a drum to transport ready-mixed concrete from the concrete mixing plant to the job site; the drum may rotate when the vehicle is driving or stand still. The drum is emptied on the job site by rotating the drum. The drum is driven either by the driving engine of the vehicle or by a supplementary engine.

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Primary energy source (engine)	[kW]	Full	Full	Full	0	OND, Annex B, No. 55		

ODELIA PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
P_inst.,net.	Engine (exhaust+intake), fans, hydraulic transmission, noise radiation of drum mixing and dumping	[kW]	0,0	55,0	-	109		0	0
"	"	"	-	-	55,0	90+11lg*P		0	0

Data:

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
60	50000	[month/yea	12	20	20	urban/suburban/rural	intermittent	

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Proposal limit value [db(	Proposal for test-code:	Proposal test-mode:	Remark(s):
None	None	None	None	None	None	None	Use EN ISO 12001:2012		

EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]	[min./day]	Typical area of usage:		Typical usage:	
60	32000	[month/yea	10	20	20	urban/suburban/rural	intermittent	

CECE Conclusion

Economical Impact:

There are two possible ways to supply the power for the hydraulic pump: Power Take Off (PTO) of the truck engine (95% market share and ca. 220- 360 kW power range) and auxiliary engine (5% markets hare and ca. 45-90 kW).
Examples and the poulation in Germany can be found in Annex 3.

Environmental Impact:

People are commonly aware of truck mixers in transit from the mixing plant to the job site. Driving and waiting is not part of the machine in operation process, it is part of the transportation process. The transportation process is excluded in the scope of the directive.
Distribution of the noise emission over time:
Remixing upon arrival on the job site takes about 4 minutes. The remixing is generally done under full power. For loading and unloading instead little power and minimum rpm are necessary. Unloading time into a concrete pump is about 10 min. Afterwards the cleaning also at min rpm takes another 5 min. During transit and waiting time only minimum rpm are allowed not to influence the concrete properties.
The noise created by turning over the material in the drum during transit or loading and unloading can not be influenced.
A truck mixer will do about 5 tours a day in average. That means the portion of high power and rpm operation is only about 4 %. The relevance to society may be questioned.

Other Impact:

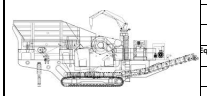
A large portion of the data is incorrect (wrong companies, cranes included, concrete mixers included, no truck mixers exists below 45 kW, etc.)

Summary:

- Low population no relevance to society during stationary use.
- The period of emitting noise during operation is short in comparison to road travelling time.
- Influence of the construction equipment manufacturer on engine manufacturers and truck- manufacturers very low due to little quantity.
- To make meaningful groups for limits it would be necessary to split the products into categories with even lower quantities (PTO driven/auxiliary engine, combustion engine/electric motor)
- CECE position: Truck mixers should remain under OND art. 13.

Header

Picture:



Equipment No.:	102-103
Equipment Name:	Mobile sieve installations / mobile waste breakers (wood, concrete)
Equipment Characteristic:	Steel-tracked
Falls under article:	None
Stage:	I

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

Summary-sheet, ver.: 2018-02-08

Identification

Current definition:
None

Current regulation

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
none	none	none	none	none	none	none	none	none	none

ODELIA PROPOSAL Data:

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]		[min./day]	Typical area of usage:		Typical usage:	
54 / 49	15000	[month/yea	10	20	240	urban/suburban/rural		intermittent	

CECE PROPOSAL

Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Proposal limit value [db(	Proposal test-code:	Proposal test-mode:	Remark(s):
none	none	none	none	none	none	none	none	none	none
EI-Indicator:	Population (EU-28)	Typical operational mode:	[days/month]		[min./day]	Typical area of usage:		Typical usage:	
40	15000	[month/yea	9	18	240	urban/suburban/rural		intermittent	

CECE Conclusion

Economical Impact:

Economical impact of reduction of process noise:

• As an alternative to metal screens, it is possible to use rubber or polyurethane screens. By doing so it is possible that process noise, generated by screens, could be reduced. However, rubber or polyurethane screens have up to 30% less throughput than metal screens because of their depth in relation to the screening area. To overcome this, the time the machine operates will be increased by 43% or two machines will be required instead of one to process the existing material. As a result, investment costs and processing costs increase.

Environmental Impact:

• In addition to the economic impact, there will also be increased exhaust emissions due to longer operating times for a machine or the use of two machines. This increase in exhaust emissions is the negative consequence of reducing noise emissions.

There is no rational argument for adding mobile crushing and screening equipment to Directive 2000/14/EC on noise emission by outdoor equipment, when the following has been considered:

i. The number of crushing and screening machines operating in urban areas is very low.
ii. Operating time when a crushing or screening machine is used in an urban area is typically very low, ranging from one day to a few weeks.
iii. It is not possible to standardize a procedure for the measurement of process noise.
iv. Process noise reduction for these types of machines creates other negative effects on the environment.
v. Mobile crushing and screening machines are most widely used in quarries and recycling applications, which are non-urban areas, where noise emission does not impact on the surrounding environment.

Other Impact:

Within the EU there are approximately 10,000 to 15,000 mobile crushing and screening machines.
55-66% (approx. 9000) of these are mobile screening machines and 35-45% (approx. 6000) are mobile crushing machines. These figures are based on the estimation of new crushing and screening machines sold in the EU per year and their expected lifetime.
An estimated 615 mobile crushing and screening machines, from a total of 15,000 machines, operate in urban areas within the EU. This is a very low number of machines which contribute to environmental noise emissions. Even allowing for deviation in the estimation, this would still represent a very small number of machines operating in urban areas.
Process noise measurements rely on several factors, including:
i. Type of feed material
ii. Feed material size
iii. Crusher settings
iv. How the separation of fines material is setup
v. The layout of the construction site and the position of machines
Due to the significant variation across these factors, it is not possible to successfully create a standardized measurement of process noise.
Natural stone found within different quarry sites varies widely, and each type of natural stone has different sets of properties. Due to a lack of standardization in the material being processed, it is not possible to create a standardized procedure for the measurement of noise emissions. As each type of material being processed is different this means no reproducible values are available. The only consistent noise emission is from the machine itself.

The distinction between the number of mobile crushing and screening machines working solely in quarries or solely in recycling applications is difficult. The European working group CEN/TC 151/WG9 is working on a standard to divide this type of machinery into heavy mobile machines and compact mobile machines – irrespective of application area.
The main components of heavy mobile machines need to be removed for transportation to comply with transport rules. Therefore, these machines are not used in demolition sites in urban areas due to the additional cost and time associated with their transport.
By contrast, compact mobile machines are very often used in quarries due to savings in investment costs and where smaller processing capacity is sufficient. They

Summary:

• Odelia does not give definitions so it is difficult to estimate numbers of machines etc.
• No standardized procedure currently exists for testing noise emissions. Process noise is dependent on several different factors.
• Using rubber screens to reduce process noise has negative effects on the environment (increased engine emissions).
• The number of mobile crushing and screening machines operating in urban areas is very low.
• When crushing or screening machines operate in urban areas the time they operate is limited.

Annex

Annex I: Compaction machines CECE schematic overview

Annex II: Conveying and spraying machines for concrete and mortar – Types and population in Germany

Annex III: Equipment nr 17 - Drill Rigs Categories

Annex IV: Equipment nr 42 - piling equipment configurations

Annex V: Equipment nr 55 - Truck Mixers – Overview

Annex VI: Distribution of mobile crushing and screening plants in different application areas

Annex VII: Correlation between test codes for vibrating rollers

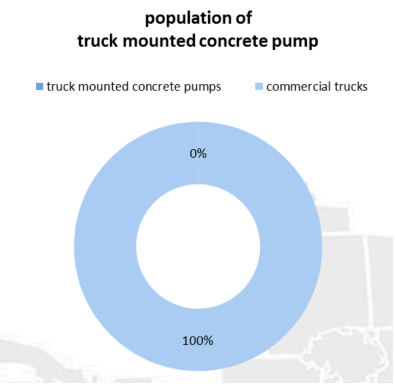
Annex I: Compaction machines CECE schematic overview

		CECE Proposal		Reference table		
New Eq. No.:	New Equipment name/definition:	Proposed limit CECE Scenario "Merge groups"		Remarks	Base standard for measurement	Additional requirement for measurement
		Power Cat. [kW]	[db(A)]	CECE; "Merge groups"		
8a	Compaction machines: Vibrating roller	P ≤ 8	105	Treat Vibratory rollers in the same manner and use same test-code for all vibrating rollers (ride-on, controlled by bystanding operator, handguided, remote controlled, ...) e.g. by measuring on a cushion Limit values for hand guided vibratory-rollers then de jure are changed Proposal for definition of operating modus acc. to ISO 6165 and ISO 8811 to:"Direct controlled machines"; "Remote controlled machines"; "pedestrian controlled machines"	EN ISO 3744:1995	2000/14/EC Annex III; Part B; Chapter 8; Indent ii)
		8 < P ≤ 70	106			
		P > 70	86 + 11 x log P			
8b	Compaction machines: Non-vibrating roller	P ≤ 55	101	Treat Non-vibratory rollers in the same manner and use same test-code for all non-vibrating rollers (ride-on, controlled by bystanding operator, handguided, remote controlled, ...) e.g. by measuring on a reverberant surface in stationary condition. Proposal for definition of operating modus acc. to ISO 6165 and ISO 8811 to:"Direct controlled machines"; "Remote controlled machines"; "pedestrian controlled machines"	EN ISO 3744:1995	2000/14/EC Annex III; Part B; Chapter 0
		P > 55	82 + 11 x log P			

8c	Compaction machines: Vibratory rammers	P ≤ 8	108	According the CECE-proposal limit values for rammers exceeding 70 kW become obsolete	EN ISO 3744:1995	2000/14/EC Annex III; Part B; Chapter 8; Indent iii) New reference should be given in the directive to: EN 500-4:revised version applying the re-grouping of category 8-equipment as proposed by CECE and measuring rammers on the gravel-track.
		P > 8	109			
8d	Compaction machines: Vibratory plates	P ≤ 3	105	According the CECE-proposal limit values for vibratory plates exceeding 70 kW become obsolete	EN ISO 3744:1995	2000/14/EC Annex III; Part B; Chapter 8; Indent iil) New reference should be given in the directive to: EN 500-4:revised version applying the re-grouping of category 8-equipment as proposed by CECE and measuring vibratory-plates on the gravel-track.

Annex II: Conveying and spraying machines for concrete and mortar – Types and population in Germany

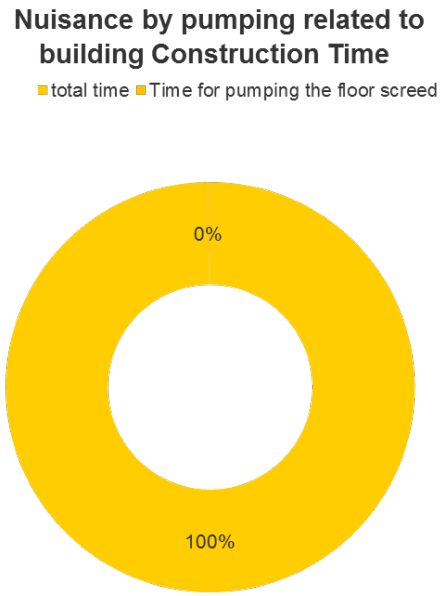
A. Truck mounted concrete pump working on a typical job site in Germany, being fed by a truck mixer.



Population in Germany:

Number of licensed truck mounted concrete pumps in Germany = 1601
licensed trucks in Germany = 2 700 000
Concrete Pumps / Commercial Trucks = 0,000592, 600 ppm, 6 CP per 10 000 CT.
The relevance of annoyance to society by this type of machine may be questioned

B. Pneumatic conveyor for the transport of floor screed with mixing function, Mixer pump for conveying of exterior plaster



Distribution of the noise emission over time:

The noise emission is measured under maximum output of the machine. The machines run mainly (70%) in mixing operation and 30% in pump operation.

Annual recorded run time is about 1,000 hours.

30% is done at rated rpm as the pumping function requires the rated power. Noise emissions are rated at full load to be comparable among manufacturers.

For single-family house with 200m² about 10m³ floor screed are needed. Mixing operation is about 2,5 h at rated rpm and load. Building construction takes about 9 months or 1500h. Laying the floor screed about a day.

Duration of the discomfort caused by the pumping function 2,5h.

Annex III: Equipment nr 17: Drill Rigs Categories

A. Non-percussive

Non-percussive i.e. Rotary drilling is a method in which the drilling tool at the bottom of the borehole is rotated and at the same time, a feed force is applied by a feed system or drill collar. The ground or rock at the bottom of the borehole is crushed or cut by pressure, shear or tensile stress produced by the different drilling tools. The cuttings are periodically or continuously removed out of the borehole.

A.1. Rock Drilling

Drilling in solid formations like granite, limestone, concrete…
This method is using very high feed force and rotation to crush the formation. To generate the high feeding force the drill rigs are very heavy.

A.2. Overburden Drill Rig

Overburden non-percussive drilling (anchor drilling) is characterized by simultaneous drilling with drill pipe and drill casing. The casing protects from collapsing of the unstable borehole in soft overburden layers. After retracting the drill pipe, a product (strand anchor, self-drilling anchor, rebar installation) can be installed via the casing into the borehole.

Drill rigs are mounted on crawlers and they are able to position the drill mast in various directions. Drill pipe and drill casing are driven by a top hammer (top drifter).

Main application is special foundation construction.

A.3. Horizontal Directional Drilling technique (HDD)

Operating principle

Drilling starts in an entrance pit which allows easy bore head penetration into the ground.

Additionally, a starting pit, an intermediary pit or a target pit may be prepared on the construction.

It is supplied with energy via an integrated drive unit. The drill rig hydraulically pushes the drill stems through the ground to the target pit, starting with the bore head. This is how a pilot bore is produced between the entrance pit and the target pit. The drill stem guidance prevents the drill stems getting bent between the sub-saver and the entrance point in harder ground.

Once the bore head has arrived at the target pit, the operator demounts the bore head and mounts the back–reamer as well as the long pipe to the stem.

The drill rig pulls the drill stem along with the back-reamer and long pipe back through the bore hole with hydraulic pressure

A.4. Piling Drill Rig

Three systems are mainly used for piled drill rigs:

a. Drilling with Kelly

Classic bored pile system which transfers torque and vertical crowd force to drilling tools via a telescopic kelly bar.

- Borehole wall is supported either by excess hydrostatic pressure or by drill casings.
- Installation of drill casings by rotary drive or by casing oscillators attached to rig.
- By using different drilling tools, the system can be employed in all types of soil (including bedrock).

b. Drilling with Continuous Flight Auger (CFA)

Significant increase of drilling performance can be reached when using a continuous flight auger which is installed in one continuous pass:

- The soil which is loosened at the auger tip is conveyed to the
- surface by the auger flight.
- Borehole wall is supported by the auger filled with drill spoil.
- Use of a crowd winch facilitates penetration into hard soil formations.
- Attaching a kelly extension increases the drilling depth by 6 - 8 m.
- Pile is concreted through hollow stem by means of concrete pump.
- Concrete is pumped by a concrete pump through the hollow stem of the auger while extracting the auger. Concrete feed pressure can be measured at the tip of the continuous flight auger.

c. Twin Rotary Drive Drilling System for small diameters (FoW)

Drill casing and auger are drilled into the ground simultaneously by two rotary drives rotating in opposite directions.

- The soil which is loosened at the auger tip is conveyed to the surface by the auger flight
- inside of the casing and discharged through a gate underneath the rotary drive.
- Concrete is placed through hollow stem auger as drill casing and auger are simultaneously withdrawn.
- A special design of the rotary drives allows the construction of piled walls directly in **f**ront **o**f existing **w**alls of adjacent buildings (=> FoW system). The usable excavation pit area is maximized.

A.5. Vibrating Drill Rig

Vibratory drilling is a technique that advances the drill string and drill casing by vibration rotation. A special drill head directs sinusoidal vibrations (50 to 150 hertz) down the drill string. A slow rotation is added when necessary.

Drill rig can be mounted on truck or on a crawler type carrier. Application is mainly exploration drilling, since relatively undisturbed core samples of almost any overburden formation can be gained without the use of air, fluid or other additives.

A.6. Core Exploration Drill Rigs

Drill rigs using high speed (500 -3000 rpm) spindle and diamond bit.

This type of drill rig is used to extract core samples of rock.

A.7. (Truck Based) Water Well Drill Riggs

Drill rigs used for the installation of (deep) wells, ground water control or exploration holes.
The hydromechanic drive can be powered by a PTO (Power Take Off) or an additional deck engine (diesel or electrical power pack)

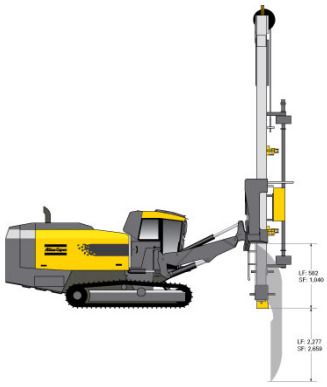
B. Percussive (including rotary-percussive)

Percussive drilling is a method by which the hole is produced by crushing the ground or rock at the bottom of the drill hole by striking it with the drilling tool and removing the cuttings out of the bore hole.

Rotary percussive drilling is performed by a piston striking directly on the bit (down the hole hammer drills) or by percussive energy transmitted via a drill string to the bit. The piston is powered by either hydraulic fluid or compressed air"

B.1. Rock Drilling Top Hammer System Coprod

For the principle, see the overview picture below



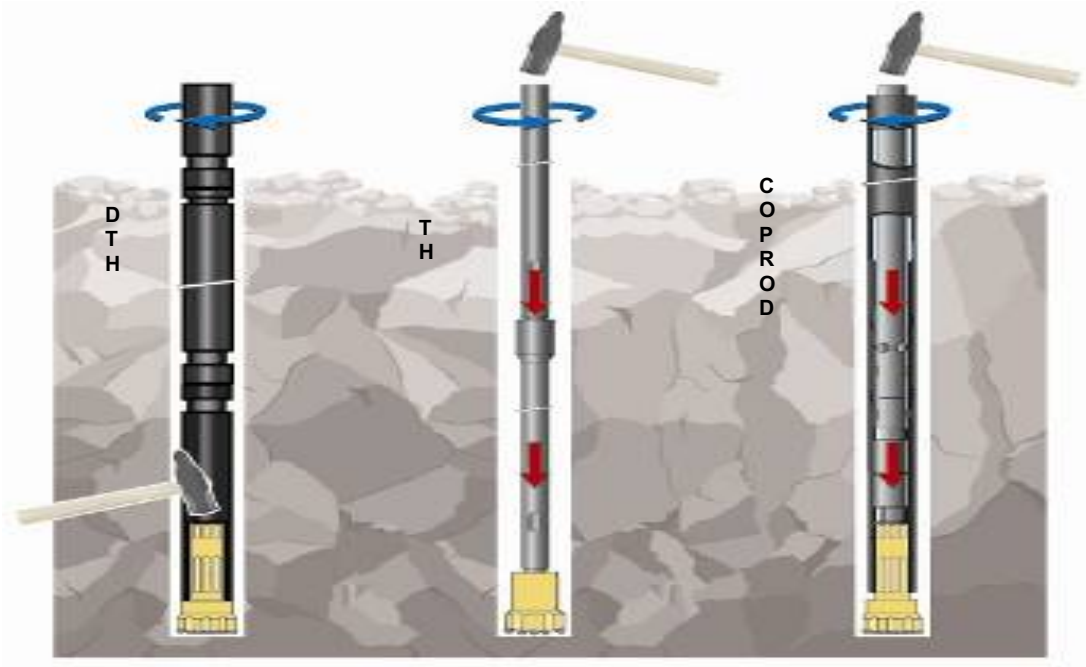
B.2. Rock Drilling Top Hammer (TH)

For the principle, see the overview picture below:

B.3. Rock Drilling Down The Hole (DTH)

For the principle, see the overview picture below

Overview Coprod, DTH, TH



B.4. Overburden Drill Rig

Overburden percussive drilling (anchor drilling) is characterized by simultaneous drilling with drill pipe and drill casing. The casing protects from collapsing of the unstable borehole in soft overburden layers. After retracting the drill pipe, a product (strand anchor, self-drilling anchor, rebar installation) can be installed via the casing into the borehole.

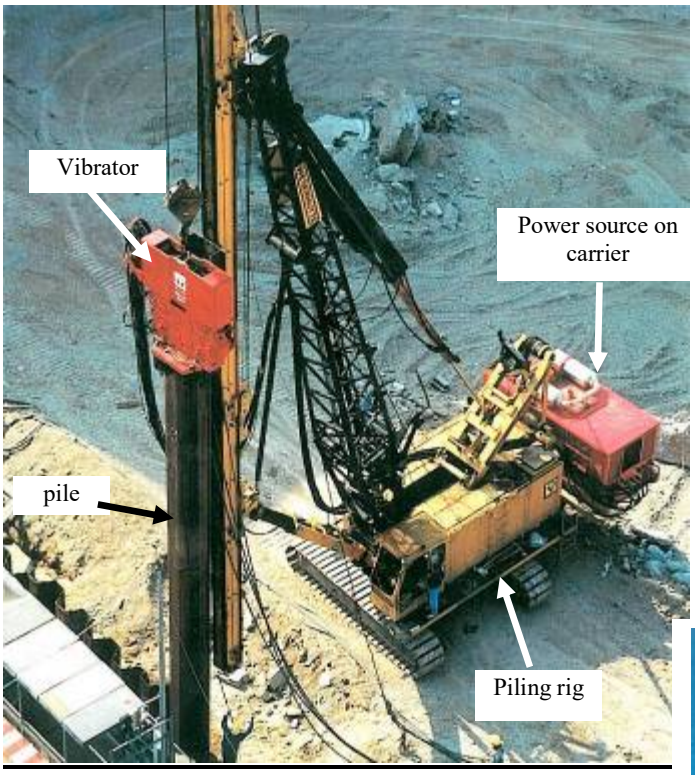
Drill rigs are mounted on crawlers and they are able to position the drill mast in various directions. Drill pipe and drill casing can be driven by a single rotary head or by two separate powered rotary heads (so called double-head method).

Main application is special foundation construction.

B.5. Horizontal Directional Drilling (HDD)

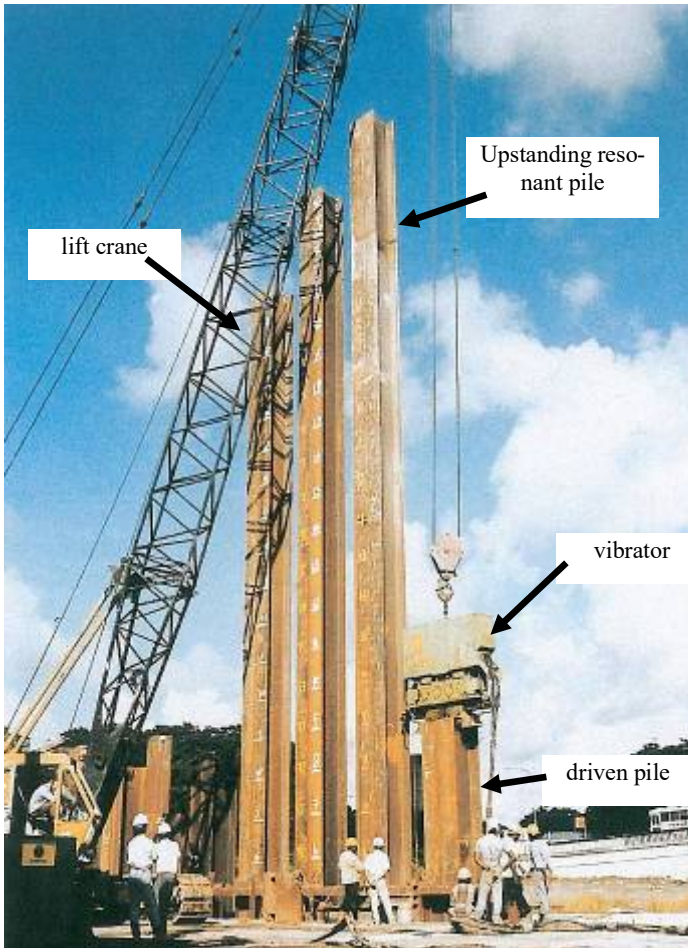
Horizontal Directional Drilling technique (HDD) idem as non-percussive but with an additional impact unit providing additional impact for areas with harder ground conditions.

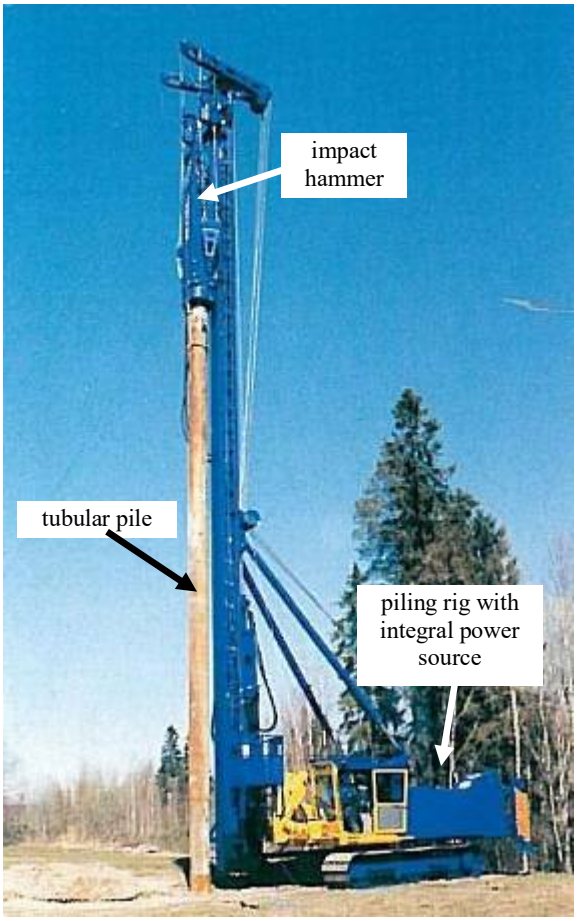
Annex IV: Equipment nr 42 - piling equipment configurations



Leader mounted vibrator driving bearing piles

Free hanging vibrator driving bearing piles





Impact hammer on piling rig driving tubular bearing piles

Free riding impact hammer driving interlocking piles following a vibrator

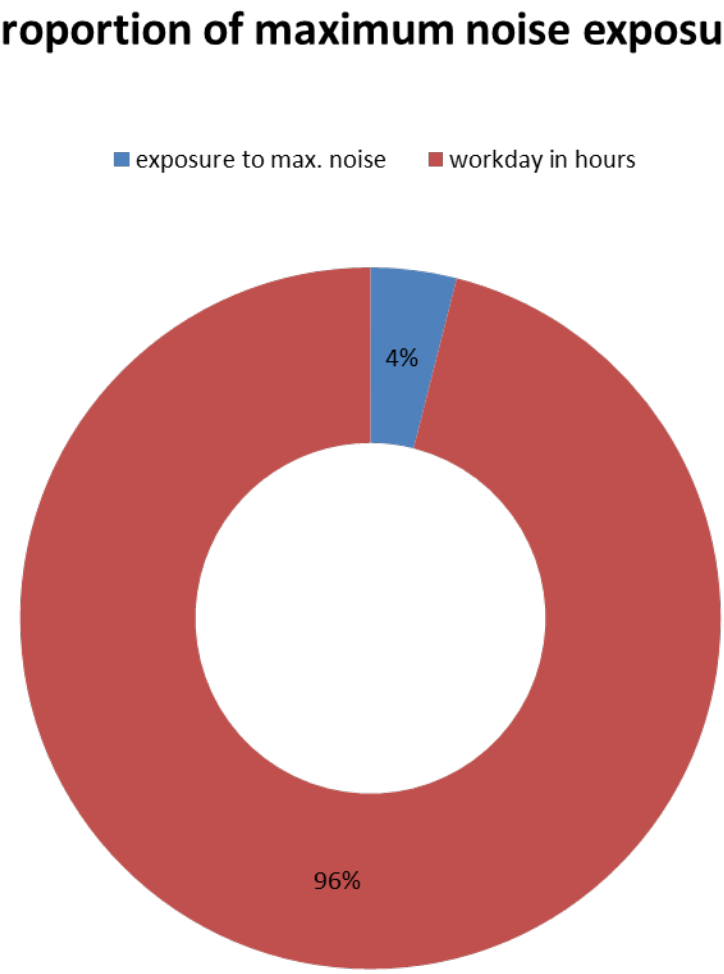
Annex V: Equipment nr 55 - Truck Mixers – Overview

The power to drive the drum is supplied by:

- PTO (**P**ower **T**ake **O**ff) of the truck (95 %)
- Separate engine (5%)

Population in Germany:

Truck mixers in Germany 6100,
licensed commercial trucks in Germany 2 700 000.
Truck mixers / Commercial Trucks = 0,00226, 2,2 promil,
2 Truck mixers / 1 000 Commercial Trucks.



The noise created by turning over the material in the drum during transit or loading and unloading cannot be influenced.

A truck mixer will do about 5 tours a day in average. That means the portion of high power and rpm operation is only about 4 %.

The relevance to society may be questioned.

Annex VI: Distribution of mobile crushing and screening plants in different application areas

The total population in the European Union of mobile crushing and screening plants is approx. 10.000 to 15.000. 55-65% (approx. 9.000) of these are mobile screening machines and 35-45% (approx. 6.000) are mobile crushing machines. These figures are based on the estimation of new crushing- and screening machines sold in the EU per year and their expected lifetime.

Mobile crusher and screening machines are often used in quarries and recycling applications. Recycling applications consist of recycling yards, demolition sites outside urban areas and demolition sites inside urban areas. Demolition sites outside urban areas are large road construction sites, e.g the reconstruction of motorways. Quarries, recycling yards and demolition sites outside urban areas are located far away from urban or populated area.

Mobile screens are very rarely used in demolition sites inside urban areas. Only crushing and screening machines which are located in demolition sites inside urban areas contribute to environmental noise exposure in urban areas.

The following distribution shows the different application areas of mobile crushing and screening machines.

Mobile Sieve Installations (Screens)

60% = Approx. 9,000	70% quarry	= approx. 6,300	
	30% recycling	= approx. 2,700	95% non-urban = 2,565 (recycling yard, demolition site)
			5% urban = 135 screens (demolition site inside urban area)

Mobile Waste Breakers (Crushers)

40% = Approx. 6,000	60% quarry	= approx. 3,600	
	40% recycling	= approx. 2,400	80% non-urban = 1,920 (recycling yard, demolition site)
			20% urban = 480 (demolition site inside urban area)

These diagrams show that in the European Union there are approximately 615 crushing and screening machines in urban areas - from a total number of approx. 15.000. This is a very small number of machines contributing to environmental noise exposure.

While these figures are estimations, it is relatively negligible if there are deviations in the values – as there is a very small number of mobile crushing and screening machines located in urban areas.

Annex VII: Correlation between test codes for vibrating rollers