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 ODEL-IA 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.



Contents

Intro	oduction	3
1.	Horizontal issues	4
2.	Equipment Executive Summary	5
3.	CECE Equipment Overview Sheets	8
Ann	ex I: Compaction machines CECE schematic overview	27
	ex II: Conveying and spraying machines for concrete and mortar – Types and population ermany	
Ann	ex III: Equipment nr 17: Drill Rigs Categories	31
Ann	ex IV: Equipment nr 42 - piling equipment configurations	40
Ann	ex V: Equipment nr 55 - Truck Mixers – Overview	42
	ex VI: Distribution of mobile crushing and screening plants in different application area	
	ex VII: Correlation between test codes for vibrating rollers	



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 highprecision 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);

 $D_{equip,\,situ,i} : \qquad distribution \,\, of \,\, inhabitants \,\, over \,\, sound \,\, level \,\, class \,\, i \,\, for \,\, each \,\, equipment \,\, type \,\, and \,\, in \,\, each \,\, situation$

 $\label{eq:Dsitu} D_{\text{situ},i:} \qquad \mbox{distribution of inhabitants over sound level class i for all equipment} \\ \mbox{and in each situation}$

• 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:
 - o 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 truckmanufacturers 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 truckmanufacturers 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



			Odelia Equi	ipment No.:	8a1					
5		Ter shall	Equipm	nent Name:		ction m	achines: Vibrat	ting Rollers, walk-behind		
eane	0	- Alexandre Alex	Equipment No	. proposal:			f 8a1 and 8a2)	ang Rollers, waik-bening		
	- torte	3	Falls un	der article:	12	ging of	our and ouz)			COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT
				Stage:	12					Summary-sheet ver : 2019-02-08
	Current definition:									Summary-sneet, Ver.: 2019-02-06
	propelled, tow with one or m one or more r have to be op possess an ir plates which	ved, walk-behind or ore metallic cylindri netallic cylindrical b erated by an attend udependent drive sy are made to vibrate	an attach ical bodie odies (dru ling opera ystem and . They are	nment to es (drums) ums) or r ator or by I where t e operate	a carryin or rubb rubber ty remote he opera ed by an	ig mach ier tyres res in w control; itor's sta attendir	ine. Compaction s; the operator's s thich the operation - towed roller: contain ation is to be four ng operator or as	r asphalt surfacing, through a rolling, tampir machines are subdivided as follows: - rolle tation is an integral part of the machine; - w on facilities for travelling, steering, braking a umpaction machines with one or more meta d on a tractor unit; - vibratory plates and vit an attachment to a carrier machine; - explo by explosion pressure. The machine is ope	ers for ride-on op ralk-behind roller and vibrating are llic cylindrical bo pratory rammers: sion rammers: co	erators: self-propelled compaction machines s: self-propelled compaction machines w disposed in such a way that the machine dies (drums) or rubber tyres which do no compactions machines with mainly flat to mpaction machines with mainly a flat pa
	Technical Parameter	of source:	Unit:	Range, fron	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
egulation	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
regul			-	8,0	70,0	-	109		-	0
_				-	-	70,0	89 + 11·log(P)		-	0
ŕ	Technical Parameter P inst.,net.	of source: Primary energy source	Unit: [kW]	Range, fron 0,0	Range, to <u>≤</u> 8,0	Range >	Current limit value [db(A 105	Current test-code: EN 500-4:2011 / ISO 3744:1995	Current test-mode: static-mode on	Remark(s): {tighten LV
50S	P_inst.,net.	(engine)	[KVV]	8,0	8,0 70.0	-	105	*	"cushion"	tighten LV
PROP			-	8,0	70,0	70.0	86 + 11·log(P)	i 	-	tighten LV
, ;;	El-Indicator:	Population (EU-28)	Typical opera	tional mode:	[days/month	[min./day]	Typical area of usage:		Typical usage:	
Data	53	200000	[month/yea	1	10	60	urban/suburban/rur		intermittency: 0	
	Technical Parameter	of source: Primary energy source	Unit:	Range, fron	Range, to <	Range >	Proposal limit value [db)	Proposal test-code: EN 500-4:2011 / ISO 3744:1995	Proposal test-mode: static-mode on	Remark(s): use correlation of CECE
SAL	P_inst.,net.	(engine)	[kW]	0,0	8,0	-	105		"cushion"	use correlation of CECE
ROPOSA				8,0	70,0	- 70,0	106 86 + 11·log(P)	•		use correlation of CECE
Ĕ	El-Indicator:	Population (EU-28)	Typical opera	tional mode:	[days/month) · · ·	Typical area of usage:		Typical usage:	
	46	30000	[month/yea	8	15	60	urban/suburban/r	ural	intermittent	
New definition proposal	propelled, to 8a - vibratin is performed 8b - non-vib performed ti 8c - vibrator 8d - vibrator	wed, ride-on, rer g rollers: self-pro d through a rolling rating rollers: self nrough a rolling a y plates: compac y rammers: comp	note con pelled or g and vib f-propelle action of t tions ma paction n	trolled, towed rating a ed comp the work ichines nachine	walk-be compaction of paction i king too with ma s with n	whind o tion m the wo machir I. inly fla nainly a	r an attachmer achines with or orking tool. nes with one or t base plates w a flat foot-plate	ing, through a rolling, tamping or vibrat t to a carrying machine. Compaction r ne or more metallic cylindrical bodies (more metallic cylindrical bodies (drunr which are made to vibrate. (shoe) as the compacting tool which is sping action of the working tool.	machines are s (drums) or rubb ns) or rubber ty	ubdivided as follows: er tyres. The compaction of materia res. The compaction of materials is
			rollers v	will decr	ease a	dminist	rative burden a	and reduce efforts for measurements.		
Conclusion	Negligible Other Impa For correlati correlation i European C Summary: • Simplify th should be tr European C • Map these • Align test of	ct: on between curre s based on the in ommission servic e number of cate eated like ride-on ommission alread categories by int codes with curren ance to the currer	tegration ces for th gories fro machine dy on 3 M tegration t EN 500	om of this om curr es. This March 2 of the r 0-4:201	equipm ime on I ently 9 f implies 010) new def 1	ent inte March, to 4 ca s alignr initions	o the noise me 3rd 2010. The tegories accorr nent of test-pro	oposed here, see the research-result a asurement-procedure for ride-on vibra limit values proposed cannot be achie ding to their primary operation (this aff ocedure for ped-contr. machines in acc ad Outdoor Noise Directive llowing the "New Approach"	ting rollers. Co eved if the curre ects pedestrian	rrelation has been presented to ent test mode persists.



		MF TRO	Equi	pment No.:	8a2					
10000			Equips	ent Name:		ction m	achines: Vibrat	ing Rollers, ride-on		
	the second		Equipment No	proposal:			8a1 and 8a2)	ing rollers, nue-on		
	(6)		Falls un	ler article:	12	ging of	our und ouz)			COMMITTEE FOR EUROPEAN
	\sim	~~~		Stage:						CONSTRUCTION EQUIPMENT
	Current definition:									Summary-sheet, ver.: 2016-08-24
	propelled, tow with one or m one or more r have to be op possess an ir plates which	ved, walk-behind or ore metallic cylindri netallic cylindrical b erated by an attend udependent drive sy are made to vibrate.	an attach cal bodie odies (dr ing opera stem and They are	ment to s (drums) ums) or r tor or by where the operate	a carryin) or rubb ubber ty remote ne opera d by an	ig mach ber tyres res in w control; itor's sta attendin	ine. Compaction ; the operator's s hich the operation - towed roller: continued to be four g operator or as	asphalt surfacing, through a rolling, tampir machines are subdivided as follows: -roll tation is an integral part of the machine; - w in facilities for travelling, steering, braking a mpaction machines with one or more metal d on a tractor unit; -vibratory plates and vit an attachment to a carrier machine; - explo by explosion pressure. The machine is ope	ers for ride-on operalk-behind roller alk-behind roller nd vibrating are lic cylindrical bo pratory rammers: sion rammers: co	erators: self-propelled compaction mach s: self-propelled compaction machines v disposed in such a way that the machine dies (drums) or rubber tyres which do nc compactions machines with mainly flat I mpaction machines with mainly a flat pa
		-				-	-			
	Technical Parameter		Unit:	Range, from	Range, to <	Range >	Current limit value [db(A		Current test-mode:	Remark(s):
tion	P_inst.,net.	Primary energy source (engine)	[kW]	0,0	8,0	-	105		stationary-mode on "cushion"	a Stage-II already
egulatior		=		8,0	70,0		106		 -	Stage-II already
reg								•	<u> </u>	Stage-II already
		-	ľ	-	-	70,0	86 + 11·log(P)			
_	Technical Parameter		Unit:	Range, from	Range, to <	Range >	Current limit value [db(A	Current test-code: EN 500-4:2011 / ISO 3744:1995	Current test-mode: static-mode on	Remark(s): Stage-II already
SAI	P_inst.,net.	Primary energy source (engine)	[kW]	0,0	8,0	-	105	LIN 300-4.2011 / 13O 3/44, 1993	"cushion"	Grage-II dileduy
PROPO		-		8,0	70,0	-	106	-		Stage-II already
PR		-				70.0	86 + 11·log(P)			Stage-II already
	El-Indicator	Population (FU-28)	Typical opera	tional mode:	Idays/month	fmin./davl	Typical area of usage:		Typical usage:	
Data:	53	200000	[month/yea		10	60	urban/suburban/rur	1al	intermittency: 0	
-	Technical Parameter		Unit:	Range, from			Proposal limit value (db)		Proposal test-mode:	Remark(s):
	P inst.,net.	Primary energy source	[kW]	0,0	8,0		105	EN 500-4:2011 / ISO 3744:1995	static-mode on	Stage-II already
SAL	-	(engine)							"cushion"	Stage-II already
PROPOSA				8,0	70,0		106			Stage-II already
RO		-		-	-	70,0	86 + 11·log(P)			Stage-II alleady
	EI-Indicator:	Population (EU-28)	Typical opera		[days/month	[min./day]	Typical area of usage:		Typical usage:	
	40	30000	[month/yea		10	300	urban/suburban/r	ural	intermittent	
definition propos	A machine v propelled, to 8a - vibratin is performed 8b - non-vib performed ti 8c - vibrator 8d - vibrator	wed, ride-on, ren g rollers: self-prop l through a rolling rating rollers: self nrough a rolling a y plates: compac y rammers: comp	naterials note con celled or and vib -propelle ction of t tions ma paction n	, e.g. ro trolled, towed rating a ed comp he work chines nachine	walk-be compaction of paction king too with ma s with n	ehind o ction ma the wo machin l. l. nainly fla nainly a	r an attachmer achines with or orking tool. les with one or t base plates w a flat foot-plate	ng, through a rolling, tamping or vibrat t to a carrying machine. Compaction r ne or more metallic cylindrical bodies (more metallic cylindrical bodies (drum /hich are made to vibrate. (shoe) as the compacting tool which is ping action of the working tool.	nachines are s drums) or rubb ns) or rubber ty	ubdivided as follows: er tyres. The compaction of materia res. The compaction of materials is
Conclusion	should be tr European C • Map these • Align test o • Give refere	eated like ride-on ommission alread categories by int codes with curren ence to the curren	machine dy on 3 Megration t EN 500 tt EN 500	es. This March 2 of the r 0-4:2011 0-4 in th	implies 010) new def I le amer	s alignn initions nded D	in the amende in the amende	ding to their primary operation (this affeccedure for ped-contr. machines in acc ad Outdoor Noise Directive Ilowing the "New Approach" lates and especially rammers.		



	Picture:								
		E	quipment No.:	8b2					
er		Equi	pment Name:		ction m	achines: NON-	Vibrating Rollers		
Header			No. proposal:	8b	cuonn	lacinities, NON-			
Ť		Falls	under article:	12					COMMITTEE FOR EUROPEAN
	<u> </u>		Stage:	12					CONSTRUCTION EQUIPMENT
	Current definition:		ouige.						Summary-sheet, ver.: 2016-08-24
Identification	propelled, towed, walk- with one or more metallic one or more metallic cyl have to be operated by possess an independer plates which are made to	behind or an attac c cylindrical bodi indrical bodies (c an attending ope t drive system ar o vibrate. They a	chment to les (drums) drums) or rator or by id where t re operate	a carryin s) or rubb rubber ty remote he opera ed by an	ig mach ber tyres res in w control; itor's sta attendir	ine. Compaction ; the operator's s hich the operator - towed roller: co ation is to be foun g operator or as	station is an integral part of the machine; on facilities for travelling, steering, brakin ompaction machines with one or more me nd on a tractor unit; - vibratory plates and	ollers for ride-on ope - walk-behind rollers g and vibrating are d etallic cylindrical bod vibratory rammers: co plosion rammers: co	rators: self-propelled compaction machin : self-propelled compaction machines will lisposed in such a way that the machines lies (drums) or rubber tyres which do not compactions machines with mainly flat ba mpaction machines with mainly a flat pad
	Technical Parameter of source:	Unit:	Range, fror	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
ent atior	P inst net Primary ene	rgy source [kW]	0,0	55,0		101	2000/14/EC Annex III; Part B; Chapter 0 / ISO	stationary-mode on	Stage-II already
Current regulation	(engine)		-	-	55,0	82 + 11·log(P)	3744:1995 2000/14/EC Annex III; Part B; Chapter 0 / ISO 3744:1995	"hard surface" stationary-mode on "hard surface"	Stage-II already
Ļ	Technical Parameter: of source:	Unit:	Range, fror	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
DE LIA PROPOSA	P_inst.,net. Primary ene (engine)	rgy source [kW]	0,0	55,0	-	101	EN 500-4:2011 / ISO 3744:1995	stationary-mode on "hard surface"	Stage-II already
UDELIA			-	-	55,0	82 + 11·log(P)	EN 500-4:2011 / ISO 3744:1995	stationary-mode on "hard surface"	Stage-II already
Ξ	El-Indicator: Population (EL	-28) Typical ope	rational mode:	[days/month	[min./day]	Typical area of usage:		Typical usage:	
Dat	53 200	000 [month/y	ea 10	10	60	urban/suburban/rur	al	intermittency: 0	
	Technical Parameter: of source:	Unit:	Range, fror	Range, to <u><</u>	Range >	Proposal limit value [db		Proposal test-mode:	Remark(s):
ş	P_inst.,net. (engine)	rgy source [kW]	0,0	55,0	-	101	EN 500-4:2011 / ISO 3744:1995	stationary-mode on "hard surface"	Stage-II already
CECE PROPOSA	• (enquie/			-	55.0	82 + 11·log(P)	EN 500-4:2011 / ISO 3744:1995	stationary-mode on	Stage-II already
Ω	El-Indicator: Population (EL	-28) Typical ope	ational mode:	Idays/month	[min/dav]	Typical area of usage:		"hard surface" Typical usage:	
۵.	40 75			5	360	urban/suburban/r	ural	intermittent	
CECE New definition proposal	propelled, towed, ride 8a - vibrating rollers: is performed through 8b - non-vibrating rol performed through a 8c - vibratory plates: 8d - vibratory ramme	npacts material -on, remote co self-propelled of a rolling and vi ers: self-propel rolling action of compactions m rs: compaction	s, e.g. ro introlled, or towed brating a lled comp f the wor achines machine	walk-be compact action of paction king too with ma	whind o ction m the wo machir l. hinly fla nainly a	r an attachmer achines with o orking tool. nes with one or t base plates v a flat foot-plate	r more metallic cylindrical bodies (dr vhich are made to vibrate.	n machines are su s (drums) or rubbe ums) or rubber tyre	ubdivided as follows: er tyres. The compaction of materials
Cece Conclusion	should be treated like European Commissio • Map these categorie • Align test codes wit • Give reference to th	ride-on machi on already on 3 es by integratio n current EN 50 e current EN 5	nes. This March 2 n of the 00-4:201 00-4 in th	s implies 2010) new def 1 ne amer	s alignr initions nded D	in the amendo	ding to their primary operation (this a coedure for ped-contr. machines in a ed Outdoor Noise Directive illowing the "New Approach" lates and especially rammers.		controlled vibrating roller only, which e correlation as submitted to the



	- G	L.	Equip	pment No.:	8c					CTCT	
	ſ	En la	Equipm	ent Name:	Compa	ction m	nachines; Vibra	tory Rammers		COMMITTEE FOR EUROPEAN	
			Equipment No.	proposal:	8c						
		LL .	Falls und	er article:	12					CONSTRUCTION EQUIPMENT	
				Stage:	1					Summary-sheet, ver.: 2019-02-08	
	propelled, tov with one or m one or more i have to be op possess an in plates which	ved, walk-behind or ore metallic cylindri netallic cylindrical b perated by an attend ndependent drive sy are made to vibrate.	an attach cal bodies odies (dru ing opera rstem and . They are	ment to s (drums ums) or r tor or by where the operate	a carryir b) or rubb rubber ty remote he opera d by an	ig mach per tyres res in w control; itor's sta attendir	ine. Compaction s; the operator's s hich the operator - towed roller: co ation is to be foun ng operator or as	r asphalt surfacing, through a rolling, tampin machines are subdivided as follows: - rolle station is an integral part of the machine; - w on facilities for travelling, steering, braking a ompaction machines with one or more metal d on a tractor unit; - vibratory plates and vit an attachment to a carrier machine; - explos by explosion pressure. The machine is ope	rs for ride-on ope alk-behind rollers nd vibrating are d lic cylindrical boo pratory rammers: co sion rammers: co	rators: self-propelled compaction machines : self-propelled compaction machines w isposed in such a way that the machine lies (drums) or rubber tyres which do no compactions machines with mainly flat to mpaction machines with mainly a flat pa	
	Fechnical Parameter	of source:	t loit:	Range, from	Range, to <	Range >	Current limit value [db(A	Qurrent test-code:	Current test-mode:	Remark(s):	
	recinical Palamete	or source.	Unit.	Kange, non	riange, to s	nalige >	Content init value (col)	2000/14/EC Annex III; Part B; Chapter 8; Indent iii)	dunamic-mode on	0	
egulation	P_inst.,net.	Primary energy source (engine)	[kW]	0,0	8,0	-	108	/ EN 500-4 Rev. 1:1998 Annex C / ISO 3744:1995	"gravel-track"		
regulat		-		8,0	70,0	-	109		-	0	
		-	•	-	-	70,0	89 + 11·log(P)		-		
Ł	P inst., net.	Primary energy source	Unit: fkWl	Range, from 0,0	Range, to <	Range >	Current limit value [db(A	Current test-code: EN 500-4:2011 / ISO 3744:1995	Current test-mode: dynamic-mode on	Remark(s): tighten LV	
POS.		(engine)		8,0	70,0	-	107		"gravel-track" "	tighten LV	
PRO				0,0	70,0	70.0	0	1	0	Currently not on the market	
	El-Indicator:	Population (EU-28)	Typical operation	- tional mode:	- [days/month	/U,U [min./day]	U Typical area of usage:		Typical usage:		
Data	53		[month/yea		10	60	urban/suburban/rur	al	intermittency: 0		
-	Technical Paramete	of source:	Unit:	Range, from	Range, to <	Range >	Proposal limit value [db	Proposal test-code:	Proposal test-mode:	Remark(s):	
SAL	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	
ROPO		-	•	8,0	70,0	-	109	9 		keep LV	
R	El-Indicator: 45	Population (EU-28) 125000	Typical operation (month/yea)		[days/month 15	[min./day] 35	Typical area of usage:	1	Typical usage: intermittent		
ew definition prop	8a - vibratin is performe 8b - non-vib performed t 8c - vibrato 8d - vibrato	g rollers: self-prop d through a rolling trating rollers: self hrough a rolling a y plates: compac y rammers: comp	pelled or and vib propelle ction of t tions ma paction m	towed rating a ed comp he worl chines nachine	compaction of paction of baction king too with ma s with n	tion m the wo machir I. tinly fla nainly a	achines with o orking tool. nes with one or t base plates v a flat foot-plate	It to a carrying machine. Compaction n ne or more metallic cylindrical bodies (more metallic cylindrical bodies (drum which are made to vibrate. (shoe) as the compacting tool which is ping action of the working tool.	drums) or rubbe s) or rubber tyr	er tyres. The compaction of materia es. The compaction of materials is	
	not represe • Rammers Environme • Rammers	sentation of ramm ntative. in the higher pow ntal Impact:	er range	(> 50 k	kg opera	ating-m	time and there	tatistically inconsistent and negligible a to the limit value and there is a marker fore noise disturbing time is limited.		-	
Conclusion	Other Impa • There is n 50 kg opera • Noise redu and operati Summary: • Simplify th	ct: o known technolo ting mass). uction by adding n ng) and limit the n e number of cates	gy today nore hoo nanoeuv gories fro	to redunds or contrability	uce the overs o of the m ently 9	air-born n a ran nachine to 4 ca	ne nosie emiss nmer would inc e operating in c tegories accor	sions for rammers, which would be nec crease the weight, make the rammer m confined areas and is therefore not a re ding to their primary operation (this affe coedure for ped-contr. machines in acc	ore vulnerable alistic neither v ects pedestrian	robustness of the system in handli able solution.	



	F	_	Equip		8d Compa	iction m	achines; Vibra	tory Plates		CECE
		\mathbb{R}	Equipment No.		8d					
	Ľ₽		Falls und		12					COMMITTEE FOR EUROPEAN
		~			VII					Summary-sheet, ver.: 2019-02-08
	propelled, tow with one or m one or more r have to be op possess an ir plates which	ved, walk-behind or ore metallic cylindri netallic cylindrical b perated by an attend ndependent drive sy are made to vibrate.	an attach cal bodies odies (dru ing operativity stem and . They are	ment to a s (drums ims) or r tor or by where th operate	a carryir) or rubb ubber ty remote ne opera d by an	ng mach per tyres res in w control; ator's sta attendin	ine. Compaction ; the operator's s hich the operation - towed roller: control to the found tion is to be found g operator or as	r asphalt surfacing, through a rolling, tampir machines are subdivided as follows: - rolle station is an integral part of the machine; - w on facilities for travelling, steering, braking a ompaction machines with one or more metal d on a tractor unit; - vibratory plates and vit an attachment to a carrier machine; - explo by explosion pressure. The machine is ope	ers for ride-on open alk-behind rollers nd vibrating are di llic cylindrical bod pratory rammers: co sion rammers: cor	rators: self-propelled compaction machi : self-propelled compaction machines w isposed in such a way that the machine ies (drums) or rubber tyres which do no ompactions machines with mainly flat b paction machines with mainly a flat pa
_	Technical Parameter	of source:	Unit:	Range, from	Range, to s	Range >	Current limit value [db(/	Current test-code:	Current test-mode:	Remark(s):
		Primary energy source					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
egulation	P_inst.,net.	(engine)	[kW]	0,0	3,0	-	105	7 EN 300-4 Nev. 1. 1996 Allilex C / 130 3744. 1993	giavei-liack	
egulation		-		3,0	8,0	-	108	1 1	-	Stage-I
reç		-		8,0	70,0	-	109	"	-	Stage-I
		-	-	-	-	70,0	89 + 11·log(P)	-	-	Stage-I
	Technical Parameter	of source:	Unit:	Range, from	Range, to	Range >	Current limit value [db(/	Current test-code:	Current test-mode:	Remark(s):
Ļ	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
POSAI		-	ŀ	3,0	8,0	-	107	f m		tighten LV
RO	•	-		8,0	70,0	-	108	*		tighten LV
_		-	-	-	-	70,0	88 + 11·log(P)			tighten LV
÷	El-Indicator.	Population (EU-28)	Typical operat	ional mode:	[days/montl	[min./day]	Typical area of usage:		Typical usage:	
Dat	53	200000	[month/yea	10	10	60	urban/suburban/ru		intermittency: 0	
	P inst net	of source: Primary energy source		Range, from	Range, to		Proposal limit value (db	Proposal test-code: EN 500-4:2011 / ISO 3744:1995	Proposal test-mode: dynamic-mode on	Remark(s): Stage-II already
_	P_inst.,net.	(engine)	[kW]	0,0	3,0		105		gravel-track	keep current LV
OSA		[3,0	8,0		108			keep current LV
PROPOS				8,0	70,0	-	109	n.a.	n.a.	Currently not on the market
٩.	El-Indicator:	Population (EU-28)	Typical operat	- ional mode:	- [days/montl	70,0 [min./day]	obsolete Typical area of usage:		Typical usage:	
Î	40	75000	[month/yea		15	,	urban/suburban/	rural	intermittent	
ew definition prop	8a - vibratin is performed 8b - non-vib performed t 8c - vibrator 8d - vibrator	g rollers: self-prop d through a rolling trating rollers: self hrough a rolling a y plates: compact y rammers: comp	pelled or and vib propelle ction of t tions man paction m	towed or rating a od comp he work chines v achines	compaction of baction king too with ma s with r	ction ma f the wo machin ol. ainly fla nainly a	achines with o orking tool. les with one of t base plates v a flat foot-plate	It to a carrying machine. Compaction r ne or more metallic cylindrical bodies (more metallic cylindrical bodies (drum which are made to vibrate. (shoe) as the compacting tool which is uping action of the working tool.	drums) or rubbe is) or rubber tyre	r tyres. The compaction of materia
Iclusion	machinery a • 1 dB noise result in less Environme • Vibratory p • For vibratory Other Impa Noise reduc handling an Summary:	sentation of vibrat are not represents reduction cannot s performance of ntal Impact: plates are normall rry plates the proc ict: stion by adding mod d operating) and l	ative. t be phys the mach y used do cess nois ore hood limit the r	ically p nine inc uring a e can b s or cov manoeu	erceive reasing very sh e pred- vers on uvrabilit	ed, but f operation nort per ominan a vibra y of the	for some mach tional time for iod of time wh t. tory plate wou e machine ope	se is statistically inconsistent and negl ine models a reduction of 1 dB can alle the same compaction result. en in service and therefore noise distu ld increase the weight, make the mach rating in confined areas and is therefor ding to their primary operation (this affe	bing time is maining time more vulner	engineering resources and costs o rginal. able (robustness of the system in neither viable solution.



	Picture:									
	8	a.	Equi	pment No.:	8e					
er			Equips	nent Name:		ction m	achines: Explo	sive rammers only		
Header	1		Equipment No	. proposal:			directive			
Ψ			Ealls up	der article:	13	enoni	ullective			COMMITTEE FOR EUROPEAN
	1		Tuny un	Stage:						CONSTRUCTION EQUIPMENT
	ę			Stage:	0					Summary-sheet, ver.: 2019-02-08
	Current definition:	machine: A machi	ine which	compac	ts mater	م م عادز	rock fills soil o	r asphalt surfacing, through a rolling, tampin	a or vibrating activ	on of the working tool. It may be self-
								machines are subdivided as follows: - rolle		
5								station is an integral part of the machine; - w		
dentification								on facilities for travelling, steering, braking a		
ц								ompaction machines with one or more metal		
ent								nd on a tractor unit; - vibratory plates and vib		
p								an attachment to a carrier machine; - explose		
	as the compare	cting tool which is n	nade to m	iove in a	predom	nantiy v	ertical direction	by explosion pressure. The machine is ope	rated by an attend	ing operator.
	Technical Parameter	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value (db(A	Current lest-code:	Current test-mode:	Remark(s):
Current									dynamic-mode on	0
E f	P instnet.	Primary energy	ſĸWI	all	0.0	0.0	none		"gravel-track"	
บีร		source (engine)	[KVV]	aii	0,0	0,0	none	ISO 3744:1995		
				-				-		-
	Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A		Current test-mode:	Remark(s): remove from Directive
	none	none	none	none	none	none	none	none	none	enove nom briective
Ö i	El-Indicator:	Population (EU-28)	Typical opera	tional mode:	[days/month	[min./day]	Typical area of usage:]	Typical usage:	
	very low	unknown	[month/yea	10	10	60	urban/suburban/rur	al	low cycle	
-	Technical Parameter:		Unit:	Range, from	Range, to <	Range >	Proposal limit value (db	Proposal test-code:	Proposal test-mode:	Remark(s):
ECE	P inst.,net.	Primary energy source	ſĸŴĨ	all	0.0	0.0	none	0	0	remove from Directive
CECE	El-Indicator:	(engine) Population (EU-28)	Typical opera	tional mode:	[days/month		Typical area of usage:		Typical usage:	
E CE	34	1000	[month/ve		5	j	urban/suburban/r	1	intermittent	
		1000	tinonth/yea	0	3	10	urban/sdburban/i	uidi	intermittent	
CECE	Summary:									
CECE	Remove from	n directive, not so	old anyn	nore						
5										
1	5									



	Picture:									
		n.	Equi	pment No.:	11					
	<i>μ</i> τή.		Equipn	nent Name:	Concre	te or m	ortar mixers			
		Cab	Equipment Char	racteristic:	0					COMMITTEE FOR EUROPEAN
-	-0		Falls un	der article:	13					CONSTRUCTION EQUIPMENT
				Stage:	0					Summary-sheet, ver.: 2019-02-08
nellincation		or mortar mixer: A cks are called truck					rtar, irrespective	of the loading, mixing and emptying proces	ss. It may be opera	ted intermittently or constantly. Concret
. =	Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
regulation	P_inst.,net.	Primary energy source (engine)	[kW]	Full	Full	Full	0	OND, Annex B, No. 55		
AL	Technical Parameter:	of source:	Unit:	Range, fron	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
POS		(+exhaust+intake),	[kW]	0,0	2,0	-	95		0	0
PROPOSAL		-	-	2,0	Full	-	92+11lgP		0	0
	EI-Indicator:	Population (EU-28)	Typical opera	tional mode:	[days/month	[min./day]	Typical area of usage:		Typical usage:	
Data:	48	210000	[month/yea	10	20	120	urban/suburban/rur	al	intermittent	
٩L	Technical Parameter:	of source:	Unit:	Range, fron	Range, to s	Range >	Proposal limit value [db]	Proposal test-code:	Proposal test-mode:	Remark(s):
9	None	None	None	None	None	None	None	Use EN 12001:2012	None	None
ROPOS/	El-Indicator: 48	Population (EU-28) 14500	Typical opera	*****	[days/month 20	[min./day] 120	Typical area of usage: urban/suburban/r	L	Typical usage:	
	Economica This type of		ered from	n under	2,2 kW	with el	ectric motors t	o over 40 kW diesel combustion engin	es. The propose	d 95, 92+11lgP (for >2kW) limit w
	Environmen Example - m The noise en mainly 70% Annual reco Example - fle For a single	ntal Impact: nixer pump for flo mission is measu in mixing operat rded function tim oor screed: family house of	oor scree ured unde ion and 3 ne is abou 200m², a	d: er maxii 80% in p ut 800 h bout 10	mum ou oump op ours. m ³ of flo	itput of peration	the machine.	ustion engines driven self loading cond This does not reflect the noise load em Mixing operation is about 4 hours at n floor screed a single day.	itted to the envi	



neauer	S77777	1	Equi	pment No.:	13					
			Equip	nent Name:	Conve	ying an	d spraying mad	hines for concrete and mortar		
P C		1	Equipment Char	acteristic:	0					COMMITTEE FOR EUROPEAN
-	- OI Maria		Falls un	der article:	13					CONSTRUCTION EQUIPMENT
				Stage:	0					Summary-sheet, ver.: 2019-02-08
Identification	conveyed to the mechanically	he placing position by piston, worm, he	through p ose and ro	ipelines otor pum	, distribu os or pne	tion dev eumatic	vices or distributi ally by compress	on booms. Conveyance is carried o sors with or without air chamber. The	ut: - for concrete mecha ese machines may be n	whereby the material to be transported is nically, by piston or rotor pumps; - for mor nounted on trucks, trailers or special vehic
uo	Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(/	EN 12001:2012, Annex C	Current test-mode:	Remark(s):
regulation	P_inst.,net.	Primary energy source (engine)	[kW]	Full	Full	Full	0	EN 12001:2012, Annex C		
os/	Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(/	Current test-code:	Current test-mode:	Remark(s):
a: PROPOS/	P_inst.,net.	Primary energy source (engine)	[kW]	Full	Full	-	93+11lg*P		U	0
i i i	El-Indicator:	Population (EU-28)	Typical opera	tional mode:	[days/month	[min./day]	Typical area of usage:]	Typical usage:	
Dat	47	52000	[month/yea		20	120	urban/suburban/ru		intermittent	
SAL	Technical Parameter	None	Unit: None	Range, from			Proposal limit value [db	Use EN ISO 12001:2012	Proposal test-mode:	Remark(s):
	None El-Indicator	None Population (EU-28)	None Typical opera	None	None (davs/month	None [min./day]	None Typical area of usage:	USE EN ISO 12001:2012	Typical usage:	
PROF	47	22500	[month/yea		20	·	urban/suburban/	l	intermittent	
	Distribution (oncrete pump: of the noise emis						· · · ·		Safety requirements".
Conclusion	Example - cc Distribution of The noise er predominant In average 1 only 160 hot The actual n Distribution of The noise er operation. Annual recoo For a single	oncrete pump: of the noise emis mission is measu by operated unde 1 000m3 of conc urs per year. ooise exposure di oor screed pump of the noise emis mission is measu rded functioning family house of 2	ared unde er a parti- crete is p uring a w : ssion ove ared unde time is a ad to be o 200m ² , a	er maxir al load. umped rorkday r time: er maxir bout 10 compar- bout 10	per yea should num ou 00 hour able am m ³ floor	tr per n be take tput of rs. 30% nong m	nachine. The a en into accoun the machine. b is done at rat anufacturers. d is needed. M	This does not reflect the noise lo verage output is about 70 m3/h t. The machines function mainly 7 ed revolutions per minute (rpm)	oad emitted to the en our which leads to a 0% of the time in mix as the pumping func urs at rated rpm and	vironment. The machines are functioning time of the concrete pum ing operation and 30% in pump tion requires the rated power. Noise load. Building construction takes abo



		Picture:	W.																
			ē.	Equi	pment No.:	17													
Ŀ			91,	Equips	nent Name:	Drill rig													
Header			ŤŤ	Equipment No	proposal:			ECE: 17a: Bara	ussive and rotary percussive drilling										
f		, end		Falls up	der article:		a and C	ECE: 1/a: Perc	ussive and rotary percussive drilling		COMMITTEE FOR EUROPEAN								
				Pails un	der articie.	13					CONSTRUCTION EQUIPMENT								
		@=~			Stage:	0					Summary-sheet, ver.: 2016-08-24								
dentificatio		Current definition: 17. Drill ria: A	machine which is a	used for d	rillina ho	les on c	onstruct	on sites by: - pe	rcussive drilling; - rotary drilling; - rotary per	cussive drilling. D	rill rigs are stationary during drilling. They								
Ĕ									drill rigs include those mounted on lorries,										
len		winch). When	drill rigs are mount	ed on lon	ries, tract	ors and	trailers,	or a wheel-base	d, transportation may be carried out at high	er speeds and on p	public roads.								
	_	Technical Dominator	of source:	Unit:	Range, from	Bango Io d	Banga	Current limit value (db(A	Current last and a	Current test-mode:	Remark(s):								
Current	regulatio	recinical Falameter.	or source.		Range, nom	Kalige, to s	range >	Content linit value (ubi)A		0	о П								
L L L	jul	P instnet.	Primary energy	[kW]					2000/14/EG Annex III;Part B; Typ 17 / ISO 3744:1995 / EN 791:1995 Anhang A	0	U								
õ	nec 0		source (engine)	[KVV]															
	٩L	Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):								
	PROPOSAL		Engine						EN 791:1995	0	Sets limit value								
ODELIA	QP	Net installed pow	(+exhaust+intake), hydraulics, gears,	[kW]				128											
Ē	R		drilling																
ō	ä	El-Indicator:	Population (EU-28)	Typical opera	tional mode:	[days/month	[min./day]	Typical area of usage:		Typical usage:									
	Data:	50	30000	[month/yea	10	10	240	urban/suburban/rur	al	intermittent									
	_	Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Proposal limit value [db]	Proposal test-code:	Proposal test-mode:	Remark(s):								
			Engine (+exhaust						EN ISO 3744 according to EN16288-1 to 7	Minimum 15 second	Keep in Art. 13.								
	ц		+intake +cooling							test in normal									
щ	SA	Net installed pow	system), hydraulics, gears, drilling,	[kW]				0		operating rates and temperatures									
CECE	PROPOSA		percussive apparatus,																
1	PR		rods, drilling tools																
		El-Indicator:	Population (EU-28)	Typical opera	tional mode:	[days/month	[min./day]	Typical area of usage:		Typical usage:									
		0	4000	[month/yea	8	15	200	urban/suburban/r	ural	intermittent									
	_	New definition:																	
									arrying sites by percussive drilling or ro	tary percussive	drilling. Drill rigs are stationary during								
	ŏdo	unning. They	/ may move from	one uni	ing poir	it to an	Juner u	ider their own	carrier										
	ā																		
CECE	ioi																		
ö	init																		
	def																		
	New																		
_	_	F																	
		Economica Monufacturi	•	rouooiuo	ما تال عام		noll (hu		ar alabally) Sotting a limit for paraula	ivo deilleigo rogu	viras o lorgo DRD investment from								
									ar globally). Setting a limit for percuss be reflected on the prices of the equip										
									sser regulated non-EU markets and the										
									and quarying companies, many of whic										
		manufacture	is. morease in pi	1003 Will	also all	ect to p	Tontabi	ity of drining a	ind quarying companies, many or write		a consequentity an derived products.								
	ľ	Environmer	ntal Impact:																
				s is sma	all. After	the spl	ittina in	to percussive	and non-percussive drill rigs, the perc	ussive drill rias w	vill go from medium to low relevance.								
		i neretore, tr	nev should be lef	In Art.															
		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																	
	_	technologies	A current trend	for perc		trilling i	s to inc												
Ц	_	technologies therefore the	A current trend total noise emis	for perc		drilling i	s to inc	rease percuss	ion power, which will not decrease the										
CECE	_	technologies therefore the Other Impa	A current trend total noise emis	for perc sion.	ussive o					instantaneous n	oise, but reduces drilling time and								
CECE	onclusion	technologies therefore the Other Impa The noise da	s. A current trend total noise emis ct: ata in the NOISE	for perc sion. databas	ussive o	ed on a	an outd	ated C-type st	andard. These values are too low acco	instantaneous n	noise, but reduces drilling time and								
CECE	Conclusion	technologies therefore the Other Impa The noise da 12/2014). Ar	a. A current trend total noise emis ct: ata in the NOISE ny assessments l	for perc sion. databas based or	ussive o	ed on a	an outd	ated C-type st		ording to the curr Consequently, a	oise, but reduces drilling time and								
CECE	Conclusion	technologies therefore the Other Impa The noise da 12/2014). Ar NOISE data	a. A current trend total noise emis ct: ata in the NOISE ny assessments l	for perc sion. databas based or	ussive o	ed on a	an outd	ated C-type st	andard. These values are too low acco	ording to the curr Consequently, a	oise, but reduces drilling time and								
CECE	Conclusion	technologies therefore the Other Impar The noise da 12/2014). Ar NOISE data Summary:	A current trend total noise emis at: ata in the NOISE y assessments I will yield limit val	for perc sion. databas based or ues that	ussive o e is bas n NOISE cannot	ed on a data r not be	an outd eflect to fullfilleo	ated C-type st to low values i according to	andard. These values are too low acco	ording to the curr Consequently, a	oise, but reduces drilling time and								
CECE	Conclusion	technologies therefore the Other Impa The noise da 12/2014). Ar NOISE data Summary: • We welcon	b. A current trend total noise emision total noise emision total noise emision ata in the NOISE ny assessments i will yield limit val me the split in per	for perc sion. databas based or ues that	ussive o e is bas NOISE cannot and nor	ed on a data r not be	an outd eflect to fullfilleo ssive di	ated C-type st too low values i d according to ill rigs.	andard. These values are too low accorn n comparison to the current standard. the current standard and conceivable	instantaneous n ording to the curr Consequently, a echnologies.	oise, but reduces drilling time and								
CECE	Conclusion	technologies therefore the Other Impa The noise da 12/2014). Ar NOISE data Summary: • We welcon • Because o	b. A current trend total noise emise t: ata in the NOISE ny assessments I will yield limit val en the split in per f the splitting, the	for perc sion. databas based or ues that cussive Environ	e is bas NOISE cannot and nor	ed on a data r not be n-percus	an outd eflect to fullfilleo ssive di Indicate	ated C-type st too low values i d according to ill rigs. or should be re	andard. These values are too low acco	instantaneous n ording to the curr Consequently, a echnologies.	ioise, but reduces drilling time and								
CECE	Conclusion	technologies therefore the Other Impar The noise da 12/2014). Ar NOISE data Summary: • We welcon • Because of medium to lo	A current trend total noise emis total noise emis total noise emis ata in the NOISE any assessments I will yield limit val me the split in per f the splitting, the ww relevance and	for perc sion. databas based or ues that cussive Environ should	ussive of e is base n NOISE cannot and nor mental by this I	eed on a data r not be n-percus Impact be left in	an outd eflect to fullfilleo ssive di Indicati n Art. 1	ated C-type st too low values i d according to ill rigs. or should be re 3.	andard. These values are too low accoden comparison to the current standard. the current standard and conceivable to accode the current standard and conceivable to accode the current standard and significantly adopted. I	instantaneous n ording to the curr Consequently, a lechnologies.	toise, but reduces drilling time and rent standard (in effect since any limit proposals based on the the percussive drill rigs will go from								
CECE	Conclusion	technologies therefore the Other Impa The noise da 12/2014). Ar NOISE data Summary: • We welcom • Because of medium to lo • According	A current trend total noise emis ot: ata in the NOISE will yield limit vai the the split in per the splitting, the wow relevance and to us, the percus	for perc sion. databas pased or ues that cussive Environ should sive drill	e is bas NOISE cannot and nor mental by this I rigs will	ed on a data r not be n-percus Impact pe left ir remair	an outd eflect to fullfilleo ssive di Indicat n Art. 1 i "medii	ated C-type st po low values i l according to ill rigs. or should be re 3. um" in the flow	andard. These values are too low accco n comparison to the current standard. the current standard and conceivable ecalculated and significantly adopted. I chart but according to us "Low relevar	instantaneous n ording to the curr Consequently, a echnologies. t is evident that ice" so they also	toise, but reduces drilling time and rent standard (in effect since iny limit proposals based on the the percussive drill rigs will go from remain in Art 13. And even if they								
CECE	Conclusion	technologies therefore the Other Impart The noise da 12/2014). Ar NOISE data Summary: • We welcon • Because oo • Because oo • According vere "no low	A current trend total noise emis ot: ata in the NOISE will yield limit vai the the split in per the splitting, the wow relevance and to us, the percus	for perc sion. databas based or ues that cussive Environ should sive drill process	e is bas NOISE cannot and nor mental by this I rigs will noise is	ed on a data r not be Impact pe left in remain predor	an outd eflect to fullfilleo ssive di Indicati n Art. 1 "medii minant	ated C-type st o low values i d according to ill rigs. or should be re 3. "" in the flow and the proces	andard. These values are too low accoden comparison to the current standard. the current standard and conceivable to accode the current standard and conceivable to accode the current standard and significantly adopted. I	instantaneous n ording to the curr Consequently, a echnologies. t is evident that ice" so they also	toise, but reduces drilling time and rent standard (in effect since iny limit proposals based on the the percussive drill rigs will go from remain in Art 13. And even if they								



пеасег				COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT						
				Stage:	13 0					Summary-sheet, ver.: 2019-02-08
	may move fro	m one place of wor	rk to anoth	ner, unde	oles on c er their ov	vn powe	er. Self-propelled	ercussive drilling; - rotary drilling; - rotary pe d drill rigs include those mounted on lorries dd, transportation may be carried out at hig	, wheeled chassis,	rill rigs are stationary during drilling. The tractors, crawlers, skid bases (pulled by
-	Technical Parameter	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(/	Current test-code:	Current test-mode:	Remark(s):
regulation	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
١L	Technical Parameter	of source: Engine	Unit:	Range, fror	n Range, to ≤	Range >	Current limit value [db(/	Current test-code: EN 791:1995	Current test-mode:	Remark(s): Sets limit value
, os⊿	Net installed pow	((+exhaust+intake),	[kW]	0,0	30,0	n.a.	107	EN 791:1995	°	10
PROPOSA	Net installed pow	Engine (+exhaust+intake), hydraulics, gears, drilling	[kW]	30,0	full	92,0	92+10*lg P	EN 731:1990	U	
Data:	El-Indicator:	Population (EU-28)	Typical open	·····	[days/month	[min./day]	Typical area of usage:	1	Typical usage:	
ä	50 Technical Parameter	30000	[month/ye		10 Range, to <	240	urban/suburban/run Proposal limit value (db		intermittent Proposal test-mode:	Remark(s):
PROPOSAL	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	
PRG	El-Indicator:	Population (EU-28)	Typical open	ational mode	[days/month	[min./day]	Typical area of usage:		Typical usage:	
	0	10000	[month/ye	8	15	200	urban/suburban/	rural	intermittent	
oposal		which is used for to another unde				iction,	mining and qu	arrying sites by rotary drilling. Drill rigs	s are stationary d	uring drilling but may move from or
proposa						iction, I	mining and qu	arrying sites by rotary drilling. Drill rigs	s are stationary d	uring drilling but may move from o
New definition proposa	Economica Manufacturi from manufacturi from manufacture Environme Number of r relevance. T conceivable	I Impact: ng volumes of nc acturers, without of construction e ers. Increase in p ntal Impact: ion-percussive di herefore, they si	r their ov on-percus guarante quipmen ririces will rill rigs is hould be current t	ssive dr ee of rea t. Pricin I also af ssmall. I left in <i>A</i> rend for	ill rigs a aching p g is affe fect to p After the	re sma practica ected b profitab e splitti Process	II (hundreds p I solutions. Th oth within EU ility of drilling a ng in to percus s noise from di	errying sites by rotary drilling. Drill rigs er year globally). Setting a limit for no is will be reflected on the prices of the and lesser regulated non-EU markets and quarying companies, many of whi sive and non-percussive drill rigs, the illing tools (rods, tubes, pipes) is dom increase power, which will not decrea	n-percussive dril equipment whic and therefore re ch are SME's, an non-percussive inant and cannot	I rigs requires a large R&D investm h are already high in comparison to Juces competitiveness of EU d consequently all derived product drill rigs will go from medium to low be suppressed with existing or



	Picture:		1							1
		0 00 9	Equip	ment No.:	28					
der		and the state	Equipme	ent Name:	Hydrau	lic ham	mers			
Header			Equipment No.	proposal:	0					COMMITTEE FOR EUROPEAN
-		LEV.	Falls und	er article:	13					CONSTRUCTION EQUIPMENT
		ų.		Stage:	0					Summary-sheet, ver.: 2019-02-20
Identification	generated by		through th	ne tool i	nto the m	aterial,	which causes th	rrier machine to accelerate a piston (someti e material to break. Hydraulic hammers nee arrier.		
2	Technical Parameter	of source:	Unit:	Range, fron	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
Current regulation	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.
ŕ	Technical Parameter	of source:	Unit:	Range, fron	Range, to <	Range >	Current limit value [db(A		Current test-mode:	Remark(s):
ODELIA PROPOSA	Mass	n.a.	[kg]	Full	Full	Full	Stage I 120 + 3lg*m Stage II 117 + 3lg*m		No change: Dynamic noise test under defined test conditions	n.a.
	El-Indicator:	Population (EU-28)	Typical operat	ional mode:	[days/month	[min./day]	Typical area of usage:		Typical usage:	
Data	78	200000	[month/yea	10	20	26	urban/suburban		n.a.	
Ĺ	Technical Parameter	of source:	Unit:	Range, fron	Range, to ≤	Range >	Proposal limit value [db(Proposal test-code:	Proposal test-mode:	Remark(s):
CECE	0	0	0	Full	Full	Full	None	0	0	0
Q CE	EI-Indicator.	Population (EU-28)	Typical operat	ional mode:	[days/month	[min./day]	Typical area of usage:		Typical usage:	
PR	0	0	[month/yea	0	0	0	0		0	
ECE clusion	friable grour CECE Posit Environme Noise contro and econom Urban used per work site Only a few r	is a technologica d) that the user i ion: Hydraulic har ntal Impact: ol remains an imp ic benefits (taking breakers are typ e). This category	s breakin mmers sl portant ele g into acc cally the represen lic hamm	ement i count te smalle t 50%	many y emain u n new p echnolo st range of the w e continu	ears, a inder C product gy, relia (from hole po uously	II R&D efforts f IND art. 13. development; ability and cust 4kW/50kg to 3 opulation (appr used during th	0kW/500kg) and there are used for a sox. 100000pcs). e whole day in urban areas: less than	not allow to impo s need to be bai short period of ti	nove noise emission. lanced with both the environmental ime (20 days/year and 1.7 hour/day
	Other Impa Summary:									
		e technical param ition: Hydraulic ha					the OND art. 1	3		



	Picture:	67										
			Equi	ipment No.:	42							
aer		7	Equipr	ment Name:	ODELI							
пеасег		7	Equipment No		CECE	COMMITTEE FOR EUROPEAN						
	. /	/]	Falls un	der article: Stage:	13					CONSTRUCTION EQUIPMENT		
_	Current definition:			Stage:	0					Summary-sheet, ver.: 2019-02-08		
Identification	components u guiding system	sed for installatior	n or extrac e.g. pile ca	tion of pi aps, helm	les, whic nets, plat	heel or rail mount	of an assembly of machines and ed, floating leader attachment, leader or and shock/vibration absorbing devices,					
-	Technical Parameter	of source:	Unit:	Range, from	Range, to s	Range >	Current limit value [db(/	Current test-code:	Current test-mode:	Remark(s):		
current regulatior		Working Tool	[kJ]		-	_		2000/14/EG Annex III; Part B; Typ 42 / ISO 3744:1995 / ISO 6395:1988				
PROPO		of source: diesel Hammer.	Unit:	Range, fron	Range, to	t	Current limit value [db(/	Current test-code: EN 16228-1:2014, EN 16228-4:2014, EN 16228-	Current test-mode: n.a.	Remark(s): The calculation of the EI factor is based on the		
duella ta: PRO	impact entergy	hydraulic hammer	[kJ]	full	full	n.a.	132	7:2014		total population, but the equipment is now divide into four subarouns		
Data:	El-Indicator: 70	Population (EU-28)	Typical opera	ational mode:	[days/montl	[min./day]	Typical area of usage:		Typical usage:			
Ó	70 Technical Parameter	3000 of source:	[month/ye	a 10 Range, fron	20 Range, to s	60 Range >	urban/suburban/run Proposal limit value (db		Intermittent Proposal test-mode:	Remark(s):		
Ļ			1					EN 16228-1:2014, EN 16228-4:2014, EN 16228-	piling on a steel-pile			
	Impact entergy El-Indicator:	diesel Hammer, hydraulic hammer Population (EU-28)	[kJ] Typical opera	none ational mode:	none [days/montl	none [min./day]	No Limit Typical area of usage:	7:2014	Typical usage:			
-	0	600	[month/ye		15	45	urban/suburban/	ural	intermittent			
		r 42a. Impact dı in-situ Pile Drivi		ng equip	oment a	ccordir	ng to DIN EN 1	6228-1 Annex A:				
VEW definition proposal	cylinder. A.2.41 Hydra Piling hamm Process:	.2.41 Hydraulic Hammer iling hammer, driven by hydraulic cylinder(s). The impact occurs by striking the impact body on pile cap directly on the pile.										
-	The proposed ODELA 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 geological conditions. Field of application:											
Onclusion	Summary:	Summary										
ŭ	a) The selecti b) The sound - the m - dte ng - der g c) The Experi d) The geolog e) The surrou 2. Stricter e: 3. Database 4. Type 42 s parameters! 5. By the pro 42a Impac	. The sound radiation is essentially determined by the process, the working process and on external parameters, in particular of:) The selection of the piling process – this is usually due to the structural requirements an the soil conditions, for example structural analysis, tender) 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, AZ-profile, AZ-profile, double-profile, hollow profile, double-T beam)) The Experience of the operator and the selection of machine parameters (strokes vibrator frequency, motor speed, rate of driving)) The geological conditions (sandy soil, loam, rocky ground)) The surroundings (reflecting surfaces), for example: adjacent buildings										



	Picture:		1							
			Equi	pment No.:	42					
Header	R		Equips	nent Name:	ODELI					
Hea		<u></u>	Equipment No	. proposal:		new pro	posed split: 42	b Free suspended Vibratory driver piling	l equipment	COMMITTEE FOR EUROPEAN
		THE A	Falls un	der article:	13					CONSTRUCTION EQUIPMENT
ž	Current definition:	ΨUV		stage.	0					Summary-sheet, ver.: 2019-02-08
Identificatio	42. Piling equipment: Pile installation and extraction equipment, e.g. impact hammers, extractors, vibrators or static pile pushing/pulling devices of an components used for installation or extraction of piles, which also includes: - pilling rig consisting of carrier machine (crawler, wheel or rail mounted, fli guiding system): - accessories, e.g. pile caps, helmets, plates, followers, clamping devices, pile handling devices, pile guides, acoustic shrouds and s power packs/generators and personal lifting devices or platforms.									ted, floating leader attachment, leader or
	Technical Parameter	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):
Current	M static	Working Tool	[kNm]					2000/14/EG Annex III; Part B; Typ 42 / ISO 3744:1995		
-		-			-	-		/ ISO 6395:1988		
DELIA	Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A	Current test-code: EN 16228-1:2014, EN 16228-4:2014, EN 16228-	Current test-mode: n.a.	Remark(s): The calculation of the EI factor is based on the
A LA	static-moment	vibrator	[Nm]	-	-	n.a.	0	7:2014		total population, but the equipment is now divided into four subgroups.
		Population (EU-28)	Typical opera			ļ	Typical area of usage:		Typical usage:	
0	70	3000	[month/yea		[days/month 20	[min./day] 60	urban/suburban/rur	1a	intermittent	
-	Technical Parameter	of source:	r -	Range, from			Proposal limit value [db	Proposal test-code:	Proposal test-mode:	Remark(s):
CECE	El-Indicator:	free suspended vibratory driver Population (EU-28)	[kW]	none tional mode:	none	none	none Limit Typical area of usage:	IEN 16228-1:2014, EN 16228-4:2014, EN 16228- 7:2014	vibrating on a tube	<pre>istay in article 13; calculation formula for Vibrator power: P = (2 * pi ^ (3 * M ^ 2 * f ^ 3) / mges P: vibratior power [kVi] M: static Momenti [kg m] M: static Momenti [kg m] f: rotations speed [mim*-1] mges: dynamic mass [kg] [weight of vibrator plus [weight of clamp]</pre>
	0	500	[month/yea		15	45	urban/suburban/r	rural	intermittent	
CECE	Free Suspended Vibratory Driver according to EN 16228-1 Annex A: A.2.42.a A.2.42.a Vibratory Driver 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. Vibration is denerated by a combination of the operation of the vibrator Feternal stationary hydraulic power pack is required for the operation of the vibrator - Hydraulic power pack typ 29 OND 2000/14/EC - Vibrator typ 42 OND 2000/14/EC - Vibrator typ 42 OND 2000/14/EC - Vibrator is released by vibrations - Jacking the pile by crowd forces of the leader - Jervalent steel driving elements									
CECE										
	42c Leade	hanging vibrators er guided vibrator t Pile Push-Pull Ec	quipment							



	Picture		Feed	pment No.:	42						
er	Q.		Equipr	nent Name:	42	A . 426 F		nt Viberting + statis			
Header			Equipment No	Equipment Name: ODELIA: 42b Piling equipment Vibrating + static Equipment No. proposal: CECE new proposed split: 42c High frequency Vibrator driver							
Ë,	动物		Falls un	der article:	13	lew pro	iposeu spiit. 42	c high frequency vibrator unver		COMMITTEE FOR EUROPEAN	
		CICED	-	Stage:	0					CONSTRUCTION EQUIPMENT Summary-sheet, ver.: 2019-02-08	
	components u guiding syste	used for installation	or extract .g. pile ca	tion of pi aps, helm	les, which nets, plat	h also ii es, follo	ncludes: - piling	ers, extractors, vibrators or static pile pushir rig consisting of carrier machine (crawler, v devices, pile handling devices, pile guides,	vheel or rail moun	of an assembly of machines and ted, floating leader attachment, leader or	
		- ·	Current test-mode:	Remark(s):							
Current regulation	M_static	Working Tool	Unit: [kNm]		Range, to <u>-</u>		Current limit value [db(/	2000/14/EG Annex III; 2000/14/EG Annex III; Part B; Typ 42 / ISO 3744:1995 / ISO 6395:1988			
4	Technical Parameter	of source:	Unit:	Range, fron	Range, to -	Range >	Current limit value (db)	A Current lest-code:	Current test-mode:	Remark(s):	
ELIA PROPOS.	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 divide into four subaroups.	
ODELIA ta: PROI	EI-Indicator.	Population (EU-28)	Typical opera	itional mode:	[days/montl	[min./day]	Typical area of usage:		Typical usage:		
Dat	70	3000	[month/ye	10	20	60	urban/suburban/ru	ral	intermittent		
	Technical Parameter	of source:	Unit:	Range, fron	Range, to	Range >	Proposal limit value (db		Proposal test-mode:	Remark(s):	
CECE PROPOSAL	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	istay in article 13; calculation formula for Vibrator power: P = (2 * pi (3 * M - 2 * (^ A)) / mges P: vibrator power [kV] M: static Moment [kg m] f: rotations speed [min-1] mges: dynamic mass [kg] [weight of vibrator plu- iveight of clamp]	
	El-Indicator: 0	1000	Typical opera	~~~~~	[days/mont] 15	[min./day] 45	Typical area of usage: urban/suburban/	l	Typical usage: intermittent	+	
		h Frequency Vibra				1.0	arbanoabarban	- drai		1	
CECE New definition	 Jacking the Prevalent s Typical mach frequency: Amplitude: 	Social is released by vibrations Jacking the pile by crowd forces of the leader Prevalent steel driving elements Vpical machine parameters: frequency: 25 – 45 Hz Amplitude: determined by imbalance and oscillating mass application requires compact dimensions of the vibrator									
CECE Conclusion	database. A reduction of This is difficul In a machine Environme The number This vibrator a constructio Field of appli - Mainly on c - High workir - High workir - Mobile mult Summary: 1. The sour a) The select b) The source - the leng - der geon c) The Exper d) The geologies - By The surror 2. Stricter e 3. Database	d in the study Ode of the sound power ult to implement, p population out of ntal Impact : of Leader guided t typ is working in in on project for found cation: cation: onstruction sites i gefficiency / sho lifunction machine tig afficiency / sho lifunction machine and radiation is essi- tion of the piling pi d emission of the c pilical conditions (s undings (reflecting exhaust gas regula is too imprecise:	r level fro erhaps ev <100 cop ligh frequ the urban Jation wo with limiter tr piling p for differ entially de rocess – triving ele element (e g element tor and ti andy soil surfaces titors are -> coll	m 128 d ven imppières in E ency vil / suburi / suburi / suburi rk for us ed space eriod ent spe etermine tis is u (U-prof he selec , loam, 1), for e counter cotion of	B (A) tot poratory (c) paratory (c) parat	1 115 dE Among Jriver ini rural. T pend in ments vyy cons e procese tring) e procese tring) anachine ound	(A) means a r the manufactu ment work is no Europe is limit he average op relation to the structions / app ss, the working e structural rec e structural rec nt on: , wood) Z-profile, double parameters (s) it buildings sound reduction op a uniform r	process and on external parameters, in juirements an the soil conditions, for exam- e-profile, hollow profile, double-T beam trokes vibrator frequency, motor speed, i	- evel 128dB(A)! businesses. stomized individ y low. Typically, t site. particular of: mple structural a) rate of driving)	ual pieces. these machines come at the beginning nalysis, tender	
	5. By the pro 42a Impa 42b Free 42c Lead			28-1:20	14, the o	compari	son of different	t types of devices is not provided, therefore	ore type 42 shoul	d be divided into four subcategories:	



	Picture:		1							
			Equi	pment No.:	42					
er			Equips	nent Name:	ODELI		CECE			
Header										
Í	ĨĹ,		Falls un	der article:	0			d Sheet Pile Push-Pull Equipment		COMMITTEE FOR EUROPEAN
				Stage:	0					CONSTRUCTION EQUIPMENT Summary-sheet, ver.: 2019-02-08
	Current definition:		1		•					Summary-sneet, ver.: 2019-02-08
Identification	0.0									
it on	Technical Parameter:	of source:	Unit:	Range, fron	Range, to s	Range >	Current limit value [db(/	1	Current test-mode:	Remark(s):
Current regulation	M_static	Working Tool	[kNm]					2000/14/EG Annex III; Part B; Typ 42 / ISO 3744:1995 / ISO 6395:1988		
os/	Technical Parameter:	of source:	Unit:	Range, from	Range, to s	Range >	Current limit value [db(/		Current test-mode:	Remark(s):
ELIA PROPOS.	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
ODELIA a: PROF			<u> </u>							into four subgroups.
OL Data:	El-Indicator:	Population (EU-28)	Typical opera		[days/montl	[min./day]	Typical area of usage:	1	Typical usage:	
Da	70	3000	[month/yea		20	60	urban/suburban/ru		intermittent	
_	Technical Parameter:	of source:	Unit:	Range, from	n Range, to <	Range >	Proposal limit value [db		Proposal test-mode: pushing of a profile	Remark(s): stay in article 13
CECE PROPOSAI	pull-down load	sheet pile push-pull equipment Population (EU-28)	[kN]	none	none	none	none Limit	7:2014	Typical usage:	
R	0	100	[month/yea	·····	[days/mont]	45	Typical area of usage: urban/suburban/		intermittent	
	-	Pile Push-Pull Ec				1	1			1
 Equipment guided by a leader, or free riging at the top of a sneet pile wall. Sneet piles will be installed or pulled by force of hydraulic cylinders. Sneet piles are grip hydraulic clamps. Process: <u>9</u> - Jacking the pile by pretension of the hydraulic cylinders. exclusively steel sheet piles Typical machine parameter: - Extracting and pull-down load: 600/800 kN 										
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 dE 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 environmental 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:) The sound radiation is essentially determined by the process, the working process and on external parameters, in particular of:) The sound radiation is essentially determined by the process, the working process and on external parameters, in particular of:) The sound radiation is essentially determined by the process, the working process and on external parameters, in particular of:) The sound rediving element (steel, plasic, concrete, wood) - the material of the driving element (steel, plasic, concrete, wood) - the material of the driving element (steel, plasic, concrete, wood) - the surroundings (reflecting surface), concrete, wood) - the surroundings (reflecting surface), concrete, wood) - the surroundi									ial pieces.	
									nould depend on the process-relevant	



пеааег	<u>g</u>											
-			Falls un	der article: Stage:	13 0					CONSTRUCTION EQUIPMENT Summary-sheet, ver.: 2019-02-08		
								concrete from the concrete mixing pl ven either by the driving engine of th		rum may rotate when the vehicle is driving ementary engine.		
. 5	Technical Paramete	n of source:	Unit:	Range, fror	Range, to	Range >	Current limit value [db(/	Current test-code:	Current test-mode:	Remark(s):		
regulation	P_inst.,net.	Primary energy source (engine)	[kW]	Full	Full	Full	0	OND, Annex B, No. 55				
	Technical Paramete		Unit:	Range, fror	Range, to s	Range >	Current limit value [db(/	Current test-code:	Current test-mode:	Remark(s):		
PROPOSAI	P_inst.,net.	Engine (exhaust+intake), fans, hydraulic transmission, noise radiation of drum mixino, and drumpion	[kW]	0,0	55,0	-	109		0	0		
3		-	-	-	-	55,0	90+11lg*P		0	0		
	El-Indicator:	Population (EU-28)	Typical opera	tional mode:	[days/mont]	[min./day]	Typical area of usage:		Typical usage:			
Data	60	50000	[month/yea	12	20	20	urban/suburban/ru	ral	intermittent			
AL	Technical Paramete		Unit:		Range, to	f		Proposal for test-code:	Proposal test-mode:	Remark(s):		
, 0	None El-Indicator:	None	None	None	None	None	None	Use EN ISO 12001:2012	-			
, ION	El-Indicator: 60	Population (EU-28) 32000	Typical opera		[days/mont] 20	[min./day] 20	Typical area of usage: urban/suburban/	1	Typical usage: intermittent			
Conclusion	range) and Examples a Environme People are of the trans; Distribution Remixing u minimum rp waiting time The noise of A truck mixing questioned.	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 pa 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.										
	A large port Summary: • Low popul	Other Impact: Large portion of the data is incorrect (wrong companies, cranes included, concrete mixers included, no truck mixers exists below 45 kW, etc.) immmary: 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)										



Г		Picture:											
			1	Equi	pment No.:	102-103	3						
P.			1	Equipm	nent Name:			stallations / m	bbile waste breakers (wood, concrete)				
Header		La la		quipment Char	guipment Characteristic: Steel-tracked								
Ĩ		Falls under article: None								COMMITTEE FOR EUROPEAN			
		Stop:									CONSTRUCTION EQUIPMENT		
⊢		Current definition:				<u> </u>					Summary-sheet, ver.: 2018-02-08		
Identification		None											
	_	Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):		
t	egulation												
Current	ulat	none	none	none	none	none	none	none	none	none	none		
ū	reg	ione -	TIONS	none	none	none	none	none	ione -	libile	i ci i c		
	۹L	Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Current limit value [db(A	Current test-code:	Current test-mode:	Remark(s):		
1	PROPOSAL			ļ		ļ							
	D D			ļ	l	ļ							
ODELIA				l	İ	Ì			j	1			
10	Data:	El-Indicator:	Population (EU-28)	Typical opera		[days/month	[min./day]	Typical area of usage:	1	Typical usage:			
	Da	54 / 49	15000	[month/yea	10	20	240	urban/suburban/rur		intermittent			
		Technical Parameter:	of source:	Unit:	Range, from	Range, to <	Range >	Proposal limit value [db	Proposal test-code:	Proposal test-mode:	Remark(s):		
	٩Ľ												
CECE	õs	none	none	none	none	none	none	none	none	none	none		
ü	PROPOSAI	El-Indicator:	D				<u> </u>						
	۵		Population (EU-28)	Typical opera	·····		[min./day]	Typical area of usage: urban/suburban/r	1	Typical usage:			
-		40	15000	[month/yea	9	18	240	urban/suburban/i	urai	intermittent			
		Economical Economical	impact of reduction	on of pro	cess no	oise:							
							use rut	ber or polyure	thane screens. By doing so it is possib	ole that process	noise, generated by screens, could		
		be reduced.	However, rubber	or polyu	irethan	e scree	ns have	e up to 30% le	ss throughput than metal screens beca	ause of their dep	th in relation to the screening area. To		
		overcome th	is, the time the m	nachine o	operate	s will be	e increa	ised by 43% o	r two machines will be required instead	d of one to proce	ess the existing material. As a result,		
		investment c	osts and process	sing cost	s increa	ase.							
		Environmer	ntal Impact:										
		 In addition 	to the economic	impact, t	here wi	ill also b	e incre	ased exhaust	emissions due to longer operating tin	nes for a machir	e or the use of two machines. This		
			xhaust emission										
		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											
			s been considere										
			er of crushing and										
			time when a crus						oan area is typically very low, ranging fi	rom one day to a	a tew weeks.		
									pative effects on the environment.				
									ries and recycling applications, which a	are non-urban ar	eas, where noise emission does not		
		impact on th	e surrounding en	ivironme	nt.								
		Other Impad	et:										
				oximatel	y 10,00	0 to 15,	000 mo	bile crushing	and screening machines.				
									5% (approx. 6000) are mobile crushing	g machines. The	ese figures are based on the		
									ear and their expected lifetime.				
									of 15,000 machines, operate in urban a ing for deviation in the estimation, this				
CECE	sni		urban areas.	environ	mentai	noise e	11155101	is. Even allow	ing for deviation in the estimation, this	would still repre-	sent a very small number of machines		
ü	0 uo		e measurements	s rely on	severa	I factors	s, includ	ding:					
	C	i. Type of fee	ed material										
		ii. Feed mate											
		iii. Crusher s											
			separation of fine				. of mo	ohinoo					
			t of the construct						uccessfully create a standardized measure	surement of pro			
									pe of natural stone has different sets of				
									edure for the measurement of noise en				
									stent noise emission is from the machir		,, o,		
		The distinctiv	on between the n	umbero	f mobile	o cruebi	ina and	screening ma	chines working solely in quarries or so	lelv in recycling	applications is difficult. The European		
									ype of machinery into heavy mobile ma				
		of application							,,		,		
									transportation to comply with transpor	t rules. Therefor	e, these machines are not used in		
									ated with their transport.				
			compact mobile	machine	s are v	ery ofte	n used	in quarries du	e to savings in investment costs and w	here smaller pro	ocessing capacity is sufficient. They		
		Summary:	a not also	ono ''	in eller	sult +-	ation - t	numbers -/	achines etc.				
			s not give definiti						nachines etc. Process noise is dependent on several	different factors			
									ne environment (increased engine emis		<i>.</i>		
									ban areas is very low.	,			
		 When crush 	hing or screening	machin	es oper	rate in u	ırban a	reas the time t	hey operate is limited.				
1													
-													



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

		CEC	Proposal	Reference table			
New Eq. No.:	New Equipment name/definition:	CI	sed limit ECE Ierge 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	EN ISO 3744:1995	2000/14/EC Annex III; Part B; Chapter 8; Indent ii)	
		8 < P ≤ 70	106	Limit values for hand guided vibratory-rollers then de jure are changed Proposal for definition of operating modus acc. to ISO			
		P > 70	86 + 11 x log P	6165 and ISO 8811 to:"Direct controlled machines"; "Re- mote controlled machines"; "pedestrian controlled ma- chines"			
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, con- trolled by bystanding operator, handguided, remote con- trolled,) e.g. by measuring on a reverberant surface in stationary condition.	EN ISO 3744:1995	2000/14/EC Annex III; Part B; Chapter 0	
		P > 55	82 + 11 x log P	Proposal for definition of operating modus acc. to ISO 6165 and ISO 8811 to:"Direct controlled machines"; "Re- mote controlled machines"; "pedestrian controlled ma- chines"			



Revision of the Outdoor Noise Directive

8c	Compaction machines: Vibratory 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		
		P > 8	109			applying the re-grouping of category 8-equipment as proposed by CECE and meas- uring rammers on the gravel- track.
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 meas- uring 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.



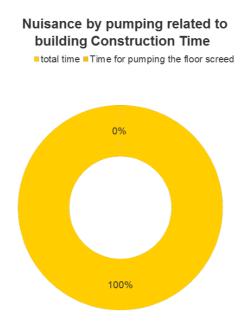
Population in Germany:

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 bed-rock).



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 front of existing walls 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:



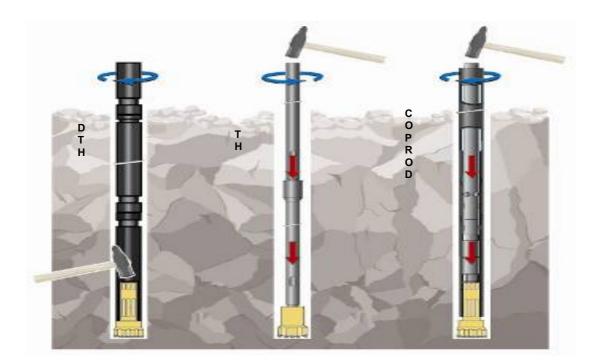


B.3. Rock Drilling Down The Hole (DTH)

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.

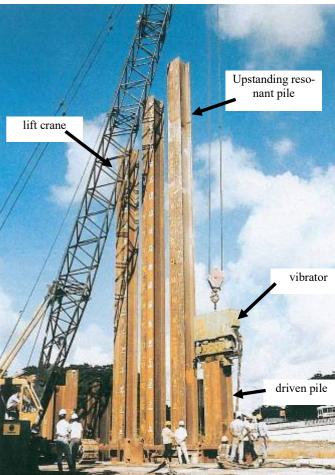


Annex IV: Equipment nr 42 - piling equipment configurations



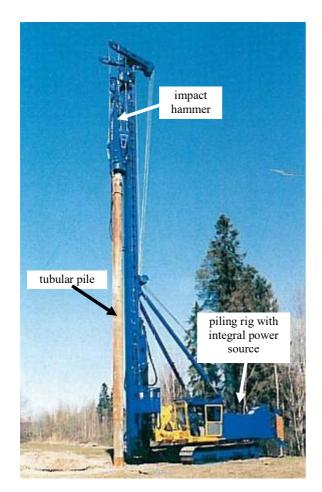
Leader mounted vibrator driving bearing piles

Free hanging vibrator driving bearing piles





Revision of the Outdoor Noise Directive



Free riding impact hammer driving interlocking piles following a vibrator Impact hammer on piling rig driving tubular bearing piles





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%)

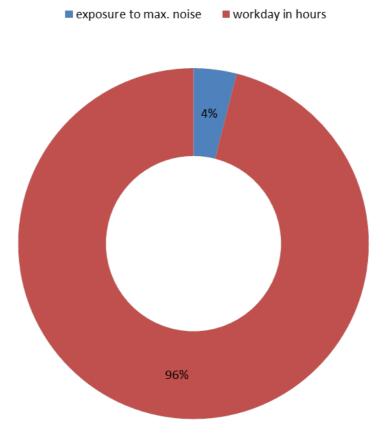




Population in Germany:

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.





proportion of maximum noise exposure

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)

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

Mobile Waste Breakers (Crushers)

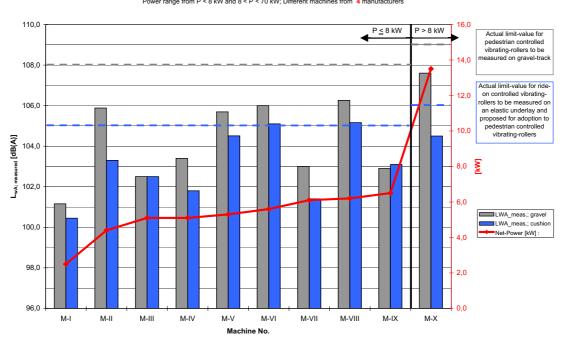
	60% quarry	= approx. 3,600	
			80% non-urban =
40% = Approx. 6,000			1,920 (recycling yard,
40% – Approx. 0,000	40% recycling	- approx 2,400	demolition site)
	40% recycling	= approx. 2,400	20% urban = 480
			(demolition site inside
			urban area)

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



Samples of measured values for pedestrian controlled vibrating-rollers measured on gravel-track versus measurement on elastic underlay Power range from P < 8 kW and 8 < P < 70 kW; Different machines from 4 manufacturers