EVALUATION OF RISK

CONCRETE DISCHARGING DECELERATOR (CDD)

Beto dec GmbH
Buchet 3
A-4707 Schlüßlberg

Datum.	GZ:	
9. Dezember 2008	080132A	RGM

CONTENTS

APPENDIX:

Patent Number: 503809

1 TERMS OF REFERENCE

On behalf of beto dec GmbH, Buchet 3, A-4707 Schlüßlberg who is the producer of CDD Patent number 503809 a risk evaluation has to be made. This has to be done in the course of an evaluation procedure of conformity on the base of statutory provisions as to security of goods, products and other objects in accordance with OeNorm EN ISO 14121-1 which is to be executed following trade laws as to distribution of engines and security acts.

In this evaluation of risks especially the cutting points of components have to be observed.

Extract from directive as to engines 2006/42/EG, appendix I:

The producer of an engine has to care for making a risk evaluation. After this the engine must be constructed and built under observance of the result of this evaluation. In the course of this action of evaluation and reduction of risks the producer or his agent has to appoint the limits of the engine including its intended use as well as every reasonably foreseeable misuse. Endangering caused by the engine and the endangering situation connected with the device must also be found out, the risks must be evaluated considering the possibilities of injuries or health damages and the probability of their coming up. The risks have to be evaluated to find out if a reduction of risks is essential according to lower dangers connected with risks as appointed in engine code number 1.1.2 letter b.

According to regulation as to distribution and display of engines and the basic requirements of safety of engines the following items have to be observed:

If components of engines which are not prefabricated parts for safety are put in circulation for being built in or connected with other machines or parts of machines there is no declaration of compliance to be stated and no CE-label has to be attached.
However, a statement including the following details must be certificated according to the sample given in attachment 1.B:

1. Name and address of producer or his agent in Austria or the distributor
2. Description of parts of engine (components)
3. There must be a remark that the initial operation is interdicted until a
4. declaration of accordance has been given as to the machine components which have been built in.
5. Signer's name and address
6. If necessary name and address of accredited office who has performed the examination and number of certification.
7. If necessary name and address of accredited office to whom the documents have been transferred for depositing.
8. If necessary name and address of accredited office who has examined data.
9. If necessary the source of harmonized European norms (EN) or Austrian norms executing them (Oenorm EN).

2 BASICS

- Industrial safety law – AschG, BGBl.Nr. 450/1994 i.d.g.F.
- Regulation of working places – AstV, BGBlNr. 368/1998 i.d.g.F.
- Regulations for working materials – AM-VO,BGBl.II Nr. 164/2000
- General order for industrial safety – AAV,BGBl.Nr.218/1983 i.d.g.F.
- Order as to safety of machines – MSV, BGBlNr. 306/1994 i.d.g.F.
- Instruction as to machines i.d.g.F.
- OENORM EN ISO 12100-1 Safety of machines – fundamental terms, general guidelines – part 1: fundamental terminology,
  - Methodology
- OENORM EN ISO 12100-2 Safety of machines – fundamental terms, general guidelines – part 2: technical principles
- OENORM EN 1005-1/2 Safety of machines – physical human work
- OENORM EN ISO 14121-1 Safety of machines – evaluation of risks – guideline
- WEKA manual safety of machines

3 IDENTIFICATION OF COMPONENT

3.1 GENERALLY

Principally transported concrete of cement, sand and gravel is produced on the area of beto dec, Buchet 3 in A-4707 Schlüßlberg. According to requirement water and when indicated additives are worked off and given over to concrete transporting trucks. The readymade concrete is transported to the building site and filled into the mould by concrete pumps or transferred to trucks with built-in pumps who carry out the task. The component "Concrete discharging decelerator" – CDD – is fixed to the end of the concrete hose. Due to the S-form of CDD the unloading of concrete can be made more homogeneously. CDD is a part (component) of a superior machine, it is not a safety device. Here it is put in circulation in order to be built in a machine or to be added to other machines or part of machines. Therefore here is no need of a declaration of accordance nor of a CE-label but a declaration for machine components has to be written out.

3.2 DATES OF PRODUCER/ DISTRIBUTOR

Company:	beto dec GmbH
Address:	Buchet 3 A-4707 Schlüßlberg
Contact person:	Mr. Brandstetter
Tel.:	+43-676-842 565 301
E-Mail;	office@betodec.at

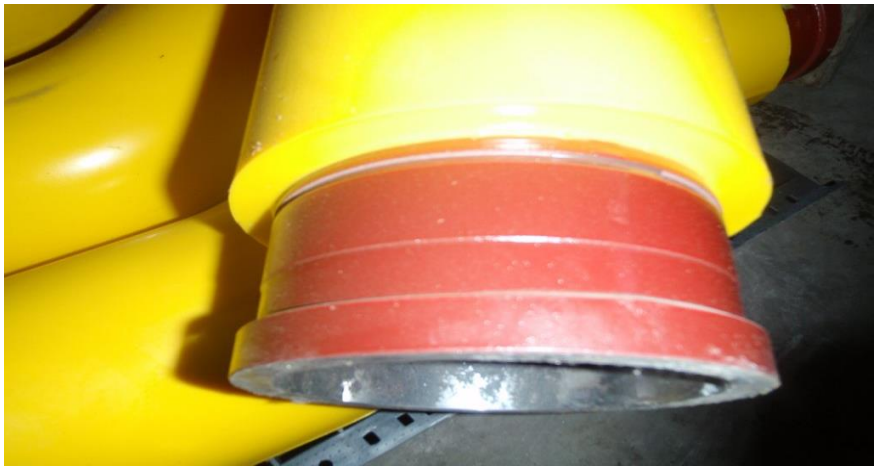
3.3 DESCRIPTION

The CDD is connected with a high pressure pipe at the end of the concrete pipe. It is a synthetic pipe which in length extension is formed like an S.

In order to influence concrete pumped via a concrete charge it must be connected to an S-shaped adapter at the end of the charge (as known from level of engineering (DE 196 18 316 C2).

This adapter is made of polyurethane in which a metal adapter is grouted for being connected with the pump hose.

This piece of metal has got grooves in its circumference to make up conclusiveness of power together with conclusiveness of form with the polyurethane. These grooves cannot be seen in this graphic as they are covered by synthetics. But the adapter for coupling is visible.



Basically, the adapter being a deviation may bring about an obstruction of concrete in the hose which may cause uncontrollable movements of the hose. In this case there may be danger of bodily injury of the operating staff. That is the reason why in spite of great advantages these adapters have not been used very often. The risk of injury of the staff was not accepted widely so far.

The distributor has developed a device for discharging concrete in which the discharging can be influenced without danger of injury.

This CDD minimizes the danger of injury by having built in a predetermined breaking point.

If the CDD has got such a breaking point (pull linkage) before the fixed S-formed transition the end of the pump hose can be connected with the end of the CDD without danger. In case of plugging up the CDD will break down and therefore uncontrolled movements can be excluded.

The pressure operated concrete can pass off unhamperedly before the S-hose as it does not run through the broken pull linkage.

Due to the fixed and firm S-hose other possible powers cannot move the concrete hose any more. This is a great advantage with concrete charges having pressure-operated piston pumps with comparatively high pressure pulsations.

Photograph of a CDD which has been separated at the pull linkage

The CDD is connected with the concrete hose with a clamp that can be opened, so it is easily possible to connect it.

In addition it is possible to replace the broken CDD quickly

The clamp is covered by a movable hood which is pulled over the connecting point between concrete hose and connecting piece. So the danger of injury caused by edgings can be decreased.

3.4 DOCUMENTATION

Documentation of device (instruction manual, graphics etc.) available at the company.

4. LIMITS OF DEVICE

4.1 USE ACCORDING TO REGULATIONS

The CDD is to be used only for coupling with adequate pressure operated concrete hoses and accordingly pipeworks with clamps. In use according to regulations it is flown through by flowable concrete which is pumped by piston pumps (not described here) into concrete hoses under pressure. Other use e. g. manipulation of pulverized dusts which do not appear as flowable concrete is not allowed.

Risk evaluation – field of application

The following risk evaluation is correspondent to the present state of the component stated when the drawing and the production site were inspected.. The risk evaluation loses its validity if the distributor changes

any components. The field of application contains construction, action and

maintenance of device until there are defects to be recognized.

4.2 CUTTING POINTS OF DEVICE

Cutting points were considered as follows:

- Cutting point from concrete charge from which concrete flows out of the pump i. e. the connecting point to hose by clamp
- Cutting point of giving out flowable concrete to destinated place, i. e. the place where concrete has got to flow out.

4.3 DIRECTIONS FOR MAINTENANCE

Producer's and distributor's prescriptions as to maintenance and safety are valid.

5 RISK ASSESSMENT – ESTIMATION

Operating status as considered:	☑ Normal activity with interruptions ☑ Maintenance	☑ Installation ☐ Other

A **Starting point for risk evaluation**

S **Degree of injury**

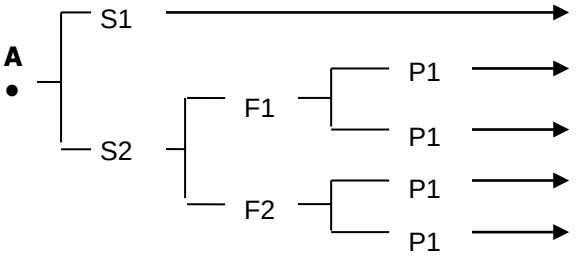
S1	Slight (generally reversible) injury	☐
S2	Severe injury (generally irreversible) including death	☐

F **Frequency and/or duration of exposition to danger**

F1	Exposition: rarely or more often – and/or short duration of exposition	☐
F2	Often to permanent and/or long duration of exposition	☐

P **Possibility of avoiding danger**

P1	Possible under certain conditions	☐
P2	Hardly possible	☐



B	1	2	3	4
•	●	○	○	○
•	●	●	○	○
	•	●	●	○
	•	•	●	○
	•	•	•	●

Number of risk

B	very low
1	low
2	medium
3	high
4	very high

● Category preferred

○ Overdimensioned measures compared to risk

• Possible categories requiring additional measures

If the grade of possible damage cannot be treated or determined the risk is to be estimated high.

STM: SAFETY TECHNICAL MEASUREMENT

PIK = Instruction at machine (pictogramme)	IM = Information in use manual
CMM = Constructive mechanic measure	WI = Working indication
MPD = Mechanic protection device	MA = Maintenance advice
CPD = Controlling protection device/measure	PSO = Personal safety outfit

The column risk number is subdivided, the first number describing the endangerment before following possible measurements, the second one dangers after fulfilling them. The fact that there are no riskless devices at all must be obtained. Therefore risk- number B will always be there as remaining risk.

6 RISK ASSESSMENT – MEASUREMENT

This Checklist is shown in the table A1 (List of threats) the ÖNORM EN ISO 14121-5 is applied.

endangerment / short description		solution principle / measurement to be operated	RZ	position/name:	notices
			STM	according to direction:	accordance accomplished on:
1	mechanic dangers				
	a) acceleration/slowing down	non relevant			
	b) sharp parts	Sharp parts (edges) and protruding parts must be avoided. Edges on components as well as sharp parts must be abraded and protected by cardboard. Workers have to be informed about use of protecting outfit	2 B KMM AA PSA	metal part EN ISO 12100-1 EN ISO 12100-2	3. Nov. 2008
	c) approaching of moving part to a fixed part	Securing of movable machine to which CDD (fixed component) is fixed Unsecured and not securable parts must be marked by colour	3 B KMM MSE PIK	superior machine EN ISO 12100-1 EN ISO 12100-2	3. Nov. 2008
	d) blade edges	personnel must be informed and controlled as to proper clothing and gloves	2 B PIK PSA	metal part EN ISO 12100-1 EN ISO 12100-2	3. Nov. 2008
	e) elastic elements	non relevant			

endangerment / short description		solution principle / measurement to be operated	RZ	position/name:	notices
			STM	according to direction:	accordance accomplished on:
	f) falling parts	correct assembling of component, control of assembling, adequate static fixedness. Repeated control and notice in manual as to repeated control	2 B KMM BA AA	component EN ISO 12100-1 EN ISO 12100-2	 3. Nov. 2008
	g) gravity (stored energy)	Control of assembling, adequate static fixedness, static construction of component, repeated control ad notice in manual as to repeated control	2 B KMM BA AA	component EN ISO 12100-1 EN ISO 12100-2	 3. Nov. 2008
	h) height above ground	correct assembling, control of assembling, adequate static fixedness, static construction of component, repeated control and notice in manual as to repeated control	2 B KMM BA AA	component EN ISO 12100-1 EN ISO 12100-2	 3. Nov. 2008
	i) high pressure	adequate dimensioning and construction of the entire pressure system of component. Mounting of pretermined breaking point periodic maintenance and control of pressure system following a fixed plan use of personal protection outfit of instructed personnel Hints in manual as to regularly executed actions	3 B KMM WA BA PSA	Air pressure system EN ISO 12100-1 EN ISO 12100-2	 3. Nov. 2008
	j) mobility of CDD	adequate static fixedness use of adequate fixing correct assembling of device control of superior machine	3 B KMM MSE PIK	Superior machine EN ISO 12100-1 EN ISO 12100-2	 3. Nov. 2008

endangerment / short description	solution principle / measurement to be operated	RZ STM	position/name: according to direction:	notices accordance accomplished on:
k) moving parts	adequate clearance to surrounding must be kept protective cover securing movable superior machines	3 B KMM MSE PIK	superior machine EN ISO 12100-1 EN ISO 12100-2	 3. Nov. 2008
l) rotating parts	non relevant			
m) rough sliding surface	Possibilities of going up and down on fixly mounted ladders with enclosure surrounding parts must be kept clean Wearing of adequate shoes and clothing Regular instruction of personnel There will be a remaining risk of sliding, stumbling or falling down in any case 	3 B KMM WA BA PSA	Equipment field EN ISO 12100-1 EN ISO 12100-2	 3. Nov. 2008
n) sharp edges	Sharp edges at components and jutting out parts causing danger of injury must be avoided. Flashes on components must be abraded. Sharp edges and corners must be rounded or furnished with edge protection. Repeated control and instruction of personnel as to use of personal protecting outfit	2 B KMM AA PSA	metal part EN ISO 12100-1 EN ISO 12100-2	 3. Nov. 2008

	endangerment / short description	solution principle / measurement to be operated	RZ STM	position/name: according to direction:	notices accordance accomplished on:
	o) stability/security	non relevant			
	p) Stability	sufficient static strength by adequate statics of construction	2 B KMM BA AA	component EN ISO 12100-1 EN ISO 12100-2	3. Nov. 2008
	q) Vacuum	non relevant			
2	Dangers by electricity				
	a.) electric arc	non relevant			
	b.) electrostatics	non relevant			
	c.) energized parts	non relevant			
	d.) inadequate distance to high tension parts	non relevant			
	e.) overloading	non relevant			

endangerment / short description		solution principle / measurement to be operated	RZ	position/name:	notices
			STM	according to direction:	accordance accomplished on:
	f.) parts having got energised because of failure	non relevant			
	g.) short cut	non relevant			
	h.) thermal radiation	non relevant			
3	Thermal endangerments				
	a.) explosion	non relevant			
	b.) flame	non relevant			
	c.) object or material of high or low temperature	non relevant			
	d.) radiation of heat sources	non relevant			

endangerment / short description		solution principle / measurement to be operated	RZ	position/name:	notices
			STM	according to direction:	accordance accomplished on:
4	Endangerment by noise				
	a.) cavitation incident	non relevant			
	b.) contaminated air system	non relevant			
	c.) gas escaping at high speed	non relevant			
	d.) producing process (stomping, cutting, etc.)	non relevant			
	e.) movable parts	non relevant			
	f.) rubbing faces	non relevant			
	g.) unevenly rotating parts	non relevant			
	h.) Whistling pneumatic apparatuses	non relevant			

endangerment / short description		solution principle / measurement to be operated	RZ	position/name:	notices
			STM	according to direction:	accordance accomplished on:
	i.) worn out parts	non relevant			
5	Endangerment by vibrations				
	a.) occurrence of cavitation	non relevant			
	b.) misalignment of moving parts	non relevant			
	c.) movable equipment	non relevant			
	d.) rubbing faces	non relevant			
	e.) uneven rotating parts	non relevant			
	f.) swinging parts	non relevant			
	g.) worn out parts	repeated testing	1 B	entire component	
			BA WA	EN ISO 12100-1 EN ISO 12100-2	3. Nov. 2008

endangerment / short description		solution principle / measurement to be operated	RZ	position/name:	notices
			STM	according to direction:	accordance accomplished on:
6	Endangerment by radiation				
	a.) Ionising source of radiation	non relevant			
	b.) low frequency electromagnetic radiation	non relevant			
	c.) optical radiation (infrared, visible, ultraviolet) including Laser beams	non relevant			
	d.) high frequency electromagnetic radiation	non relevant			
7	Endangerments by materials and substances				
	a.) aerosol	non relevant			
	b.) biological and microbiological viral or bacterial substances	non relevant			
	c.) combustible material	non relevant			

endangerment / short description		solution principle / measurement to be operated	RZ	position/name:	notices
			STM	according to direction:	accordance accomplished on:
	d.) dust	non relevant, only dustless products are worked off			
	e.) explosives	non relevant			
	f.) fibres	non relevant			
	g.) flammable materials	non relevant			
	h.) fluid	non relevant			
	i.) steam	non relevant			
	j.) gas	non relevant			
	k.) fog	non relevant			
	l.) oxidants	non relevant			

endangerment / short description		solution principle / measurement to be operated	RZ		position/name:	notices
			STM		according to direction:	accordance accomplished on:
8	Endangerment in connection with ergonomics					
	a.) access	non relevant				
	b.) construction or configuration of display	non relevant				
	c.) construction, configuration or detection of optical displays	non relevant				
	d.) effort	Instructing of personnel as to correct handling of load using tools	2	B	Giving up and taking off component	
			AA		EN ISO 12100-1 EN ISO 12100-2 EN 1005-1/2	3. Nov. 2008
	e.) fluttering, blinding, creating shadows and stroboscoping effects	non relevant				
	f.) local lighting	non relevant				
	g.) psychic overburden/underwork	non relevant				

endangerment / short description		solution principle / measurement to be operated	RZ	position/name:	notices
			STM	according to direction:	accordance accomplished on:
	h.) physical attitude	non relevant			
	i.) repeated actions	non relevant			
	j.) visibility	non relevant			
9	Endangerments in connection with surrounding of machine				
	a.) dust and fog	non relevant			
	b.) electromagnetic disturbance	non relevant			
	c.) stroke of lightning	non relevant			
	d.) moisture	non relevant			

endangerment / short description		solution principle / measurement to be operated	RZ		position/name:	notices
			STM		according to direction:	accordance accomplished on:
	e.) Contamination	Instruction of personnel as to cleaning when docking	2	B	giving up and taking off component	
			AA		EN ISO 12100-1 EN ISO 12100-2	3. Nov. 2008
	f.) snow	non relevant				
	g.) temperature	non relevant				
	h.) water	non relevant				
	i.) wind	non relevant				
10	Combination of Endagerments eg. Repeated action + stenuousness + high temperature	Repeated instructions execution of construction according to norms reference to endangerments in manual repeated instruction of personnel repeated examination	2	B	entire device	
			BA AA KMM		EN ISO 12100-1 EN ISO 12100-2	3. Nov. 2008

7 REMAINING RISKS

Remaining endangerments were found out in course of compiling an analysis of risks as follows:

Endangerment by crushing

- Docking and taking off the CDD is allowed to be operated only when superior machine is at standstill and secured. Moreover action is allowed to be done only by instructed expert staff.

Endangerment by careless use of personal protection equipment

- Instruction in manual as to use of personal protection equipment. Personnel are to be informed regularly as to this item and the effectiveness of the instruction must be controlled regularly.

Endangerment by tumbling and falling

- The area of entering and surrounding as well as area of operation have to be kept clean to av avoid endangering by tumbling and falling down.
- Personnel must be informed by manual as to endangerment by tumbling and falling down and instructed about immediate cleaning after escaping of materials and removing of non used parts in area of working and surrounding.

Endangerment by human error

- The operator has to allow only authorized persons to work with CDD. He is responsible to a third party in the area of working.
- Organisational measurements for secure working during normal operation and works of maintenance and machine care must be observed (working directives). Regular instructions and controls must be executed verifiably.
- When starting production before first starting of CDD its functional efficiency must be examined daily.

- Unauthorised reconstruction and changing influencing security of CDD are not allowed.
- Generally, prescriptions of producer as to maintenance and security must be observed.

Noise caused by machine

- Sound level of superior machine to which CDD is mounted may go up to >80 dB(A).
- Endangerment by noise may cause irreparable hearing damage if while working at the device noise pressure level in daily mean dependent of local conditions is over 80 dB(A). Working personnel must wear adequate securing equipment, adequate securing measurements have to be carried out.

Cleaning

- Cleaning of moving parts is allowed to be carried out only at standstill of device and securing it against starting and only by instructed personnel.
- The cleaning personnel must wear adequate shoes.

(Signature)