CDR 402

OPERATING INSTRUCTIONS

Translation of the original instructions

NORTON
SAINT-GOBAIN
clipper®

CE Declaration of conformity

The undersigned manufacturer:

SAINT - GOBAIN ABRASIVES S.A.
190, BD. J. F. KENNEDY
L-4930 BASCHARAGE

Declares that this product:
« Drill Rigs »: ***CDR 402*** Code : ***70184641274***

is in conformity with the following Directives :

- ***"MACHINES" 2006/42/CE***
- ***"LOW VOLTAGE" 2006/95/CE***
- ***"ELECTROMAGNETIC COMPATIBILITY " 2004/108/CE***
- ***"NOISE" 2000/14/CE***

And the European standard:

- ***EN 12348 – Core drilling machines on stand – Safety***

Valid for machines as of serial number:
70100000

Storage site for the technical documents:
Saint-Gobain Abrasives 190, Bd. J. F. Kennedy 4930 BASCHARAGE, LUXEMBOURG

This declaration of conformity loses its validity when the product is converted or modified without agreement.

Bascharage, Luxembourg, 01/02/2012.

Olivier Plenert, executive officer.

CDR 402
OPERATING INSTRUCTIONS

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1 BASIC SAFETY INSTRUCTIONS

The core drill rig CDR 402 is exclusively designed for the drilling of construction products mainly within a Construction Site.
Uses other than the manufacturer's instructions shall be considered as contravening the regulations. The manufacturer shall not be held responsible for any resulting damage. Any risk shall be borne entirely by the user. Observing the operating instructions and compliance with inspection and servicing requirements shall also be considered as included under use in accordance with the regulations.

1.1 Symbols

Important warnings and pieces of advice are indicated on the machine using symbols. The following symbols are used on the machine:

Read operator’s instructions

Ear protection must be worn

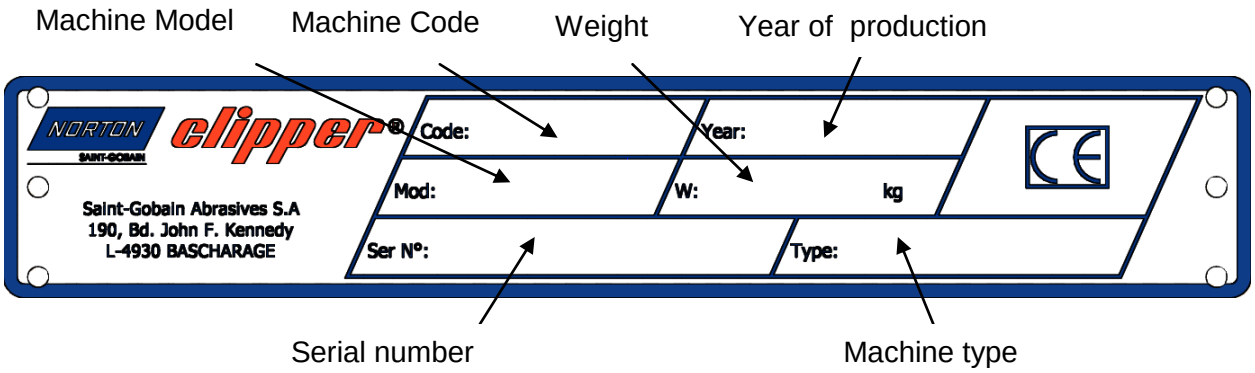
Hand protection must be worn

Eye protection shall be worn

Airway protection must be worn

1.2 Machine plate

Important data can be found on the following plate located on the machine:



1.3 Safety instructions for particular operating phases

Before commencing work

- Before commencing work, make yourself familiar with the working environment at the place of use. The working environment includes: obstacles in the area of work and manoeuvre, the firmness of the floor, necessary protection at the site relating to public thoroughfares and the availability of help in the event of accidents.
- Immediately remove damaged or badly worn core bits, as they endanger the operator whilst rotating.
- Only fit NORTON diamond core bits to the machine! The use of other tools can damage the machine!
- Read the core bits' specifications carefully to choose the adequate tool to your application.
- Make sure the handle of the machine is free from oil or grease.
- Attention is drawn to the use of BS2092 safety goggles in conformity with specified Processes No.8 of the Protection of Eyes Regulation 1974, Regulation 2(2) Part 1.
- Make sure that no mounting tool is left on the machine before starting it.

Electrical powered machine

- Make sure that the electrical supply of the machine is equipped with a grounded protective connector. If you have doubts, let a qualified electrician check the electrical system.
- Never pull the machine by the cable to transport it or to separate it from the electrical supply.
- Avoid any contact between the cable and extension cable and heat sources, oil, and sharp edges.
- Always check the cable before commencing work. If it is damaged, let a qualified electrician replace it.
- Switch the machine off, and isolate it from the main electrical supply before attempting any maintenance or repair on the machine
- In the event of the machine breaking down or stopping for no apparent reason, switch off the main electricity supply. Only a qualified electrician is allowed to investigate the trouble and remedy the fault.
- Always isolate the machine from the electrical supply when not in use.

2 MACHINE DESCRIPTION

Any modification, which could lead to a change in the original characteristics of the machine, may be done only by Saint-Gobain Abrasives who shall confirm that the machine is still in conformity with the safety regulations.

2.1 Short description

The CDR 402 core drill rig is designed for durability and high performance for onsite wet and dry drilling operations of a wide range of masonry and natural stone products. As with all other NORTON products, the operator will immediately appreciate the attention given to detail and quality of materials used in construction. The machine and its component parts are assembled to high standards assuring long life and minimum maintenance.

2.2 Purpose of use

The machine is designed for drilling a large range of building materials. It is not designed for drilling wood or metals, except steel reinforcing securely embedded in concrete.

2.3 Layout

There are two main parts on the core drilling rig CDR 402: the motor and the rig itself.

The rig is made of sectional aluminium, which reduces the weight of the machine allowing easy transportation. The base ensures stability of the rig, and allows two ways of fixing the rig: using a vacuum pump or fixing anchors. The rig is equipped with a quick fixing plate, so the motor can be fitted or removed quickly from the rig. Three different types of electric motor are available on the CDR 402, offering excellent quality of drilling and extended life duration. Every motor is equipped with a P.R.C.D. (Portable Residual Current Device). This circuit breaker protects the motor from an electrical overload. The P.R.C.D. is a circuit breaker and not a switch. Always stop the motor using its switch and not the P.R.C.D.

2.4 Technical Data

Max. drill bit diameter	400mm
Movement	625mm
Tilting	45°
Weight of the rig	13 kg (00310387343 CDR 402D Dowel base)
Dimensions(Length x width x height)	330x400x1050 mm

You can find the code number on the machine plate. If you bought a complete kit, your machine is composed of a column with combined base, a motor and a motor assembling plate. These are the characteristics of the motor:

70184641274

Motor	CDM 352
Power	3,3 kW
Motor protection	P.R.C.D. 10 mA
Rotation speeds	230/480/720min^{-1}
Total weight	28,5 Kg
Range of core bit diameter	50-350mm
Connector	1¼'' UNC male

2.5 Statement regarding the vibration emission

Declared value of vibration emission following **EN 12096.**

Machine Model / code	**Measured value of vibration emission at m/s²**	**Uncertainty K m/s²**	**Tool used Model / code**
CDR 402 70184641274	<2.5	0.5	Pro CB BETON

- The vibration value is lower and does not exceed 2.5 m/s².
- Values determined using the procedure described in the standard **EN 12348.**
- The measurements are made with new machines. Actual values may vary with site conditions, in terms of:
  - Materials worked
  - Wear Machine
  - Lack of maintenance
  - Inappropriate tool for application
  - Tool in poor condition
  - Unskilled operator
  - Etc…
- The exposure time to vibration is based on the performance of work (related to the adequacy Machine / Tool / worked material / operator)
- When evaluating risks due to hand-arm vibration, you need to take into account effective usage at rated power of machine during a full day of work; quite often you will realise that effective utilisation time represents around 50% of overall duration of work. You have to consider, of course, breaks, water feeding, preparation of work, time to move the machine, disk mounting…

2.6 Statement regarding noise emission

Declared value of noise emission following **EN ISO 11201** and **NF EN ISO 3744.**

Machine Model / code	**Sound Pressure level L_{Peq} EN ISO 11201**	**Uncertainty K (Sound Pressure level L_{Peq} EN ISO 11201)**	**Sound power level L_{Weq} NF EN ISO 3744**	**Uncertainty K (Sound power level L_{Weq} NF EN ISO 3744)**
CDR 402 70184641274	94 dB(A)	2.5 dB(A)	105 dB(A)	4 dB(A)

- Values determined using the procedure described in the standard **EN 12348.**

- The measurements are made with new machines. Actual values may vary with site conditions, in terms of:
  - Wear Machine
  - Lack of maintenance
  - Inappropriate tool for application
  - Tool in poor condition
  - Unskilled operator
  - Etc…

- Measured values relate to an operator in normal use, as described in the manual position.

3 ASSEMBLY AND COMMISSIONING

3.1 Assembling the motor on the rig

If you bought a complete kit, the motor quick mounting plate is already assembled on your motor. Otherwise, you can assemble the plate on your motor:

- tighten the 4 screws through the plate in the motor.
- Then, assemble the motor on rig by just slipping this plate in the corresponding device on the drilling head.
- Tighten the plate on the rig using the handle.

3.2 Tool assembly

Only NORTON core bit can be used with the CDR 402.
All tools used must be selected with regard to their maximum permitted cutting speed for the machine's maximum permitted rotation speed.
Before assembling a new bit into the machine, switch it off and isolate it from the main source of electricity.
To assemble a new bit, follow these steps:

- Remove the motor from the rig.
- Use two spanners to dismount the old bit: one to lock the motor axle, and the other to unscrew the bit. Do not grip on threaded parts.
- Grease the thread of the motor axle and of the bit.
- For bits with a 1¼'' fitting, insert a bronze or brass washer between the motor axle and the core bit.
- Adapters are available in case core bit and motor axle do not fit together.
- Screw the new core bit. Tighten using the two spanners. Check that it is completely locked on the motor axle.

3.3 Electrical connections

Electrical connections
Check that,

- the voltage/phase/current supply corresponds to the information indicated on the motor plate.
- available power supply has a ground connection in conformity with safety regulations. If you have any doubt, let a qualified electrician verify your installation.
- the connecting cables should have at least a 2.5mm^2-section per phase if you use extensions.

Security Device P.R.C.D.
This circuit breaker must be connected to an electrical supply having the neutral connector and the earth connector separated. If there is a connection between these two connectors anywhere on the electrical net, the P.R.C.D. will automatically cut the circuit.
Therefore, check with a qualified electrician, that this separation is correctly made on your electrical system.
If you use extension cables, make sure they have three wires.
This device can be uncertain with a generator. Ask the manufacturer of the generator if the coils are properly separated.
This device works also as NVR ("No Volt Release"). It stops the electrical supply of the machine during a power cut. Therefore, when electricity returns, the machine will not start. You have to reengage the P.R.C.D. to continue to work.

Before working with the CDR 402, you have to test the P.R.C.D. In order to achieve this follow these instructions:

- Connect the motor to the electrical supply.
- Engage the P.R.C.D. on I (or ON).
- Press the T (or TEST) button: the P.R.C.D. has to trip on 0 (or OFF).

If the P.R.C.D. trips during work, switch the machine off, and separate it from the electrical supply. Examine and repair the fault by checking every element of the system (connectors, cables, motor).

3.4 Changing motor speed

Always switch the motor off before changing speed. Turn the gear change lever on the next or previous gear. Turn the bit spindle by hand to allow the gear alignment.
Repeat these operations until you reach the required gear.

3.5 Water cooling

Ensure that water is flowing freely in the circuit as insufficient water supply may result in premature failure of the diamond core bit.
To supply the machine with water:

- Use the connector on the side of the motor. You can use either the water supply or a manual or electrical pump.
- Check if the water flow is right by looking through the cutting water. If it is fluid, the flow rate is correct. If it is not fluid, but like mud or paste, you either have to check if the water system is blocked, or increase the water flow rate.
- Obstruct the existing hole when you have to enlarge it, so you can obtain a correct cooling water inflow.
- Eliminate the water escape ways and increase the flow rate to the maximum when you have to drill porous or cracked materials, or make a second drill.
- Use a water-collecting device when you drill overhead.
- In case of frost, empty the water cooling system.

4 TRANSPORT AND STORING

Take the following measures in order to transport the CDR 402 securely.

4.1 Securing for transport

Dismount the core bit, separate the motor from the rig, and the motor from electrical supply.

4.2 Transport procedure

Use only surface transport to move the CDR 402. Use the handle to carry the rig. No part of the machine has been designed to lift the CDR 402.

4.3 Long period of inactivity

If the machine is not going to be used for a long period, completely clean the machine. Store the machine in a dry aired and clean place.

5 OPERATING THE MACHINE

You will find useful description of how to use the machine properly.

5.1 Site of work

5.1.1 Siting the machine

- Remove from the site anything, which might hinder the working procedure!
- Make sure the site is sufficiently well lit!
- Observe the conditions for connecting to power supplies!
- Place electric cables in such a way that damage by the CDR 402 is excluded!
- Make sure you have a continual adequate view of the working area so you can intervene in the working process at any time!
- Keep other staff out of the area, so you can work securely.

5.1.2 Space required for operation and maintenance

Leave 2 m around the machine for usage and maintenance of the CDR 402.

5.2 Drilling method

5.2.1 Preparing the cut

- Make sure that it is well anchored or clamped firmly when the material to be drilled is not part of a big construction.
- Before drilling a reinforced-concrete construction, make sure you will not damage the structure.
- Make sure the drilling will not damage any gas or plumbing pipelines, or electrical wires.
- Only use the plastic handle of the machine, and no metal parts, to operate the CDR 402, especially when electrical wires might be submerged.
- Make sure before drilling that the core will not cause damage to anything or anyone by falling out of the hole. Always delimit and sign the working area and place warning signals around it.
- If the core can cause damage by falling out of the hole, make the right framework to hold the core when you stop drilling.
- To choose the core bit rotation speed, use the graph on page, which gives the range of speed to use according to the diameter of the hole.
- Before starting your work, check the fixing and stability of the core bit.
- Use the right tools as recommended by the manufacturer depending on the material to be drilled and the required efficiency.
- Apply cooling water continuously whilst drilling and in good time!

5.2.2 Fixing the rig

Only use NORTON tools to fix the rig. Always fix the rig before assembling the motor on the rig. When drilling overhead or horizontally into a wall, only use dowels to fix the rig. Extra safety provision should be made with the use of a support sling to the drilling rig, in case of failure of anchor.

Fixation with a dowel

To fix the drill rig, you need a 15mm-dowel, a 30cm-long threaded rod, a washer and a wing nut.

- Bore a 15mm-diameter and 50mm-depth hole and clean it.
- Use the appropriate tool to set the dowel in the hole.
- Screw the threaded rod in the dowel.
- Place the rig so that the threaded rod goes through the oblong hole in the base.
- Insert the washer on the rod, and screw the wing nut thoroughly.
- You can adjust the rig by using the screws in the corners of the base.

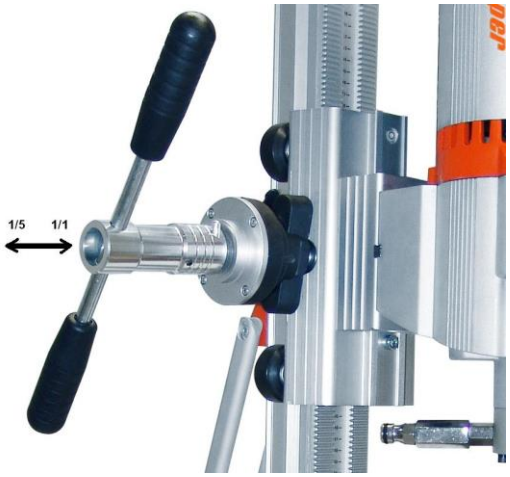
Fixation with a vacuum pump

- Fix the pump on the base of the rig.
- Place the rubber joint under the base.
- Place the machine where you want to bore, and hold it firmly.
- Start the vacuum pump. You have to reach a pressure under 0,65bar to have a sufficient adhesion of the rig.
- If you cannot reach this pressure, try to smooth the surface for example with plaster.

5.2.3 Drilling perpendicularly to the surface

Once your motor is engaged on the right gear, and the rig placed and fixed at the right position, you can begin your cut. Follow these instructions:

- Put the handle back on the nut, which allows the movement of the cutting head.
- Engage the P.R.C.D.
- Open the water supply.
- Start the motor with the core bit not touching the surface.
- Using the handle, lower slowly the core bit until it lightly touches the surface.
- Slowly turn the handle to make the first centimetre of your drilling. By doing so, you ensure that your hole will be perfectly centred.
- You can then increase the drilling feed speed. If you drill too slowly, you lower the machine efficiency. Drilling too fast results in premature wear of the diamond segments.



5.2.4 Slanting holes

You can incline the rig to make slanting holes:

- Remove the screw on the front of the rig, and loosen the two screws on the side of the rig. Keep the front screw, as you will have to reassemble it next you want to use the rig perpendicularly to the surface.
- Loosen the locking handle on the brace bracket.
- Adjust the rig until you reached the required angle.
- Retighten the two screws on the side of the rig and the locking handle.

Start drilling very slowly because the bit attacks the drilled material only with a little part of its cutting surface, even with only one of its diamond segments. By drilling slowly, you avoid misalignment of the core bit.

5.2.5 Drilling of steel rods in reinforced concrete

When you see that:

- The core bit goes ahead very slowly.
- The force you have to make on the hand wheel increases.
- The water going out of the hole is clear and there are some metallic splints in it.

You are going through the steel rods for reinforced concrete. Follow these instructions:

- If possible, select a lower gear. Remember that you must firstly take the core bit out of the hole and switch the motor off in order to change from gear.
- Reduce the thrust on the core bit.

Once you have finished cutting the rods, you can reselect the initial gear and drilling speed.

5.2.6 Mechanical clutch

The motor is equipped with a mechanical clutch. It protects against mechanical overload of the motor. However, the motor might be damaged if it works longer than two seconds. Therefore reduce the drilling force and switch the motor off.

5.2.7 Breakaway of a segment

When diamond segments, slivers of steel or parts of your drilled material come away during drilling, and prevent the core bit from drilling, abandon the hole and make another hole, with the same axis of the first but with an larger diameter (15-20mm).

5.2.8 End of the drilling

When you have made the hole you want to drill:

- Lift the core bit out of the hole.
- Stop the motor by using the switch and not the P.R.C.D.
- Stop the water supply.

5.2.9 Pulling the core out of the bit

- Unscrew the core bit from the motor axle.
- Hold the bit vertically.
- Beat lightly the tube of core bit with a wood hammer until the core goes out. Never beat the core bit with violence against a wall or with tools like hammers or wrenches. Otherwise, you may distort the tube, preventing the core from coming out of the core bit and the re-use of the bit.
- If the core is stuck into the bit, try to crush it with a chisel. Be careful not to damage the core bit.

5.2.10 Pulling the core out of the hole (blind holes)

- Using a wedge or a lever, snap the core.
- To extract the core out of the hole use the special pliers or a wire loop, or make a little hole into the top of the core and put into it an eyebolt to pull up and remove the core.

5.2.11 Drilling using an extension rod

To make hole deeper than the tool length:

- Make the hole for the full depth of the bit.
- Take the bit out of the hole and switch the motor off.
- Take the core out of the hole without moving the machine.
- Unscrew the core bit from the motor axle and put it into the hole.
- Screw the extension rod between the core bit and the motor axle. For 1¼'' back fitting end, insert a brass or bronze washer.

6 MAINTENANCE AND SERVICING

To ensure a long-term quality from the cutting with the CDR 402, please follow the maintenance plan below:

		Begin of the day	During the changing of the tool	End of the day	Every week	After a fault	After a damage
Whole machine	Visual control (general aspect, watertightness)	■				■	■
	Clean			■			
Motor cooling fans	Blow the dirt and dust			■			
Switch, cables and extension cables	Inspect	■					
Water hoses and nozzles	Clean			■			
Motor housing	Clean				■		
Reachable nuts and screws	Tighten up				■		

Service the machine only while it is switched off and isolated from the electrical supply.

Cleaning the CDR 402

After work, blow dirt and dust out of all air vents with dry air. Wear protective goggles for this operation.

Switch, cables and extension cables

Check visually that switch, cables and extension cables are not damaged. If so, get them replaced by a qualified electrician.

Inspection and control

Return your core drilling motor for service to your nearest Service Center at least every 200 hours of work. At this occasion, ask for the change of your carbon brushes.

7 FAULTS: CAUSES AND CURES

7.1 Fault-finding procedures

Should any fault occur during the use of the machine, turn it off, and isolate it from the electric supply. Works dealing with the electric system or supply of the machine can only be done by a qualified electrician.

7.2 Trouble-shooting guide

Trouble	Possible source	Resolution
Motor is not running	No electricity	Check the electrical supply (fuse for example)
	Defective switch	CAUTION : can only be solved by qualified electrician
	Defective motor	Change motor or contact motor manufacturer
	Fault due to P.R.C.D.	Check the earth link on your electrical supply. Change the P.R.C.D.
	Connection cable section too small	Change connection cable
	Defective connection cable	Change connection cable
Motor stops during the cutting, but can be restarted after a short period	Drilling advance too quick	Cut slowly
	Core bit is blunt	Sharpen the core bit in calcareous stone
	Defective core bit	Change core bit
	Core bit is not corresponding to the application	Change core bit
No water on the core bit	Water supply closed	Open the water supply
	Water supply system is blocked up	Clean water supply system

7.3 Customer service

When ordering spare parts, please mention:

- The serial number (7 digits).
- The code of the part.
- The exact denomination.
- The number of parts required.
- The delivery address.
- Please indicate clearly the means of transportation required such as "express" or "by air". Without specific instructions, we will forward the parts through the means which seem appropriate to us and but which is not always the quickest way.
  Clear instructions will avoid problems and faulty deliveries.

If not sure, please send us the defective part.
In the case of a warranty is claim, the part must always be returned for evaluation.
Spare parts for the motor can be ordered with the manufacturer of the motor or with their dealer, which is often quicker and cheaper.

This machine has been manufactured by Saint-Gobain Abrasives S.A.

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Guarantee can be claimed and technical support obtained from your local distributor where machines, spare parts and consumables can be ordered as well:

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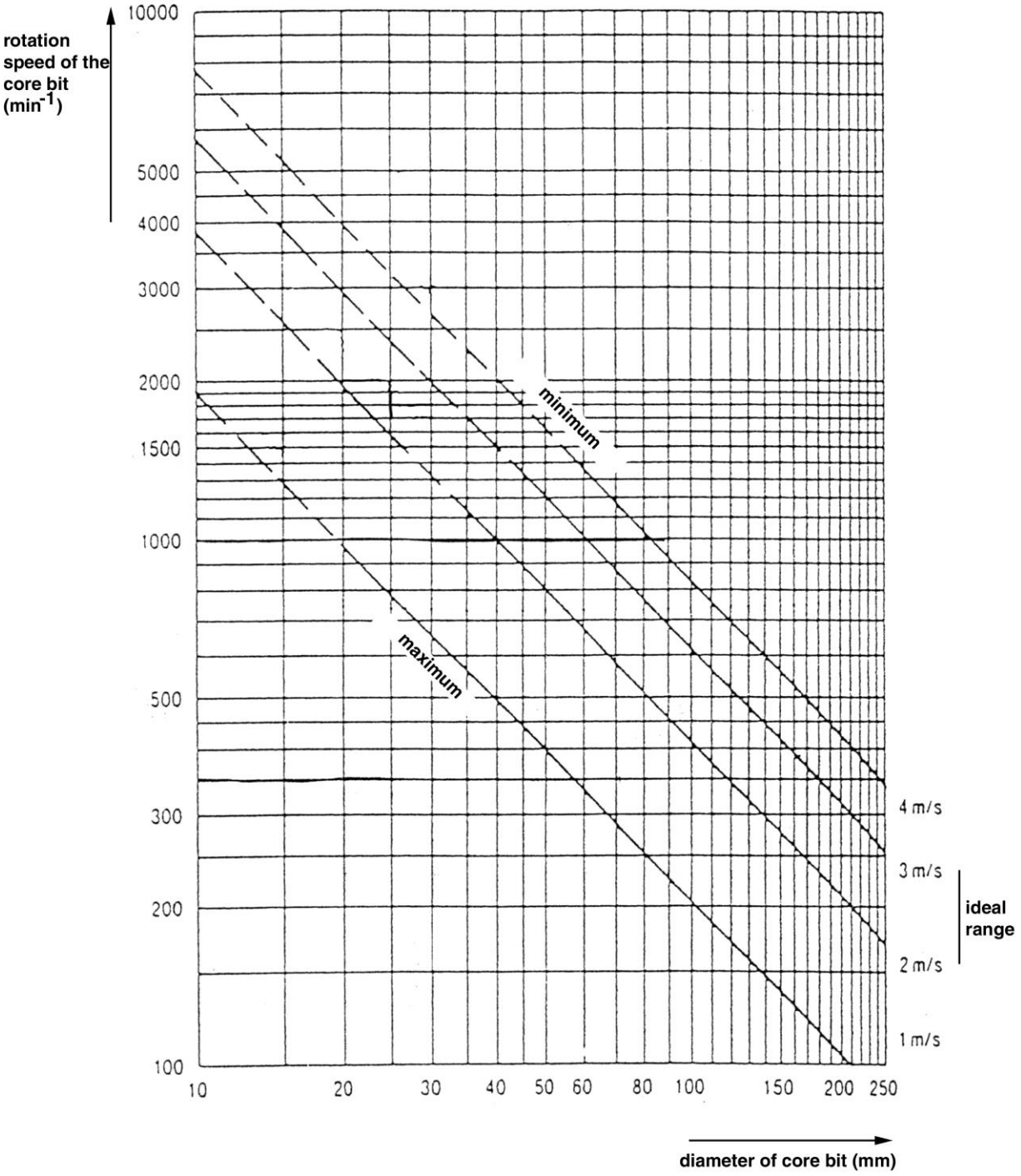
8 APPENDIX

8.1 Ideal rotation speed of the core bit in relation to the hole diameter



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