

Part 1/3

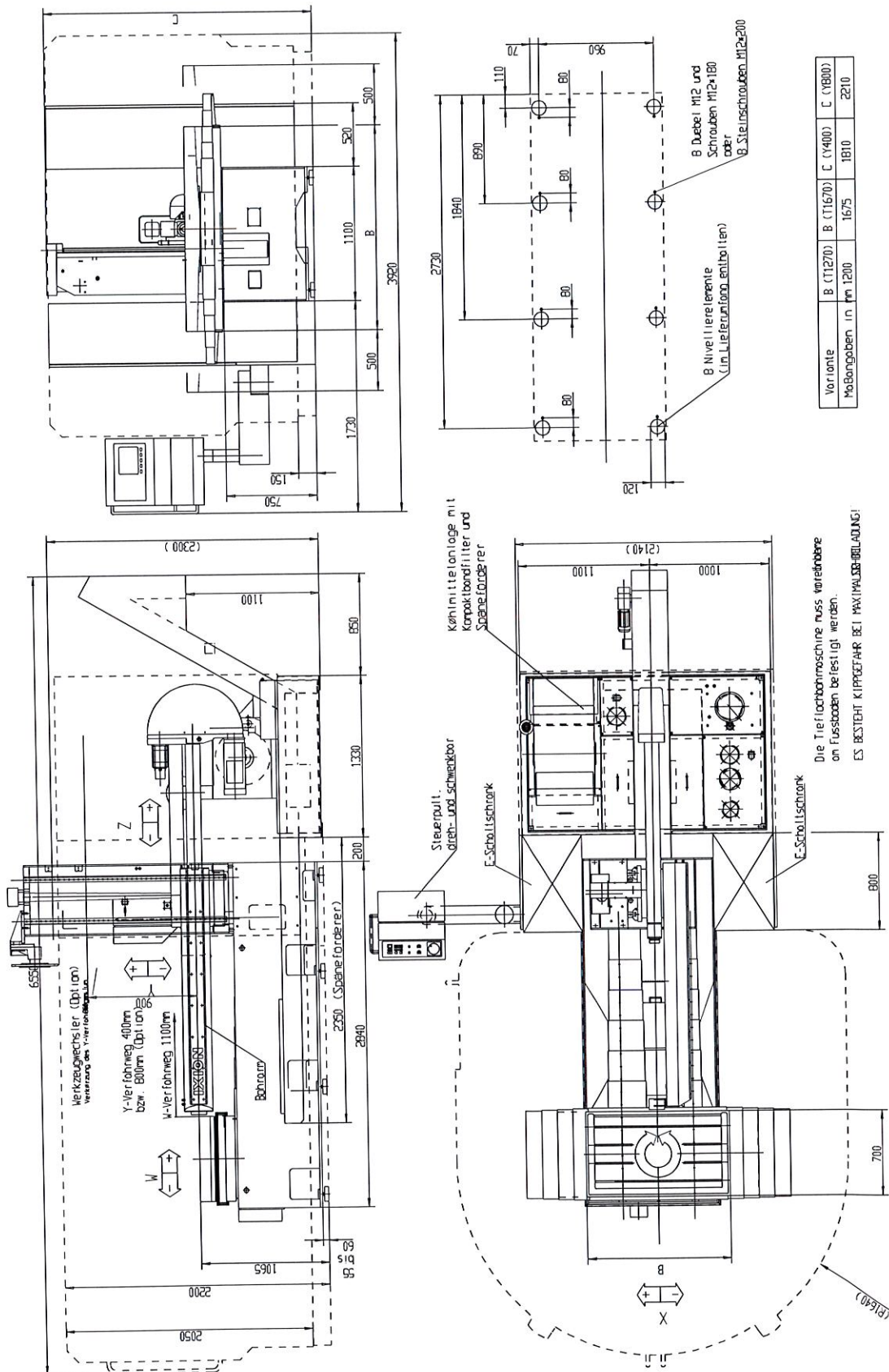
Instructions for delivery, installation and start up
for Deep drilling machine



Machine type	IXION TL 1004	IXION GmbH & Co. KG Postfach 70 08 29 22008 Hamburg	
Order no.	570	Jenfelder Str. 30 22045 Hamburg	
Machine no.	950525	Domestic sales	Tel. ++49 (40) 66 98 09 - 48 Fax ++49 (40) 66 98 09 - 91
Customer	Intec SG / CW	Foreign sales	Tel. ++49 (40) 66 98 09 - 46 Fax ++49 (40) 66 98 09 - 91
Location	CW Singapore	Service	Tel. ++49 (40) 66 98 09 - 27 Fax ++49 (40) 66 98 09 - 32
		Spares' departm.	Tel. ++49 (40) 66 98 09 - 77 Fax ++49 (40) 66 98 09 - 32
		E-mail-Adress	see http://www.ixion.de

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Installation instructions



Vorionte	B (T1270)	B (T1670)	C (Y400)	C (Y800)
Maßangaben in mm	1200	1675	1810	2210

Prerequisites for Erection Site

- **Space Requirements**

(please refer to the enclosed measurement drawing)

TL 1004: Length 6420mm x Width 3920mm x Height 2200mm

- **Floor**

- Erect the machine on a concrete floor with a density grade B5

(Nominal density 5 N/mm², Serial density 8 N/mm²)

- Evenness of Erection Site ± 5 mm
- Total machine weight including worktable to carry 2000 kg load and oil filling for coolant equipment

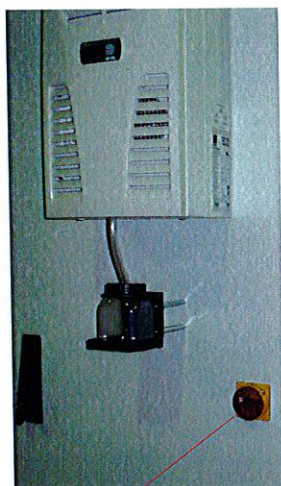
TL 1004 approx. 9.700 kg.

- The greatest load is erected on swing feet under the basic machine;
- max. surface pressure: TL 1004 0,7 N/mm²
- **Foundations**
- Foundations are not normally required.

- **Mains Connection**

 The connection of the machine to the mains is to be carried out by our technician.

- Have the connection from the mains to the erection site for the switch cupboard prepared before the machine is delivered



mains switch (ON/OFF)

Mains Connection Data:

Nominal Capacity	30 kVA
Operating Voltage	400 V
Frequency	50 Hz
Mains Supply	5 - Lead three-phase
	75 A

Terminals for Neutral and Earth in Switch Cupboard

 Please ensure all poling is clockwise !

- **Compressed Air Connection (Option)**

- Compressed air is required for operating the sump valve on the fissure edge filtering equipment: 6 bar
- Compressed air is also required for operating the shaft drill unit (optional equipment)

Transport



Remove the transport protection devices after installing the machine.

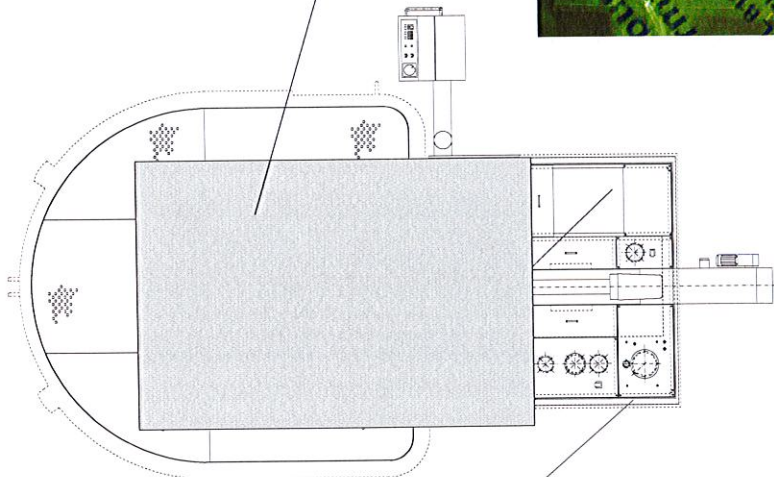
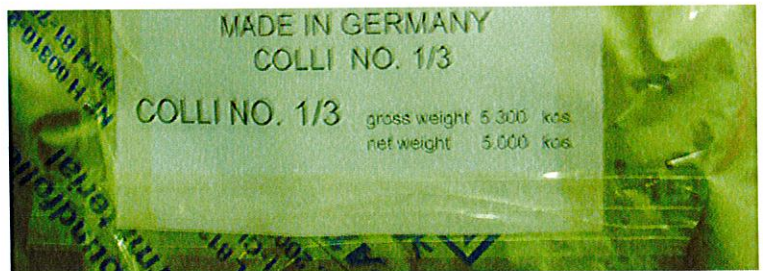


Watch for the center of gravity of the machine during transport !

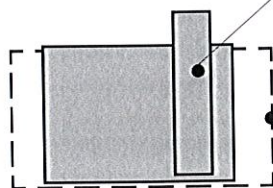
- The following data include packing (pallet, box or similar)

- **Base machine IXION TL 1004**

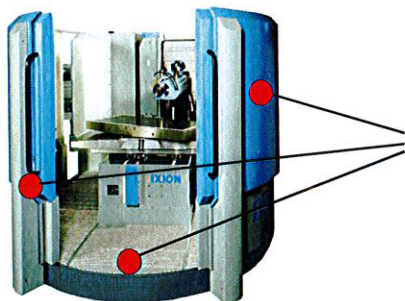
- Approx. weight 4.800 kg
- Approx. required forklift capacity 8.000 kg
- Distance from the truck's center of gravity 600 mm
- Colli for Container complete 5.900 kg



- **Cooling/lubrication fluid cleaning system TL 1004**



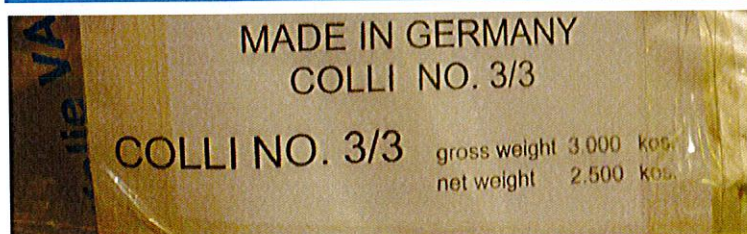
- Approx. weight 630 kg
- Dimensions:
- Length 4400 mm
- Width 2150 mm
- Height 1800 mm



- **Housing and tank**

The parts of the housing and the tank will be delivered

in 2 special collis for containertransport



Unloading by crane

☞ Do not remove the transport protection devices !

☞ Avoid hard shocks and vibrations !

- Hard shocks and vibrations affect the machine's precision.
- All units can be transported, loaded and unloaded by forklifts or cranes, with no other transporting or loading aids.

☞ Use cables of adequate strength.

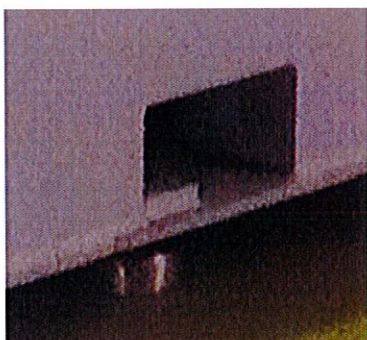
The base machine's lateral walls are provided with holes of Ø 40 mm for engaging shackles.

☞ Watch for the machine's center of gravity during transport.

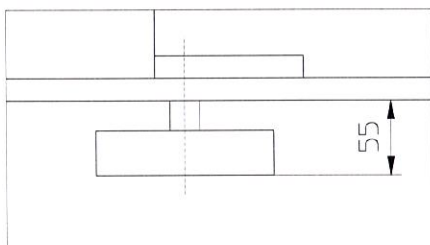
- Rotate the bench by 90° and move it to the zero position of the W-axis (end of the machine frame)
- The tail spindle must be in the lowest position of the Y-axis (Y = - 400 mm or optional Y = - 800).
- Move the Z-axis to the position Z = -1,000 mm

☞ The blocking materials must not press against any machine components. Watch out especially for the tail spindle and the drilling spud !

Installation of the Deep drilling Machine



- **Installing**
 - The machine is installed by our installers.
 - Transport the machine to its final destination before the arrival of the installers
 - Position the Deep Drilling Machine on the levelling units supplied with the machine.
- The levelling units are integral components of the machine's delivery.



- **Anchoring**
 - In case of work pieces of 1,000 kg or more or of an off-center loaded bench, the machine must be fastened to the floor !

Risk of upsets in case of off-center loading.

Risk of upsets in case of work pieces exceeding a weight of 1,000 kg.

- Fasten the machine with 8 dowels m12 and screws M12 x 180,
or stone bolts M12 x 200.

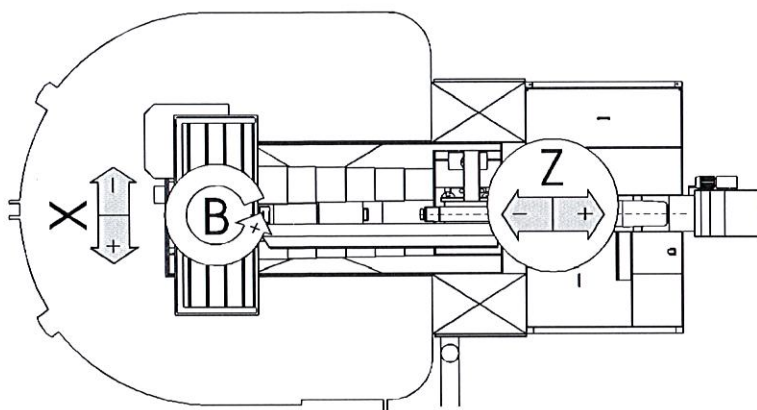
 Follow the instructions of the manufacturer of the anchoring screws.
Especially applicable if using dowels made of reaction resins !

- **Aligning**
 - Coarsely align the machine before starting operation.
Reference plane: surface of the machine bench.
 - Pre-adjust by using an air-bubble level.
The precise alignment of the machine will be carried out by our Installer when starting up the machine.

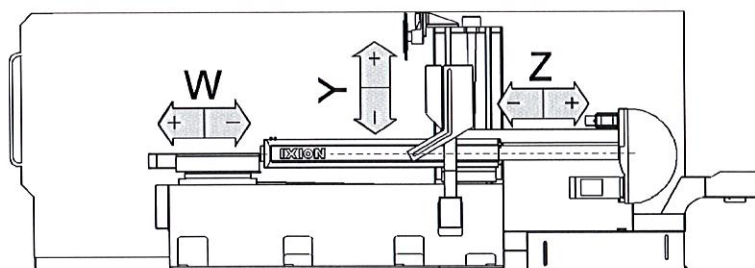
- **Transport protection**
 - The machine bench is longitudinally aligned and fastened along the Z-axis (tail spindle).

Removing the transport protection:

- Remove the wooden plug from the X- and W-axis.



014i-029



014i-022

- Detach the bench brake
- Swing the bench over to a zero position (90° across the axis Z)
- Tighten the bench brake.

The precise alignment of the machine bench will be carried out by our installer.

- **Cleaning**
 - Degrease the base machine with petrol before starting operation.
 - Lightly oil all machined surfaces.

Client preparation prior to start up

- **Operating personnel**

The operating personnel should familiarize itself with the operating and programming of the CNC-controls before the arrival of the machine.

The participation in an operating and programming training course at our or your premise is recommended.

☞ Read the operating manual before moving to any start up operations.

- **Cooling and lubricating fluids**

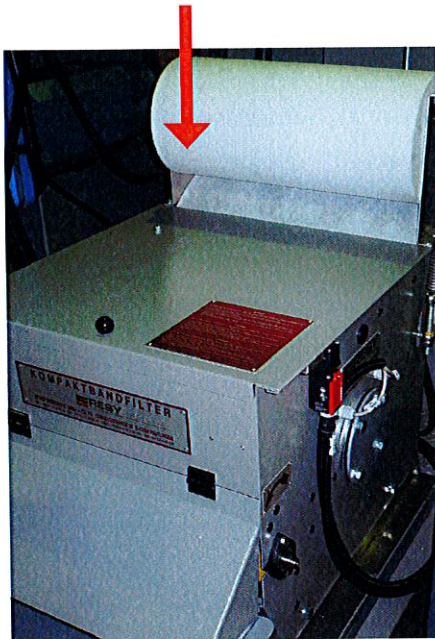
- Keep some deep drilling oil ready for the start up operations.

☞ No operating start up will be possible without some deep drilling oil.

The following volumes are required:

- TL 1004: ca. 670 l

to funnel deep drilling oil
into the KBF-filter



- It is okay if you can see the
oil in the chip conveyor

- **Tools**

Tool holder: SK 40	according to	DIN 69871
Tightening bolt:	according to	DIN 69872
Tightening IC-spindle:	according to	DIN 69872 form A

We recommend to keep the following tools on hand, referred to a drilling diameter of 10 mm.

- Center bit NC Ø 10 mm
- Spiral bit Ø 9,8 mm
- Reamer Ø 10^{H7} mm
- SK 40 Tool holders for straight-fluted hard metal drill bits (IXION rotary feed), for connecting to the cooling and lubricating system.
- SK 40 Tool holders for internally cooled tools (used only with an IC-spindle)
- Straight-fluted hard metal drill bits with sealing discs and backrest bushing



Free drill bit length:

without support bushing: max. 40 x drill bit diameter

with support bushing: max. 80 x drill bit diameter

Straight-fluted hard metal drill bit and accessories

- **Basic construction of straight-fluted hard metal drill bits** A straight-fluted hard metal drill bit consists of a one-edged cutter head made of or coated with hard metal, equipped with guides and a streamlined section tube used as a shaft. The cooling and lubricating fluid is conveyed through the shaft to the active drilling point and takes care of the continuous removal of the chips through the external annulus (reinforcement in the drill shaft). The straight-fluted hard metal drill bit is mounted on the tool holder by using a split taper sleeve of Ø 25 mm x 70 mm soldered into the drill shaft.

- **Sealing enclosure**

The sealing enclosure is designed to hold the sealing disks and the center bushing, and is fastened to the chip separator by a quick-joint.

- **Sealing discs**

The mixture of deep drilling oil and chips flushed back from the active drilling point is deviated into the machine frame by the chip separator: the seal against the drill shaft is provided by the sealing discs. The sealing discs fitted to the drill shaft - two pieces are required for each hard metal drill bit - are exposed to high stresses during the deep drilling process.

Due to the expected high rate of wear, it is appropriate to procure a major number of sealing discs for each drill bit diameter.

- **The backrest bushing**

The backrest bushing guides the straight-fluted hard metal drill bit along the tool shaft and prevents it from deviating, especially during the initial boring process.

The backrest bushing is installed into the center backrest and/or into the supporting backrest riding along with it (optional). One backrest bushing is required for each drill bit diameter.

- **Cutting angle**

The exact cutting angle of the straight-fluted hard metal drill bit is the basis for good drilling results. This applies to the continuous drilling process and the surface quality of the drilled hole as much as to the speeds of the potential forward feeding motion.

Straight-fluted hard metal drill bits are re-ground only at the front face.

About 15 - 40 regrinding operations are possible, depending on the drill bit diameter and the rate of wear. The final grinding must be done by using a fine-grained diamond grinding disc and a special grinding device.

Both a suitable drill bit grinding machine and a grinding device for use on any grinding machines already existing in your plant will be available from IXION as accessories.

 The cutting angle must sized in accordance with the drill bit diameter.

A summary listing the standard cutting angles is attached. We refer to the VDE-Guideline 3208 on 'Guidelines for deep drilling with One-landed Drill Bits' and the date of the current tool manufacturers.

- **Ordering length (standar spindle with rotary feeding)**

The ordering length of the one-landed hard metal drill bits may be calculated as follows:

$$L = T + 210\text{mm} + 15\text{mm} + 30\text{mm} + 70\text{mm}$$

Ordering length	=	Drilling depth	+	Loss distance in the chip separator	+	Wrench faces on the split taper sleeve	+	Loss distance on the optional support backrest (Ø25 mm x 70mm)	+	Split taper sleeve
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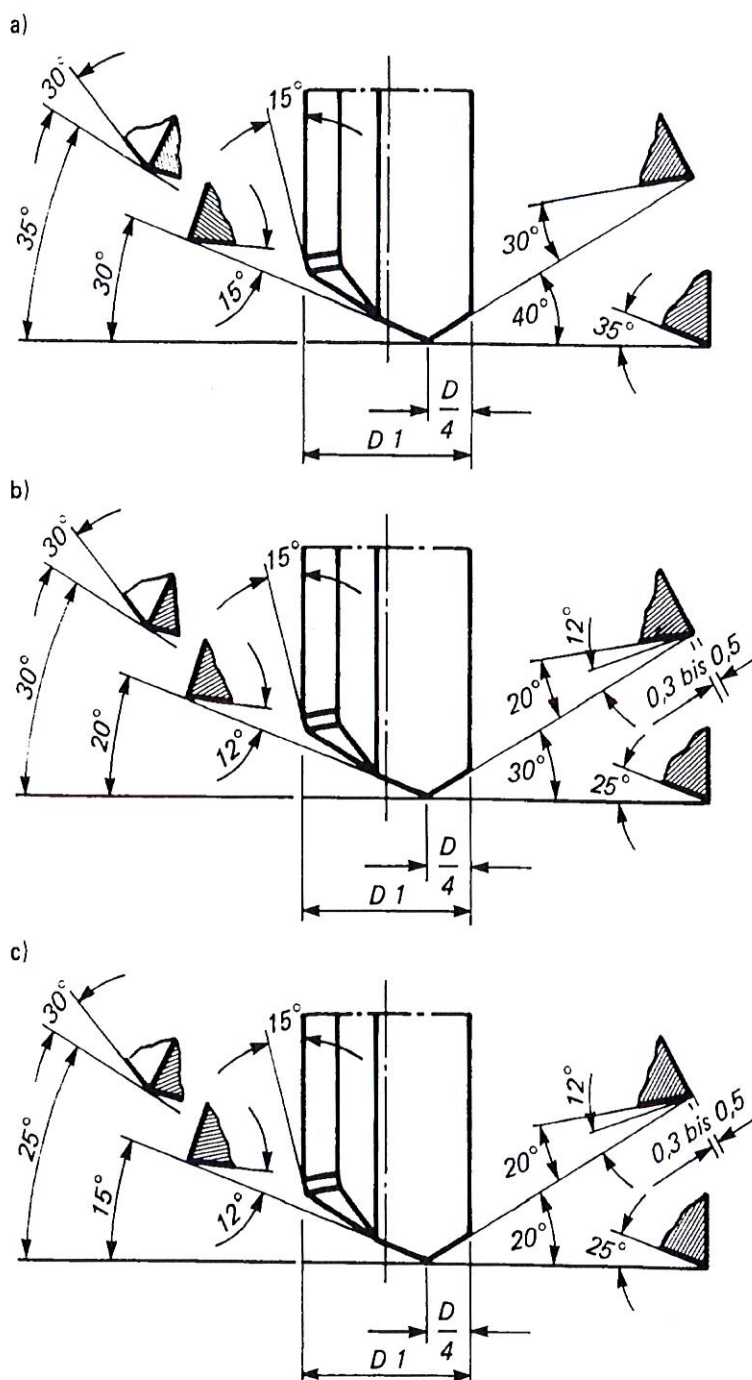
- **Ordering length (IC-spindle)**

The ordering length of the one-landed hard metal drill bits may be calculated as follows:

$$L = T + 210\text{mm} + 15\text{mm} + 30\text{mm} + 138\text{mm} + 70\text{mm}$$

Ordering length	=	Drilling depth	+	Loss distance in the chip separator	+	Wrench faces on the split taper sleeve	+	Loss distance on the optional support backrest (Ø25 mm x 70mm)	+	Compensation rotary feeding standard spindle	+	Split apert sleeve
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**Standard cutting angles
for straight-fluted hard metal drilling bits**



**Standard cutting angles for straight-fluted
hard metal drill bits**

- a) Drill bit diameter, from 1 to 4 mm
- b) Drill bit diameter, from 4.1 to 20 mm
- c) Drill bit diameter, from 20.1 to 40 mm

Oil Recommendations and Manufacturers of Deep-Hole Drilling Oil



This list contains oil recommendations of the respective manufacturers for the groups of materials specified down. We recommend to directly co-ordinate case of application with the selected oil producer.

material	RHENUS 1)	RHENUS 2)	PETROFER 3)	Mobil Oil 4)	Shell Macron
I	R-OIL DD 10 r.rhenus UA 13 S	r.rhenus UA 19 S	ISOCUT T 400	Vacmul 03C	Garia 404 M-10
II	R-OIL DD 10 r.rhenus UA 13 S	r.rhenus UA 19 S	ISOCUT T 400	Mobilmet 762	Garia 404 M-10
III	R-OIL DD 10 r.rhenus UA 13 S	r.rhenus UA 19 S	ISOCUT T 400	Mobilmet 76 Mobilmet 762	Garia 603 S-15 Garia 601 M-8 / 12 / 22 5)
IV	R-OIL DD 10 r.rhenus UA 13 S	r.rhenus UA 19 S	ISOCUT T 400	Mobilmet 763 Mobilmet 762	Garia 603 S-15 Garia 601 M-8 / 12 / 22 5) Garia 404 M-10
V	R-OIL DD 10 r.rhenus UA 13 S	r.rhenus UA 19 S	ISOCUT T400	Mobilmet 763 Mobilmet 762	Garia 603 S-15 Garia 601 M-8 / 12 / 22 5)
VI	R-OIL DD 10 r.rhenus UA 13 S r.rhenus EP 15 S 3)	r.rhenus UA 19 S	ISOCUT TB 382	Mobilmet 763 Mobilmet 423	Garia 603 S-15 Garia 601 M-8 / 12 / 22 5) Garia 404 M-10
VII	r.rhenus EP 15 S	r.rhenus UP 18 S	ISOCUT TB 382	Mobilmet 443 Mobilmet 423	Macron 2413 M-15 Macron 803 S-10 VEG (to use for pure copper)
VIII	R-OIL DD 10 r.rhenus EP 15 S	r.rhenus UA 19 S	ISOCUT TB 382	Mobilmet 763 Mobilmet 762	Garia 603 S-15 Garia 601 M-8 / 12 / 22 5)

- 1) Cast iron in the qualities 0.6025 and also spheroidal cast iron 0.7040
- 2) Structural and case hardening steels of a strength up to 800 N/mm²; e.g. 1.0570, 1.0401, 1.0503
- 3) Special steels of a strength over 800 N/mm²; e.g. 1.7131 and 1.7225
- 4) Alloyed cold worked steels and hot worked steels; e.g. 1.2312 and 1.2343
- 5) Stainless steels; e.g. 1.4541
- 6) Aluminium and aluminium alloys; e.g. 3.3535 and 3.1645

- 1) For bore diameters < 3 mm, the product cited first is low emission and free of aromatic compounds, that cited last is conventional
- 2) For bore diameters > 3 mm, the product cited first is low emission, that cited last is conventional
- 3) For bore diameters of 0.9 mm to 6 mm ISOCUT T 505
- 4) The product cited second for bore diameters < 6 mm
- 5) Different viscosity depending on the bore diameter
- 6) For stain-sensitive aluminium alloys

Manufacturers of deep drilling oils

rhenus Rhenus Lub GmbH & Co KG Erkelenzer Straße 36 D-41179 Mönchengladbach	Telefon: 02161/5869-0 Telefax 02161/5869-93 www. rhenuslubweb.com vertrieb@ rhenusweb.de	Mobil Mobil Schmierstoffe GmbH Neuhöfer Brückenstr. 127. 152 D-21107 Hamburg	Telefon: 040/75191-109 Telefax: 040/75191-619 industry@ mobil-europe-lubes.com
PETROFER CHEMIE Postfach 1006 45 D-31106 Hildesheim	Telefon: 05121/7627-33 Telefax 05121/54438 www. petrofer.de	Shell Macron GmbH Giselherstr. 57 D-44319 Dortmund	Telefon: 0231/9277-319 Telefax: 0231/9277-377 www. Shell-Macron.de