4.8 Drill recommendations

4.8.1 Spindel speed

Dieckmann gives the following recommendations for the peripheral speed according to the average core bit diameter:

surface setted bits	v = 1.0 - 3.0 m/s
diamond impregnated bits	v = 2.0 - 5.0 m/s
stratacut bits	v = 0.5 - 1.5 m/s
synset bits	v = 1.0 - 3.0 m/s
hybrid bits	v = 2.0 - 5.0 m/s
TC bits	v = 0.3 - 0.8 m/s
borit bits	v = 0.5 - 1.5 m/s

v = peripheral speed in m/s

To calculate the spindel speed you have to determine the average core bit diameter:

$$d = (od + id) / 2$$

d = average core bit diameter in mm
od = outer diameter of core bit in mm
id = inner diameter of core bit in mm

After that you can calculate the spindel speed:

$$s = 60.000 * v / (\pi * d)$$

s = spindle speed in rpm
π = 3.1415

Example (surface setted bit T-2 ø 76 x 62 mm):

v = 1.0 - 3.0 m/s

od = 76 mm

id = 62 mm

d = (76 + 62) / 2 = 69 mm

s = 60.000 * v / (3.1415 * 69)

= 276 - 830 rpm

4.8.2 Flushing water recommendations

Dieckmann gives the following recommendations for the speed of the flushing water in the space between rod and borehole:

$$v = 0.3 - 0.5 \text{ m/s}$$

v = speed of flushing water in m/s

The recommended water volume is:

$$q = 0.015 * \pi * (od^2 - rd^2) * v$$

q = water volume in liters per minute

π = 3.1415

od = diameter of borehole (or bit) in mm

rd = diameter of rod in mm

Example (coring bit T-2 Ø 76 x 62 mm, CR50 drill rod) :

v = 0.3 - 0.5 m/s

π = 3.1415

od = 76 mm

rd = 50 mm

q = 46.3 - 77.2 liters per minute

4.8.3 Weight on bits

Weight on surface setted bits

The weight on one cutting diamond should be:

$$p = 40 - 60 \text{ N}$$

p = weight on one cutting diamond in N

Because approximatly 65 % of all diamonds are cutting diamonds the weight on the bit should be:

$$l = 0.65 * c * n * p$$

l = weight on the bit in N
c = diamond weight in ct
n = diamond size in spc

Example (surface setted bit T-2 Ø 76 x 62 mm, 12 ct, 30/40 spc):

$$p = 40 - 60 \text{ N}$$

$$c = 12 \text{ ct}$$

$$n = 35 \text{ spc}$$

$$l = 0.65 * 12 * 35 * p = \underline{\underline{10.920 - 16.360 \text{ N}}}$$

Weight on diamond impregnated bits

Dieckmann gives the following recommendations for the weight on bit per cm^2 of cutting surface:

$$w = 800 - 1.000 \text{ N/cm}^2$$

w = weight on bit per cm^2 of cutting surface in N/cm^2

The cutting surface is:

$$a = (od^2 - id^2) * \pi / 400$$

a = cutting surface in cm^2
od = outer diameter of core bit in mm
id = inner diameter of core bit in mm
π = 3.1415

So the weight on bit is:

$$l = a * w$$

l = weight on the bit in N

Example (diamond impregnated bit T-2 Ø 76 x 62 mm):

$$w = 800 - 1.000 \text{ N/cm}^2$$

$$od = 76 \text{ mm}$$

$$id = 62 \text{ mm}$$

$$a = (76^2 - 62^2) * 3.1415 / 400 = 15.17 \text{ cm}^2$$

$$l = 15.17 * w = \underline{\underline{12.136 - 15.170 \text{ N}}}$$

Weight on stratacut bits

The weight on stratacut bits should be 2.500 - 3.000 N per cutter.

Weight on synset bits

The weight on synset bits should be 400 - 600 N per cutter.

4.9 Associated equipment

4.9.1 Core barrels

Dieckmann delivers the standard single tube core barrels type B in diameters from 46 to 146 mm and in lengths of 500, 1000, 1500 and 3000 mm.

We also deliver the standard double tube core barrels type D in diameters from 101 to 146 mm and in lenghts of 1500 and 3000 mm.

Dieckmann developed and delivers the triple tube core barrel type MD-T in size 131 x 102 mm and in lengths of 1000, 1500, 3000 and 6000 mm.

We also deliver the wireline core barrels type SK-6-L and GEOBOR-S in lengths of 1500 and 3000 mm.

4.9.2 Liner conversion kit

Dieckmann developed and delivers a liner conversion kit for standard double tube core barrel type D-131 to use a 4" plastic liner with this core barrel.

4.9.3 Casing tubes

Dieckmann delivers metric casing tubes in sizes Ø 44-143 mm, both LH and RH, in lengths up to 6000 mm.

4.9.4 Wireline drill rods

Dieckmann delivers flush jointed wireline drill rods made of high precision cold drawn seamless tubes of STRUCTO 720, in lengths up to 6000 mm for SK-6-L/GEOBOR-S/CSK-146.

4.9.5 Drill rods

Dieckmann delivers steel drill rods in lengths up to 6000 mm in following dimensions:

CR 33.5	RW
CR 42	EW
CR 50	AW
WW 51	BW
WW 63.5	NW
WW 73	HW

2-3/8" API reg.
2-7/8" API reg.
3-1/2" API reg.
4" API reg.
4-1/2" API reg.
5-1/2" API reg.
6-5/8" API reg.