Asahi Diamond Industrial Australia Pty. Ltd.

Product Catalogue

Mining

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SCAN ME

Introduction

Asahi Diamond Industrial is one of the world leaders in Diamond tooling servicing the Engineering, Construction and Mining sectors with high quality, reliable and cost effective products.

Technology advances are so rapid that one year old technology may be considered redundant. To keep pace with these technological advances we continually develop and modify our high precision, highly efficient tools, while promoting application development.

Used in a wide range of applications, Asahi tools are commonly used within the mining sector for drilling and geotechnical operations where high quality and reliability is required. They play an integral role in preventing excessive noise and protecting the environment. They are also used for dismantling buildings and bridges, seismic strengthening, upgrading infrastructure, and processing of various types of stone.

Through a stable supply of raw materials and a constant development process, Asahi Diamond can always guarantee stable, high quality products across the range.

Our Story

In 1947 Triefus Company Ltd. became a public company and its shares were quoted on the London Stock Exchange. At this time there became an increasing awareness of the importance of Diamond tools in the modern industrial world. An engineer was appointed to the team and following a small investment Triefus and Company Limited commenced manufacturing single point Diamond dressers.

By 1949 a small manufacturing company was established which made its first take-over in 1952. Expansion became rapid and profits grew. Also in 1949 a survey of Diamond tool and drilling potential was undertaken in Australia. Sales of rough Diamond commenced in 1950 and a small manufacturing plant was set up the following year. Similar plants were also established in other countries including France and India.

World demand for industrial Diamond products increased dramatically and the close links already established with industrial Diamond merchants and product manufacturers resulted in rapid growth for the Triefus group. A particularly close association developed between the Triefus UK manufacturing company and the Asahi Diamond Industrial Co. Limited, which had been established in Tokyo in 1937. This close association was later expanded to include cross shareholdings and eventually led to Asahi taking control of the Triefus Group in 1990.

Asahi Today

The Asahi group is one of the world's largest manufacturers of industrial Diamond products with an enviable reputation for service and expertise.

Here at Asahi Australia we were manufacturing and marketing industrial Diamond products at our principal office and factory located in Mona Vale NSW, a northern beaches suburb of Sydney, right up until 2002. Sales Offices are still maintained at these premises with products now being sourced from our Group Companies in Japan, France, South Korea, Taiwan and Indonesia. Our products and services are used in various Diamond application areas for:

- Mining and Exploration
- Precision Engineering
- Construction Projects

All of our mining products are manufactured in our state-of-the-art Jakarta factory. This is where our first factory was built in 1996, predominantly to supply and service the South-East Asian market.

Our Australian factory ceased production in 2002 and all our equipment and manufacturing expertise was transferred to the Asahi Jakarta plant, who now produce our extensive range of mining and exploration products that we supply globally. We are now in our third built factory in Jakarta having grown out of the previous two and we have recently been quality accredited with ISO9001 Certification.

Our Promise to You

In addition to aiming to exceed your expectations we promise to offer our customers:

Service: A personalised service from your first point of contact - access to unparalleled advice from our team of experts and products that are delivered on time.

Quality: Technologically advanced high performing products that are built to last.

Price: Exceptional prices on exceptional quality products.

Honesty: To deliver what we promise and to treat all our customers with honesty and integrity.

Short Facts

Global Head Office: Tokyo, Japan.

Number of employees: 2,147 worldwide.

Manufacturing countries: Japan, Indonesia, Taiwan, China and France

Global presence: Australia, Japan, Indonesia, Thailand, China, Taiwan, United States of America, Europe, Russia, Mongolia, Singapore, Malaysia, Vietnam, Cambodia, Philippines, South America, South Africa, DK Congo, Myanmar and India.

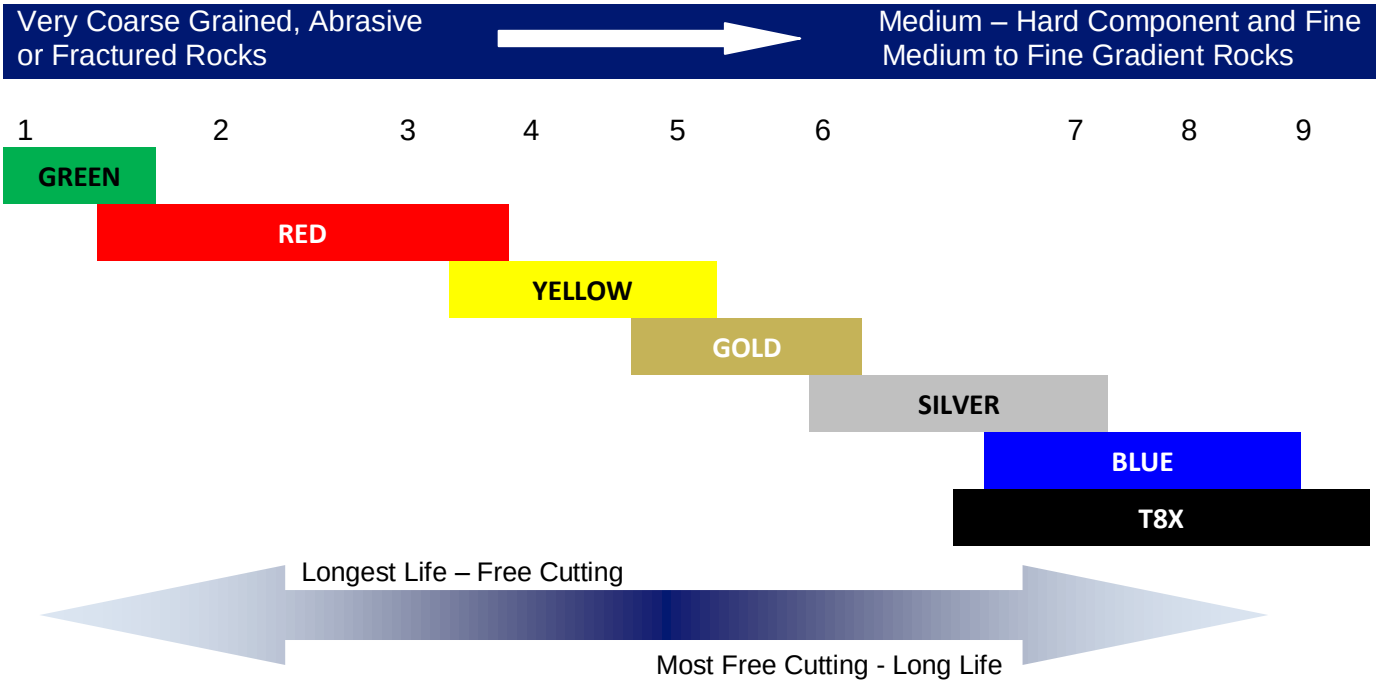
Bit Selection Chart

Rock Formations	Rock Abrasiveness & Conditions	Rock Hardness	Bit Code	Coloured Series	"T" Series	Ta Series
Tuff, Shale, Gypsum, Clay, Potash, Talc, Soapstone, Coal, Rock Salt, Soft Sandstone, Calcite, Soft Limestone, Amber	Highly Abrasive	Soft	1	Green		
			2	Red		
Marble, Schist, Limonite, Kimberlite, Dolomite, Slate, Sandstone, Limestone, Weathered Granite, Siliceous Schist, Serpentine, Phyllites	Medium Abrasive	Soft to Medium	4	Yellow		
			5	Gold		
			6	Silver		
Siliceous Volcanics, Hard Schist, Hard Limestone, Gneiss, Basalt, Andesite Pegmatite, Granite, Gabbro, Anorthosite, Amphilbolite, Norite, Diorite, Magnetite, Hematite	Medium Abrasive	Medium to Hard	7	Blue	T8X	
			8			
			9			TA90
Quartizite, Rhyolite, Tonalite, Aplite, Gneiss, Chert, Tactonite	Low Abrasive	Hard	10			TA100
			11			TA110
						TA11X
Ironstone, Quartz, Red Granite, Jasperlite, Saphire	Non Abrasive	Extremely Hard	12			TA120
			13			
		Ultra Hard	14			TA130
			15			TA150

Colour Series Drill Bits

Soft – Medium Grained Hard Rocks

The colour series of Asahi Diamond Drill Bits are designed for soft sedimentary to hard competent igneous and volcanic rocks as shown below.



GREEN
Designed for extremely abrasive and broken formations particularly loose conglomerate, rubble and manmade fill.

RED
Designed for soft to medium formations including sandstone, siltstone, shale, conglomerate and tuffaceous zones. A widely used general purpose Bit where high Bit loads may be required.

YELLOW
Generally used in medium to hard broken formations including pegmatite, weathered granite and epithermally altered volcanics.

GOLD
Suitable for a variety of medium, hard and weathered formations.

Specifically designed for use in concrete, including concrete with reo.

SILVER
Suitable for medium to hard moderately abrasive formations where a softer matrix Bits tend to glaze.

Ideal for metamorphic volcanic such as schist or gneiss and some andesites and basalts.

BLUE
Designed for coring hard competent volcanic and igneous formations particularly where higher rotational speeds and reduced Bit weight is available.

Works well in fine – medium grained granite, dolerite, some basalt and various porphyries.

T8X
This series of Bits incorporates the latest innovations in coated synthetic Diamond. They are distributed in a strong matrix that resists premature “pull out” of Diamond, but soft enough to resist the “strip out” of spent or flattened Diamonds in hard rock drilling applications.

This series shows significant improvements in both Bit life and penetration.

NOTE: The TA series of Drill Bits are subject to a separate data sheet.

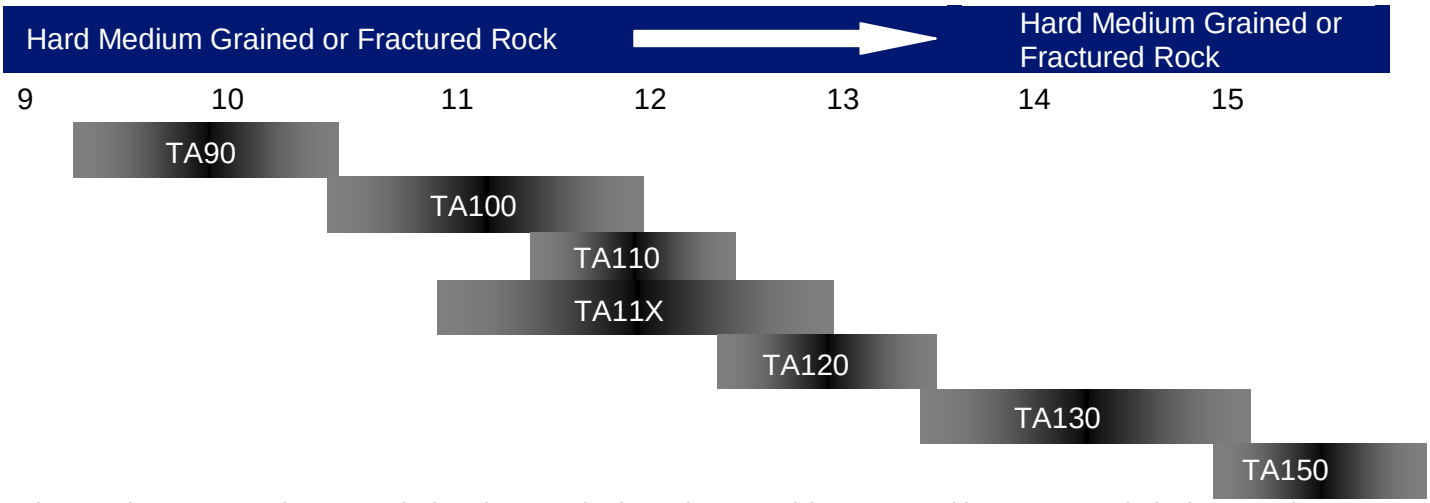
TA Series Drill Bits

Hard – Super Hard Rock

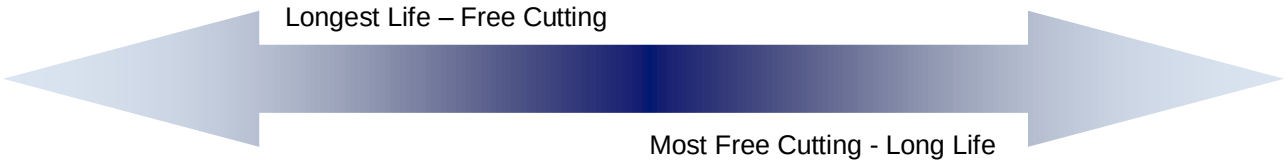
The TA range of Drill Bits are designed for hard to super-hard and medium to ultra fine grained rocks and have been developed using data collected throughout Australia and South East Asia.

They have now been used in almost every major Australian mining and exploration centre under a variety of cutting conditions with varying penetration rates.

The combined increase in a Bit life and penetration rate achieved with TA series Bits has resulted in HIGHER RIG PRODUCTIVITY and lower cost per meter drilled.



These Bits are an advantage in hard ground where low machine torque / horsepower is being used.



Benefits

- The TA Series are free cutting long life Bits.
- Weight and RPM should be varied according to the degree of difficulty in drilling.
- Because these Bits are so free cutting, machine wear and tear and fuel costs are reduced.
- Provided the correct Bit is selected for the ground conditions encountered, little or no “stripping” will be required.

NOTE: The TA series of Drill Bits are subject to a separate data sheet.

Impregnated Diamond Drill Bit Selection

Coloured “T” Series – “TA” Series

The selection of the optimum Bit for anticipated ground conditions requires careful consideration.

While Bit life is an important factor, data can be provided to show that penetration rate may be a more important consideration.

To optimize, the drilling economy RPM and feed rate should be balanced to suit the rock type being drilled.

RPI/RPC Index

The RPI index is the number of Bit revolutions per inch of penetration.
The RPC index is the number of Bit revolutions per cm of penetration.

RPI (RPC) = The RPM on your drill string divided by your penetration in inch/min (cm/min).

Example:

1000 RPM ÷ 5in/min = 200 RPI
1000 RPM ÷ 10cm/min = 100 RPC

It is recommended that to keep the Bit open while still maintaining good Bit life, an RPI of 200-250 or RPC of 80-100 should be aimed for.

Parameters for the use of Drills Bits

1. Rock Drilling Characteristics

Strength and Fracture Toughness

The two main criteria of how easily a rock can be drilled are its strength and its fracture toughness. Described another way, this criteria reflects how easily a crack can be induced in a rock and how easily that crack may be induced to propagate.

From the description available of igneous, sedimentary and metamorphic rocks it can be seen that rock strength depends on the mineralogical make up of the rock, for example, sandstone with a high quartz content and cemented together with calcite has a low strength, because the calcite that bonds the grains together is weak, whereas granite which has far less quartz has a high strength because it does not have a continuous weak phase, as does sandstone.

Quartzite may have a higher strength than either sandstone or granite because it is all quartz. It does however have lower fracture toughness because there is a continuous medium, the silica cement, in which cracks can propagate.

Granite is made up of inter-grown crystals, with no continuous medium and any fracture, in consequence, has to keep crossing crystal boundaries.
Basalt has a much higher fracture toughness, because the inter-grown crystals are so much smaller and a propagating fracture meets crystal boundaries more often.

Abrasives

Rock abrasiveness is a rock property that is important in drilling with Diamond Bits. The abrasiveness can affect both penetration rate and the life of the Bit.

The abrasiveness of a rock is controlled by its mineralogical make up, so that a rock containing soft minerals will be less abrasive than a rock containing hard minerals.

Hardness of minerals is measured by the ability of one mineral to scratch another. This is measured as MOHs Hardness Scale.

In simple terms the harder the constituent of the rock the more abrasive it will be, regardless of its strength.

Of common rock forming minerals, quartz is rated as being hard, so that rocks containing large quantities of quartz will be abrasive. For example sandstone containing 60% quartz is far more abrasive than basalt, which is composed principally of feldspar even though basalt is harder than stronger than sandstone.

From knowledge of the mineralogy and the mode of rock origin of a rock, it is often possible to determine how well a Bit will drill but not how far it will drill.

2. Theoretical Cutting Action of a Diamond Bit

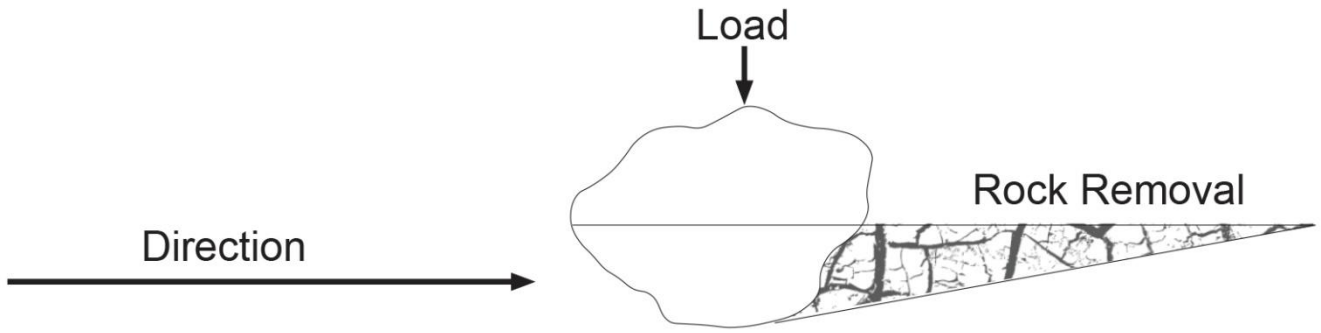
Much test work has been carried out to try and determine precisely what happens when Diamonds are cutting rocks in order to try and establish the main parameters that affect successful drilling.

The two most widely accepted theories generated by these studies can be summarised as follows:

2.1 Ploughing Theory

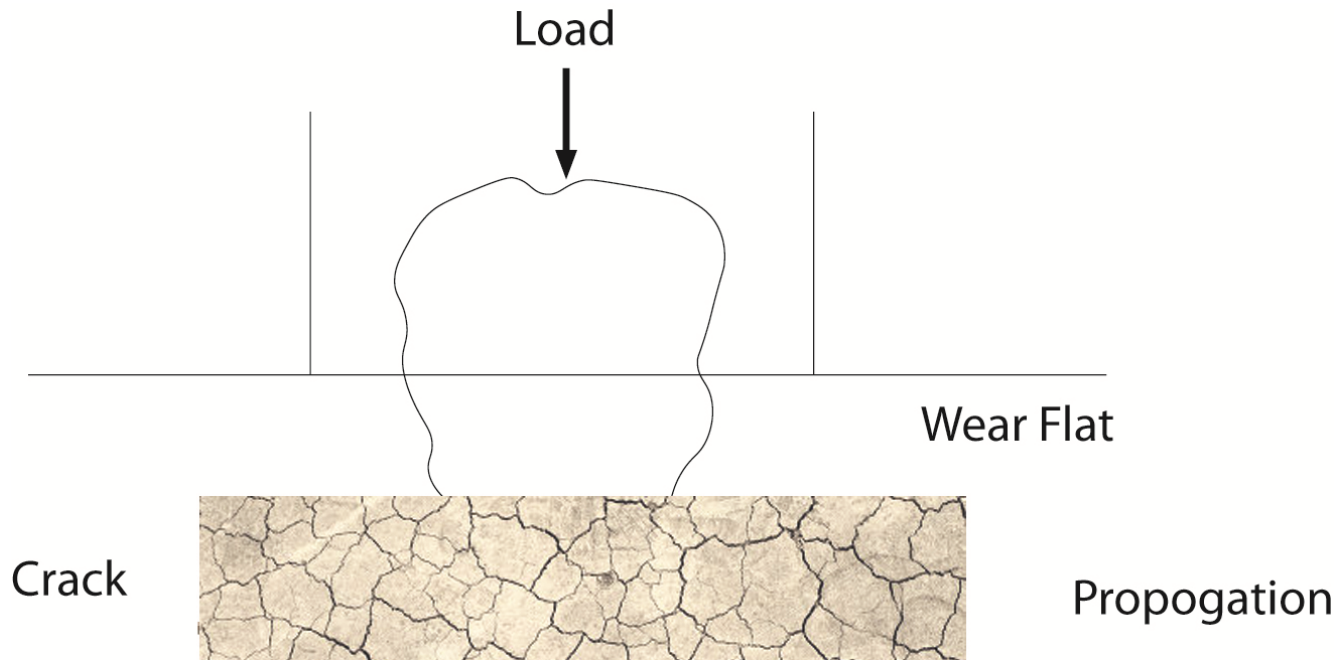
The Diamond makes an impression into the rock when moved.

After initial failure of the rock, Diamond penetration takes place causing the Diamond to “plough” the rock and the rock is broken by a shearing action.



2.2 Cutting by Crack Propagation

To drill a particular rock the stress level beneath the Diamond must exceed the strength of the rock, which forms cracks when this is achieved. The crack field becomes larger as the load is increased.



The performance of the Diamond is directly related to the wear flat area generated on the Diamond face.

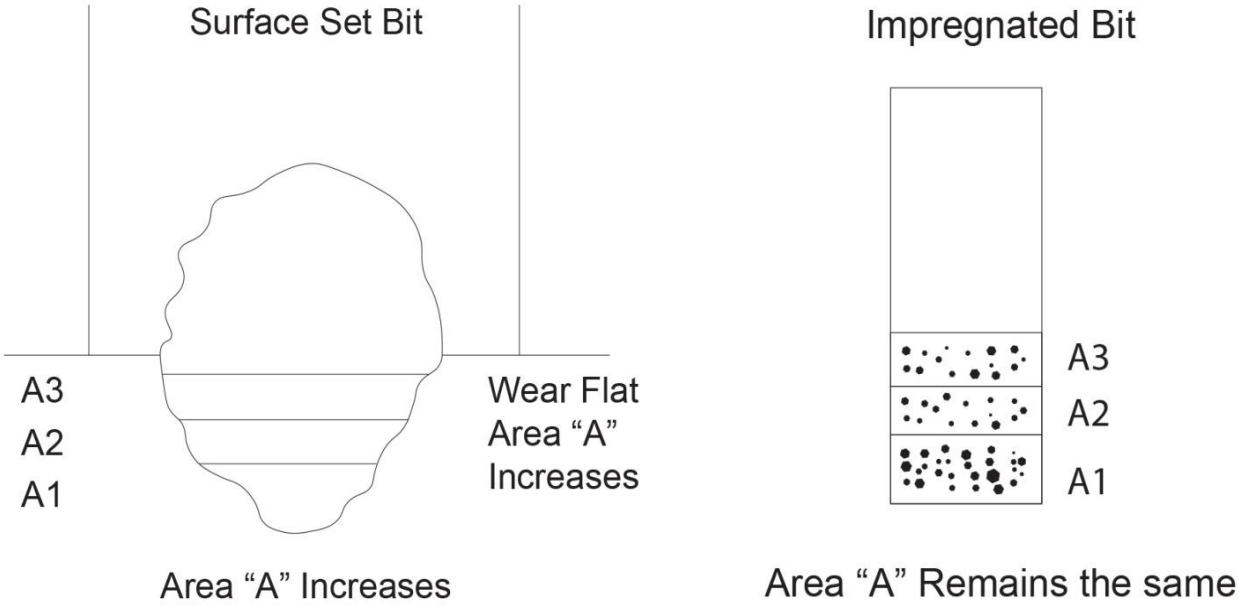
With new sharp Diamonds, the area in contact with the rock is small so that the load required is small. As the Diamonds wear the contact area increases so the load has to increase.

This relationship between the contact area (wear flat area) and the Bit load finally reaches a point where the load is not sufficient to permit drilling to continue, as the Diamonds are worn flush with the matrix.

With Surface Set Bits, it can be seen that the contact area increases as drilling progresses and the Diamonds wear.

With Impregnated Bits, as the matrix strips away and exposes new Diamonds, the total wear flat area remains reasonably constant and does not increase as it does with Surface Set Bits.

The following diagram illustrates this point:



3. Surface Set Bits

Surface Set Bits are characterized by a single layer of Diamonds set on the working face of the Bit in a specific pattern.

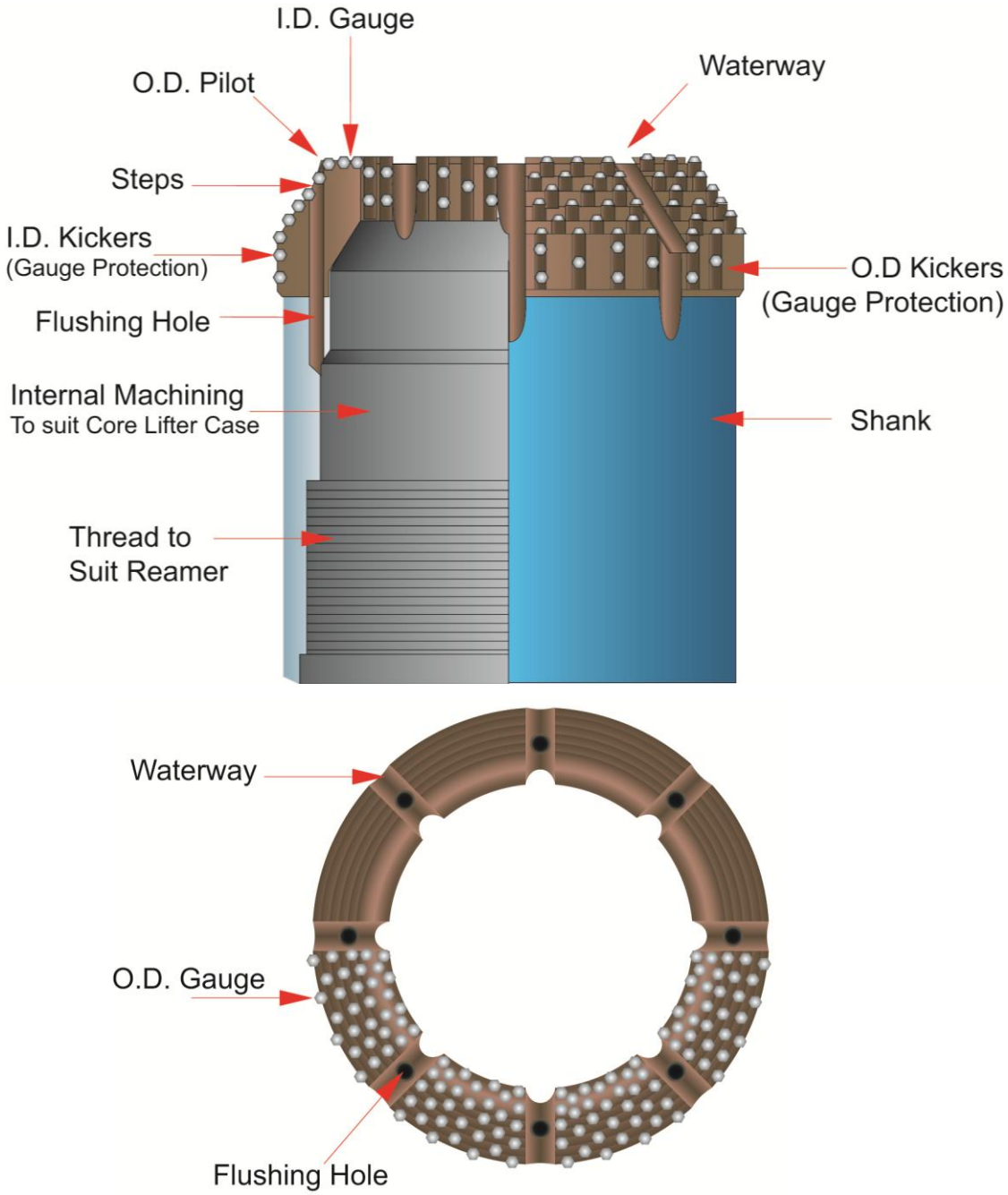
A wide range of standard Bits are manufactured by Asahi.

These include a variety of Bit profiles, Diamond grades and Diamond sizes designed to provide the most efficient cutting for the formation being drilled.

Surface Set Bits can be used to drill the entire range of rock formations, although advances in impregnated Bit technology means they are much more effective in harder formations.

Surface Set Core Bits

(Internal and Face Discharge)

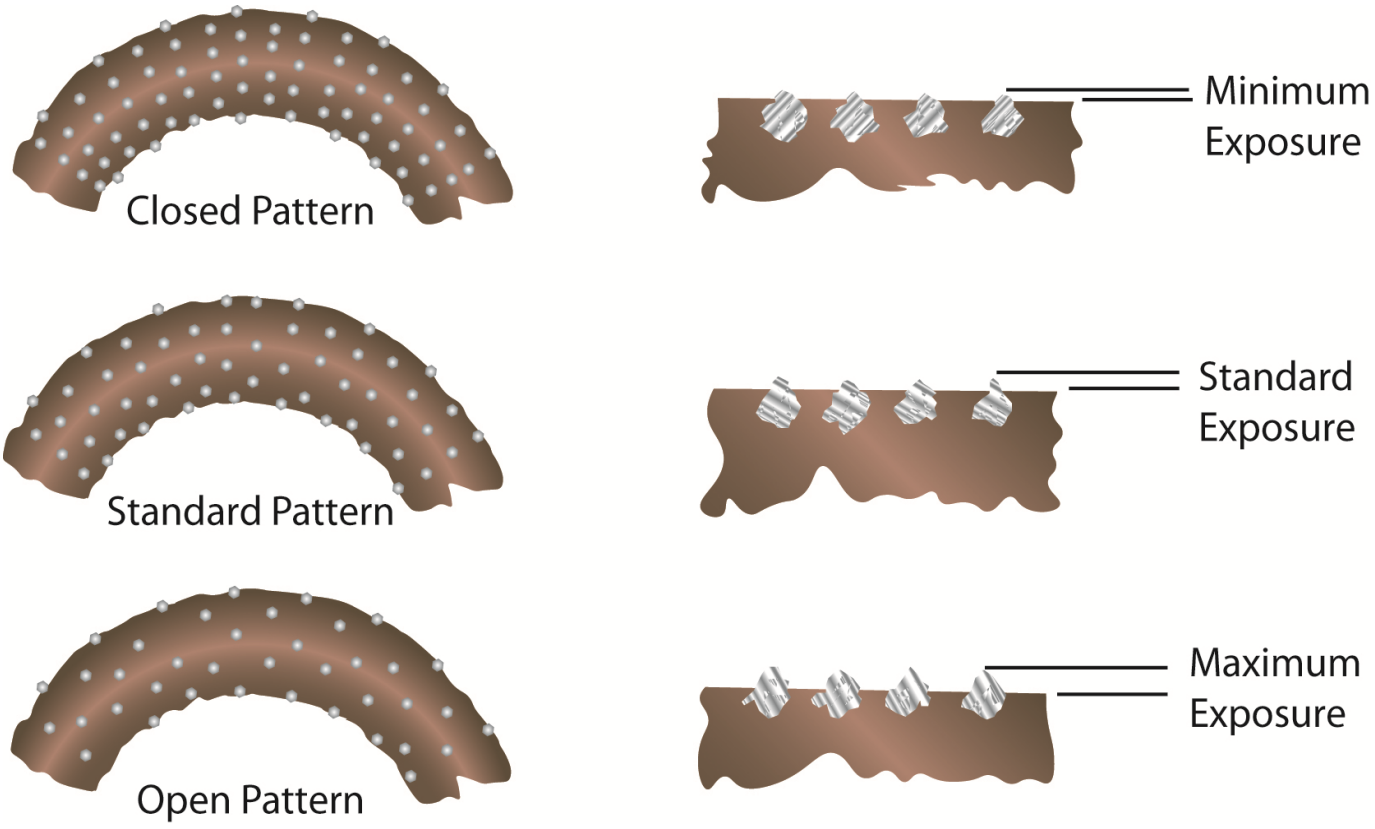


Drilling with Surface Set Bits generally continues until a substantial increase in required Bit weight indicates that the Diamonds have become “blunt” or broken, requiring the Bit to be pulled and either discarded or returned to the manufacturer for salvage.

There are a number of variables that are generally considered when determining a particular Surface Set Bit design. These are:

- Diamond size
- Diamond quality
- Diamond distribution
- Diamond shape
- Diamond quantity
- Diamond protrusion
- Face design

All are important but Diamond quality will be a significant factor in the initial price of the Bit, the life of the Bit and therefore the cost per meter drilling.



3.1 The Crown Shape

The crown shape is largely dictated by the specific requirements of the job being done.

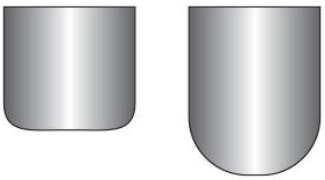
The most common profiles are flat, semi-round, single step or multi-step.

The semi-round crown is the most commonly used in conventional drilling, whilst the various step face profiles are predominately used in wire line drilling.

Surface Set Bit Profiles

Flat round profile

- Standard Profile
- Good all-round performance



Semi-round profile

- Strong Profile
- For use in fractured formations

Stepped profile

- Higher penetration rate
- Fragile and fractured formations

3.2 Flushing and Cooling

The drilling fluid serves two main purposes – it cools the cutting surfaces of the Bit flushing the cuttings from the face of the Bit, and transports them out of the hole.
In some cases, additives are used to lubricate the Bit, enhance Bit life and increase and carrying capacity of the fluid used.

Tests have shown that the cutting points on a Bit can very quickly reach temperatures of over 1,000 degrees Fahrenheit if they are not cooled. It is therefore essential to have fluid circulation across the face of the Bit at all times when drilling.

A suitable drilling fluid will not only cool the Bit, remove cuttings from the face and transport them from the hole, but will also readily drop the cuttings in the settling pits and help stabilize the hole and the rod string.

The amount of fluid pumped down the drill hole should be calculated to achieve an up-hole velocity in the annular space between rod and hole of 60 to 100 feet per minute (18 to 30 meters per minute).

The up-hole velocity is a function of the amount of fluid being pumped and the annular space between the rod and the hole.

The required flow rates can be calculated by using the formula:

F = C Multiplied by S

Where:

F = the flow rate in litres per minute
S = The annular section between rod and hole in square centimeters
(Dia Hole2 – Dia Rod2)

And:

C = 2.4 for the average, generally recommended value
C = 1.8 for the minimum recommended value
C = 3.0 for the maximum recommended value

Typical Flow Rates are:

Hole Size	Rod Size	Litres/min	Gallons/min
AMLC	AW/J	5 - 8	1 – 2
BMLC	BW/J	10 – 17	2 – 4
NMLC	NW	21 – 35	5 – 8
HMLC	HW	40 - 46	9 - 15

In practice these are guidelines only which should be varied as circumstances dictate.

For example: If the penetration is very rapid, the flow rate may have to be adjusted to remove the greater volume of cutting or the larger size of the cuttings. In very soft or sticky ground the number of waterways should be increased to prevent the Bit from mudding up.

3.3 Peripheral Speeds

The peripheral speed depends on the rock being drilled, but should normally vary in the range 1 to 3.5 meters per second.

The peripheral speed is normally measured at the outer edge of the Bit, or OD; being the fastest moving part of the Bit.

The peripheral speed can be calculated using the formula:

$$PS = \frac{3.14 \times Dia}{1000} \times \frac{RPM}{60}$$

Where:

PS =	Peripheral speed in meters/min
Dia =	Diameter of the Bit in mm
RPM =	Spindle or head revolutions per minute

Recommended rotation speeds are:

A size	400 to 1,400 rpm
B size	320 to 1,120 rpm
N size	250 to 890 rpm
H size	200 to 700 rpm
P size	150 to 550 rpm

3.4 Weight on Bit

There are a number of factors that influence the recommended weight on an Asahi Surface Set Bit:

- Diamond quality
- Size, shape, number and distribution of Diamonds
- Profile of the crown
- The formation being drilled
- Deviation in the hole and other hole conditions
- Characteristics of the flushing fluid

While there is a relationship between Bit pressure, rotation speed and penetration rate, weight on the Bit should be adjusted to give the best performance per Diamond and per revolution.

A Diamond graded AAA will fracture under a static load of about 10.2kg, while poorer quality stones will fracture at static loads less than this.

Impact loads are thought to cause fractures at less than static loads, which explains the damage caused to Diamond Bits by vibration.

As rule of thumb, weight on the Bit should not exceed:

$$W\ max = C \times N \times 5kg$$

Where:

C = active carat weight, about 66% of the total set weight of the Bit
N = the average number of stones per carat

For example:

An NQ Bit set with 17 carats of 40 – 60 spc Diamonds would have a maximum allowable weight on Bit of

$$W\ Max = (17 \times 0.66) \times 50 \times 5 = 2{,}805kgs = 2.8\ tonnes$$

4. Impregnated Core Bits

The objective of an Impregnated Diamond Bit is to produce a Bit where the matrix erodes at a specific rate. As active Diamonds become blunt they are released to expose fresh, sharp Diamonds to continue cutting efficiently.

The matrix is a critical factor in impregnated Bit manufacture. It must have the capacity to retain the synthetic Diamonds for as long as they continue to cut, but also wear at a rate that will allow non-performing Diamonds to strip out exposing new sharp Diamonds.

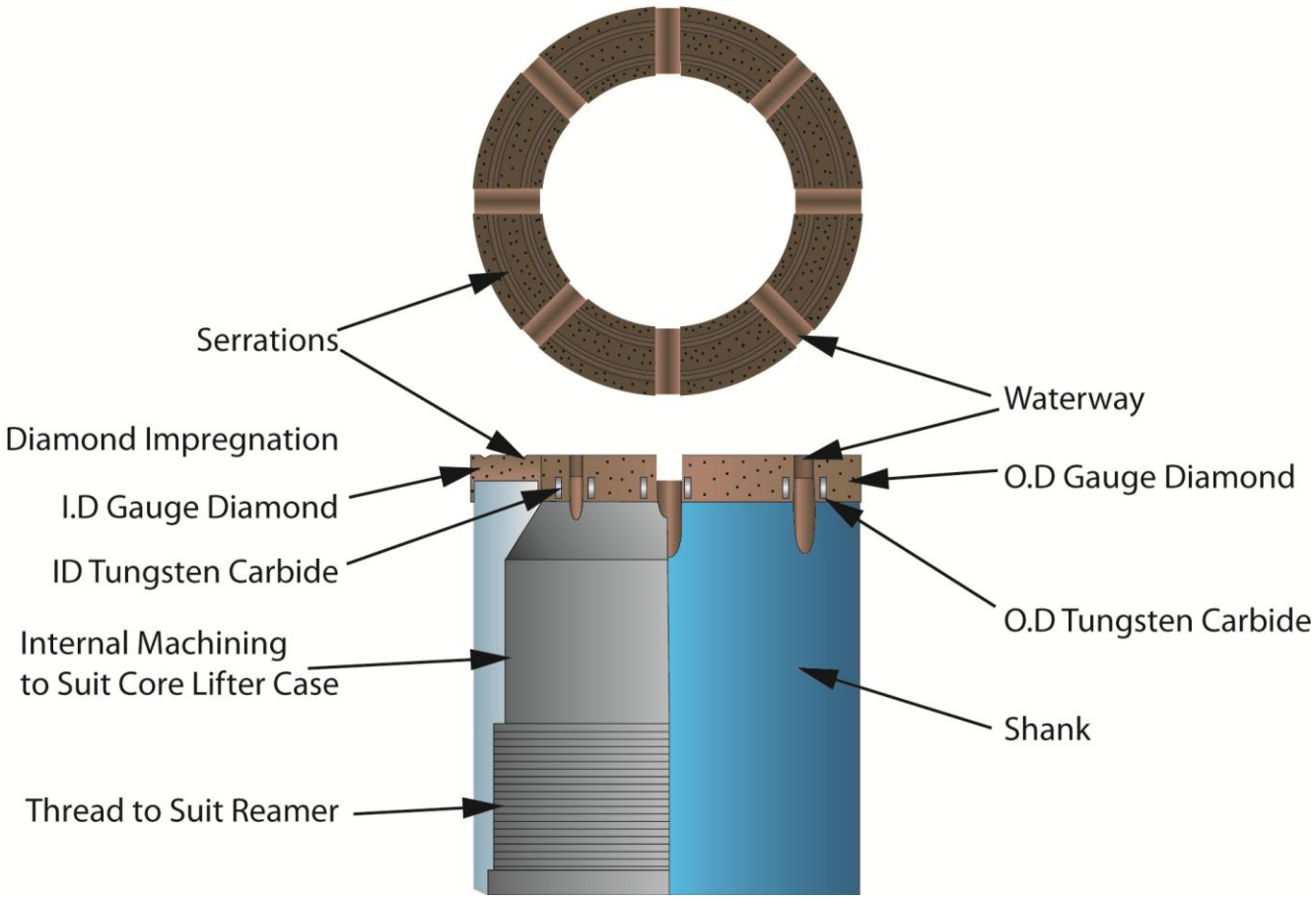
Diamond concentration is a further important consideration in an Impregnated Core Bit. An increase in concentration reduces the strip rate of the matrix and increases the load required for self-sharpening.

Two extremes of Diamond size and Diamond concentration within a matrix are possible.
At one extreme, the matrix is far too hard and worn Diamonds will not be released, at the other extreme the matrix releases Diamonds prematurely while they still have cutting life left.

In the former Bits become glazed and excessive loads are required to continue drilling, penetration can even stop altogether. In the latter the Bit wears far too rapidly and Bit costs increase significantly.

Impregnated Core Bit

(Internal discharge)



The final consideration in the manufacture of Bits, whether surface set or impregnated, is the waterways.

With the matrix to rock clearance much smaller in impregnated Bits, the waterways assume an even greater degree of importance.

Where Bit clogging can occur, coolant flow has been found to be a controlling factor in achieving maximum penetration rates.

An adequate number and depth of waterways is therefore required to ensure adequate cleaning of drilled material and maximize penetration.

4.1 Operational Guidelines

As with Surface Set Bits there are no hard or fast rules, but there are certain basic requirements, and a driller who is used to drilling with Surface Set Bits has to learn different drilling techniques to obtain maximum benefit from impregnated Bits.

Asahi's Impregnated Bits, which are generally used at higher rotating speeds than Surface Set Bits, need to be operated within a working range of penetration rate and RPM.

These two parameters combine to provide the RPC index, or, revolutions per centimeter of penetration, which is a useful guide to successful drilling.

The third parameter used is load, or Bit weight on the Bit.It has been observed that too much weight on the Bit can actually reduce penetration and it has been found that the Asahi TA series Bits require less weight than other Bits to cut at an optimum speed. Too little weight will, however, tend to cause "glazing".

4.1 A Rotation Speeds

The recommended speed range for Asahi's impregnated core Bits is 3 to 5 meters per second.

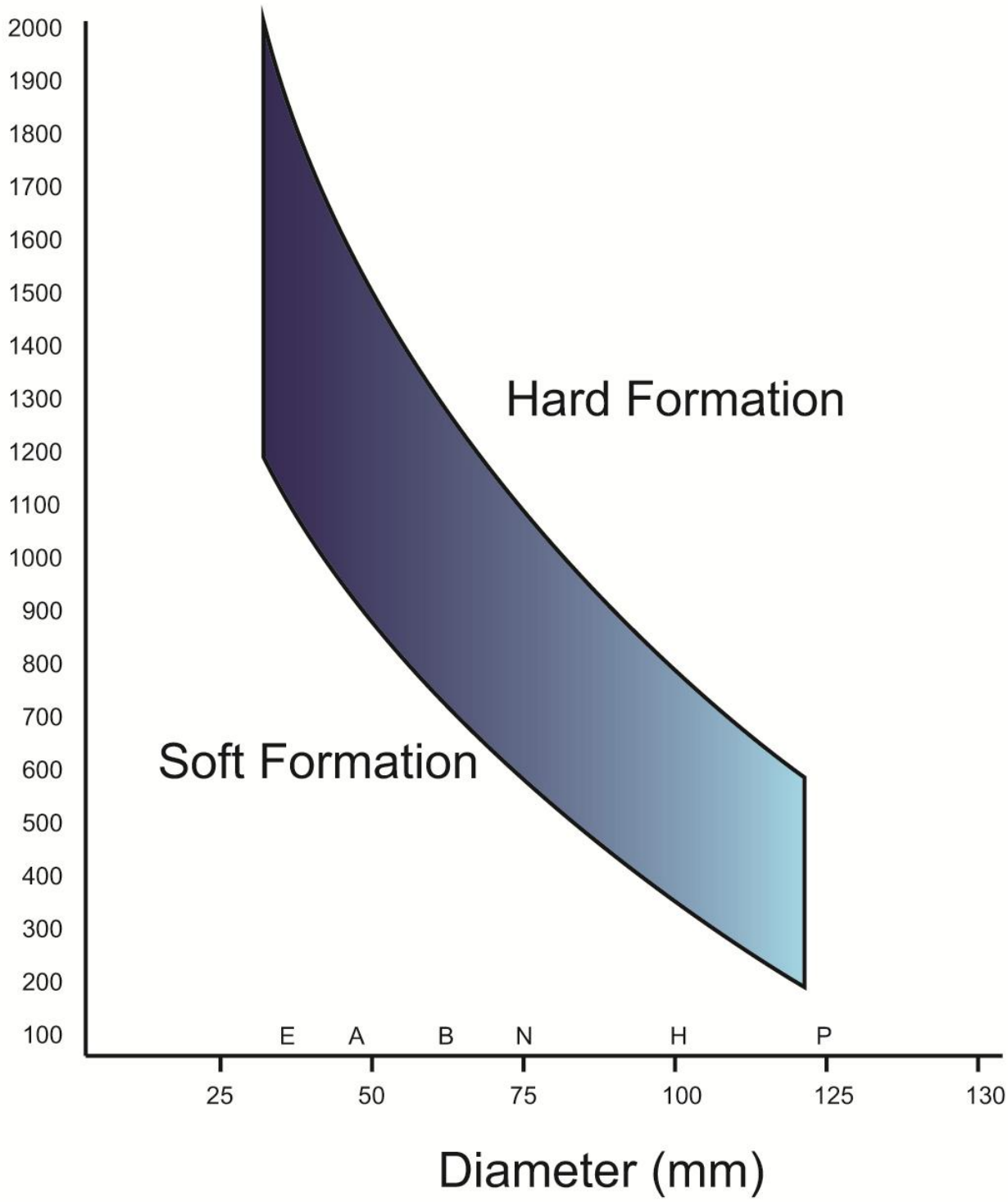
The formula for calculating the peripheral speeds is the same as with the surface set Bits and has been mentioned previously.

Recommended rotation speeds are:

TT 46 / A size	1,000 to 1,800 rpm
TT 56 / B size	850 to 1,550 rpm
N size	620 to 1,200 rpm
H size	420 to 880 rpm
P size	300 to 580 rpm

Recommended Rotation Speed Range

Impregnated Drill Bits



4.1 B Feed Pressure

The feed pressure on an Asahi Impregnated Core Bit can vary widely depending on the formation being drilled and the Bit being used.

The feed pressure can usually be increased as long as this results in an increase in penetration rate, but reference should constantly be made to the RPC index and the rotation speed being used.

In any event the total weight should never exceed 2,000lbs per square inch of kerf area (150kg per square centimeter).

- If the load is too light the Diamond particles will polish and glaze and the Bit will become blunt
- If the load is too high abnormally high Bit wear will occur
- The use of high drilling loads will also increase the risk of uneven profile wear, with the inside gauge wearing more rapidly than the outside gauge
- This leaves a large part of the Diamond impregnation unused and unusable

The recommended Bit weight is:

TT 46	450 – 1,350kg / 1,000 – 3,000lbs
TT 56	900 – 1,800kg / 2,000 – 4,000lbs
BQ	900 – 2,800kg / 2,000 – 6,000lbs
NQ	1,350 – 2,800kg / 3,000 – 6,000lbs
HQ	1,800 – 3,600kg / 4,000 – 8,000lbs
PQ	2,270 – 4500kg / 5,000 – 9,950lbs

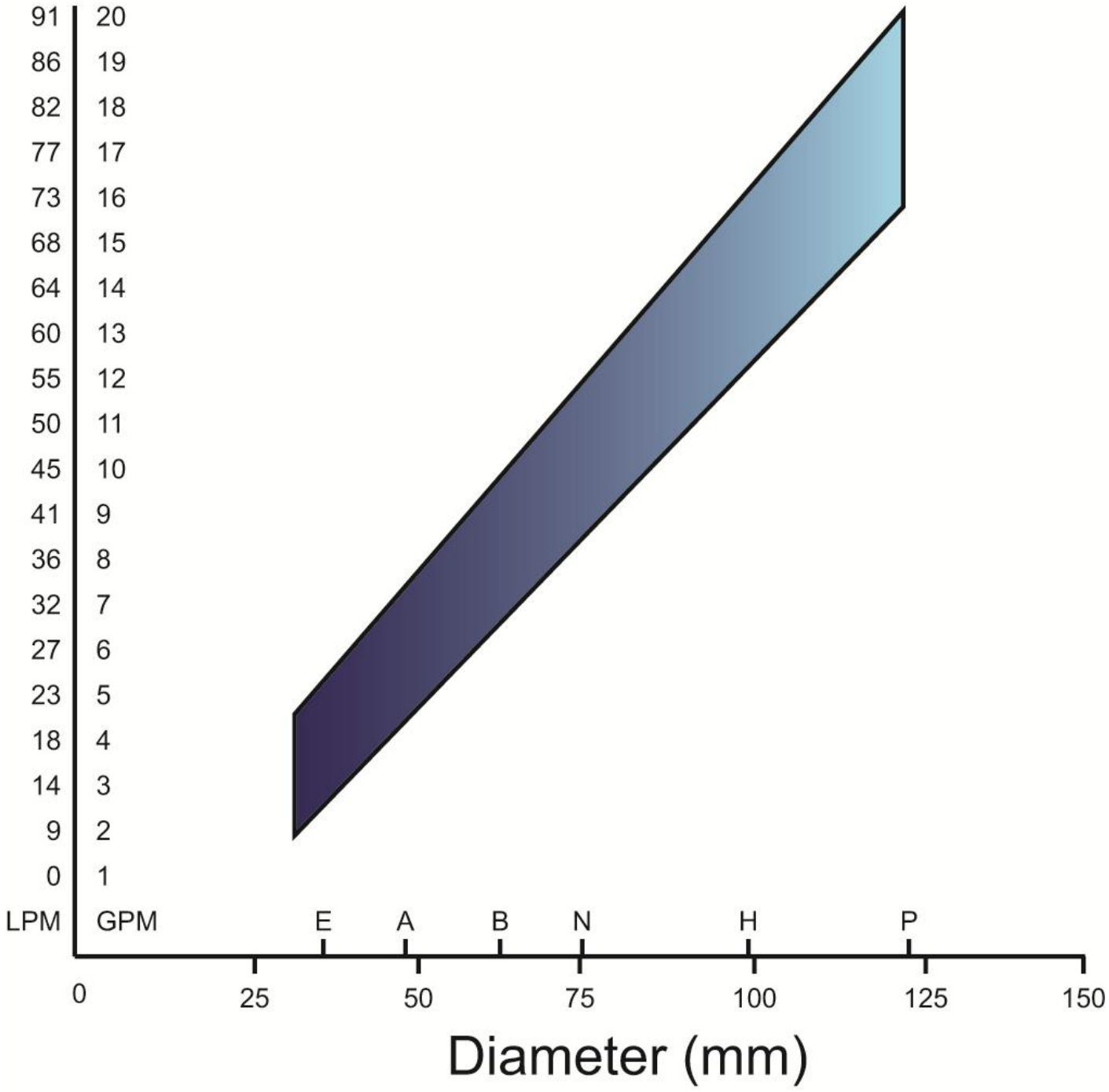
4.2 C Coolant

When drilling with Impregnated Core Bits a higher coolant flow rate is required than when drilling with Surface Set Bits. This is particularly the case with wire line drilling where flow rates are 20% - 30% greater using Impregnated Core Bits than Surface Set Bits to adequately cool the Bit and remove cuttings.

Typical recommended flow rates for impregnated Bits are:

Hole size	Rod size	Litres/min	Gallons/min
TT 46	46mm	11 – 16	2.5 – 3.5
TT 56	56mm	16 – 27	3.5 – 6.0
BQ	BQ	27 - 36	6.0 – 8.0
NQ	NQ	36 – 40	8.0 – 10.0
HQ	HQ	46 - 67	10.0 – 15.0
PQ	PQ	87 - 112	18.0 – 25.0

Recommended Fluid Flow Rates



4.2 D RPC Index

The revolutions per cm of penetration, or RPC index, is probably the most important parameter in achieving maximum productivity and lowest Bit costs.

The RPC index can be quite simply calculated by dividing the spindle RPM by the penetration rate in cm per minute

Example:

800rpm divided by 10cm/minute penetration rate = 80 RPC

Ideally the RPC to aim for is between 100 and 75. If the RPC is well below 75 then excessive Bit weight will result.

Either RPM should be increased or penetration rate decreased by reducing the weight on the Bit.

If the RPM or Bit weight cannot be altered, the Bit should be changed for the next one down in the series.

If the RPC is much above the recommended maximum of 100 the Bit could polish.
Either reduce the RPM or increase the penetration rate by increasing the Bit weight.
If the RPM or Bit weight cannot be altered change the Bit for the next up in the series.

RPC index for the Asahi Australia TA Series

Formula Spindle RPM	RPM/RPC = Pen Rate @ Revolutions per cm 100 mm Penetration Rate / Min	75 mm
350	35	47
400	40	53
450	45	60
500	50	67
600	60	80
700	70	93
800	80	107
900	90	120
1000	100	133
1100	110	147
1200	120	160
1300	130	173
1400	140	187

4.2 E Bit Observation

It is important when drilling to try and understand what is going on down the hole.

When the Bit is pulled the driller should examine it to try and correlate its condition with what he thought had been going on down the hole. This way he should achieve a greater understanding of the use of Impregnated Bits and achieve maximum benefit from their use.

The most common problems encountered when using Impregnated Core Bits tend to be improper selection of matrix for the ground being drilled, poorly maintained equipment such as pressure pumps, hydraulic systems, rod strings and unstable core barrels, plus a basic misunderstanding about what is going on down the hole.

For all drillers the main objective should be to obtain the ideal wear pattern of a flat face, with slight chamfered edges, and to obtain maximum productivity. If these results are achieved it can be assumed that that correct parameters have been used while drilling.

4.2F Advantages of Impregnated Core Bits

- In medium to hard formations, Impregnated Core Bits are capable of achieving higher Bit life and greater productivity than Surface Set Bits, in which will result in lower overall costs and higher profits.

- Impregnated Bits are robust and capable of withstanding rougher treatment.

- Impregnated Core Bits are not so easily damaged by broken and fractured formations so that they can provide a less costly alternative for drilling in these conditions.

- Impregnated Core Bits have been shown to provide better directional stability than Surface Set Bits.

- Impregnated Bits can provide a cost saving on inventory investment as each Impregnated Core Bit covers a wider range of rack types.

- Impregnated Core Bits are fully consumable and are not returnable for salvage. They do not generate accounting costs and the problems associated with a circulating population of Surface Set Bits.

PCD Clore Bits

Polycrystalline Diamond (PCD) Bits have a purpose designed cast matrix head with 13.3mm round PCD inserts fixed in a cutting pattern. Non-CORE BITS are used for open hole drilling.

PCD drill Bits have proven successful in soft to medium-hard consolidated formations. They are used widely in coalfield exploration and open hole drilling to the zone of interest before core drilling commences.

Coal mine methane gas drainage and horizontal drilling for trenchless technologies are also important applications.

Size	Connection	Stock Code
C 46	AW Pin	6715
C 55	AW Pin	3918
C 55	AWJ Box	1250
C 65	BWJ Box	5202
C 65	AW Box	5202AW
C 65	AWJ Box	5202AWJ
C 65	AW Pin	9521
C 76	NW Pin	2112
C 76	NQ Box	2112NQ
C 96	2 3/8” Reg Pin	6631
C 96	NW Pin	4293
C 96	NW Pin	4293-5H
C 99	NW Pin	4401N
C 99	2 3/8 API Reg Pin	6649
C 102	NW Pin	4983
C 123	2 3/8” API Reg Pin	9881
C 123	2 7/8 API Reg Pin	9883N

Surface Set Bits

Type	Description	Water Ways	Carat	Spc	Grade	Stock Code
5 ½ x 4	5 Step Core Bit	8x0mm	27ct	30/40	A	5999
10 ¼ x 8	6 Step Core Bit	18x6mm	113ct	30/40	A	4111
BQDT	4 Step Core Bit	3x3mm	14ct	60/80	AAAE	01-9032
BQDT	6 Step Core Bit	4x6mm	13ct	60/80	AA	8319
HMLC	5 Step Core Bit	8x6mm	21ct	40/60	AAAE	2298
HMLC	5 Step Core Bit	8x5mm	26ct	15/20	A	7765
HMLC	4 Step Core Bit	6x10mm	28ct	25/35	A	9450
HQ3	4 Step Core Bit	6x6mm	30ct	10/15	A	1961
HQ3	6 Half + 3 Full Step Wedging Bit	6x4mm	30ct	40/60	AAA	9469
HQ3	8 Step Core Bit	8x3mm	32ct	30/40	AA	5205
HQ3	7 Step Core Bit	6x4mm	51ct	20/25	AA+	7799
HQ3	7 Step Core Bit	6x10mm	48ct	20/25	AA+	756
HQ3	4 Step Core Bit	6x6mm	30ct	10/15	A	8408
HQDT	5 Step Core Bit	8x5mm	33ct	10/15	A	778
HQDT	1 Step Inverted Core Bit	6x4mm	18ct	60/80	AA	5321
HQDT	5 Step Core Bit	6x5mm	18ct	40/60	AAAE	5330
HQTT	4 Step Core Bit Elong	6x6mm	30ct	10/15	AAE	6520
N	Bullnose BH8 NW Pin	N/A	30ct	40/60	AA	1488
N	Bullnose Non Coring	N/A	23ct	30/40	AA	1613
N	Bullnose BH8 N Rod Pin	N/A	30ct	40/60	AA	6100AA
NMLC	Semi Round Crown Core Bit	8x6mm	30ct	7/9	A	75
NMLC	3 Step Core Bit	4x3mm	20ct	15/20	A	1815
NMLC	3 Step Core Bit	4x3mm	25ct	7/9	A	2946
NMLC	4 Step Core Bit	4x3mm	17ct	25/35	AAE	3263
NMLC	4 Step Core Bit	4x0mm	15ct	60/80	AA	7986
NQ2	1 Step Inverted	4x4mm	13ct	60/80	AA	1935
NQ2	6 Half + 3 Full Step Wedging Bit	4x3mm	23ct	40/60	AAA	7796
NQ2	4 Step Core Bit	6x0mm	15ct	40/60	AA	8494
NQ2	4 Step Core Bit	6x3mm	17ct	25/35	AA	8495
NQ3	5 Step Core Bit	6x6mm	22ct	15/20	A	4231
NQ3	5 Step Core Bit	4x4mm	18ct	25/30	AA	6472
NQ3	6 Half + 3 Full Step Wedging Bit	4x4mm	24ct	40/60	AA	7506
NQDT	6 Step Core Bit	4x6mm	22ct	25/30	A	3746
NQDT	6 Step Core Bit	4x6mm	22ct	25/30	AA	3746AA
NQDT	4 Step Core Bit	6x5mm	24ct	15/30	AA	9445
NQDT	4 Step Core Bit	6x6mm	18ct	25/30	AA	9449
NQDT	6 Step Core Bit	4x6mm	23ct	25/30	AA	9460
PQ3	5 Step Core Bit	6x10mm	38ct	15/20	AA+	1372
PQ3	5 Step Core Bit	6x10mm	38ct	15/20	AA+	1372INT
PQ3	5 Step Core Bit	6x10mm	38ct	15/20	A	3575INT
PQ3	5 Step FD Core Bit	6x10mm	38ct	15/20	A	3575TC
PQ3	4 Step Core Bit	8x10mm	62ct	7/9	A	01-3575
PQDT	6 Step Core Bit	8x5mm	36ct	20/25	A	2823
TT56	O/S Semi Round Crown Core Bit	5x3mm	12ct	15/20	A	8503
TT56	Reamer	N/A	7ct	25/30	A	8505

NMLC Conventional Barrel Impregnated Core Bits

NMLC

Description	DOI (mm)	Waterways (mm)	Stock Code
Green Core Bit. Face Discharge	6	6 x 4	3386
Red Core Bit. Face Discharge	6	10 x 4	1809FD
Yellow Core Bit. Face Discharge	6	10 x 4	188FD
Gold Core Bit. Face Discharge	6	10 x 4	189FD
Silver Core Bit. Face Discharge	6	10 x 4	5528FD
Silver Core Bit. Face Discharge	9	10 x 4	5528FD/9
Blue Core Bit. Face Discharge	6	10 x 4	190FD
T8X Core Bit. Face Discharge	9	10 x 4	1208
T8X Core Bit with Milled Flute Water Ways	9	8 x 6	6164
Black Series 9 Core Bit. Face Discharge	9	10 x 4	Feb-09
Black Series 9 Core Bit. Face Discharge	6	10 x 4	02-9009/6
Black Series 10 Core Bit. Face Discharge	9	10 x 4	6896
Black Series 10 Core Bit, Face Discharge	6	10 x 4	6896/6
Black Series 12 Core Bit. Face Discharge	6	10 x 4	02-435
Black Series 12 Core Bit. Face Discharge	9	10 x 4	02-426
Black Series 13 Core Bit. Face Discharge	6	10 x 4	816
Black Series 13 Core Bit. Face Discharge	9	10 x 4	816/9
TA110 Core Bit with Milled Flute Water Ways	9	8 x 6	6156
TA130 Core Bit with Milled Flute Water Ways	9	8 x 6	6173
TA150 Core Bit with Milled Flute Water Ways	9	8 x 6	6165

Conventional Barrel Impregnated Core Bits

HMLC

Description	DOI (mm)	Waterways (mm)	Stock Code
Green Core Bit, 3 Strips of Hardened Face. Face Discharge	6	8 x 4	781HF
Red Core Bit. Face Discharge	6	8 x 4	2243
Gold Core Bit. Face Discharge	6	8 x 4	2190
Silver Core Bit. Face Discharge	6	8 x 4	8876
Blue Core Bit. Face Discharge	6	8 x 4	2191
T8X Core Bit. Face Discharge	9	8 x 4	8810
Black S9 Core Bit. Face Discharge	6	8 x 4	8825
Black S10 Core Bit. Face Discharge	6	8 x 4	8877
Black S12 Core Bit. Face Discharge	6	8 x 4	8826
Black S13 Core Bit. Face Discharge	6	8 x 4	8801

4C

Description	DOI (mm)	Waterways (mm)	Stock Code
Red Core Bit	6	10 x 5	6026
Yellow Core Bit	6	10 x 5	6032
Silver Core Bit	6	10 x 5	6028
Blue Core Bit	6	10 x 5	6025
Black S9 Core Bit	6	10 x 5	6027
Black S10 Core Bit	6	10 x 5	6042

8C

Description	DOI (mm)	Waterways (mm)	Stock Code
Red Core Bit. Face Discharge	6	6 x 4	3144
Silver Core Bit. Face Discharge	9	6 x 4	3145/9
Blue Core Bit	9	6 x 4	3143/9
TA90 Core Bit	9	6 x 4	8620

“B” Series Wireline Conventional Barrel Impregnated Core Bits

BQ

Description	DOI (mm)	Waterways (mm)	Stock Code
Red Core Bit	9	6 x 3	2699/9
Yellow Core Bit	9	6 x 3	1847/9
Silver Core Bit	6	6 x 4	177
Silver Core Bit	9	6 x 4	177/9
Silver Core Bit	12	6 x 4	177/12
Silver Step Face Core Bit	9	6 x 4	177ST
Blue Core Bit	9	6 x 4	178/9
T8X Core Bit	9	8 x 4	503
T8X Wedging Core Bit	9	6 x 4	839
Black S10 Core Bit	9	6 x 4	02-321/9
TA90 Core Bit	9	6 x 4	7034
TA100 Core Bit	9	6 x 4	7035
TA100 Wedging Core Bit	9	6 x 4	7821
TA110 Core Bit	9	6 x 4	5946
TA110 Wedging Core Bit	9	6 x 4	7911
TA120 Core Bit	9	6 x 4	7036
TA120 Wedging Core Bit	9	6 x 4	02-314
TA130 Core Bit	9	6 x 4	5275
TA130 Core Bit	12	6 x 4	5275/12
TA130 Wedging Core Bit	9	6 x 4	7912
TA150 Core Bit	9	6 x 4	2366
TA150 Core Bit	12	6 x 4	02-9013
TA150 Wedging Core Bit	9	6 x 4	7822

BQ3

Description	DOI (mm)	Waterways (mm)	Stock Code
Red Core Bit. Face Discharge	6	6 x 4	3144
Silver Core Bit. Face Discharge	9	6 x 4	3145/9
Blue Core Bit	9	6 x 4	3143/9
TA90 Core Bit	9	6 x 4	8620

“N” Series Wireline Impregnated Core Bits

NQ

Description	DOI (mm)	Waterways (mm)	Stock Code
Green Core Bit	9	10 x 4	4608/9
Red Core Bit	9	10 x 4	185/9
Yellow Core Bit	9	10 x 4	1776/9
Yellow Core Bit. Face Discharge	9	10 x 4	1776/9FD
Yellow Shale Bit with Milled Flute Water Ways	9	8 x 8	1538
Silver Core Bit	6	10 x 4	182
Silver Core Bit	9	10 x 4	182/9
Silver Core Bit	12	10 x 4	182/12
Silver Core Bit. Face Discharge	9	8 x 5	182/9FD
Silver Wedging Core Bit	9	10 x 4	1823
Silver Shale Bit with Milled Flute Water Ways	9	8 x 8	1539
Silver 6 Step Core Bit	9	4 x 4	535
Blue Core Bit	6	10 x 4	183
Blue Core Bit	12	10 x 4	183/12
Blue Core Bit	9	10 x 4	183/9
Blue Core Bit. Face Discharge	9	8 x 5	1908
T8X Core Bit	9	10 x 4	435
T8X Core Bit	12	10 x 4	435/12
T8X Wedging Core Bit	9	10 x 4	2276
Black Series 9 Core Bit	9	10 x 4	6885
Black Series 10 Core Bit	9	10 x 4	6886
Black Series 12 Core Bit	9	10 x 4	1778S12
Black Series 13 Core Bit	9	10 x 4	1524
TA90 Core Bit	9	10 x 4	9300
TA90 Core Bit	12	10 x 4	9300/12
TA90 Wedging Core Bit	9	10 x 4	5725
TA100 Core Bit	9	10 x 4	9301
TA110 Core Bit	9	10 x 4	5171
TA110 Core Bit	12	10 x 4	5171/12
TA120 Core Bit	9	10 x 4	9105
TA120 Core Bit	12	10 x 4	9105/12
TA120 Core Bit. Face Discharge	9	8 x 5	9105FD
TA120 Wedging Core Bit	9	10 x 4	7699
TA130 Core Bit	9	10 x 4	8318
TA130 Core Bit	12	10 x 4	8318/12
TA150 Core Bit. Face Discharge	9	8 x 5	9950FD
TA150 Core Bit	9	10 x 4	9950
TA150 Core Bit	12	10 x 4	02-9012
TA150 Core Bit	16	10 x 4	1554
TA155M Core Bit	9	10 x 4	9955
TA11 x Core Bit	12	10 x 4	583/12
TA11 x Core Bit	9	10 x 4	583

NQ2

Description	DOI (mm)	Waterways (mm)	Stock Code
Green Core Bit	9	10 x 4	9355
Red Core Bit	9	10 x 4	5200/9
Yellow Core Bit	9	10 x 4	499
Silver Core Bit	9	10 x 4	4494
Silver Core Bit	12	10 x 4	4494/12
Silver 6 Step Core Bit	9	4 x 4	591
Blue Core Bit	12	10 x 4	5746
Blue Core Bit	9	10 x 4	5748/9
T8X Core Bit	9	10 x 4	510
T8X Core Bit	12	10 x 4	02-432
T8X Wedging Core Bit (12OD/6ID Water Ways)	9	12 x 4	7784
Black Series 10 Core Bit	9	10 x 4	02-431
Black Series 12 Core Bit	9	10 x 4	02-427
TA90 Core Bit	9	10 x 4	8977
TA90 Core Bit	9	10 x 4	8977M
TA90 Core Bit	12	10 x 4	8977/12
TA90 Core Bit	16	8 x 8	1364
TA90 Wedging Core Bit	9	10 x 4	5808
TA100 Core Bit	9	10 x 4	9842
TA100 Core Bit	12	10 x 4	9842/12
TA100 Wedging Core Bit	9	10 x 4	6639
TA110 Core Bit	9	10 x 4	6116
TA110 Core Bit	12	10 x 4	6116/12
TA110 Wedging Core Bit	9	10 x 4	7942
TA120 Core Bit	9	10 x 4	9107
TA120 Core Bit	12	10 x 4	9107/12
TA130 Core Bit	9	10 x 4	9530
TA130 Core Bit	12	10 x 4	9530/12
TA130 Wedging Core Bit	9	10 x 4	7941
TA150 Core Bit	16	8 x 8	1864
TA150 Core Bit	9	10 x 4	5880
TA150 Core Bit	12	10 x 4	5880/12
TA150 Core Bit	18	10 x 4	5886
TA150 Wedging Core Bit	9	10 x 4	7210
TA155M Core Bit	9	10 x 4	7251
TA155M Core Bit	12	10 x 4	7251/12
TA11X Core Bit	12	10 x 4	477/12
TA11X Core Bit	16	8 x 8	1863
TA11X Core Bit	16	10 x 4	477
TA11X Hybrid Core Bit	9	10 x 4	6153
TA11X Inverted Taper Core Bit	9	10 x 4	2128
TA11X Core Bit	9	10 x 4	1223

NQ3

Description	DOI (mm)	Waterways (mm)	Stock Code
Red Core Bit. Face Discharge	9	8 x 5	195/9
Red Core Bit. Face Discharge	9	4 x 10	8996/9
Yellow Core Bit	9	10 x 4	191/9ID
Yellow Core Bit. Face Discharge	9	4 x 10	7730/9
Yellow 6 Step	9	6 x 4	1535
Gold Core Bit. Face Discharge with Reinforced Gauge	6	8 x 5	66
Silver Core Bit	9	10 x 4	192/9ID
Silver Core Bit. Face Discharge	9	4 x 10	02-454
Silver Core Bit. Face Discharge	6	8 x 5	192
Silver Core Bit. Face Discharge	9	8 x 5	192/9
Silver Core Bit. Face Discharge	12	8 x 5	192/12
Silver 6 Step Core Bit	9	6 x 4	1532
Blue Core Bit. Face Discharge	6	8 x 5	193
Blue Core Bit. Face Discharge	9	4 x 10	9411/9
Blue Core Bit. Face Discharge	9	8 x 5	194
Blue Core Bit. Face Discharge	9	10 x 4	430
Blue Core Bit	12	10 x 4	430/12
T8X Core Bit	9	10 x 4	431
T8X Core Bit	12	10 x 4	431/12
T8X Core Bit, Face Discharge	9	8 x 5	02-464
Black Series 9 Core Bit. Face Discharge	9	8 x 5	66S9
Black Series 10 Core Bit. Face Discharge	9	8 x 5	66S10
Black Series 12 Core Bit. Face Discharge	9	8 x 5	66S12
Black Series 13 Core Bit. Face Discharge	9	8 x 5	66S13
TA90 Core Bit. Face Discharge	9	6 x 5	3567
TA90 Core Bit	9	10 x 4	3567ID
TA100 Core Bit. Face Discharge	9	6 x 5	3122
TA100 Core Bit	9	10 x 4	3122ID
TA100 Core Bit	12	10 x 4	1816
TA110 Core Bit. Face Discharge	9	6 x 5	5088
TA110 Core Bit	9	10 x 4	5088ID
TA120 Core Bit. Face Discharge	9	6 x 5	3466
TA120 Core Bit	9	10 x 4	3466ID
TA130 Core Bit. Face Discharge	9	6 x 5	5187
TA130 Core Bit	12	6 x 5	5187/12
TA130 Core Bit	9	10 x 4	5187ID
TA150 Core Bit. Face Discharge	9	6 x 5	665
TA150 Core Bit. Face Discharge	9	6 x 5	8558
TA150 Core Bit	9	10 x 4	8558ID
TA155M Core Bit. Face Discharge	9	6 x 5	3472
TA11 x Core Bit. Face Discharge	9	6 x 5	02-472
TA11 x Core Bit. Internal Discharge	9	10 x 4	02-466

“H” Series Wireline Impregnated Core Bits

HQ

Description	DOI (mm)	Waterways (mm)	Stock Code
Green Core Bit	9	10 x 4	901/9
Red Core Bit	9	10 x 4	196/9
Red Shale Bit with Milled Flutes	9	8 x 8	1498
Yellow Core Bit	9	10 x 4	197/9
Yellow Shale Bit with Milled Flute Water Ways	9	8 x 8	1499
Silver Core Bit	9	10 x 4	02-654
Silver Core Bit	12	10 x 4	250
Silver Core Bit. Face Discharge	9	10 x 5	02-654FD
Silver Shale Bit with Milled Flute Water Ways	9	8 x 8	777
Blue Core Bit	9	10 x 4	198/9
T8X Core Bit	9	10 x 4	436
T8X Core Bit	12	10 x 4	436/12
T8X Wedging Core Bit	9	10 x 4	2277
T8X 6 Step Core Bit	9	10 x 4	1849
T8X Shale Bit with Milled Flute Water Ways	9	8 x 8	1302
Black Series 9 Core Bit	9	10 x 4	02-9018
Black Series 10 Core Bit	9	10 x 4	02-9019
Black Series 12 Core Bit	9	10 x 4	9020
Black Series 13 Core Bit	12	8 x 8	09-9040
TA90 Core Bit	9	10 x 4	9133
TA90 Core Bit	12	10 x 4	9133/12
TA90 Wedging Core Bit	9	10 x 4	6128
TA100 Core Bit	9	10 x 4	9132
TA100 Core Bit	12	10 x 4	251
TA110 Core Bit	9	10 x 4	5075
TA110 Core Bit	12	10 x 4	5075/12
TA110 Hybrid Core Bit	9	10 x 4	5076
TA120 Core Bit	9	10 x 4	9104
TA120 Core Bit	12	10 x 4	9104/12
TA130 Core Bit	9	10 x 4	8317
TA130 Core Bit	12	10 x 4	8317/12
TA150 Core Bit	9	10 x 4	1160
TA150 Core Bit	12	10 x 4	1160/12
TA150 Core Bit	16	8 x 8	1866
TA11X Core Bit	12	10 x 4	5083/12
TA11X Core Bit	9	10 x 4	5083
TA11X Shale Bit with Milled Flute	9	8 x 8	1504
TA11X Wedging Bit	9	10 x 4	824

HQ3

Description	DOI (mm)	Waterways (mm)	Stock Code
Green Core Bit	9	12 x 4	466ID/9
Green Core Bit. Face Discharge	9	12 x 4	466/9
Red Core Bit (12OD/6ID Water Ways). Face Discharge	9	12 x 4	151RH/9
Red Shale Bit with Milled Flutes	9	8 x 8	1275
Yellow Core Bit	9	12 x 4	150ID/9
Yellow Core Bit (12OD+6ID Water Ways). Face Discharge	9	12 x 4	150SP/9
Yellow 6 Step	9	8 x 4	1537
Gold Core Bit (12 OD/6ID Water Ways). Face Discharge	9	12 x 4	1543/9
Silver Core Bit	9	12 x 4	2307/9ID
Silver Core Bit (12OD/6ID Water Ways)	9	12 x 4	2307/9
Silver 6 Step Core Bit	9	8 x 4	690
Silver Shale Bit with Milled Flute Water Ways	9	8 x 8	536
Blue Core Bit (12OD/6ID Water Ways). Face Discharge	9	12 x 4	149RH/9
T8X Core Bit	9	12 x 4	437
T8X Core Bit. Face Discharge	9	12 x 6	02-465
T8X Core Bit. Face Discharge	12	12 x 6	02-465/12
T8X Turbo Core Bit (8x5mm Full + 8x5mm Half Water Ways)	9	8 x 5	830
T8X 6 Step Core Bit	9	8 x 4	6912
T8X Shale Bit with Milled Flute Water Ways	9	8 x 8	9140
Black S9 Core Bit (12OD/6ID Water Ways). Face Discharge	9	12 x 4	67S9
Black S10 Core Bit (12OD/6ID Water Ways). Face Discharge	9	12 x 4	67S10
Black S12 Core Bit (12OD/6ID Water Ways). Face Discharge	9	12 x 4	67S12
Black S13 Core Bit (12OD/6ID Water Ways). Face Discharge	9	12 x 4	67S13
TA90 Core Bit (12OD/6 ID Water Ways). Face Discharge	9	12 x 4	9976
TA90 Core Bit (12OD/6 ID Water Ways). Face Discharge	12	12 x 4	9976/12
TA90 Core Bit. Internal Discharge	9	12 x 4	7102
TA100 Core Bit (12OD/6 ID Water Ways). Face Discharge	9	12 x 4	9100
TA100 Core Bit (12OD/6 ID Water Ways). Face Discharge	12	12 x 4	9100/12
TA100 Core Bit. Internal Discharge	9	12 x 4	8161
TA110 Core Bit (12OD/6 ID Water Ways). Face Discharge	9	12 x 4	8691
TA110 Core Bit (12OD/6 ID Water Ways). Face Discharge	12	12 x 4	8691/12
TA110 Core Bit. Internal Discharge	9	12 x 4	9313
TA120 Core Bit (12OD/6 ID Water Ways). Face Discharge	9	12 x 4	9102
TA120 Core Bit, Internal Discharge	9	12 x 4	9966
TA130 Core Bit (12OD/6 ID Water Ways). Face Discharge	9	12 x 4	5174
TA130 Core Bit (12OD/6 ID Water Ways). Face Discharge	12	12 x 4	5174/12
TA130 Core Bit (12OD/6 ID Water Ways). Internal Discharge	12	12 x 4	5174/12ID
TA130 Core Bit. Internal Discharge	9	12 x 4	5174ID
TA150 Core Bit. Internal Discharge	9	12 x 4	9312
TA150 Core Bit (12OD/6 ID Water Ways). Face Discharge	9	12 x 4	6404
TA11X Core Bit. Internal Discharge	9	12 x 4	592
TA11X Core Bit (12 OD/6 ID Water Ways). Face Discharge	9	12 x 4	801
TA11X Shale Bit with Milled Flute	9	8 x 8	957

“P” Series Wireline Impregnated Core Bits

PQ

Description	DOI (mm)	Waterways (mm)	Stock Code
Red Core Bit	6	14 x 4	9472
Red Core Bit	9	14 x 4	9472/9
Yellow Core Bit	6	14 x 4	9471
Yellow Core Bit	9	14 x 4	9471/9
Silver Core Bit	6	14 x 4	9470
Silver Core Bit	9	14 x 4	9470/9
Blue Core Bit	6	14 x 4	5037
T8X Core Bit	9	14 x 4	02-670
Black Series 10 Core Bit	6	14 x 4	5035
Black Series 10 Core Bit	9	14 x 4	5035/9
TA90 Core Bit	9	14 x 4	7124
TA100 Core Bit	9	14 x 4	7125
TA120 Core Bit	9	14 x 4	7126
TA130 Core Bit	9	14 x 4	491
TA150 Core Bit	9	14 x 4	8688
TA11X Core Bit	9	14 x 4	7137

PQ3

Description	DOI (mm)	Waterways (mm)	Stock Code
Green Shale Bit	6	10 x 8	793
Green Core Bit (12OD/6ID Water Ways). Face Discharge	6	12 x 4	8564
Green Core Bit (12OD/6ID Water Ways). Face Discharge	9	12 x 4	8564/9
Red Core Bit (12OD/6ID Water Ways). Face Discharge	6	12 x 4	153
Red Core Bit (12OD/6ID Water Ways). Face Discharge	9	12 x 4	153/9
Red Shale Bit with Milled Flute Water Ways	6	10 x 8	791
Yellow Core Bit (12OD+6ID Water Ways). Face Discharge	6	12 x 4	2264
Yellow Core Bit (12OD+6ID Water Ways). Face Discharge	9	12 x 4	2264/9
Yellow Shale Bit with Milled Flute Water Ways	6	10 x 8	792
Gold Core Bit (12OD/6ID Water Ways). Face Discharge	6	12 x 4	65
Silver Core Bit (12OD/6D Water Ways). Face Discharge	6	12 x 4	2256
Silver Core Bit (12OD/6D Water Ways). Face Discharge	9	12 x 4	2256/9
Silver Shale Bit with Milles Flute Water Ways	6	10 x 8	2035
T8X Shale Bit with Milled Flute Water Ways	9	10 x 8	9141
Black Series 10 Core Bit (12OD/6ID Water Ways), Face Discharge	9	12 x 4	2154/9
TA90 Core Bit (12OD/6 ID Water Ways). Face Discharge	9	12 x 4	2526
TA100 Core Bit (12OD/6 ID Water Ways). Face Discharge	9	12 x 4	7128
TA110 Core Bit (12OD/6 ID Water Ways). Face Discharge	9	12 x 4	7132
TA130 Core Bit (12OD/6 ID Water Ways). Face Discharge	9	12 x 4	7139
TA150 Core Bit (12OD/6 ID Water Ways). Face Discharge	9	12 x 4	9829
TA11X Shale Bit with Milled Flute Water Ways	9	10 x 8	958
TA11X Core Bit (12 OD/6 ID Water Ways). Face Discharge	9	12 x 4	1892
Blue Core Bit (12OD/6ID Water Ways). Face Discharge	6	12 x 4	2255
Blue Core Bit (12OD/6ID Water Ways). Face Discharge	9	12 x 4	2255/9
T8X Core Bit (12OD/6ID Water Ways). Face Discharge	6	12 x 4	2241
T8X Core Bit (12OD/6ID Water Ways). Face Discharge	9	12 x 4	2241/9
TA120 Core Bit (12OD/6 ID Water Ways). Face Discharge	9	12 x 4	7129

Metric Series Conventional Barrel Impregnated Core Bits

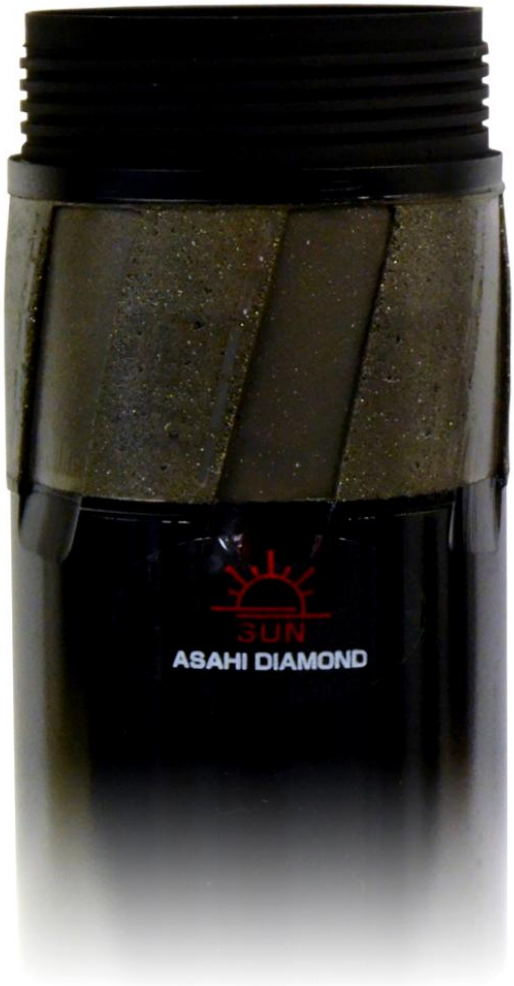
TT56

Description	DOI (mm)	Waterways (mm)	Stock Code
Red Core Bit	9	6 x 4	384
Red oversize Core Bit 57.7	9	6 x 4	374
Silver oversize Core Bit 57.7mm	9	6 x 4	2591
T8X oversize Core Bit 57.0mm	6	6 x 4	2593S
TA90 Core Bit	9	6 x 4	3919
TA90 oversize Core Bit 57.7mm	9	6 x 4	2592
TA110 Core Bit	9	6 x 4	382
TA110 oversize Core Bit 57.7mm	9	6 x 4	364
TA120 oversize Core Bit 57.7mm	9	6 x 4	5834
TA150 Core Bit	9	6 x 4	3924
TA150 oversize Core Bit 57mm	9	6 x 4	7758
TA150 oversize Core Bit 57.7mm	9	6 x 4	2595
TA11X oversize Core Bit (57mm)	9	6 x 3	1925

WL66

Description	DOI (mm)	Waterways (mm)	Stock Code
TA100H oversize Core Bit 68.8mm	9	10 x 3	02-1010
TA110 Core Bit	9	8 x 4	02-1023
TA 110 oversize Core Bit 68.8mm	9	8 x 4	02-1037
TA130 Core Bit	9	8 x 4	02-1024
TA130 oversize Core Bit 68.8mm	9	8 x 4	02-1011
TA150 Core Bit	9	8 x 4	02-1027
TA150 oversize Core Bit 68.8mm	9	10 x 3	02-1005
TA155M Core Bit	9	8 x 4	2417
TA11X Core Bit	9	8 x 4	02-1039

Helical Pad Reamer



The Asahi Helical Pad Reamer offers a 3 in 1 concept by incorporating natural Diamonds and tungsten carbide set in a mixture of impregnated Diamond matrix. This formula meets the criteria of most drilling applications, from more abrasive to fine grained formations encountered worldwide.

The new Helical pattern incorporates a gentle taper from the leading edge up to the major parallel section of the reamer which is set to the standard hole size. This feature allows a much smoother and more gradual approach to the set size resulting in extended life.

Helical Reamers have various combinations of matrix strength, Diamond grade and concentration available to suit the required drilling application.

Helical Pad Reamer

Series	Diameter	Position	Gauge	Stock Code
BQ	60.00mm	Front End	Standard	9962
BQ	60.00mm	Back End	Standard	9972
BQ	60.35mm	Front End	Oversize	02-305
BQ	60.35mm	Back End	Oversize	9977
NQ	75.70mm	Front End	Standard	6700
NQ	75.70mm	Back End	Standard	6551
NQ	75.30mm	Front End	Bit Size	691
NQ	76.20mm	Front End	Oversize	1654
NQ	76.20mm	Back End	Oversize	1657
NQ	76.70mm	Front End	Oversize	534
NQ	76.70mm	Back End	Oversize	724
HQ	95.55mm	Front End	Bit Size	747
HQ	96.00mm	Front End	Standard	9610
HQ	96.00mm	Back End	Standard	9618
HQ	96.60mm	Front End	Oversize	723
HQ	96.60mm	Back End	Oversize	722
HQ	97.55mm	Front End	Oversize	9610/OS
HQ	97.55mm	Back End	Oversize	9610/OS
PQ	122.60mm	Front End	Standard	2272
PQ	126.00mm	Back End	Oversize	1656SP
NMLC	75.70mm	Front End	Standard	3146
NMLC	75.70mm	Front End	Standard	973
HMLC	99.20mm	Front End	Standard	2331
HMLC	99.20mm	Front End	Standard	02-9002

Drilltec / Kalex Tungsten Bits, Shoes and Hole Openers

Asahi Drilltec and Kalex Bits and Shoes are designed for soft formation drilling. Our Shoes and Bits are available in all standard sizes.

Asahi also manufactures Drilltec Pilot Bits for Inseam Drilling in coal mines. The design incorporates a 16mm metric thread in the front of the Bit to cater for a Pilot Bit. They also feature large irregular particles and waterways with large water holes.

Standard Pilot Bit sizes are 65mm and 80mm with AW / AWJ rod box thread. Other sizes and threads can be manufactured to order.

To further increase the hole diameter a Drilltec Hole Opener can be used behind the Bit. These Bits used with hole openers can be utilised with low torque drilling.

The combination of a 65mm Pilot Bit and an 80mm hole opener has proved successful when attempting to stay in the seam as it generally will deflect off the roof and floor.

Drilltec / Kalex Tungsten Bits, Shoes and Hole Openers

Size	Description	Stock Code
5½x4C	Drilltec Core Bit	1312
5½x4C	Drilltec oversize Core Bit	1312X
10¼	Drilltec Reamer	266
10¼x8C	Drilltec Core Bit	5478
65mm	Drilltec Pilot Bit	9952
65mm	Drilltec Pilot Bit with AWJ Box Thread	9952-AWJ
80mm	Drilltec Pilot Bit with AW Box Thread	261
80mm	Drilltec Pilot Bit with AWJ Box Thread	261-AWJ
BQ3	Drilltec Core Bit	8081
BQDT	Drilltec Core Bit	1854
HMLC	Drilltec Core Bit	257
HQ	Drilltec Casing Shoe-Advancer Shoe Bit 95mm	1337S
HQ	Kalex HQ Rod Shoe	2873
HQ3	Drilltec Core Bit	1357
HQ3	Drilltec oversize Core Bit 98mm	1338
HQDT	Drilltec Core Bit	1855
HQTT	Drilltec Core Bit	4278
HW	Drilltec Casing Shoe Bit	1940
HW	Drilltec oversize Casing Shoe Bit	1940-O/S
HWT	Drilltec Casing Shoe Bit	1940HWT
HWT	Drilltec oversize Rod Shoe Bit	1069
HWT	Kalex HWT Rod Shoe	643
NMLC	Drilltec Core Bit	2729
NMLC	Drilltec Heavy Duty Core Bit 83mm	2729HD
NQ	Drilltec Rod Shoe Bit	5495
NQ3	Drilltec Core Bit	8083
NQDT	Drilltec Core Bit	254
NQDT	Drilltec. Face Discharge	254FD
NW	Drilltec Casing Shoe Bit	2316
NW	Kalex NW Casing Shoe	5815
PQ3	Drilltec Core Bit	2342
PQDT	Drilltec Core Bit	5467
PW	Drilltec Casing Shoe Bit	4675
PW	Drilltec oversize Casing Shoe Bit	4675L
PW	Kalex PW Casing Shoe	1993
PWT	Drilltec Casing Shoe Bit	4675PWT
PWT	Kalex PWT Casing Shoe	1497
SW	Drilltec Casing Shoe Bit	4676
TT56	Drilltec oversize Core Bit 58mm	652

Rod Shoes and Casing Shoes

Rod Shoe

Type	Description	DOI (mm)	Waterways (mm)	Stock Code
HQ	Red Rod Shoe Bit	6	6 x 4	6442
HQ	Gold Rod Shoe Bit	6	6 x 4	145
HQ	Gold Rod Shoe Bit 77.5mm ID	6	6 x 4	145S
HQ	Silver Rod Shoe A5B with Reinforced OD Gauge	6	6 x 4	02-669
NQ	Gold Rod Shoe Bit	6	6 x 4	2039
NQ	Silver Rod Shoe Bit	6	6 x 4	8080

Casing Shoe

Type	Description	DOI (mm)	Waterways (mm)	Stock Code
BW	Gold Casing Shoe Bit	6	6 x 3	2306
HW	Gold Casing Shoe Bit	6	10 x 5	146
HWT	Red Rod / Casing Reaming Shoe Bit A54	6	10 x 5	02-662
HWT	Red Rod / Casing Reaming Shoe Bit A54	9	10 x 5	02-662/9
HWT	Gold Casing Shoe Bit	6	10 x 5	02-650
HWT	Silver Rod Casing Shoe A5B	6	10 x 5	02-665
NW	Red Casing Shoe Bit R74	6	6 x 4	144R
NW	Gold Casing Shoe Bit	6	6 x 4	144
NW	Gold Casing Shoe Bit with 3 Strips Hard Facing	6	6 x 4	715
NW	Black Series 13 Casing Shoe Bit (C7B)	6	6 x 4	2176
PW	Red Casing Shoe Bit R74	6	12 x 5	148R
PW	Gold Casing Shoe Bit A74	6	10 x 5	02-675
PW	Gold Casing Shoe Bit	6	12 x 5	148
PWT	Red Rod / Casing Reaming Shoe A54	6	10 x 5	02-673
PWT	Yellow Rod / Casing Reaming Shoe A64	6	12 x 4	02-674
PWT	Gold Casing Shoe Bit	6	12 x 5	671

Casing Advancer Shoe

Type	Description	DOI (mm)	Waterways (mm)	Stock Code
HW	Red Casing Advancer Shoe Bit R54 119mm OD	6	10 x 5	1824
HWT	Red Rod Casing Advancer Bit R54 119mm OD	6	10 x 5	1827/OS
NW	Red Casing Advancer Shoe Bit 94.9mm OD	6	6 x 4	02-4511

Triple Tube Conventional Core Barrel

Triple Tube Conventional Core Barrels

Asahi Triple Tube Core Barrels are designed to maximize core recovery in site investigation and core exploratory drilling programs.

With these Core Barrels it is possible to obtain near 100% volumetric core recovery in the most undisturbed condition possible using rotary core drilling equipment. They have been used for exploration of dam, bridge and building sites as well as the development of mineral resources.

Triple Tube Core Barrels are normally supplied with stainless steel split inner tubes. Clear plastic tubing is available in NMLC size.

The plastic tubing is used when retaining the core exactly as it is recovered from the hole is desired. The core is left in the tube and the ends are sealed.

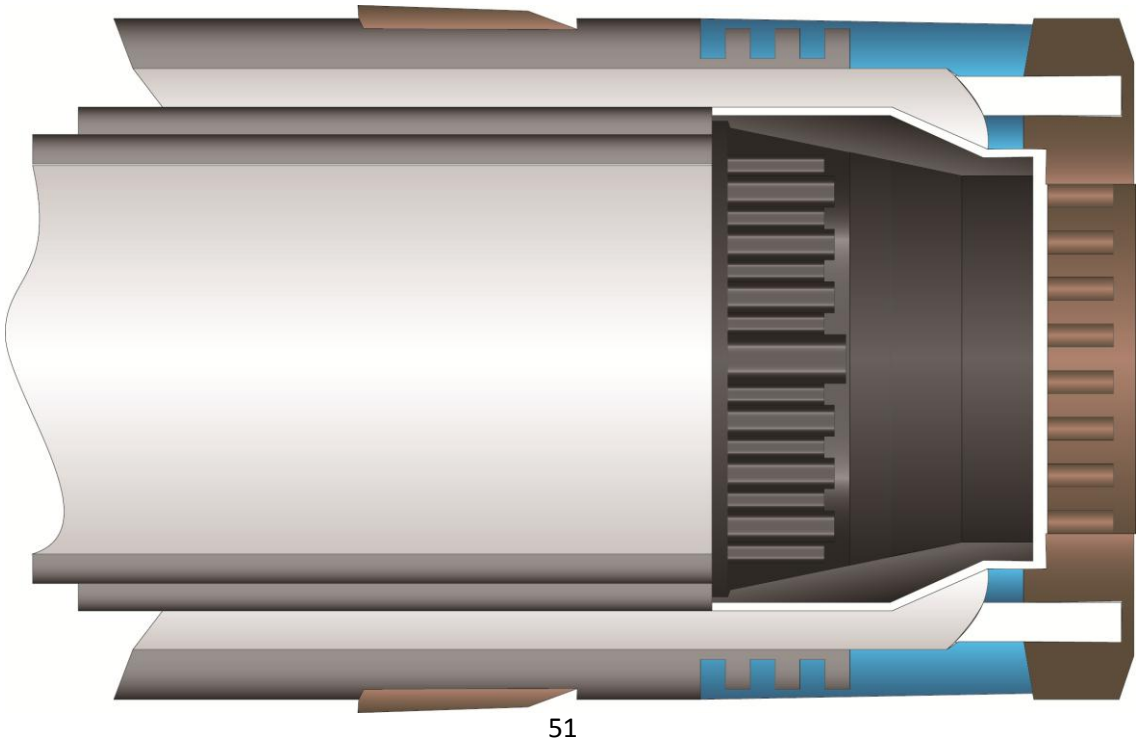
Visual examination is possible through the tubing on site or at the laboratory. The outer tubes are hard faced at each end to reduce wear and act as a stabilizer.

Size	Hole Diameter	Core Diameter	Length	Stock Code
NMLC	75.69mm	51.94mm	1.0m	3279I1MTR
NMLC	75.69mm	51.94mm	1.5m	3279I
NMLC	75.69mm	51.94mm	3.0m	3285I
HMLC	99.21mm	63.50mm	1.5m	3280I
HMLC	99.21mm	63.50mm	3.0m	3286I

Size	Description	Unit Weight (KG)	Stock Code
NMLC	NMLC Core Barrel Assy 1.5m	28.00	3279
NMLC	NMLC Core Barrel Assy 3m	45.90	3285
NMLC	NMLC Outer Tube 1.5m	12.50	3340
NMLC	NMLC Outer Tube 3m	24.00	3344
NMLC	NMLC Inner Tube 1.5m	3.50	3362
NMLC	NMLC Inner Tube 3m	7.00	3366
NMLC	NMLC Split 1.5m	3.00	3377
NMLC	NMLC Split 3m	6.00	3381
NMLC	NMLC Water End (6 & 7)	3.60	1352
NMLC	NNMLC Race Housing Assy (9 -16)	1.75	415
NMLC	NMLC Bov Assy (19-27)	1.25	406
NMLC	NMLC Adjusting Washer 1/8”		404
NMLC	NMLC Adjusting Washer 1/16”		405
NMLC	NMLC Locating Washer		402
NMLC	NMLC Core Lifter		419
NMLC	NMLC Core Lifter Case		424
NMLC	NMLC/HMLC Pump Coupling		421
NMLC	NMLC/HMLC Wrenches 5/16		420
NMLC	Grease Fitting		422
NMLC	NMLC/HMLC Allen Wrenches 1/8		429
NMLC	NMLC BOV Loader		411
NMLC	NMLC Spanner		403
HMLC	HMLC Core Barrel Assy 1.5m	52.85	3280
HMLC	HMLC Core Barrel Assy 3m	86.60	3286
HMLC	HMLC Outer Tube 1.5m	23.50	3341
HMLC	HMLC Outer Tube 3m	44.50	3345
HMLC	HMLC Inner Tube 1.5m	10.50	3363
HMLC	HMLC Inner Tube 3m	19.00	3367
HMLC	HMLC Split 1.5m	4.25	3378
HMLC	HMLC Split 3m	8.50	3382
HMLC	HMLC Water End (6 & 7)	7.00	464
HMLC	HMLC Race Housing Assy (9-16)	2.75	1354
HMLC	HMLC Bov Assy (19-27)	1.75	451
HMLC	HMLC Adjusting Washer 1/8”		449
HMLC	HMLC Adjusting Washer 1/16”		450
HMLC	HMLC Locating Washer		447
HMLC	HMLC Core Lifter		463
HMLC	HMLC Core Lifter Case		8117
HMLC	NMLC/HMLC Pump Coupling		421
HMLC	NMLC/HMLC Allen Wrenches 5/16		420
HMLC	Grease Fitting		422
HMLC	NMLC/HMLC Allen Wrenches 1/5		429
HMLC	HMLC Spanner		448

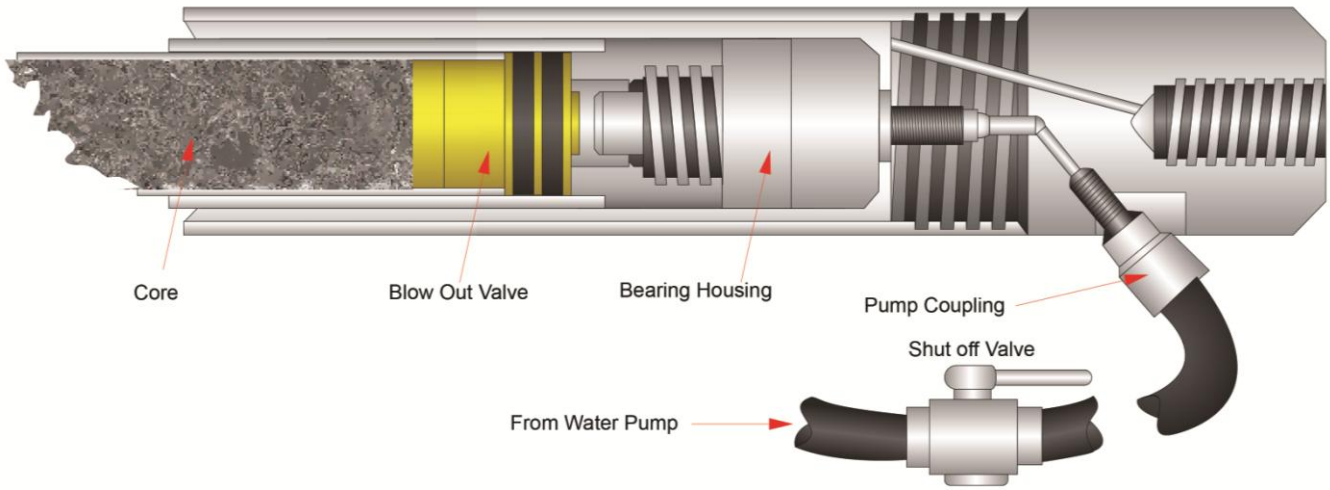
Set Up Instructions

- Unscrew the water end from the outer tube.
- Withdraw the water end and the holding tube assembly from outer tube.
- Remove the set screw from the bearing housing and insert the grease nipple.
- Apply grease.
- Remove grease nipple and replace the set screw.
- Dismantle the rest of the barrel and reassemble ensuring that all the threads are tight.
- Loose threads can result in water leaking through the inner tube and washing the core.
- It is generally not necessary to disassemble the bearing housing unless the barrel has been stored for some time, in which case the bearings should be checked to ensure that they are fully greased.
- Check the distance between the core lifter adaptor case and the inner shoulder of the Bit.
- For medium to hard formations this clearance should be about 1.5m.
- For soft and friable formations this distance should be reduced to about 1.0m to prevent water from washing the core away.
- There should always be some clearance to prevent the core lifter adaptor case from rubbing on the Bit and allow cuttings to be washed from the inside gauge of the Bit.
- This clearance is adjusted with the spacer washers that are located between the bearing housing and the holding tube.



Core Removal

- Remove Bit and reamer from outer tube.
- Remove the core lifter case, core lifter and locating washer from the holding tube using two C spanners.
- Remove the plug from the water end and insert the pump coupling; connect coupling to closed water pump shut off valve.
- Slowly open valve. Pressure will be applied to the top of the blow out valve, causing the valve and the split tube to be ejected from the holding tube.
- Clean barrel by tilting it with water end upward and rotate the holding tube, allowing water to wash through the barrel.
- Remove pump coupling from water end and replace the plug.



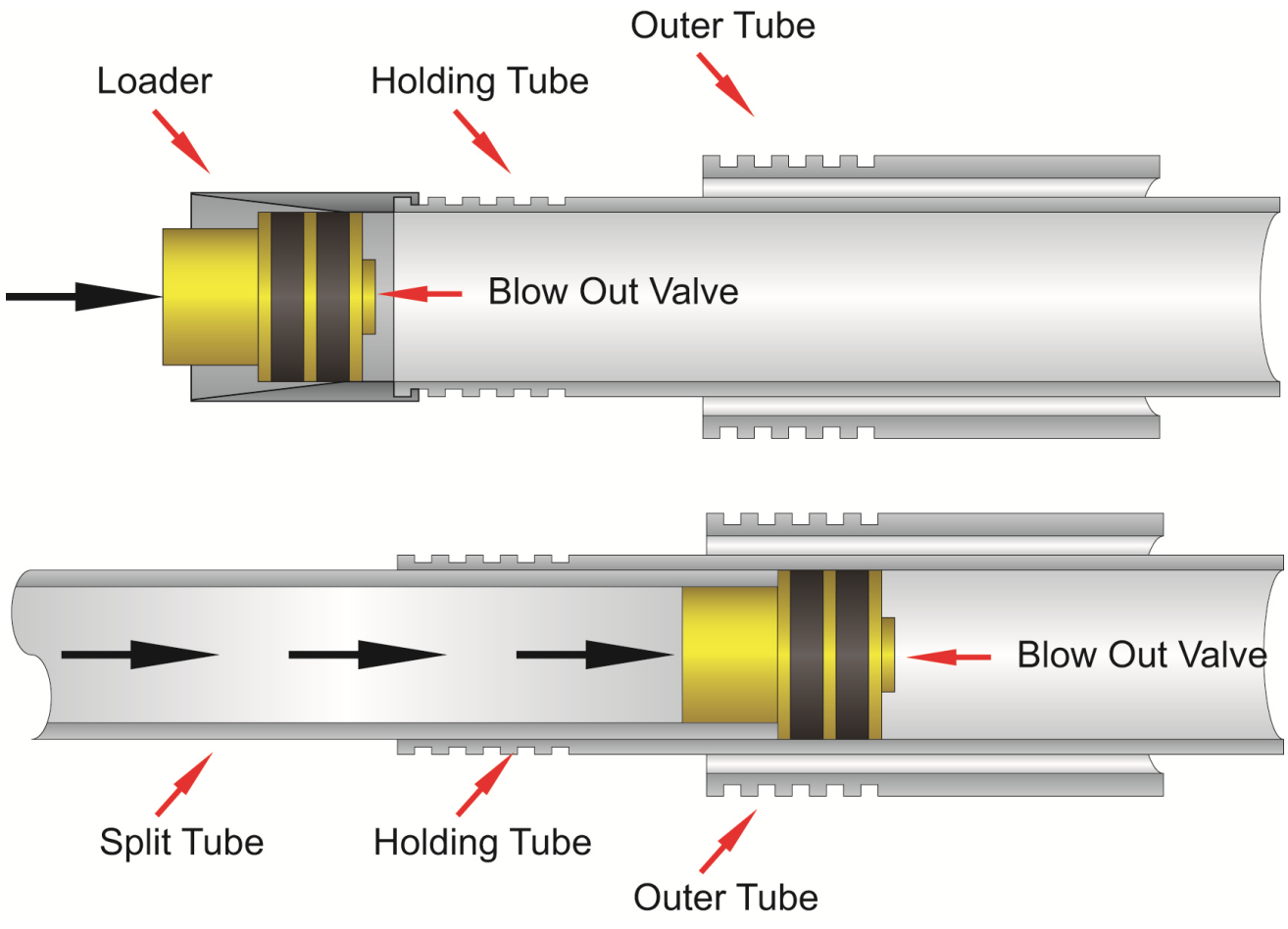
Inner Tube Replacement

Place blow out valve loader over the holding tube and insert the blow out valve. Push the valve through the loader into the holding tube.

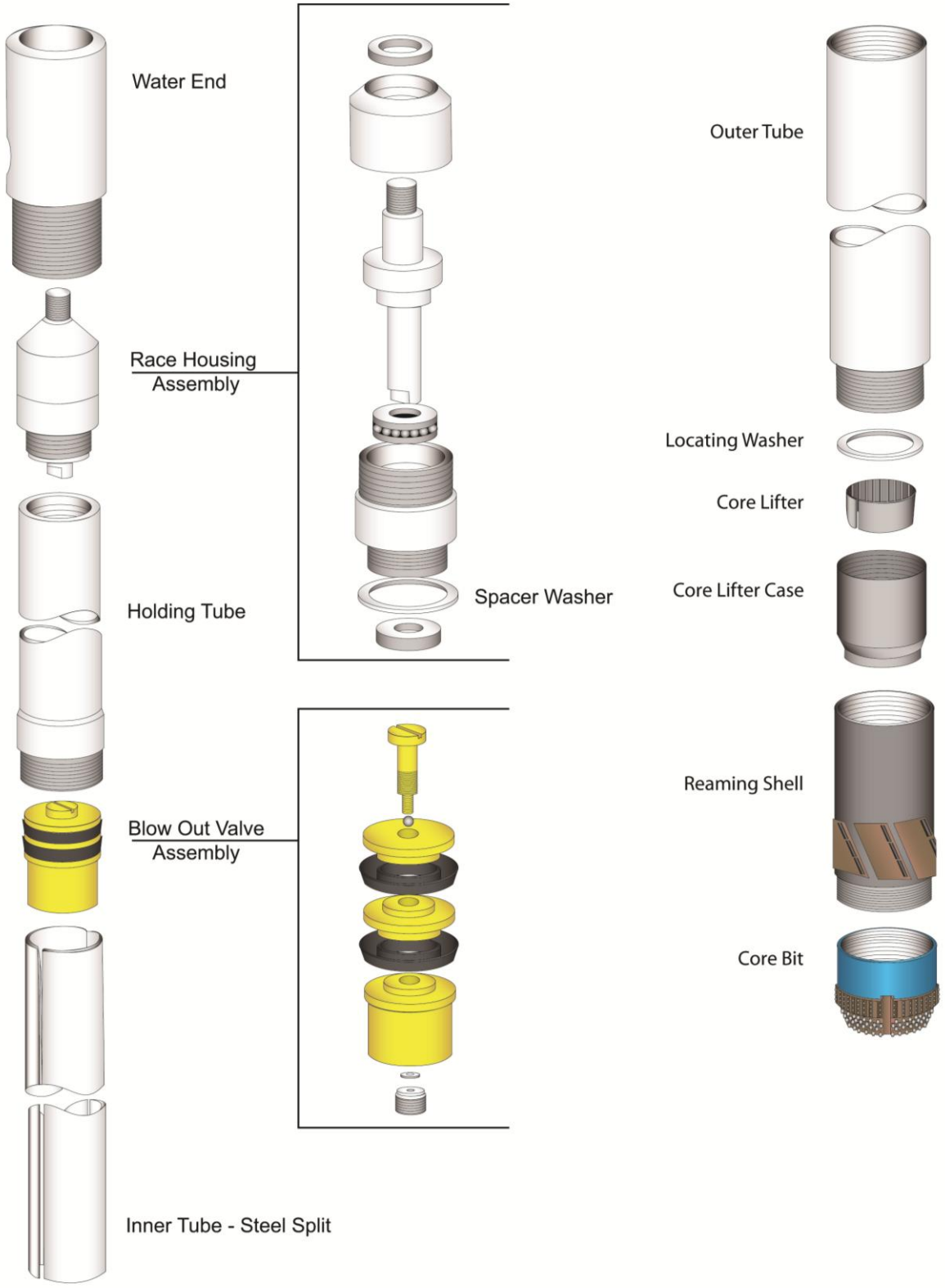
- Clean splits before inserting into holding tube.
- Remove loader and place the split tube over the end of the valve.
- Push the whole assembly into the holding tube until valve stops on its seating in the holding tube assembly.
- At this point the split inner tube should be flush with the end of the holding tube.
- When the inner tube is seated correctly replace the locating washer, core lifter adaptor case, core lifter, reamer and Bit.
- The core barrel is ready for another run.

Note:
The hole in the water end is designed to let air escape from the holding tube as the core enters the barrel. If it becomes blocked a core blockage will be indicated after drilling only a short distance and if drilling continues the pressure will prevent the core from entering the barrel.

In softer formations the core may wash away and there will be no apparent reason for lost core. Water will not leak through the hole if the seals are in good condition and the threads are tight.



Conventional Core Barrel Breakdown



Servicing Conventional Core Barrel

Visual inspection and any necessary repairs should be done at the drill site at least every 100 meters drilled, or every week. The Barrel should be taken to the workshop for servicing as often as possible.

The following procedure can be followed:

General

- Dismantle the Barrel completely.
- Clean all parts (except seals) with diesel or another non-acidic cleaning fluid.
- Inspect all parts for damage.

Water End

- Clean all waterways in the water end body.
- Check that the vent hole in the plug is clear.
- Screw it into the body.

Race Housing Assembly

- Clean the spindle ensuring that the centre hole is not blocked.
- Check the oil seals and the bearings for wear.
- Reassemble, tightening all threads firmly.
- Apply the tools over the thick shoulder of the race clamp and the main part of the body.
- Clean the grease nipple then grease the bearings.
- Remove the grease nipple and insert the set screw.

Blow Out Valve Assembly

- Check the U packing's, spring, ball valve and sieve for wear.
- Ensure that the ball seat is clean and none of the holes are blocked.
- Reassemble, taking care not to damage the packing's.
- Tighten all threads firmly.

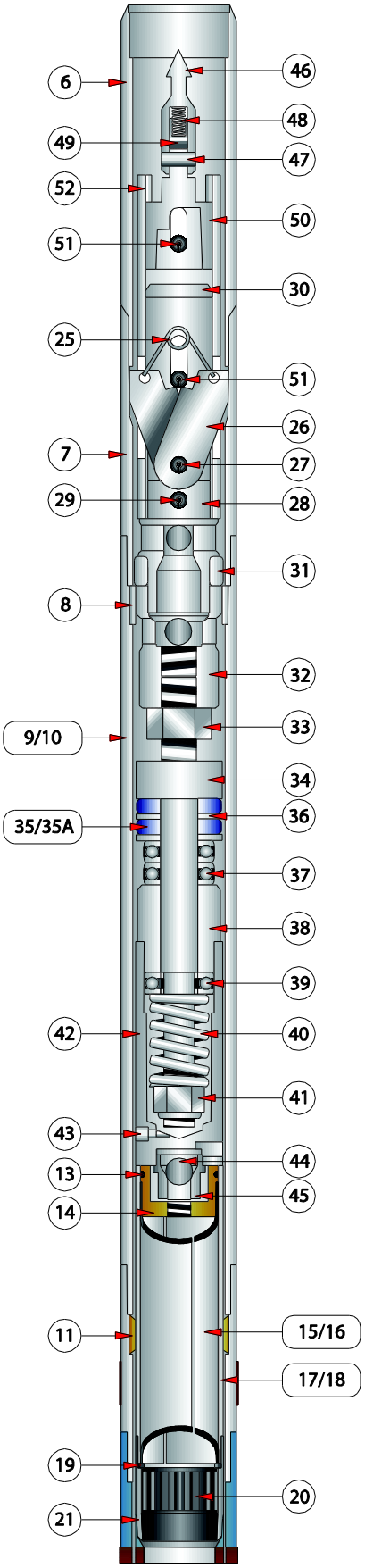
Tubes

- If the holding or inner tubes are dented they will be difficult to assemble and cause core jamming before the barrel is full.
- Check that the split inner tube halves are circular when held together and that they will fit over the blow out valve body.
- When the blow out valve and inner tube are fitted together they should pass easily through the holding tube.
- The packing's should cause some resistance.
- If the packing's are removed the assembly should slide freely through the holding tube.

Assembly

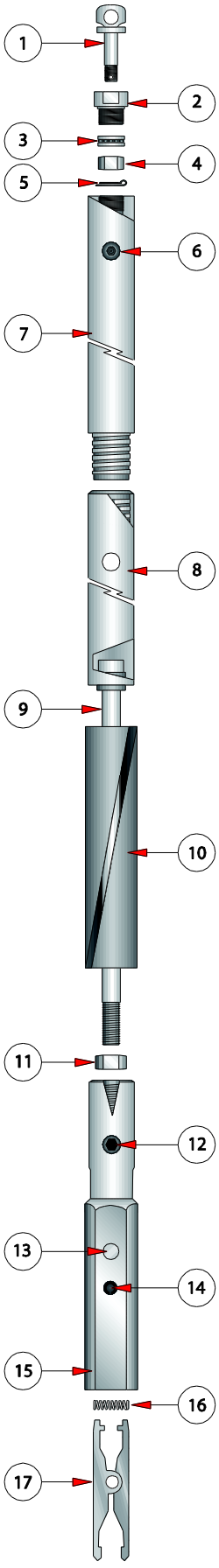
- Fit the holding tube to the bearing housing with the required spacer washers (as per the setting up instructions).
- Fit the spindle thread of the bearing housing to the water end.
- Grease the threads before assembly to assist in future disassembly.
- Insert the blow out valve and split inner tube into the holding tube.
- Test the blow out valve and bearing seals by removing the plug and coupling to a pump or compressor.
- Blow out the inner tube.
- The inner tube and splits should slowly slide out.
- If water (or air) blows out the end of the holding tube then the U packing's are worn or incorrectly fitted.
- If there is leakage through the bearing assembly then the oil seals must be replaced.
- Reload the blow out valve and inner tube.
- Slide the holding tube/water end assembly into the female threaded end of the outer tube and screw the water end into the outer tube.
- Insert the core lifter and locating washer into the core lifter adaptor case and screw to the holding tube.
- Screw a Bit and Reamer to the outer tube.
- Check the clearance between the Bit and core lifter adaptor case.
- Adjust the spacer washers if necessary.
- Fully tighten the water end, outer tube, Reamer and Bit and re-check the clearance.

Wireline Core Barrel



Item No	Stock Code	Description	No. Req	Unit Weight (KG)
6-52	14-02-505I	H W/L-3 Core Barrel Assy 5ft	.	75.90
6-52	14-02-510I	H W/L-3 Core Barrel Assy 10ft	.	112.70
13-52	14-12-505I	H W/L-3 Inner Tube Assy 5ft	.	34.50
13-52	14-12-510I	H W/L-3 Inner Tube Assy 10ft	.	45.60
25-52	12-20-502I	H W/L Head Assy	.	21.80
6	12-21-534I	H W/L Locking Coupling	1	4.16
7	12-21-535I	H W/L H W/L Adaptor Coupling	1	2.50
8	12-21-536I	H W/L Landing Ring	1	0.30
9	12-21-545I	H W/L Outer Tube 5ft	1	25.90
10	12-21-550I	H W/L Outer Tube 10ft	1	51.40
11	12-21-539I	H W/L Inner Tube Stabiliser	1	0.26
12	12-21-540I	H W/L Thread Protector (Not Shown)	1	2.07
13	14-21-526I	H W/L-3 O-Ring	1	0.01
14	14-21-527I	H W/L-3 Piston	1	0.67
15	14-21-528I	H W/L-3 Split Tube 5ft	1	3.40
16	14-21-529I	H W/L-3 Split Tube 10ft	1	6.80
17	12-21-525I	H W/L Inner Tube 5ft	1	7.10
18	12-21-530I	H W/L Inner Tube 10ft	1	16.10
19	14-21-532I	H W/L-3 Stop Ring	1	0.01
20	14-21-533I	H W/L-3 Core Lifter	1	0.09
21	14-21-531I	H W/L-3 Core Lifter Case	1	0.44
22	14-21-537I	H W/L-3 Adaptor, Inner Tube (Not Shown)	1	1.60
23	14-21-338I	H W/L-3 Piston Plug (Not Shown)	1	0.10
24	12-21-461I	H W/L Inner Tube Wrench (Not Shown)	2	3.63
25	12-21-504I	H W/L Latch Spring	1	0.01
26	12-21-505I	H W/L Latch	2	0.27
27	12-21-403I	H W/L Spring Pin 1/2" x 2"	1	0.03
28	12-21-507I	H W/L Latch Support	1	0.18
29	12-21-508I	H W/L Spring Pin 3/8" x 2"	1	0.02
30	12-21-5191I	H W/L Upper Latch Body	1	3.06
31	12-21-5092I	H W/L Landing Shoulder Ring	1	0.42
32	12-21-5093I	H W/L Lower Latch Body	1	1.70
33	12-21-510I	H W/L Lock Nut	1	0.24
34	12-21-511I	H W/L Spindle Assy	1	2.73
35	12-21-512S	H W/L Shut off Valve (Soft)	2	0.05
35A	12-21-512H	H W/L Shut off Valve (Hard)	2	0.05
36	12-21-513I	H W/L Valve Adjusting Washer	2	0.13
37	12-21-514I	H W/L Ball Thrust Bearing (Encapsulated)	3	0.23
38	12-21-515I	H W/L Spindle Bearing	1	1.69
39	12-21-414I	H W/L Hanger Ball Thrust Bearing	1	0.17
40	12-21-516I	H W/L Compression Spring	1	0.43
41	12-21-517I	H W/L Set Lock Nut	1	0.12
42	12-21-519I	H W/L Inner Tube Cap	1	2.34
44	12-21-421I	7/8" Stainless Steel Ball	1	0.05
45	12-21-423I	H W/L Check Valve Body	1	0.21
46	12-22-301I	H W/L Spearhead Point	1	0.19
47	12-22-305I	H W/L Spiral Pin 7/16" x 1"	1	0.01
48	12-22-302I	H W/L Compression Spring	1	0.01
49	12-22-303I	H W/L Detent Plunger	1	0.02
50	12-22-504I	H W/L Spearhead Base	1	1.14
51	12-21-503I	H W/L Spring Pin 1/2" x 2-3/4"	2	0.04
52	12-22-506I	H W/L Latch Retracting Case	1	2.52

Wireline Over Shot



Wireline Over Shot

Item No	Part No	Description	No. Req	Unit Weight (KG)
1-17	12-32-500	H W/L Over Shot Assy		16.40
1-5	12-31-221	N-H W/L Cable Swivel Assy		0.26
1	12-31-202	N-H W/L Eye Bolt	1	0.11
2	12-31-203	N-H W/L Cable Swivel Collar	1	0.11
3	12-31-204	N-H W/L Needle Thrust Bearing	1	0.01
4	12-31-205	N-H W/L Net	1	0.02
5	12-31-206	Cotter Pin 3/32" x 1"	1	0.01
6	12-21-220	Grease Fitting	1	0.01
7	12-32-407	N-H W/L Cable Swivel body	1	7.23
8	12-32-421	N-H W/L Jar Tube Weldment	1	2.83
9	12-32-412	N-H W/L Jar Staff	1	0.66
10	12-31-411	N-H W/L Locking Sleeve	1	1.27
11	12-31-408	N-H W/L Locking Nut	1	0.02
12	12-32-314	N-H W/L Machine Screw	1	0.01
13	12-31-517	H W/L Over Shot Head	1	0.06
14	12-31-418	Spring Pin 1/4" x 2"	1	0.01
15	12-32-515	H W/L Over Shot Head	1	2.70
16	12-31-316	N-H W/L Lifting Dog Spring	1	0.01
17	12-31-419	N-H W/L Lifting Dog	2	0.25

Wireline Drill Rods

Wireline Drill Rods when used in conjunction with W/L Core Barrels allow the core to be retrieved through the Rods without removing the core barrel from the hole.

These Rods are manufactured from SAE grade 1541 and are stress relieved annealed all the way through, at both ends for 10”.

All N, H and HWT W/L Rods as shown are compatible with “Q series” Rods.

Size	Length	Weight	Stock Code
N W/L	1.0m	7.8 kg	30-36-404
N W/L	1.5m	11.7 kg	30-36-405
N W/L	3.0m	23.4kg	30-36-410
H W/L	1.5m	17.2 kg	30-36-505I
H W/L	3.0m	34.4 kg	30-36-510I
HWT W/L	1.5m	25.2 kg	20-17-505I
HWT W/L	3.0m	50.5 kg	20-17-510I

CHD76 Drill Rods

The Asahi CHD76 Drill Rod is manufactured using high quality “tool Joint” pin and box threads. It is friction welded to a “mid” body cold drawn tube stock.

The CHD76 threads give these Rods unprecedented strength in both tensile and torque, coupled with the security of friction welded joints these Rods surpass any other Rod on the market for directional drilling.

These Rods are able to be supplied in 1.5m or 3m pipe lengths and they are also pre-machined to suit internal survey equipment as standard supply.

Specifications:

Maximum Torque	6550 Nm
Maximum Tensile Force	545.5 Kn

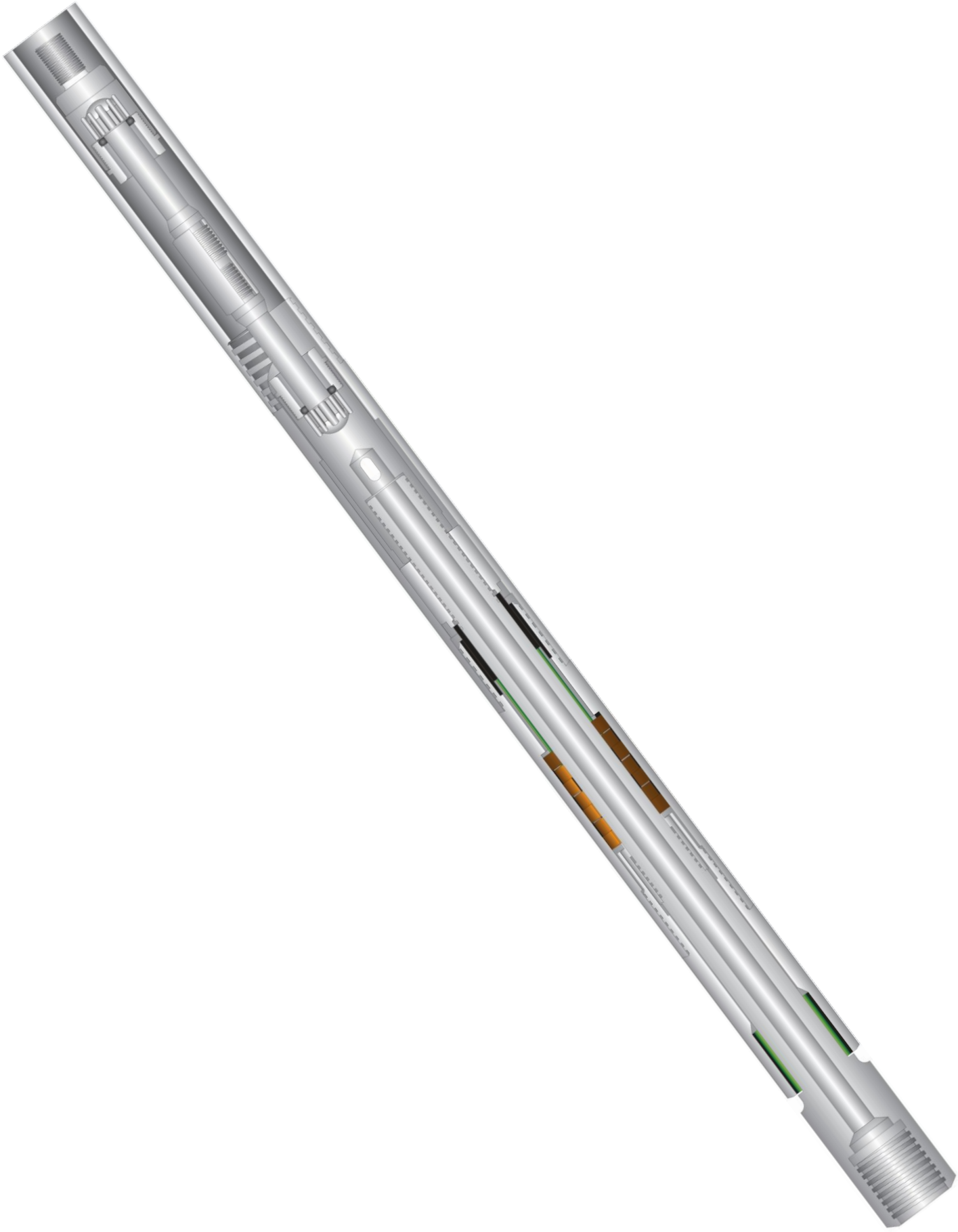
Size	Length	OD	Tool Joint ID	Mid ID	Weight	To be ordered in bundles of...
N – CHD76	1.5m	69.85mm	55.00mm	60.22mm	14.5 kg	19 Rods
N – CHD76	3.0m	69.85mm	55.00mm	60.22mm	25.0 kg	19 Rods

Rod Recovery Tools

Asahi Recovery Bell Taps and Spear Taps are used to recover broken or damaged drill rods from the drill hole by screwing inside/outside of the broken rod.

We keep a stock of Taps for CHD, NQ & HQ. Other sizes can be manufactured on request.

Down Hole Motors



Down Hole Motors

Asahi supplies Down Hole Motors that are commonly used for directional drilling in coal and hard rock mining as well as civil construction. They are also used as an alternative to conventional deflection style drilling where wedges are used.

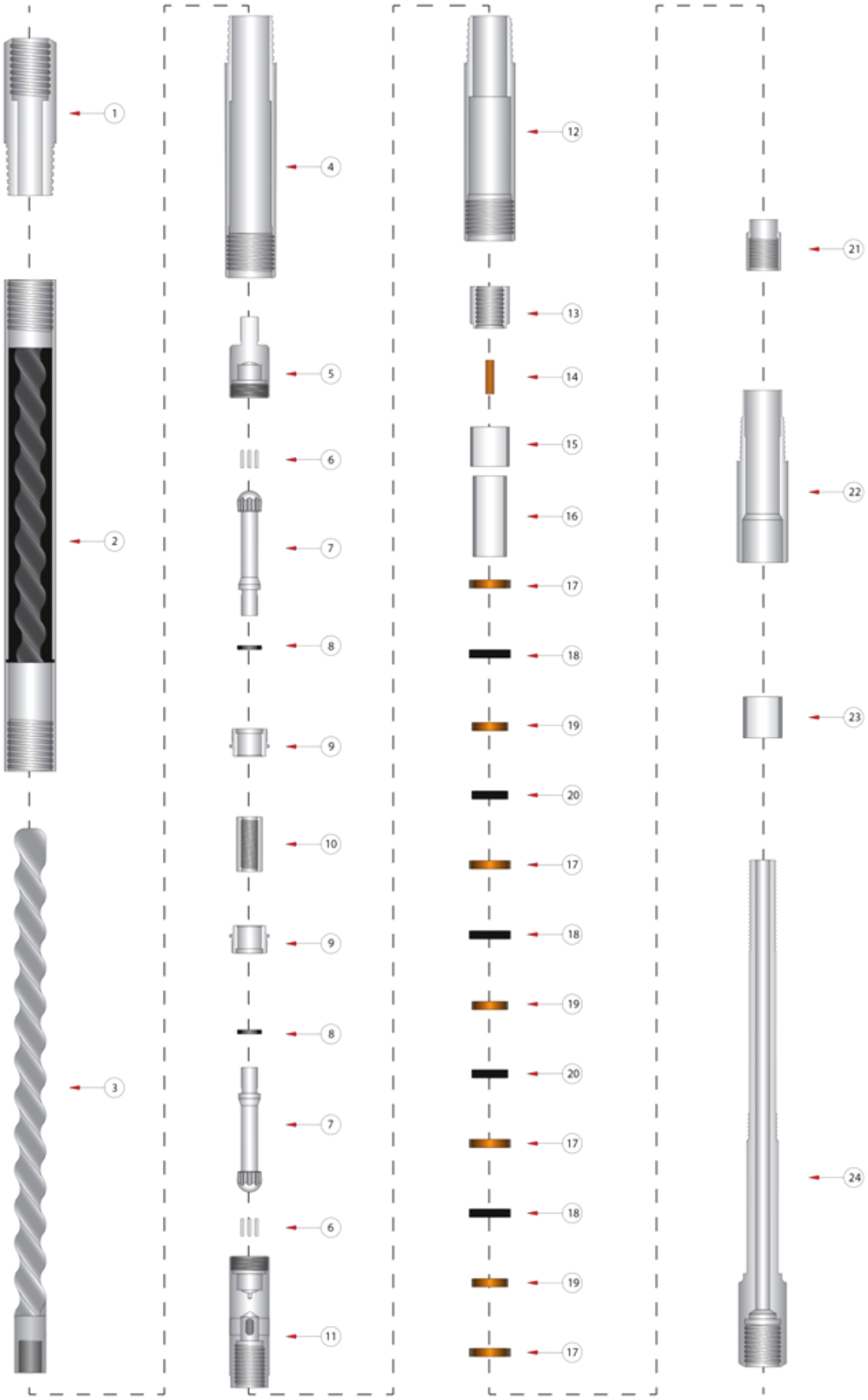
The Down Hole Motor is driven via fluid pumped into the motor, which then turns it into a mechanical rotary motion through the form of a rotor. This rotary motion is than applied to a Drill Bit (either PCD, Impregnated Diamond) and attached to the end of the motor to cut into the formation being drilled.

The direction of the motor can be determined by a “bent sub”. These subs can be fitted to the DHM to adjust the “angle” of the motor and how fast it can turn within the hole.

Asahi stock bent sub’s in standard angle’s, 1 degree, 1 ½ degree and 1 ¼ degree.

Tool Sizes	2 3/8	2 7/8 Becu	2 7/8 Steel
Diameter (inches)	2.375	2.875	2.875
Lobes	(5-6)	(4-5)	(5-6)
Stages	2.5	3	4
Length (ft)	9	9.5	11
Weight (lbs)	140	160	180
Top Connection	BW	NW	NW
Bit Connection	BW	NW	NW
Make up Torque (ft/lbs)	600	1200	1200
Bit Sizes (inches)	2 ⅞ – 3 ½	3 ¼ - 4	3 ¼ - 4
Max Weight on Bit	3500	6000	6000
Max Bit Pressure Drop (psi)	200	200	200
Minimum Flow Rate (gpm)	25	30	40
Maximum Flow Rate (gpm)	50	70	80
Recommended Flow Rate (gpm)	42	60	70
Bit Speed (rpm)	200 - 375	160 - 375	250 – 450
Pressure Drop at Max Torque (psi)	400	400	495
Max Operating Torque (ft/lbs)	130	190	225
Maximum Overpull (lbs)	12500	20000	20000

Down Hole Motor



Down Hole Motor

Item No.	Stock Code	Description	No. Req
1	DHM01-4140	Top Sub	1
2	DHM02	Stator	1
3	DHM03	Rotor	1
4	DHM/1.250	Bent Sub	1
5	DHM06	U Joint Connector	1
6	DHM07	U Joint Pins	?
7	DHM08	U Joint Shaft	2
8	DHM09	U Joint O Ring	2
9	DHM10	U Joint Shaft Retainer Nut	2
10	DHM11	U Joint Connector Tube	1
11	DHM12	U Joint Bonnet	1
12	DHM13 Assy	Upper Bearing Housing	1
13	DHM15	Upper Retaining Nut	1
14	DHM14	Key For Drive Shaft	1
15	DHM16	Upper Radial Bearing	1
16	DHM17	Thrust Spacer Sleeve	1
17	DHM22	Outer Thrust Bearing	4
18	DHM20	Outer Thrust Sleeve	3
19	DHM21	Inner Thrust Bearing	3
20	DHM23	Inner Thrust Sleeve	2
21	DHM24	Lower Retaining Nut	1
22	DHM25 Assy	Lower Bearing Housing	1
23	DHM27	Lower Radial Bearing	1
24	DHM26 Assy	Drive Shaft with Bearing	1
5-11	DHM29	U Joint Assembly Completer	
12-24	DHM30	Drive Shaft Assembly	

Water Swivels

NATA Certified 2500psi/170bar Safe Working Pressure

Asahi Diamond manufactures two configurations of Swivels:

- A top entry used within the coal industry with a ¾" BSP male thread.
- A side entry to suit the exploration industry with up to a 1 ¼" NPT female.

The front pin comes in standard thread sizing, and spindles are made out of stainless steel with a large bore to allow a more efficient water flow.

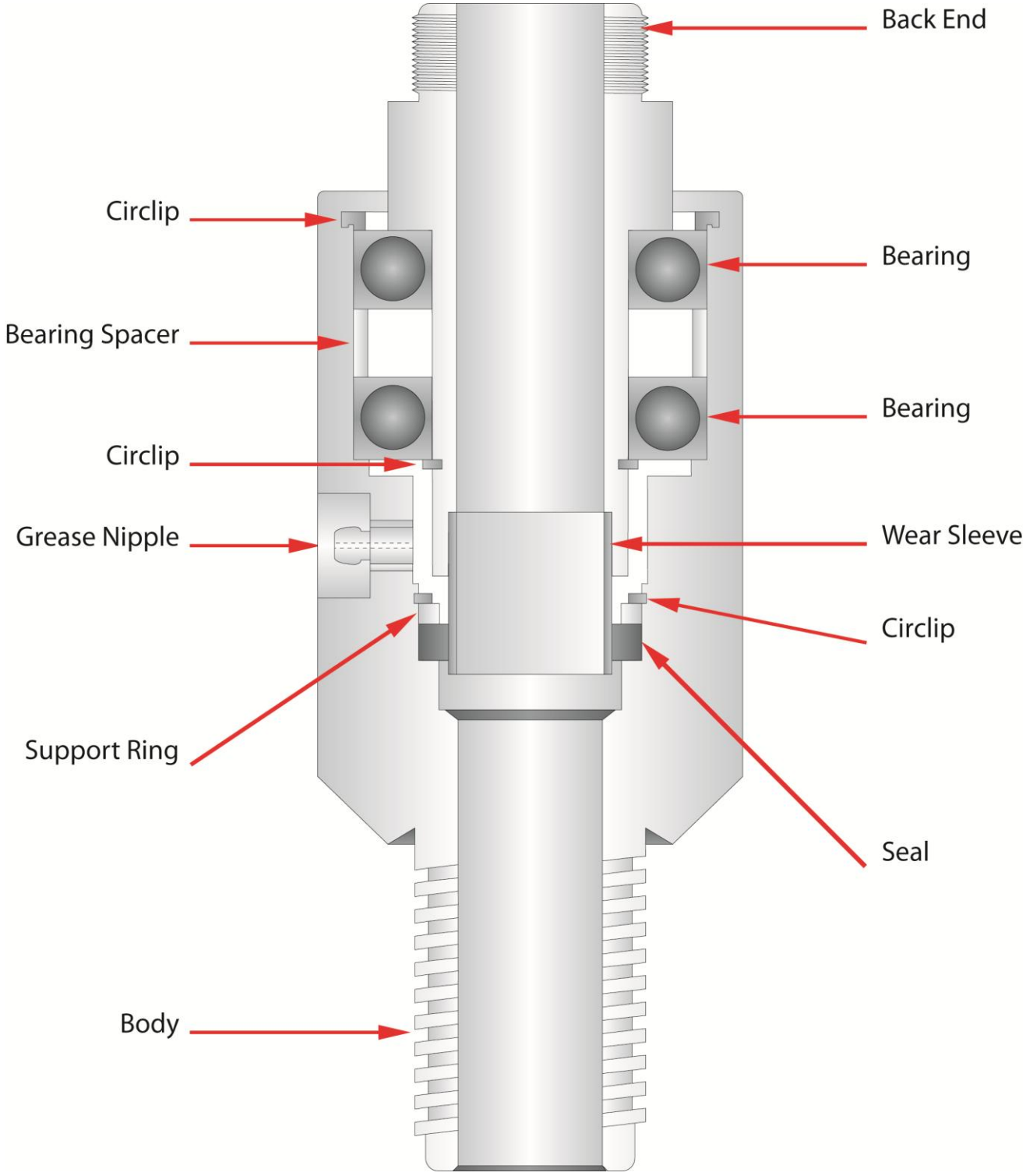
Asahi stock a complete range of spare parts to suit all Swivels and can also supply a repair kit including tools for quick on site dismantling/assembly.

During repairs and servicing these features keep downtime to a minimum.

Description	Connection	Stock Code
Top Entry Water Swivel	42mm Pin	3842/42MM
Top Entry Water Swivel	AW Pin	3842/AW
Top Entry Water Swivel	AQ Pin	3842/AQ
Top Entry Water Swivel	AWJ Pin	3842/AWJ
Top Entry Water Swivel	BQ Pin	3842/BQ
Top Entry Water Swivel	CHD Pin	3842/CHD
Top Entry Water Swivel	NQ Pin	3842/NQ
Top Entry Water Swivel	NW Pin	3842/NW
Compact Plus Water Swivel	AW Rod Box	70-11-100

Water Swivels

NATA Certified 2500psi/170bar Safe Working Pressure



Compact Plus Water Swivels

Specifications:

Rotating Capacity	10,000 lbs / 4,540 kg
Static Capacity	20,000 lbs / 9,000 kg

Description	Weight (KG)	Stock Code
Compact Plus W/S Assy AW Box (includes all items below excluding 7011150)	7.60	70-11-100I
Compact Plus W/S Cap	1.98	70-11-110I
Compact W/S O-Ring	0.01	70-10-113I
Compact W/S Spring Washer	0.01	70-10-112I
Compact W/S V Pack Set	0.07	70-10-114I
Compact Plus W/S Wear Sleeve	0.03	70-11-115I
Compact W/S Packing Cage	0.35	70-10-117I
Compact W/S Ball Bearing	0.30	70-10-118I
Compact Plus W/S Upper Body	1.79	70-11-112I
Compact W/S O-Ring	0.01	70-10-111I
Compact Plus W/S Spindle AW Box	0.87	70-11-121I
Compact Plus W/S Thrust Bearing	0.30	70-11-120I
Compact Plus W/S Lower Body	1.86	70-11-113I
Grease Fitting	0.01	12-21-220I
Compact W/S Felt Seal	0.01	70-10-120I
Compact Plus W/S Repair Kit	0.96	70-11-150I

Universal Water Swivels

Specifications:

Rotating Capacity	11,000 lbs / 5,000 kg
Static Capacity	25,000 lbs / 11,400 kg

Description	Weight (KG)	Stock Code
Universal W/S Assy BW Box (includes all items below excluding 7015150)	13.50	70-15-100I
Universal W/S Hoisting Cap	5.55	70-15-115I
Universal W/S Compression Spring	0.04	70-15-114I
Universal W/S V Packing Set	0.02	70-15-117I
Universal W/S O-Ring	0.01	70-15-113I
Universal W/S Packing Housing	1.18	70-15-118I
Universal W/S Nut Spindle	0.25	70-15-119I
Universal W/S Locking Washer	0.01	70-15-120I
Universal W/S Spacer	0.01	70-15-121I
Universal W/S Retaining Ring	0.03	70-15-112I
Universal W/S Ball Bearing	0.66	70-15-111I
Universal W/S Spindle Ext	0.35	70-15-116I
Universal W/S Spindle BW Box	1.79	70-15-123I
Universal S/W Thrust Bearing	0.59	70-15-124I
Universal W/S Body	3.00	70-15-122I
Grease Fitting	0.01	12-21-220I
Universal W/S Repair Kit	1.67	70-15-150I

Pressure Relief Valves

Asahi Pressure Relief Valves ensure protection of the pump during drilling operations.

The valve automatically snaps to a fully opened position when the predetermined pressure is exceeded. Pressure settings can be adjusted within the operating range.

We also sell a complete range of Pressure Gauges and Pump Parts.

Pressure range	Stock Code
0 – 1100 psi	72-00-018I

Equipment and Spares

PQ / NQ / HQ Spanners

Asahi Diamond Wrenches are used for exploration inseam drilling, geotechnical and environmental core drilling and soil sampling.

They use a unique non-slip locking connection and offer superior strength without damaging or distorting the tube rod surface providing maximum performance.

Type	Description	Stock Code
HQ	Wrench	12-21-461
NQ	Wrench	12-21-460
PQ	Wrench	12-21-6601

Core Bit Sizes

Size Type	Core Dia (mm)	Hole Dia (mm)
BMLC	35.2	60.0
NMLC	52.0	75.0
HMLC	63.5	99.2
3C	76.2	111.1
4C	101.6	139.7
8C	202.7	260.3
TT46	35.3	46.3
TT56	45.2	56.3
T76	61.7	76.3
T101	83.7	101.3
AQ	27.0	48.0
BQ	36.5	60.0
NQ	47.6	75.7
HQ	63.5	96.0
PQ	85.0	122.6
BQ3/TT	33.5	60.0
NQ3/TT	45.0	75.7
HQ3/TT	61.1	96.0
PQ3	83.0	122.6
NQ2	50.5	75.7

Casing Shoe

Size Type	Core Dia (mm)	Hole Dia (mm)
NW	76.0	91.8
HW	99.7	117.5
PW	123.8	143.5
SW	146.7	172.5

Flush Joint Casing

Size Type	O.D. (mm)	I.D. (mm)	TPI	Kg/3mtr
EW	46.0	38.1	4	13
AW	57.1	48.4	4	18
BW	73.0	60.3	4	31
NW	88.9	76.2	4	39
HW	114.3	101.6	4	51
PW	139.7	127.0	3	69
SW	168.2	152.4	3	88

Drill Rods

Size Type	O.D. (mm)	I.D. (mm)	TPI	Kg/3mtr
AQ	44.5	34.9	4	14
BQ	55.6	46.0	3	18
NQ	69.9	60.3	3	24
HQ	88.9	77.8	3	35
HWT	114.3	101.6	3	47

Compolite Drill Rods

Size Type	O.D. (mm)	I.D. (mm)	TPI	Kg/3mtr
43	43.1	36.0	4	10.2
53	53.0	46.0	3	14.1
AW / AWJ	43.1	36.1	3	11.0
BW / BWJ	55.6	46.0	5	0

Core Cutting Saw Blades

Asahi Core Cutting Saw Blades are used in the mineral and mining exploration industry for core cutting applications to give a more detailed analysis of various rock formations. They have proven very successful across Australia.

Designed for cutting materials including: all medium to hard rock formations.

Diameter (mm)	Diameter (in.)	Segment Type	Segment Size	Bore Size	Stock Code
300	12”	Hard Core	40 x 2.4 x 7	1”	4628/1
300	12”	Medium / Hard Core	40 x 2.4 x 7	1”	4628/2
350	14”	Hard Core	40 x 2.4 x 7	1”	7947/1
350	14”	Medium / Hard Core	40 x 2.4 x 7	1”	7947

Notes...