CONVENTIONAL DOUBLE TUBE CORE BARRELS

**TT Series Core Barrels**
These are ultra thin wall core barrels available in diameters 46 and 56mm, suitable for underground mining operations. These core barrels require relatively light feed pressure and torque, which means that they cut effectively at high rotation speeds using lightweight diamond drills.

**T2 Series Core Barrels**
These are thin wall core barrels available in diameters 46, 56, 66, 76, 86 and 101mm, suitable for general exploration purposes. These core barrels have a relatively small cutting area and therefore permit rapid penetration, especially in harder rock formations. Water or mud flush is required. Designed for use in conjunction with metric casing. The TNW core barrel is the imperial size equivalent of the T2-76, virtually identical in design, but with a slightly smaller O.D. enabling it to fit into NW or NX casing.

**T6 Series Core Barrels**
The T6 series is a continuation of the T2 series, but of a sturdier design, and available in larger diameters, 76, 86, 101, 116, 131 and 146mm, suitable for general exploration purposes. Water, mud or air can be used as the flushing medium, but when using air, oversized bits and head couplings are recommended to allow sufficient space for the cuttings to clear. Designed for use in conjunction with metric casing. The T6-H core barrel is the imperial size equivalent of the T6-101, virtually identical in design, but with a slightly smaller O.D. enabling it to fit inside HW or HX casing.

**T6S Series Core Barrels**
These core barrels have a split inner tube and are intended for use in geotechnical work in very loose formations. The split inner tube combined with face discharge bits gives an undisturbed sample. Suitable for mud flushing and with minor modifications for air flushing. Available diameters are 101, 116 and 131mm.

**WF / WG Series Core Barrels**
These are geotechnical core barrels, available in DCDMA sizes N, H, P and S. They are primarily designed for coring relatively soft formations using face-discharge core bits, with water or mud as the flushing medium. Problems may be encountered using these barrels in harder rocks due to the relatively large area of the bit face, which will slow penetration rate and cause faster bit wear compared to equivalent sizes in T2 or T6 series. The head design is rather primitive and the bearings are exposed to the flushing medium, therefore these core barrels need regular servicing and maintenance. They continued to be widely used largely due to clients wishing to specify hole and core sizes according to U.S. and U.K. standards.

CONVENTIONAL TRIPLE TUBE CORE BARRELS

**Coreliner System**
Clear semi-rigid PVC "Coreliners" are available for most double tube conventional core barrels. These thin PVC tubes are pushed into the inner tube before each core run. After retrieving the core barrel from the hole, the coreliner (which now contains the drilled core) is removed quickly and in "one piece" simply by gripping the liner and easing it out of the inner tube with a pair of pliers. This method can give 100% core recovery even in difficult formations. Special core bits and core lifters with a slightly reduced internal diameter are required when using coreliners.

WIRELINE DOUBLE TUBE CORE BARRELS

**WL Series Wireline Core Barrels**
Wireline core barrels are used when coring to greater depths, mainly because they eliminate the need to couple and uncouple the rod string each time the core is retrieved. An overshot device is dropped on a cable and directly couples onto the inner tube assembly, allowing fast retrieval of the core after each core run. Available in DCDMA sizes B, N, H. and P. A geotechnical version of the wireline system is also available in S size, giving cores in excess of 100 mm.

WIRELINE TRIPLE TUBE CORE BARRELS

**Triple Tube WL3 Series Wireline Core Barrels**
These are identical to the standard WL series barrels but incorporate a third, split inner tube. This can be pumped out of the inner tube after retrieval, allowing the core to be examined in its in-situ state. Generally used when high quality core is required in broken, fractured formations. The use of a third tube requires the bits to cut slightly smaller diameter core than standard WL series barrels. PVC Coreliners can be used instead of the split inner tube, enabling the core to be retained in one piece within the core box.
Generally speaking, core recovery will be maximized by choosing a large diameter core barrel. This is because the cutting area (amount of rock removed) decreases as a proportion of the hole area as diameter increases, thus causing less disturbance of the core at larger diameters. If core recovery is a problem, consider switching to a larger diameter. Notice that the DCDMA series of core barrels have diameters specified by the letters B, N, H, P, S etc, whereas the Metric series are specified by millimetre diameters 46, 56, 66, 76, 86, 101, 116, 131, 146 mm. Care must be taken when mixing the two systems, paying special attention to the fit of the core barrel inside the casing tubes.

**CORE BARRELS FOR SPECIAL APPLICATIONS**

**Air Flush Core Barrels**

The 412F core barrel has been specially designed with a larger space than usual between the inner and outer tubes, making it possible to pump a high volume of air through the barrel onto the face of the bit. This core barrel is normally used with face discharge type core bits, with or without Coreliners.

**Core Barrels for Very Soft Formations**

In very soft formations the rotation of the core bit and the passage of the flush may destroy the core before it passes into the inner tube. The Mazier type core barrel has a spring-loaded inner tube that allows the core lifter case to protrude in advance of the bit when coring in soft formations, and to retract back into the bit when coring harder rocks. The bits are face discharge type and PVC Coreliners are used in the inner tube. The Mazier core barrel can achieve 100% core recovery even in the most difficult formations.

**Single Tube Core Barrels**

Single tube core barrels are used in situations where the quality of the core is only of minor importance, or in very hard consolidated formations where there is little chance that the flush will erode the core. Nowadays, single tube core barrels are used mainly for concrete coring. The B series single tube core barrels are available in diameters 46, 56, 66, 76, 101, 116, 131 and 146 mm.

**TIPS FOR CHOOSING THE CORRECT CORE BARREL**

Which type of core barrel is best for your application? Your overall aim is to make a choice that will give as close as possible to 100% core recovery, whilst maintaining a good rate of production. Below we consider some of the most important questions to ask:

**How deep is the borehole?**

*For shallow holes* (less than 30 metres deep) a conventional double tube core barrel is the most economical choice. *For deeper holes* (greater than 30 meters) consider using a wireline core barrel. The advantage switches strongly to wireline as hole depth increases because of the effect of reduced rod handling on trip time.

**What is the geology?**

*In hard, competent formations* choose a thin-walled double core barrel for the fastest rate of penetration with lowest pressure on bit: The T2 series double tube core barrels are recommended.

*In soft or broken formations*, consider using a triple tube core barrel, T6 or WG series with Coreliners. If core washing is likely to be a problem consider using WF series core barrels together with face-discharge core bits.

*For very soft formations*, when core recovery is very difficult, consider using a Mazier core barrel.

*For coring concrete*, the most economical choice is a B series single tube core barrel.

**What is the flushing medium?**

*When water* is used as the flushing medium (usually in hard rocks), T2 core barrels are the best design. *When mud or polymers* are used as the flushing medium (softer rocks), T6 core barrels are the best design. *When air or foam* is used as the flushing medium, the 412F is the best choice for soft rocks, and for harder rocks consider using T6 with over-set bits (larger than normal O.D.) and over-set adaptor couplings.

**What diameter core is required?**

Generally speaking, core recovery will be maximized by choosing a large diameter core barrel. This is because the cutting area (amount of rock removed) decreases as a proportion of the hole area as diameter increases, thus causing less disturbance of the core at larger diameters. If core recovery is a problem, consider switching to a larger diameter. Notice that the DCDMA series of core barrels have diameters specified by the letters B, N, H, P, S etc, whereas the Metric series are specified by millimetre diameters 46, 56, 66, 76, 86, 101, 116, 131, 146 mm. Care must be taken when mixing the two systems, paying special attention to the fit of the core barrel inside the casing tubes.