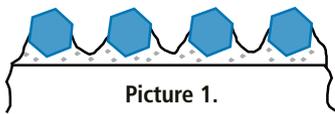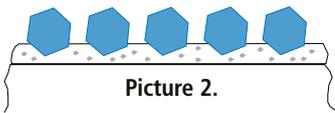# Lastest DEVELOPMENT Brazed wi

The South Korean diamond wire manufacturer Widecut is introducing innovative brazed wire, which the company believes will be very popular and successful in the diamond wire market.

Picture 1.

Picture 2.

Electroplated wire

Sintered wire.

Brazed wire is very suitable for cutting in nuclear plants and cutting oil pipes. Picture above showing cutting in a nuclear plant (Picture provided by BD Nuclear Ltd.).

But what is a brazed wire? Current diamond wire types have Sintered, Electroplated and now also Brazed wire. Widecut explains the proceedure for the brazed wires:

Brazed, takes out more of the wire

Brazed beads are made by sticking diamonds on a steel body with mixture of chemical paste and heat treated in a furnace. There are three advantages why brazed wire became one of the most demanding diamond wire types. First, sticking diamonds on a steel body by using the Paste gives strong hold of the diamonds (see picture 1). Paste seems to wrap the diamonds upto half way. When there is strong hold of the diamonds, diamonds can work longer and thus, operators can use the wire for longer time. Second, controlling distance between the diamonds is possible. Thus, Widecut can create a 'chip pocket' or a path or gap between the diamonds, which makes the exiting of sludge much easier. Also, 'chip pocket' makes a good path for easy water flow, which enhances the wire performance. Third, by using paste, a double layer of the diamonds is possible. This enables control of the diamond layer, which links to lifetime of the wire. Therefore, brazed wire will be a popular tool because it will give fast speed and good and constant life and incorporates the advantages of sintered and electroplated wires.

Electroplated wire

Electroplated is made by using electricity to stick the diamonds around the steel body of the beads. Thus, it has single diamond layer and all diamonds are exposed on the surface of the bead which offers fast speed from the beginning of the cutting job. However, because an even electroplated layer is holding the diamonds, holding of diamond maybe weaker than brazed beads (see picture 2 for better understanding). Also, the electroplating method cannot control the distance between the diamonds, which is difficult to create a "Chip Pocket".

Sintered wire

Sintered bead is a mixture of industrial powder such as Cobalt, Tungsten and diamonds, which are made as beads, either cold or hot pressed. Its main characteristic is that Sintered bead has a multi diamond layer. Its biggest advantage is that Widecut can adjust/design the wire, such as the bond level, diamond grade and diamond layer thickness, to match the actual cutting site. Thus, Widecut has had great success with their sintered wire and has received a very good reputation for it. Sintered wire is mostly used in general cutting jobs but when it comes to steel cutting job, it was not suitable to cut 100% steel because cutting steel requires diamond exposure like electroplated or brazed wire.

Brazed wire development

For the past several years, Widecut offered sintered and electroplated wires. However, there are increasing numbers of projects that require the cutting of steel structures, such as nuclear power plant dismantle jobs, mainly in Germany, UK, France and Japan. Therefore, more and more customers are asking for professional diamond wire for special steel cutting applications. In the past, electroplated was also used, but in the case of nuclear power plant dismantling, it requires faster cutting because the operator

can only stay in the plant for a limited time. Also the jobs in nuclear power plants are very tough so long lasting wire will help operators from changing the wire frequently. Also, brazed wire is very demanding for underwater pipe removal projects.

"After several internal and external field tests we succeed to introduce brazed wire to the market. After confirming the internal test, we took it out on the field for additional tests and compared it with existing brazed wires. The result we received paid off all the hard works and efforts we have invested. We are now very excited to start to supply the market with this new and very efficient diamond wire," said Widecut founder and president John Han and added that there will be continuous demands for sintered and electroplated wires. Depending on customer's applications, they will need to select the tools to carry their jobs in the most efficient way. Widecut recommends wire types according to customers' requests.

Brazed wire.

Distinctive features of Widecut's Brazed Wire

There is less diamond layer separation compared with currently existing brazed wires in the market. When diamond layer separation occurs, bead cannot utilize its full life. The bead next to the bead with diamond layer separation will have dramatic diamond wear out because it simply has to work double (see photo dia layer separation below). You can see what happens when diamond layer separation occurs from the photo. This will lead to short life of the wire. However, Widecut brazed wire is a

<Common problem with Brazed Wire>

Diamond Layer Separation (After 2 cuts)

Rapid wear due to poor paste condition

<Widecut Brazed Wire solves diamond layer separation problem>

Diamond Layer (After 2 cuts)

Diamond Layer (After 6 cuts)

most promising wire which will have less problem.

The highest strength between the beads

Widecut believes that their wires offer the highest strength between the beads which means holding of the beads on the cable is the strongest. "We are able to say this because one of our daily jobs is to test the wire on our universal testing machine to check the strength of the wire. When we test as shown on the photo, we reach up to 850kg.f. When the universal testing machine number is high, this means each bead has less possibility of moving or jam-

Above the Widecut universal testing machine tests in reinforced concrete to the left and tests in steel to the right.

ming," said Han.

The reason why they can obtain such strong wires is the assembling techniques such as selection of spring, prepressing know-how and the quality of the rubber. Brazed wire especially requires strong hold of the beads because the job sites it works is mainly steel cutting jobs and generally steel structure is thinner than concrete structure. When wire cuts thin steel, vibration will occur and this makes beads jam and spin more easily than general sawing jobs. So Widecut have to structure the wire which can fulfill its performance until life of diamond beads are all finished. Han said that there are many ways to increase the strength and recommend clients to inquire for this.

Strict tests

All wires are launched after very strict testing. All Widecut's wire go through two types of tests. First test is done in Widecut's plant to see general cutting speed and life. When the internal test result is promising, it is sent to sites because internal result and actual site result maybe different. When both internal and external tests are passed it is introduced to the market. Wires sold by Widecut are reliable and customers should have confident using it.

Both for dry and wet cutting

Widecut's brazed wire is originally designed to be used both dry or wet because the most applications which requires brazed wire needs to be used dry. However, for professional dry cut-

Brazed Wire Specification offered by WIDECUT

CODE	PHOTO	SPECIFICATION	APPLICATION	CHARACTERISTIC
HT4B		10.2mm*48BPM	Steel	• Standard
HT17B		10.2mm*53BPM	Steel	• Premium steel wire • More beads thus, longer life
HT3B		10.0mm*40BPM	Very heavy reinforced concrete	• Fast cutting speed
HT18B		9.5mm*48BPM	Finish/Secondary wire	• Used when finishing the job

ting application Widecut recommends to apply heat resistance rubber so the wire can bear in high temperature until the beads are fully used. Also, depending on customers' applications Widecut customize the wires by adjusting diamond grade, size, concentration and bonding system.

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Wire on Widecuts universal testing machine