

GEL-PUSH SAMPLER



FOR YOUR UNDISTURBED SAMPLING
FOR YOUR HIGH QUALITY TESTING



Kisjiban



SAMPLE GARALLY



SAMPLED BY GP-R (300mm dia.)
FILL MATERIAL FOR A ROAD



SAMPLED BY GP-R (300mm dia.)
VERY HARD GRAVELS
WITH LOOSE SANDS



SAMPLED BY GP-R (300mm dia.)
GRAVELS AND FINES



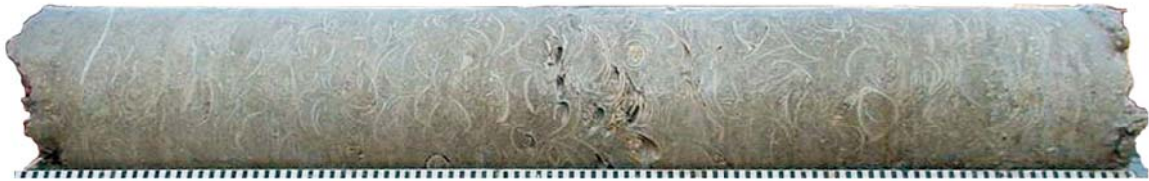
SAMPLED BY GP-R (200mm dia.)
LOOSE GRAVEL LAYER

It is a technic to clip out the ground.





SAMPLED BY GP-D (200mm dia.) GL-16.10 - 17.15m
SANDY MATERIAL LAYER



SAMPLED BY GP-D (200mm dia.) GL-18.05 - 19.08m
"SHELL BED" , SANDY MATERIAL WITH SHELLS



0°



180°

A CAVITY PASSING GROUNDWATER

SAMPLED BY GP-D (200mm dia.)
GRAVELS WITH SAND

GP Samplers will bring clips of ground to your laboratory.



SAMPLED BY GP-R (150mm dia.)
LOOSE SAND OF FILL MATERIAL

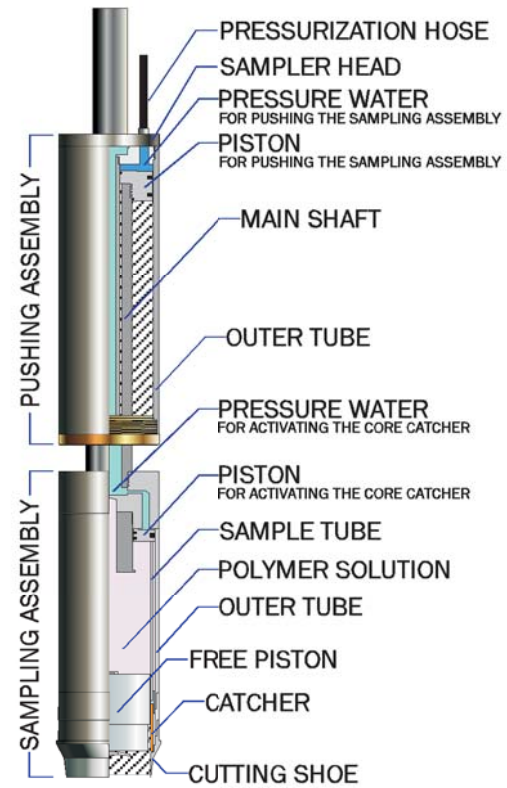
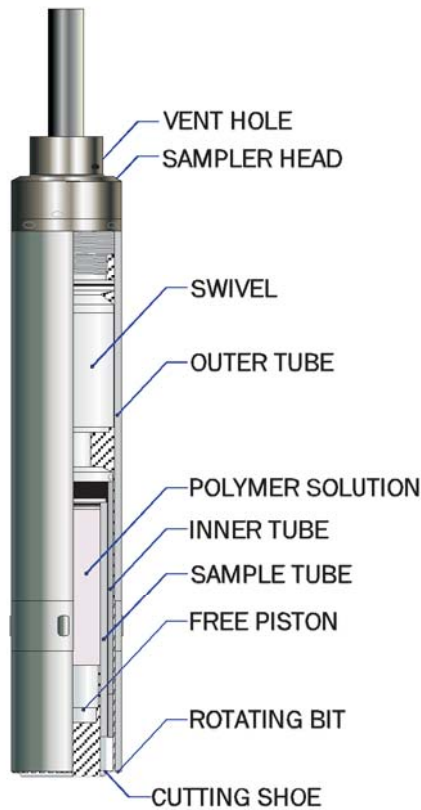
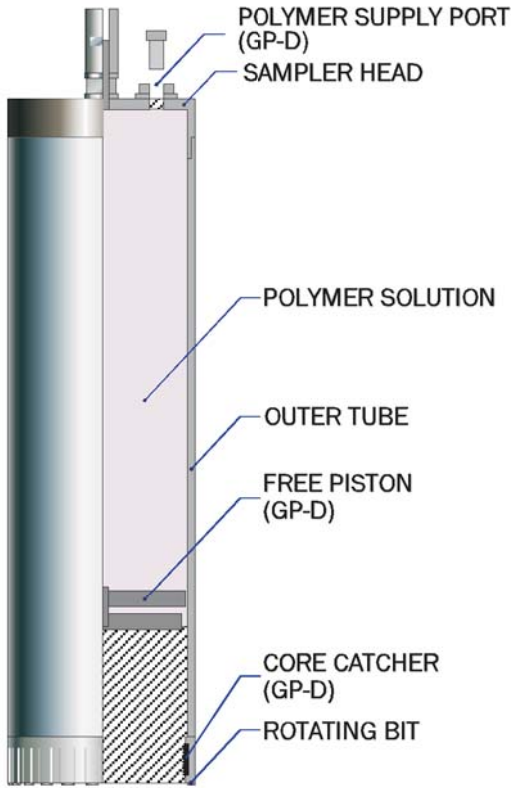


SAMPLER LINE-UP

ROTARY SINGLE TUBE SAMPLER

TRIPLE TUBE SAMPLER

STATIONARY PISTON SAMPLER



MODEL

GP-R NO CORE CATCHER MODEL
GP-D CORE CATCHER MODEL

GP-Tr
 Triple Tube Sampler

NEW GP-S ※
 Static Penetration

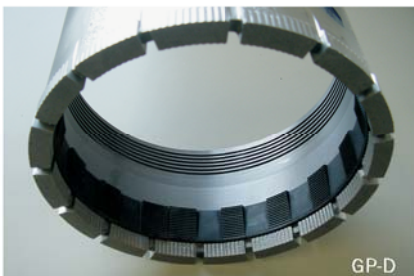
METHOD

ROTARY SINGLE TUBE

ROTARY TRIPLE TUBE

HYDRAULIC PISTON
 with original catcher

※The GP-S was improved from one piece to a two pieces configuration.



SAMPLE DIA.

GP-R: 100 - 300 mm
 GP-D: 100 - 200 mm

73.5 - 83.0 mm

72.1 mm

APPLICABLE SOILS

SANDY GRAVEL
 MUDDY SAND
 FILL MATERIAL
 FRACTURED ROCK

HARD SILT/CLAY
 DENSE SAND

SOFT SILT/CLAY
 LOOSE SAND WITH FINE



SAMPLING

WHAT IS GP SAMPLING ?

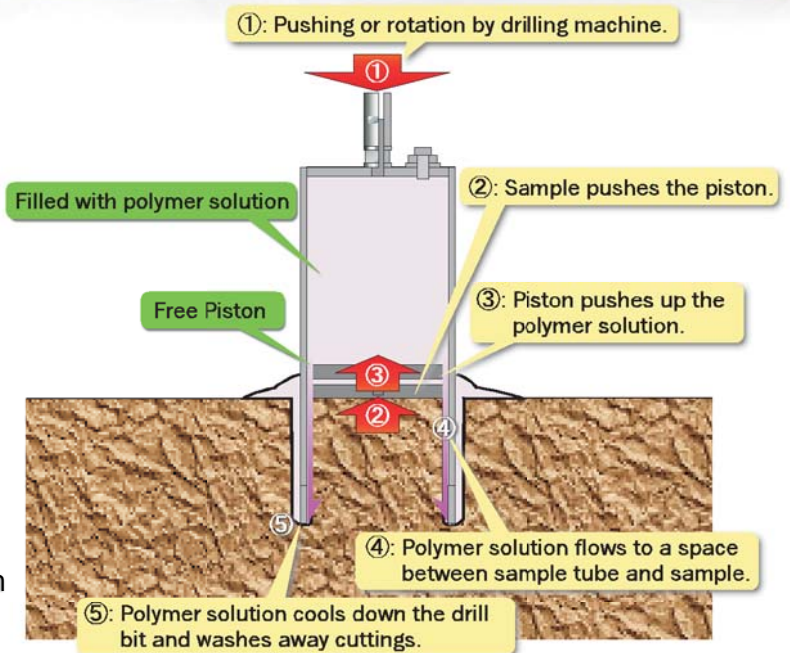
"GP" means "Gel - Push".

All GP Samplers have a structure to enclose high density polymer solution inside.

The sample which is taken into the sample tube push away the polymer solution to the tip of the GP Sampler.

The polymer solution act as a lubricant or drilling mud.

- ①: Rotation or pushing.
- ②: The piston stations on a sample as the sampler is penetrating.
- ③: The polymer solution is pushed away as the sample comes into the sample tube.
- ④: The polymer solution flows to a space between sample tube and sample.
- ⑤: The polymer solution cools down the drill bit and washes away cuttings.



HOW IS GP SAMPLING ?

GP-Tr ,GP-S and GP-D are the same as conventional sampling methods in borehole. However, GP-R is different from conventional methods. It is the method of sampling from ground surface.

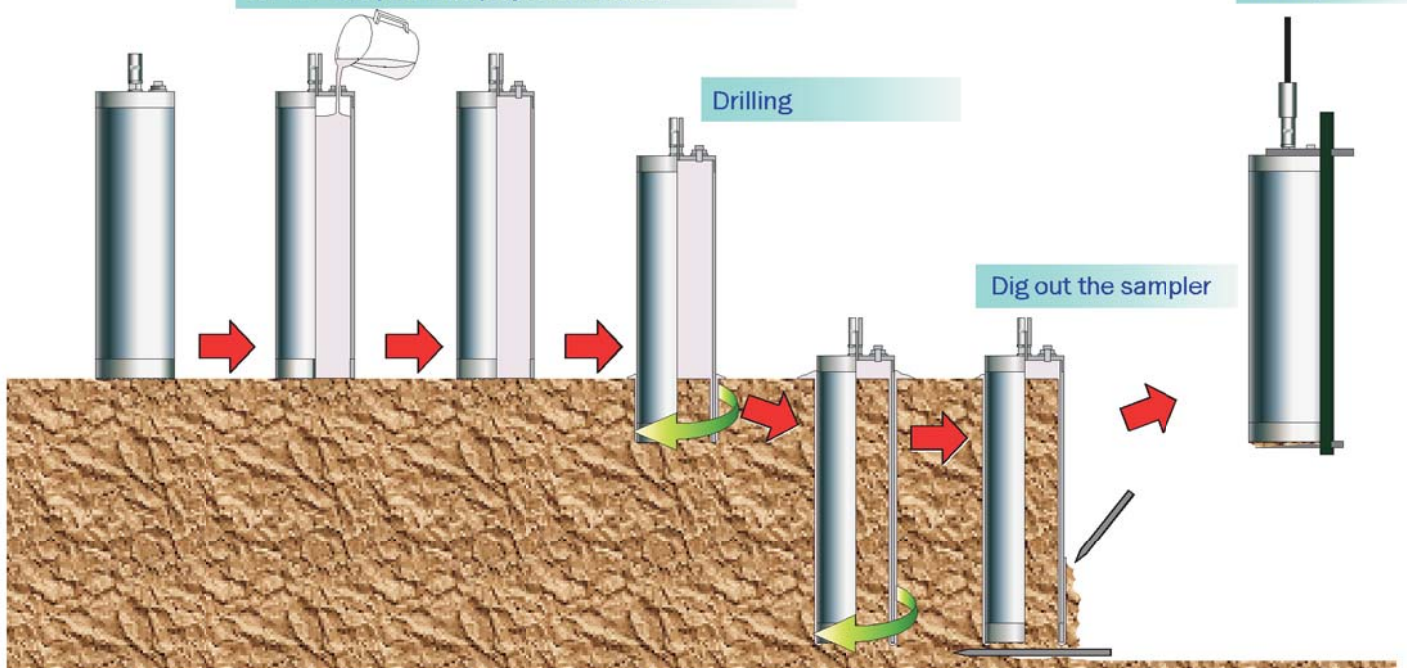
Set the sampler at sampling position

Fill the sampler with polymer solution

Lift up

Drilling

Dig out the sampler



A sampling process by GP-R sampler.



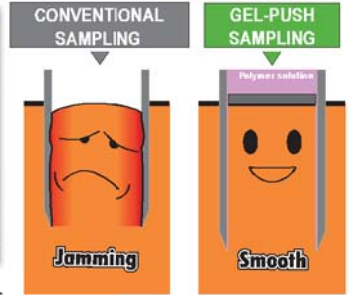
POLYMER GEL

POLYMER GEL REDUCES FRICTION BETWEEN SAMPLE AND SAMPLE TUBE DURING THE SAMPLING

The sample disturbance is significant not only by bit rotation but also by friction between sample and sample tube. Polymer solution reduces this friction.



Photo 1 : GP Sample which is covered with polymer gel.



POLYMER GEL REDUCES FRICTIONS DURING SAMPLE EXTRUSION

A smaller friction due to polymer gel makes sample extrusion easier.

Figure 1. Results of the laboratory experiments to measure piston pressure and displacement during sample extrusion. Sample can be extruded easier in a thin-wall tube with polymer than a thin-wall tube without polymer.

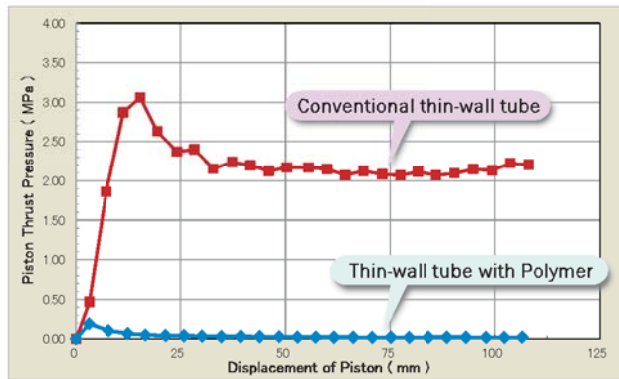
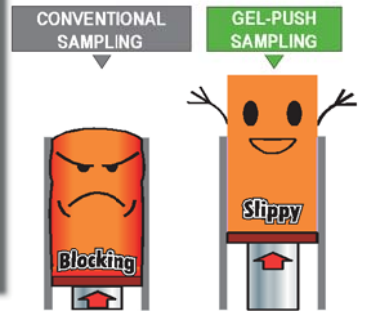


Figure 1: Relations of Piston Thrust Pressure and Displacement of Piston.

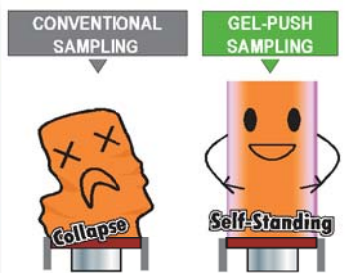


POLYMER GEL SUPPORTS THE SAMPLE STANDING

A loose sample sometimes collapses after extrusion from the sample tube. However a loose sample coated by polymer gel is easily self standing. The polymer will be removed by trimming just before laboratory testing.



Photo 2 : Self-standing sand samples after extrusion from the sample tubes. They are sampled by GP-S.



POLYMER GEL PREVENTS SLAKING

Polymer solution prevents the soil and rock samples from slaking.

Figure 2. Examples of the slaking tests. Case 1 : Ten seconds later in fresh water. The sample started slaking. Case 2 : Ten seconds later in 0.3% polymer solution. No slaking even 72 hours elapsed.

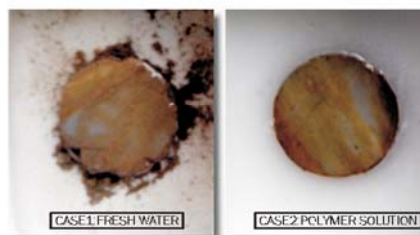
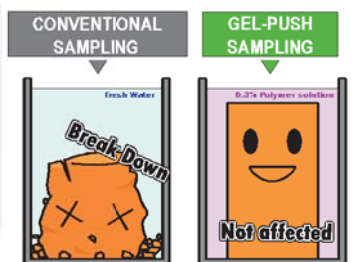


Figure 2 : Results of the slaking tests after ten seconds in fresh water and polymer solution.





FOR HIGH QUALITY

"High Quality Soil Testing"

is not realized only by a good sampler.

It is achieved by ensuring all processes from a sampling to a laboratory testing, including sampling, packaging, transportation, extrusion, trimming and testing. Developments of GP Samplers remind us their importance.



An original centralizer



A sample case for cutting & large cutter with polymer solution.



A carrying case & a triaxial test apparatus for 300mm dia. specimen.

Comparison of the quality with a frozen sample

The quality of GP sampling is compared with the frozen method. A sample (300mm dia.) by the freezing sampling method and a GP sample by GP-D (200mm dia.) were collected at the same site.

The test results show the quality of the GP sample is as good as Frozen sample.

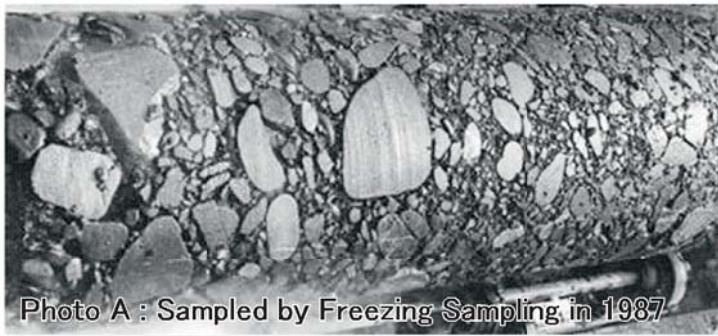


Photo 3 : Samples by Freezing sampling method (Photo A) and Gel-Push sampling (Photo B).

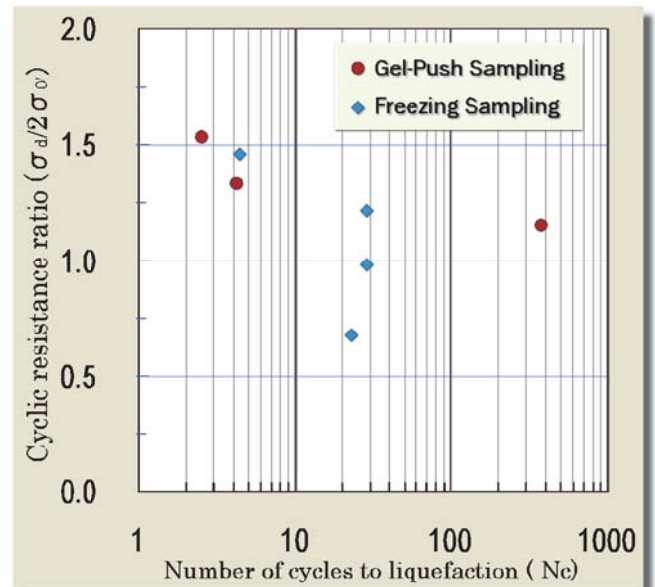


Figure 3 : Cyclic resistance ratio obtained on the frozen sample and Gel-Push sample. The results are comparable.

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<https://www.kiso.co.jp/global/>

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