

Soil Adhesion Suppression Material for
Hydraulic Excavator Bucket

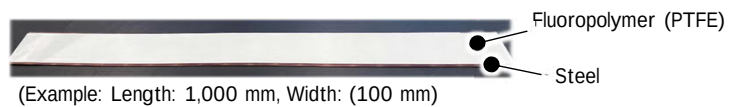
GeoDrop™

Patent pending in the United States, Canada, and Singapore



01 OUTLINE

By attaching soil adhesion suppression materials made of fluororesin (PTFE) and metal directly joined to the bottom and sides of the bucket, the bucket not only increases the efficiency of digging and loading operations, but also contributes to suppressing noise and vibration and extending the bucket's service life.



Structure of GeoDrop

02 FEATURE

- CO₂ emissions are reduced by about 10%.

We estimate that **bucket shaking, and impact work can be reduced by about 90%**, and **the operating time of heavy equipment can be reduced by about 10%**.

- GeoDrop makes it difficult for clay to adhere.

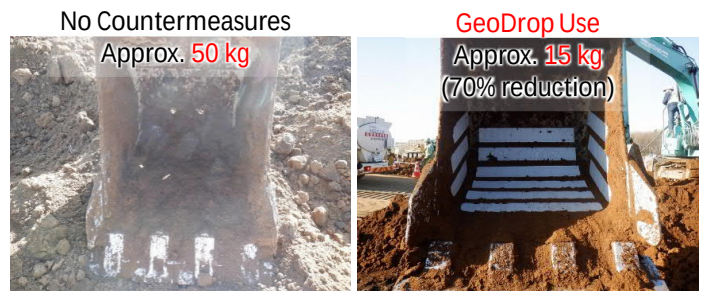
At a civil engineering worksite, we operated a hydraulic excavator with GeoDrop attached and another one without any countermeasures for the same amount of time (excavating approximately 100m³). As a result, we confirmed that the weight of **the remaining soil was reduced by approximately 70%**.

- Reduces environmental impact.

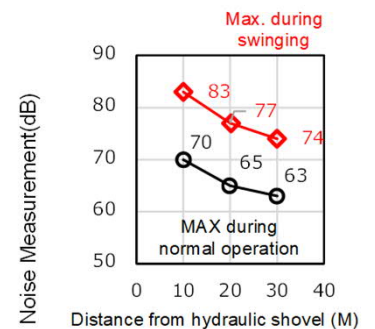
Noise measurement results confirm that the generated **noise is about 12 dB lower**. Since it is difficult for clay to adhere to the bucket, bucket rocking and impact work is eliminated.

- Effects persist even after wear.

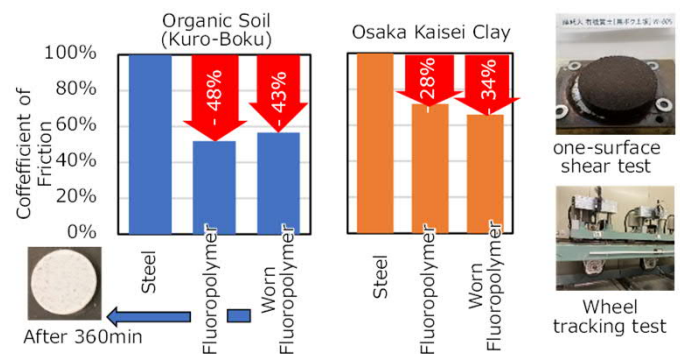
When the friction coefficient of steel alone is taken as 100%, that of **fluororesin is approximately 20-50% smaller**. Even fluoropolymers worn in wheel tracking tests remain effective, as **the coefficient of friction remains unchanged**.



Results of field experiments (Excavator 0.45 m³)



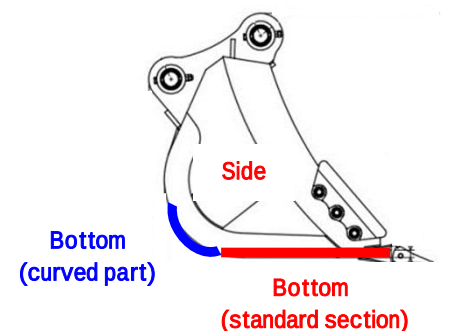
Results of noise experiments



Results of noise experiments

03 SPECIFICATION

Pasting location	Bottom (standard section) / Side	Bottom (curved section)	
Bucket size	0.04~2.0m ³	0.04~0.44m ³	0.45~2.0m ³
Specification	PTFE_1.0mm Steel_1.4mm	PTFE_0.5mm Steel_0.6mm	PTFE_0.5mm Steel_1.4mm
Strength※	4.2N/mm	2.4N/mm	
Photographed from an angle			



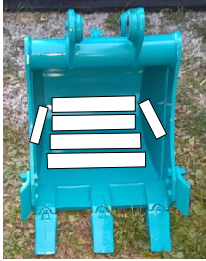
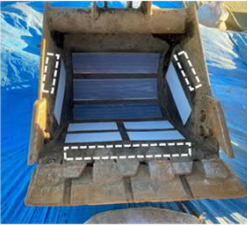
Cross-sectional view of the bucket

※ Peeling test method: Using ISO 19095 Type-C jigs.

The joining area of the test piece is 20 × 160 mm and the dimensions of the test piece are 20 × 250 mm.

04 EXAMPLE OF BUCKET SIZE

The installable bucket sizes range from 0.04 to 2.0 m³. It is more effective to attach it as far back in the bucket as possible; therefore, it is recommended to avoid installing the front row and instead shift the entire installation towards the back.

Bucket size	0.05m ³ class	0.1m ³ class	0.25m ³ class	0.45m ³ class
Reference Photo				
Bottom (curved part)	PTFE_1.0mm Steel_1.4mm 35cm × 2pieces	PTFE_1.0mm Steel_1.4mm 40cm × 3pieces	PTFE_1.0mm Steel_1.4mm 55cm × 4pieces	PTFE_1.0mm Steel_1.4mm 65cm × 4pieces
Bottom (curved part)	PTFE_0.5mm Steel_0.6mm 35cm × 2pieces	PTFE_0.5mm Steel_0.6mm 40cm × 2pieces	PTFE_0.5mm Steel_0.6mm 55cm × 2pieces	PTFE_0.5mm Steel_1.4mm 65cm × 2pieces
Side	PTFE_1.0mm Steel_1.4mm 20cm × 2pieces	PTFE_1.0mm Steel_1.4mm 30cm × 2pieces	PTFE_1.0mm Steel_1.4mm 35cm × 4pieces	PTFE_1.0mm Steel_1.4mm 40cm × 6pieces
Total joining area	A=0.18m ²	A=0.26m ²	A=0.47m ²	A =0.63m ²

Bucket size	0.7m ³ class	0.8m ³ class	1.0m ³ class	1.5m ³ class
Reference Photo				
Bottom (curved part)	PTFE_1.0mm Steel_1.4mm 80cm × 5pieces	PTFE_1.0mm Steel_1.4mm 90cm × 5pieces	PTFE_1.0mm Steel_1.4mm 100cm × 6pieces	PTFE_1.0mm Steel_1.4mm 80cm × 6pieces 40cm × 6pieces
Bottom (curved part)	PTFE_0.5mm Steel_1.4mm 80cm × 2pieces	PTFE_0.5mm Steel_1.4mm 90cm × 2pieces	PTFE_0.5mm Steel_1.4mm 100cm × 2pieces	PTFE_0.5mm Steel_1.4mm 80cm × 2pieces 40cm × 2pieces
Side	PTFE_1.0mm Steel_1.4mm 50cm × 8pieces	PTFE_1.0mm Steel_1.4mm 50cm × 8pieces	PTFE_1.0mm Steel_1.4mm 50cm × 10pieces	PTFE_1.0mm Steel_1.4mm 50cm × 10pieces
Total joining area	A=0.96m ²	A=1.03m ²	A=1.30m ²	A =1.42m ²

05 INSTALLATION PROCEDURES

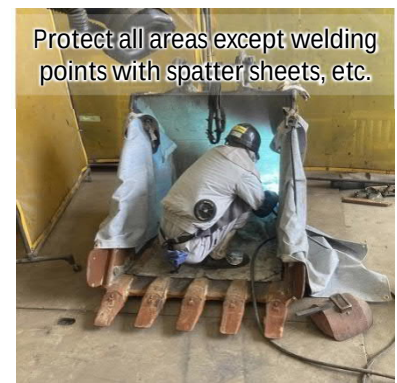


Wash with a high washer or similar tool and dry.
Remove rust using a disc grinder or sander.

Cleaning condition after chipping



Chipping cleaning completed



Protect all areas except welding points with spatter sheets, etc.

Welding condition



Protect all areas except welding points with spatter sheets, etc.

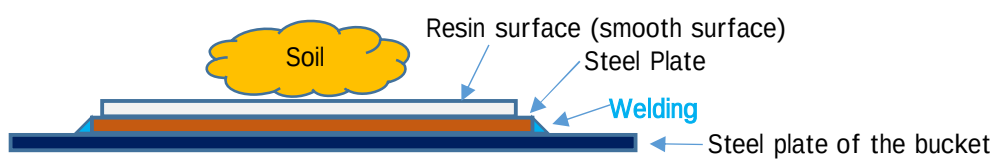
Welding condition



Welding completed

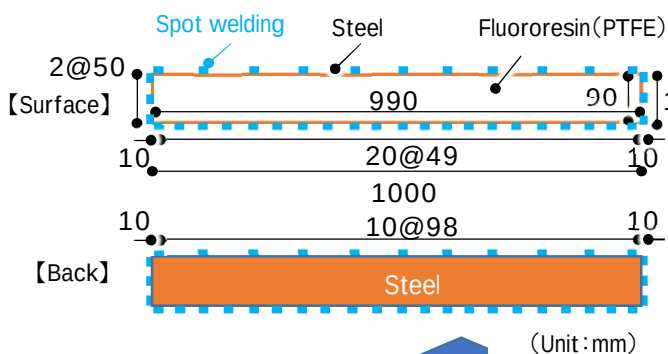
06 INSTALLATION METHOD

The steel plate surface of the GeoDrop and the steel plate of the bucket shall be installed by spot welding. Semi-Automatic welding machines shall be used, and the wire material shall be mild steel with a diameter of $\phi 0.6$ to 1.2 mm.



Cross-sectional view of the installation of the bucket by welding

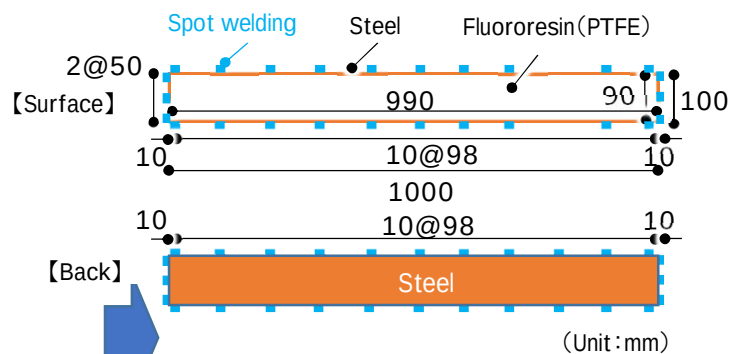
Example of 1m length placement



Bucket entrance

Example of bucket bottom

Example of 0.5m length placement



Bucket entrance

Example of bucket side

07 WELDING CONSIDERATIONS

- Welders engaged in welding should be qualified personnel who have passed at least the basic grade (downward welding) test of JIS Z 3801 or JIS Z 3841.
- Due to the difference in thickness between the bucket and the Steel of GeoDrop, use a semi-automatic welding machine instead of an arc welding machine. The wire material to be used is soft steel, and the diameter should be $\phi 0.6$ to 1.2mm..
- For the sides of GeoDrop, rotate the bucket and weld downward.
- Do not perform welding if the temperature is below -5°C . Welding is allowed if the temperature is between -5°C and 5°C , provided the area within 100 mm of the welding point is properly heated.
- When installing GeoDrop, weld evenly from the center to prevent lifting, distortion, or stretching.

08 GeoDrop USAGE



Used daily for 1.5 months
(mainly clay)



Used daily for 1.5 months
(mainly sand)

09 APPLICABLE SOIL TYPES

- Clay
- Silt
- Sand

※ Cleaning the bucket maintains the soil adhesion control effect.

10 PRECAUTIONS AND DISCLAIMER

Regarding installation activities, the three companies (Obayashi Corporation, Obayashi Road, and Hirotec) or authorized distributors (Taiko Industry, Betontech, and Kanamoto) will not be held responsible for any peeling or detachment under any circumstances, except in cases of intentional or gross negligence.

1. Do not install the product using methods not specified in this product catalog.
2. Do not resell the purchased product.
3. Do not engage in activities that infringe on intellectual property rights related to the product (such as patent rights) through the production or sale of counterfeit items.
4. Do not apply force to the product before attaching it to the bucket.
5. When performing bucket operations targeting concrete blocks, metal pieces, asphalt debris, rocks, etc., be mindful that the product may get damaged or peel off.
6. After installing the product, visually inspect for peeling or detachment according to the frequency of use.
7. If the product appears to be peeling after installation, maintain the bucket and take corrective actions such as re-welding.
8. Weld in such a way as to prevent welding defects listed in JIS Z 3001-4 "Welding Terms - Part 4: Welding Imperfections" (the company is not responsible for peeling or detachment due to welding defects, regardless of following the manual's procedures).
9. If you cut and process the purchased product, the company is not responsible for any peeling or detachment that occurs at the welded areas, regardless of following the manual's procedures.

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- | | |
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