



Applications

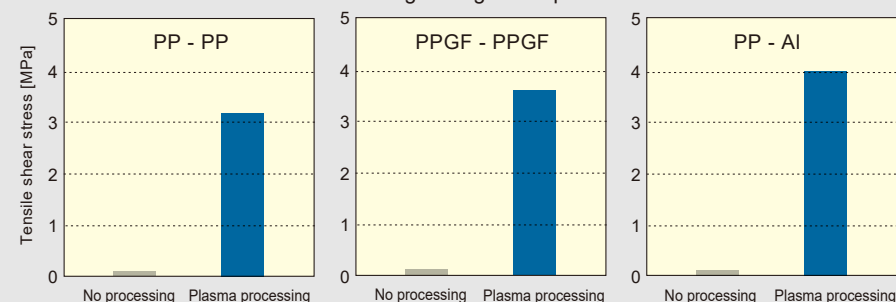
Modifies the surface of resins and metals

Improving adhesive strength

- ▶ The bonding strength can be improved for different materials such as resin and metal by irradiating the bonding surface with plasma before bonding.



Bonding strength comparison

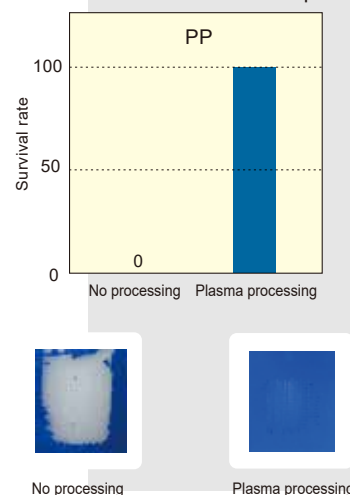


*Using urethane-type adhesive (non-primer type) supplied by Yokohama Rubber.
*Plasma processing was performed using FPF20-GM.

Improving adhesion of coating and paint

- ▶ Irradiating the application surface before application eliminates peeling of the coating.

Cross-cut adhesion test comparison



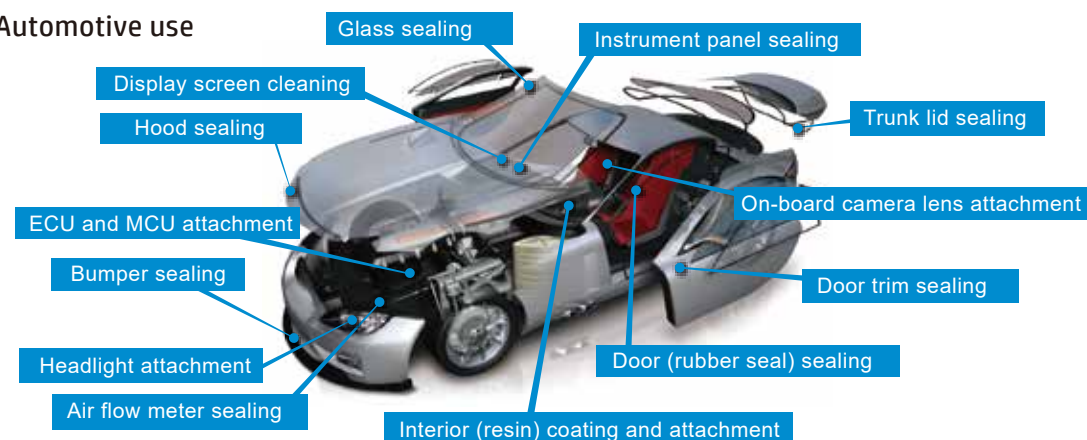
Ultra high density atmospheric pressure plasma unit

Tough Plasma

Others

- Glass dry cleaning
- Surface reforming of film
- Processing before coating and printing
- Electronic component cleaning
- Precision cleaning of optical parts, metal, etc.
- Cleaning for cut edges of die-cast aluminum
- Preprocessing for liquid gasket (FIPG)
- Processing before attaching battery cases
- Preprocessing for PCB molds

Automotive use



Specifications		FPF20-GM	FPF20-ST	FPB20
Nozzle tip	Wide nozzle	20 mm, 30 mm, 40 mm	20 mm、40 mm	20 mm
	Spot nozzle	φ5 mm	φ5 mm	φ5 mm, φ1.6 mm
Processing gas	Flow	N ₂ 60 L / min	N2 60 L / min	N ₂ 5 L / min
		Air 30.6 L / min	Air 0.6 L / min	Air 20 ml / min
Power supply		AC200 V (50/60 Hz)	AC200 V (50/60 Hz)	AC100 V (50/60 Hz)
Electricity consumption		1,800 W	1,250 W	200 W
Dimensions (L×W×H)	Head	89 × 92 × 230 mm	89×80×273 mm	60 × 50 × 150 mm
	Controller	380 × 413 × 1,220 mm	405×473×1,220 mm	215.2 × 380.2 × 178.6 mm
Weight	Head	1.5 kg	1.2 kg	0.5 kg
	Controller	110 kg	105 kg	11.5 kg
	Moving power			1.5 kg

*1: Under development *2: Integrated with cables

FUJI CORPORATION

19 Chausuyama, Yamamachi, Chiryu, Aichi, 472-8686 Japan
Tel: +81-566-81-2110

Contact for product inquiries Sales Department 4

Phone: (+81) 566-81-8294
Email: plasma_support@fuji.co.jp
Website: <https://www.fuji.co.jp/en/about/plasma/>



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Ultra High Density Atmospheric Pressure Plasma Unit

Tough Plasma

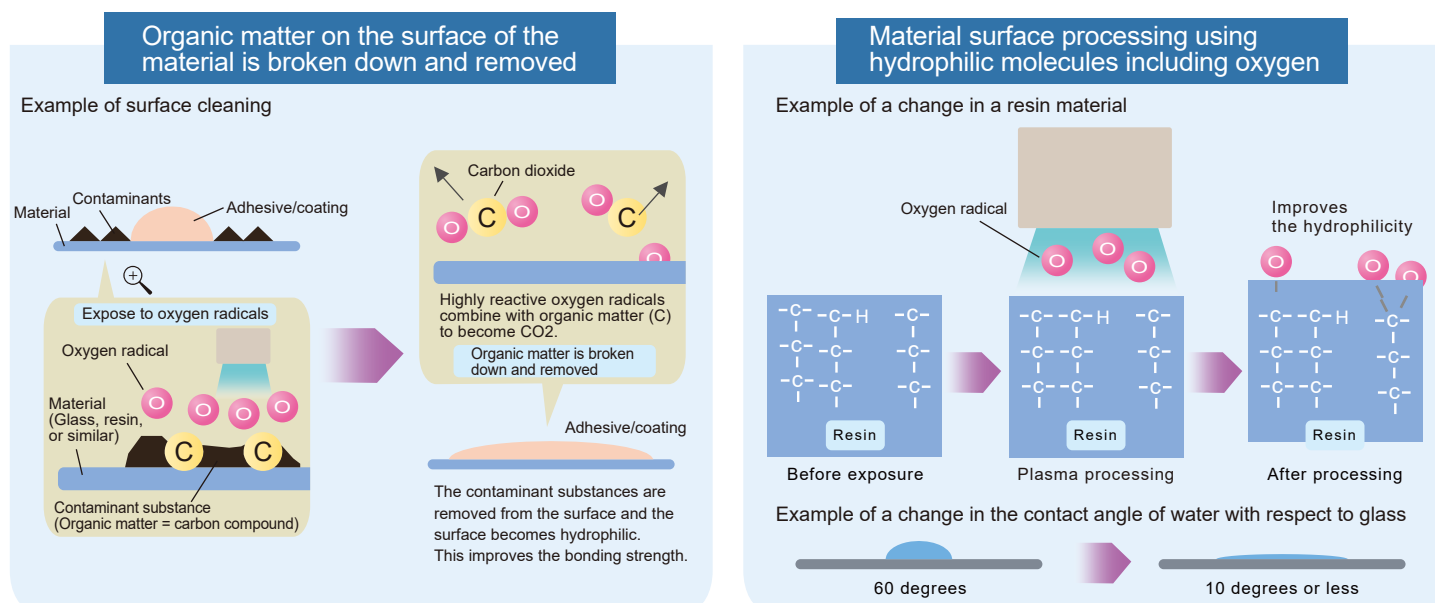
This advanced plasma technology changes manufacturing

Fuji's Tough Plasma has industry-leading performance. High density radicals generated by the Fuji original head configuration achieve high-speed processing and exposure from far distances. Tough Plasma has a wide range of applications such as attachment, coating, coating preprocessing, and dry cleaning, and help users improve productivity.



What is surface improving using atmospheric plasma?

The chemical reaction from the generated oxygen radicals delivers hydrophilic molecules, and breaks down and removes organic matter.



Tough Plasma features

High-speed processing

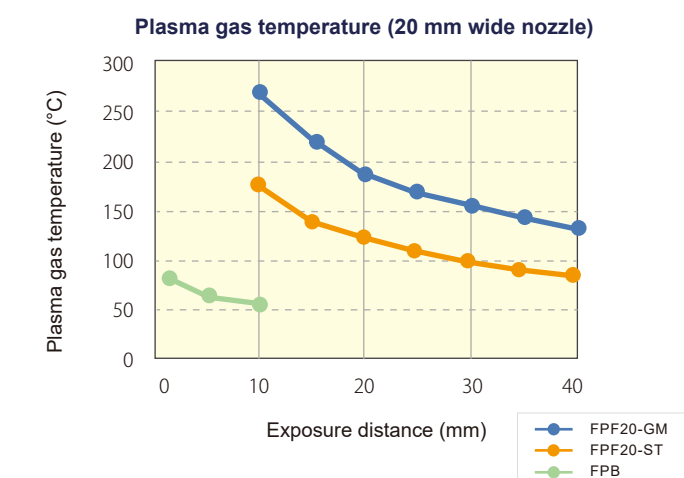
Highly reactive radical particles can be densely generated, enabling high-speed processing and improved productivity.



*Processing speed ratio when the contact angle of water to glass is 10 degrees or less.

Low temperature processing

Tough Plasma can be used for materials with low heat resistance because the plasma gas temperature is low.



* Temperature at which saturation occurs at a fixed exposure time

FPF series

FPF20-GM

High performance and high quality model that complies with international safety standards

Special feature 1

High-speed plasma processing

Can provide high-speed processing for large workpieces such as interior and exterior automotive parts

Special feature 2

Support for automated production

Operation using a multijoint robot and remote control through external devices are possible. This unit is also equipped with self-monitoring* functions.

*Self-monitoring is used to monitor the units used for the plasma unit in addition to the plasma conditions. When an error is found, these functions ensure that the unit is stopped safely and issue notices to the control panel and external units.

Special feature 3

Obtained certificates for international safety standards



FPF20-ST

Standard model superior in cost effectiveness

Special feature 1

Excellent cost performance

This low-cost model with narrowed-down functions achieves the radical generation performance is equivalent to FPF20-GM

Special feature 2

Support for automated production

It is possible to use in the same way as FPF20-GM. The combined structure of the head and cables improves the tensile strength.



FPB20

Compact, low-cost damage-free model

Special feature 1

Low temperature processing

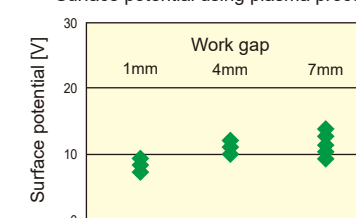
The plasma gas temperature is the lowest among the Tough Plasma lineup, so materials which are sensitive to heat are irradiated easily.

Special feature 2

Electrically neutral

Materials are only exposed to neutral radicals, so there is no electrical damage to the work.

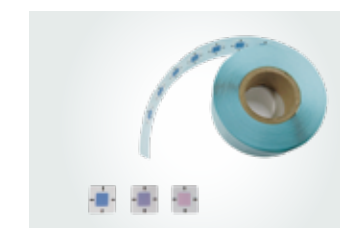
Surface potential using plasma processing



Tough Plasma FSI

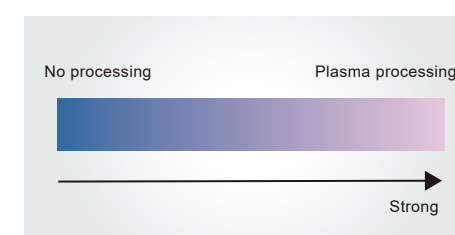
Check plasma effects easily

- The color of the indicator changes in response to plasma chemically active species.
- Because it comes as a label, it is easy to attach to work and check the effects. It is easy to attach to work using a labeler.



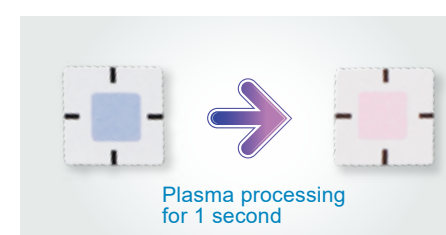
Illustrates the effects of plasma

The color of the indicator changes based on the plasma processing strength and time.



Makes inspection before starting work simple

Inspection before starting work takes just a few seconds.



Quantifies plasma effects

A color-difference meter is used to measure the color difference between before and after plasma irradiation. This makes it possible to quantify plasma effects.

