POLYTEC PT – SURFACE PRETREATMENT

NanoFlame NF 02

Field of Application

The flame pretreatment device **Polytec PT NanoFlame NF02** is based on the principle of flame-pyrolytic surface silicating.

The NanoFlame NF02 generates a very thin (20-50 nm), however very dense layer of silicon dioxide by flame-pyrolytic deposition of an organosilicon compound. These silicon dioxide layers produce very high surface energies and adhere strongly on

- Metals
- Glass
- Ceramics
- Polymeric materials

In combination with silane based coupling agents like **HP A41** adhesion promotors (for epoxies), HP A38 (for acrylics), and HP A39 (for polyurethanes) as well as hydrophobic adhesives this layer provides the basis for long-term water- and solvent-resistant adhesive bondings.

The NanoFlame NF02 is recommended for the pretreatment of small and medium-sized surfaces up to DIN A4 size.

Application

For application the surface of the material is treated for a short period of time with the outer (oxidizing) part of the fame, which should continuously be moved during operation. It is very important, that the treatment is never done with inner blue (reducing) part of flame. If necessary, the illumination of the working site should be reduced for better differentiation.

In case of pretreating very small, thin-walled or heat-sensitive parts it is recommended to repeat the flaming in short intervals. As a rule-of-the-thumb an area of 1 cm^2 requires a treatment time of 3-5 sec. Local overheating should be avoided. Generally, the temperature of the pretreated parts should not exceed 150-200°C. Particular care has to be taken in case of thermoplastic materials.

Long term adhesion properties of epoxies, acrylics, or polyurethanes can be further enhanced by applying the appropriate Polytec PT adhesion promoters after the flame treatment. This is usually done by brushing or spraying.

The storage time of the flame pretreated part should not exceed 12 hours. Storage at slightly elevated temperatures – up to 50°C - is favourable. After the application of the adhesion promoter the storage at elevated temperatures is no longer necessary. Nonetheless, further-processing should take place as soon as possible, preferably within 1 day, at longest 1 month.

Refilling

Empty flame device can be refilled with Nanoflame gas mixture from 200 resp. 600ml cartridges.

Safety and Transport Regulations

NanoFlame is a special propane-butane-organosilicon gas mixture and forms like pure propane-butane propellants explosive mixtures with air. Hence, open sources of ignition have to be removed, smoking during work with NanoFlame is not allowed.

Additional Recommendations for Surface Pretreatment of PTFE

Particular care has to be taken, when PTFE or other Fluoropolymers are pretreated.

PTFE and other fluoropolymers decompose at temperatures above 350°C. Some of these decomposition products are very toxic after inhalation. Therefore, it is absolutely necessary, that the flame pretreatment is carried out considering the instructions given under 2. In particular, the flame has to be moved to avoid overheating. Small or thin-wall parts require interrupted treatment. For obtaining the intended effect no higher temperatures than 100°C are necessary when treating such polymers.