



**NRF srl**

via Ca' de Testi, 32 - 40037

Sasso Marconi (Bologna)

Tel. (051) 91.78.02 - Fax (051) 91.70.74

Partita IVA 02226271209

Finestre e Accessori per Caravan, Autocaravan e Camper

## **SERVICE AND MAINTENANCE MANUAL FOR NRF WINDOWS**

1. Content and application of the NRF service
2. Chemical incidence
3. Mechanical incidence
4. Causes of the damage
5. Manifestation of the problem
6. Instructions for proper cleaning

*ATTACHMENT "A": INFORMATION ON STRESS COROSION*



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## **1. Content and application of the NRF service**

**Product category concerned:** Windows and portholes for motorhomes

**Affected models:** all NRF acrylic windows and portholes

**Problem:** "Corrosion causing detachment and tension" or "Formation of small cracks caused by the vehicle".

**Causes:** with "corrosion causing detachment of tension" or "formation of small cracks caused by the vehicle" we mean a chemical and / or electrochemical corrosion of a material under the simultaneous influence of a corroding agent and static voltage. The real effects appear in the form of cracks that are initially very small, but which could destroy the entire component after more time.



## **2. Chemical incidence**

After the molecular chain under tension is attacked and destroyed by the corroding agent, small cracks begin to appear which can be felt as small scratches or as shiny dots if the plate is viewed from a certain angle.

## **3. Mechanical incidence**

Window plates are manufactured from organic (acrylic) material and leave the automated manufacturing stage with a minimum level of tension. Gradually from the time the windows are installed until their final use, the tension level increases, but cracks only form if the windows are used incorrectly. During use, the window, despite the product being subjected to surface tension caused by changes in temperature and humidity, if treated correctly, can last for many years without presenting problems.



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#### **4. Causes of the damage**

In order not to damage the windows, it is essential to use cleaning products suitable for the material. In the opposite way, if you use cleaning and care products that are not suitable for acrylic (corroding agents), these attack the material of the windows, damaging them irreparably. Among other elements, for example: alcohol, some types of surfactant agents, organic solvents and softeners, are corroding agents. On top of that, these elements could be included in plastic care products such as polishing paste and also in rubber care products. It is important to know that these elements can also be found in spray products or in bottles with nebulizer. In this last case, the danger is that the substance can be carried by the wind and therefore care must be taken because the harmful product could still come into contact with the window even if used by someone else in the immediate vicinity.

#### **5. Manifestation of the problem**

There are two types of cracks: those caused by a chemical reaction, which branch off and it is impossible to define in which direction they could expand and those formed by mechanical reaction which in most cases expand in a defined direction and don't show branches. In both cases, the surface always appears completely intact because at the beginning of the formation, the crack doesn't leave traces, but the destruction process has already begun.

Cracks begin to form at the points of greatest tension, for example in windows in the areas of the hinge profiles or bolt fixings. The formation of cracks is also conditioned by local factors, including, for example, the time of action of the corroding agent, its degree of aggressiveness and the temperature. In some cases, cracks may only form on the surface or on the corners. In the end, if you use too aggressive gasket care products, cracks form on the contact surface between the gasket and the plate: in this case both (plate and gasket) must be replaced, otherwise the new parts could also be damaged.

#### **6. Instructions for proper cleaning**

Diluting a corroding detergent may not help: in most cases, the corroding agent remains concentrated after the evaporation of the parts of water at the end of use, irreparably damaging the materials.

With proper maintenance and cleaning of the acrylic parts and gaskets, it will be possible to keep the surfaces free of pores, sturdy and avoid yellowing. For the cleaning and care of acrylic windows it is recommended to use warm water with just a little quantity of common dishwashing detergent. It is very important to use a lot of water and never dry the windows. Instead for the care of the gaskets, we recommend talcum powder or white vaseline.