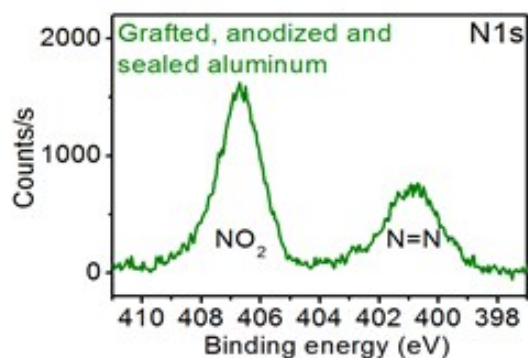


Supporting information

SI 1:

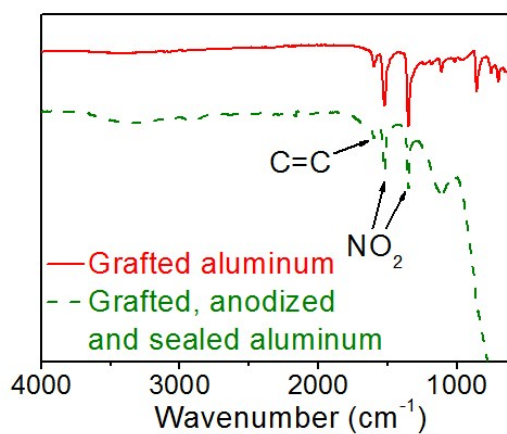
	Grafted aluminum (%at)	Grafted, anodized and sealed aluminum (%at)
C1s	72	22
O1s	18	49.5
N1s	8.5	1.5
Al2p	1.5	27



XPS C1s, O1s, N1s and Al2p atomic % for the aluminum surface grafted with the 4-nitrobenzenediazonium before and after anodization and sealing (left); XPS N1s peak of the aluminum surface grafted with the 4-nitrobenzenediazonium, anodized and sealed (right)

The total carbon, oxygen, nitrogen and aluminum amounts were obtained by dividing the relevant peak integrated areas of well-defined C1s, O1s, N1s and Al2p core level spectra by the appropriate bulk sensitivity factors. The proportion of nitrogen decreases after the anodizing process, going from 8.5 % down to 1.5 %, but the N1s spectrum presents the same two components at 406.6 eV (attributed to NO₂ groups) and at 400.8 eV (attributed to N=N) corresponding to the polymeric grafted film.

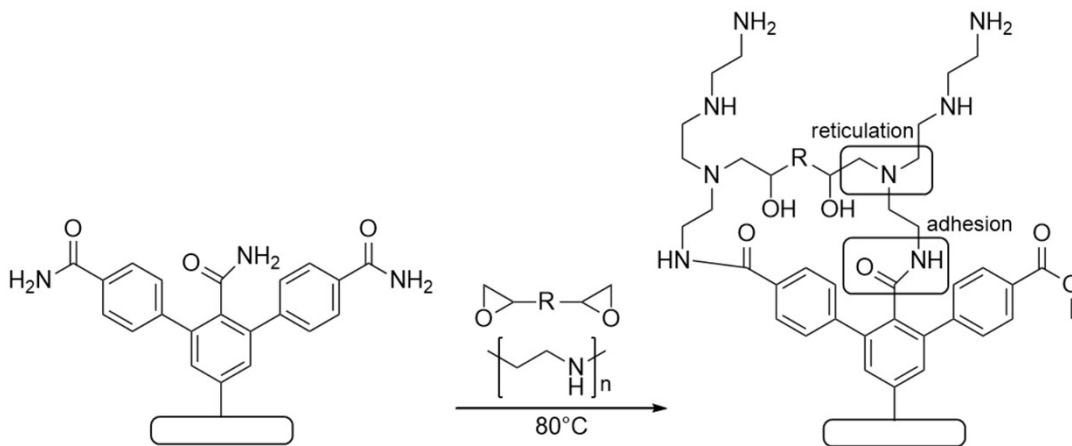
SI 2:



FT-IR spectrum of the aluminum surface grafted with the 4-nitrobenzenediazonium (solid line) and the aluminum surface grafted with the 4-nitrobenzenediazonium, anodized and sealed (dashed line)

The bands at 1350 and 1520 cm⁻¹ attributed to the NO₂ functions and the band at 1600 cm⁻¹ corresponding to phenyl groups are still clearly observed after the anodization but with a slightly smaller intensity.

SI 3:



Expected reaction between the “amide-bearing” organic coating and the painting

SI 4:

Adhesion tests were performed following Norm NF EN ISO 2409:

Grade 0: The edges of the cuts are completely smooth; none of the squares of the lattice is detached.

Grade 1: Detachment of small flakes of the coating at the intersections of the cuts. A cross-cut area not significantly greater than 5 % is affected.

Grade 2: The coating has flaked along the edges and/or at the intersections of the cuts. A cross-cut area significantly greater than 5 %, but not significantly greater than 15 %, is affected

Grade 3: The coating has flaked along the edges of the cuts partly or wholly in large ribbons, and/or it has flaked partly or wholly on different parts of the squares. A cross-cut area significantly greater than 15 %, but not significantly greater than 35 %, is affected

Grade 4: The coating has flaked along the edges of the cuts in large ribbons and/or some squares have detached partly or wholly. A cross-cut area significantly greater than 35 %, but not significantly greater than 65 %, is affected.

Grade 5: Any degree of flaking that cannot even be classified by classification 4.