Development of $Cr^{6+}$-free special anodic oxide film for eco-friendly base coating

# Surface Treatment Technology for Exterior Aluminum Building Materials

## Feature

### Development of Base Coating Processing Technology

A chromate film mainly consisting of $Cr^{6+}$, which is a toxic substance, was used for base coating on aluminum building materials in the past. Nihon Anodizing has developed a special anodic oxide film as new eco-friendly technology.

### Improvement in Coating Composition

The use of the special anodic oxide film for base coating to a material eliminates the primer between the base coating on the material and finish coating in order to help the finish coating improve its coating composition so that the finish coating will exploit its performance to the full.

With the development of the special anodic oxide film for base coating and the improvement in the coating composition, Nihon Anodizing has established an environment-friendly coating system with high adhesion performance that will not cause water pollution, air pollution, or soil pollution.

## Overview (Technical principles, actions, etc.)

**Fig. 1** shows the general composition of conventional base coating that uses a chromate film. The primer, which is required to bond the chromate film and the finish coating, helps the finish coating demonstrate its weatherability and durability performance. The primer mainly consists of epoxy resin that is heavily degraded by ultraviolet rays. Therefore, the primer cannot last over a long period of time.

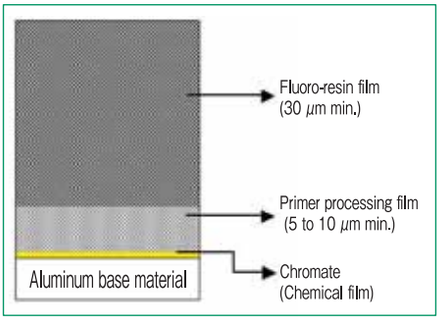


Fig. 1 Conventional Chromate Processing

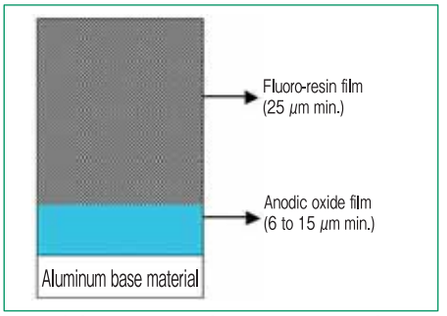


Fig. 2 Special Anodic Oxide Film as Base Coating

**Fig. 2** shows the composition of base coating that uses the anodic oxide film. Anodic oxide base coating excels the chromate film in corrosion resistance and adhesion performance, thus not requiring the primer treatment that is easily degraded by ultraviolet rays. Therefore, finished coating can be directly applied to the anodic oxide base coating to ensure the weatherability and durability.
Furthermore, the special anodic oxide film can provide improved adhesiveness to the corner section of the application.

The special anodic oxide film demonstrates its great performance around the corner section as well, because the adhesiveness of the special anodic oxide film around the corner section is better than that of the chromate film.

## Introductory Track Record

**Typical examples that applied Nihon Anodizing's special anodic oxide film as environment-friendly technology for aluminum exterior materials are shown below.**

- Kyoto Hotel (Kyoto)
- Ogimachi Kids Park (Osaka)
- New Kobe International Conference Hall (Hyogo)
- Osaka Parcel Post Office (Osaka)
- Atago Green Hills (Tokyo)
- Roppongi Hills (Tokyo)
- New Kansai Electric Power Co., Inc. Building (Osaka)
- Ajinomoto Group Osaka Building (Osaka)
- The Peninsula Tokyo (Tokyo)
- New Marunouchi Building (Tokyo)
- Others (adopted by many buildings)


Roppongi Hills


Ogimachi Kids Park


New Kansai Electric Power Co., Inc. Building


New Marunouchi Building

## Effects

**◎Nihon Anodizing's special anodic oxide film for base coating is free of hexavalent chromium ($Cr^{6+}$), thus not causing water pollution or soil pollution. Moreover, the scattering of aluminum building materials at the time of recycling will cause no air pollution.**

**◎The special anodic oxide film for base coating has good adhesion performance and does not require primer treatment, thus reducing the amount of volatile organic solvent (VOC) emissions and decreasing the risk for air pollution.**

**◎The special anodic oxide film for base coating is excellent in corrosion resistance, thus ensuring the long-time durability even on the surface where the film is only applied.**

**◎In order to reduce the environmental impact factor not only on base coating but also on entire coating, Nihon Anodizing has been advancing the development of VOC-free powdered paint.**



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