# Properties of NKK Galvalume Steel Sheet "Super Genius Coat"

Masaaki Yamashita\*, Keiji Yoshida\*\*, Takafumi Yamaji\*\*\*, Akira Matsuzaki\*\*\*, Etsuo Hamada\*\*\*\* and Hiroyuki Shinka\*\*\*\*\*

- \* General Manager, Dr, Coated Products Lab. Materials & Processing Research Center
- \*\* Team Manager, Coated Products Lab. Materials & Processing Research Center
- \*\*\* Senior Research Engineer, Coated Products Lab. Materials & Processing Research Center
- \*\*\*\* Senior Research Engineer, Materials Characterization Research Dept., Applied Technology Research Center
- \*\*\*\*\* Manager, Products Development Section, NKK Steel Sheet & Strip Corporation

A new passivation treatment method of 55%Al-Zn coated steel sheets (galvalume steel sheets) was developed that applies an organic-inorganic hybrid coating named "Super Genius Coat". Newly developed inhibitors introduced into this passivation treatment significantly enhanced corrosion resistance at formed areas, which has been a challenge for passivation treatments of 55%Al-Zn coated steel sheets. In addition, high formability was achieved by applying new organic resin.

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0.5 mm in thickness) as shown in **Table 1**. The first is SG Coat (SG), the organic-inorganic hybrid coating containing the new corrosion inhibitor. The second is G Coat (G), the organic-inorganic hybrid coating. The third is the conventional organic chromate coating mainly consisting of soluble chromate. The characteristics of these specimens were evaluated under the conditions given below.

Table 1 Type of chromate coatings

Samples	Composition		
"Super Genius" (SG)	Resin/New inhibitor/Phosphate/Insoluble chromate		
"Genius" (G)	Resin/Phosphate/Insoluble chromate		
Organic chromate	Resin/Soluble chromate		

#### (1) Corrosion resistance at flat areas

Salt spray testing (SST, JIS Z2371) was applied to the specimens with their rear face and cut edges sealed. The extent of white rust and black rust generation at flat areas was visually evaluated.

#### (2) Corrosion resistance at formed areas

SST was applied to the specimens after 5T bending. The extent of white rust and black rust generation at formed areas was visually evaluated.

#### (3) Formability

In order to simulate damage caused on the steel sheet surface by the friction between the roll and the sheet surface during roll forming, a flat sheet draw bead test was applied using a bead as shown in Fig.3. Anti-galling properties were evaluated by varying the normal force applied

between the bead and the surface of steel sheet and determining the limiting normal force that does not induce sig-

## 4.2 Formability

Fig.5 shows the result of formability evaluations by the draw bead test measured in terms of the limiting normal force that does not induce galling. Photo 4 shows examples of appearance after the draw bead tests. These results verify that the organic-inorganic hybrid SG Coat and G Coat resist galling up to much larger loads compared to the

### 5. Conclusion

Responding to increasing demands for highly corrosion-resistant materials mainly from the building materials field, we developed and commercialized a unique 55%AI-Zn coated steel sheet that is coated by the highly