

(Toshio Irie)

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Synopsis :

Accompanying the progress in three -piece can manufacturing techniques, there have been strong demands in recent years for materials with good lacquer adhesivity, weldability, and corrosion resistance as well as low manufacturing costs. The authors have developed the following three types of coated steel for cemented or welded cans: (1) Anion -free tin -free steel for cemented cans, which has an extremely low SO₄ anion content in the reverse electrolysis-processed chromium oxide film, and has excellent lacquer adhesivity for retort processing, (2) RIVERWELT, a lightly tin- coated steel for welded cans, which has excellent weldability and corrosion resistance, as a result of its nickel diffusion layer, Fe (Ni)-Sn alloy layer, island -like dispersed tin layer and chromate film layer consisting of chromium and chromium -oxide, and (3) granular chromium -plated tin -free steel which has chromium protrusions on a uniform chromium layer that are sufficiently fine for providing both good weldability and corrosion resistance. Manufacturing processes, coating structures, and some of the properties of these steels are explained and discussed in this paper.

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Development of New Types of Coated Sheet Steels for Can Manufacturing

要旨

近年、缶胴接合技術の発展に伴って、塗料密着性、溶接性、耐食


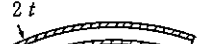

Seaming methods	Soldered can	Cemented can	Welded can
	 <p>Solder</p>	 <p>2t</p>	<p>1.3~1.4t</p> 

Table 2 Influence of reverse electrolysis conditions on chromium oxide film characteristics

Reverse electrolysis condition	After reverse electrolysis		After chemical treatment	
	Amount of anion by XPS	Cr in Cr-oxide	Uniformity of Cr-oxide	Resistant time to retort treatment

Degreasing



g/m²

0.6

(a) RIVERWELT
(b) Lightly tin-coated steel

Table 3 T-peel strength of various coated steels

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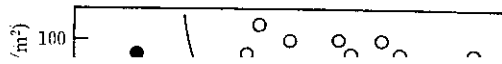
weight

6

○ No blistering
△ Light blistering

150

Chromium oxide weight
(mg/m² as Cr)



が 60~70 mg/m², クロム水和酸化物量約 8~12 mg/m²(クロム換算)で溶接性と耐食性に優れる。