

KAWASAKI STEEL TECHNICAL REPORT

Ultra-Thin-Gage and High-Strength Tin Mill Blackplates with Low Planar Anisotropy in r -Value for Two-Piece Cans*



Synopsis:

The development of sheet steels is described for two-piece cans, drawn and redrawn (DRD) cans, and drawn and wall-ironed (DWI) cans which have an ultra-thin gage for high strength use, outstanding deep drawability expressed by a high r -value, and low planar anisotropy. Both good drawability (r -value is higher than 1.1) and

has also expanded remarkably.⁷⁾

Against this background, techniques for weight saving have been positively developed,⁸⁻¹⁰⁾ in addition to improving the basic performance of can containers for the preservation of foods. Examples of these techniques

DWI cans

	DRD cans		DWI cans	
	Conventional	Light-weight	Conventional	Light-weight

operation, but by subsequent redrawing. As a result, the required average r -value (\bar{r}) becomes about 1.1 or more, so that a particularly high \bar{r} -value is not required.

$$\Delta H = \frac{1}{N} \sum_i (H_i - H_{min})$$

N : Number of earings

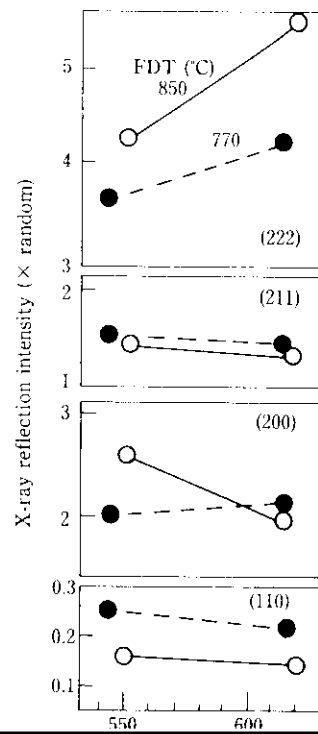
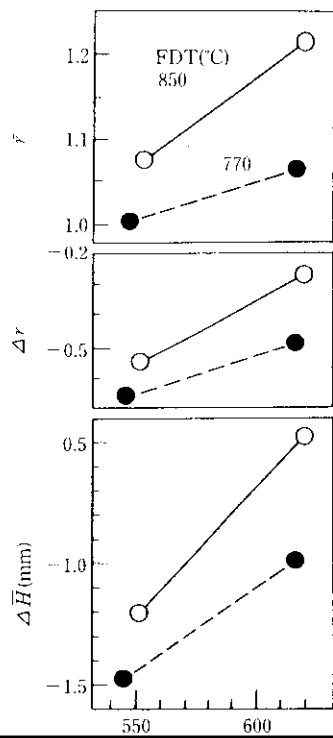
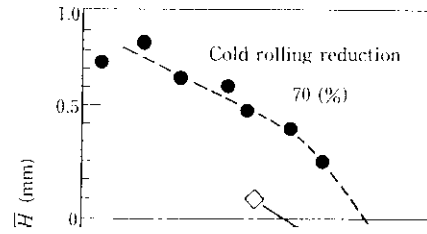
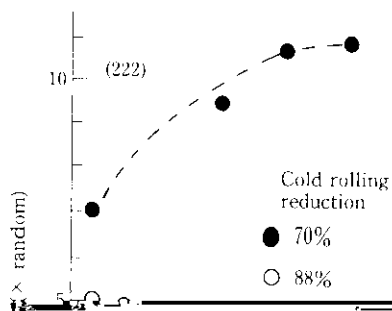


Fig. 2. Dependence of the lattice spacing $d_{(hkl)}$ (a) and the average

2.2 Effect of Cold Rolling Reduction on Earing

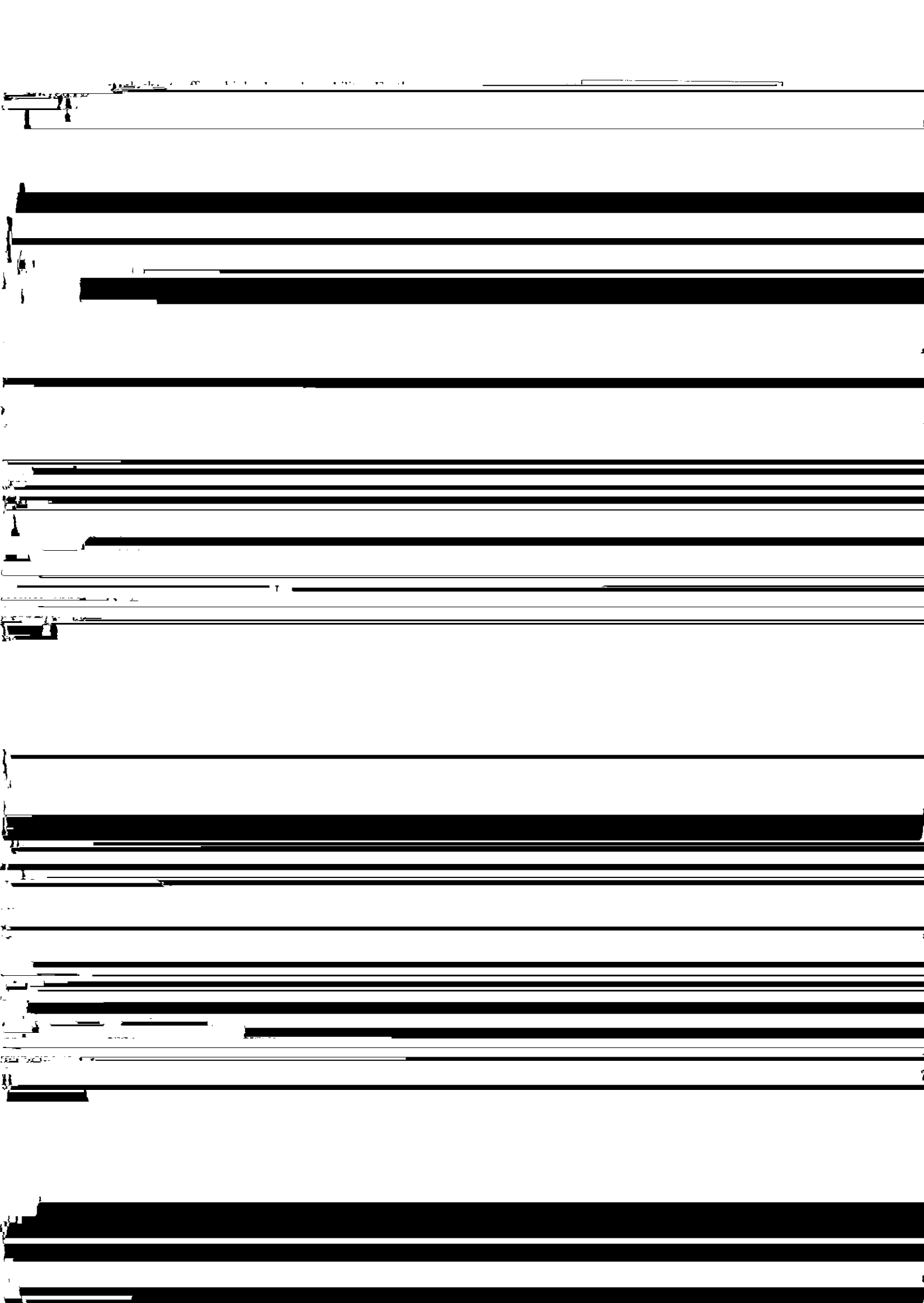
The second rolling is conducted with a high reduction for tempering to adjust the flatness and surface roughness of TMBP and, at the same time, to give the finished sheet high strength. The effect of the cold roll-





3 Development of Ultra-Thin-Gage, High-Strength TMBP for DWI Cans

Tinplate with a matt surface finish (JIS G3303) is used as the steel sheet for DWI cans. This tinplate is produced by plating the dull surface of the base steel with tin to facilitate drawing and wall ironing, the tin-remelting and alloying treatment (a heat treatment that involves melting tin in a short time and rapidly cooling

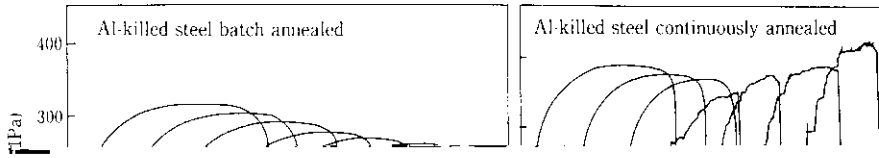


0.85

Al-killed steel
continuously



easily induced. However, when an aging treatment on a steel is conducted at a high enough temperature for the solute carbon and nitrogen to move although the distri-



D. Togo Kohan Co. Ltd: "Birikito, Tin Free Steel" (1074) 193; D. D. Mould and T. E. Johnson: *Steel Metall. Ind.*

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