



# Manufacturing Methods and Properties of Hot-Dipped One-Side Galvannealed Steel Sheets by the Stop-Off Coating Technique\*<sup>1</sup>

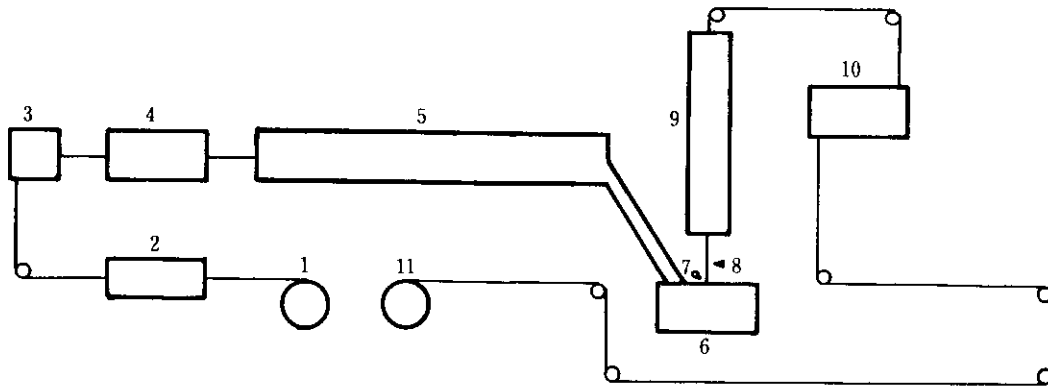
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*Manufacturing methods and properties of non-grinding hot-dipped one-side galvannealed steel strip are described. It is produced on the continuous galvanizing line which is equipped with a roll coater for stop-off coating by sodium silicate, sodium borate, magnesium oxide, titanium oxide and aluminium oxide, and a roll bender to remove the coating.*

*(1) Above 800°C the stop-off coating forms dense glass film which keeps one side of the strip surface from molten zinc and air atmosphere and is easily exfoliated from the strip using*



- |                              |               |             |
|------------------------------|---------------|-------------|
| 3 Roll coater                | 7 Flame wiper | 11 Recoiler |
| 4 Preliminary drying furnace | 8 Gas wiper   |             |

Fig. 1 Profile of continuous galvanizing line for producing one-side galvanized steel strip

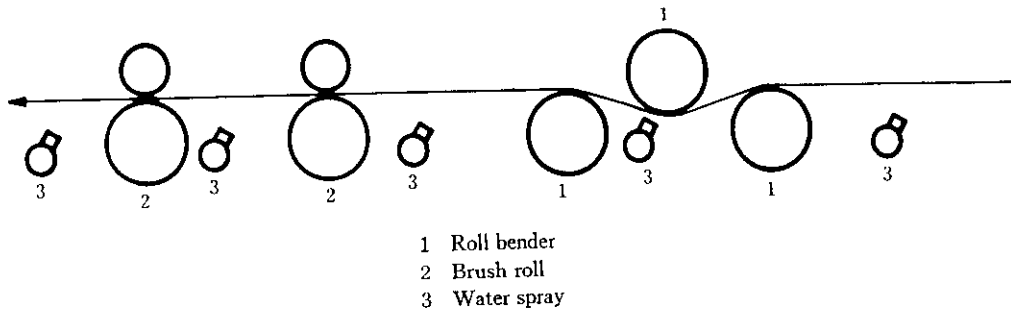


Fig. 4 Roll bender and brush roll

(5) A roll bending and brush wiping unit (Fig. 4) for removing the stop-off agent

The explanation of the process in the order of sequential arrangement of the apparatus is as follows. First of all,

### 3 Characteristics of Stop-Off Coatings

#### 3.1 Functions

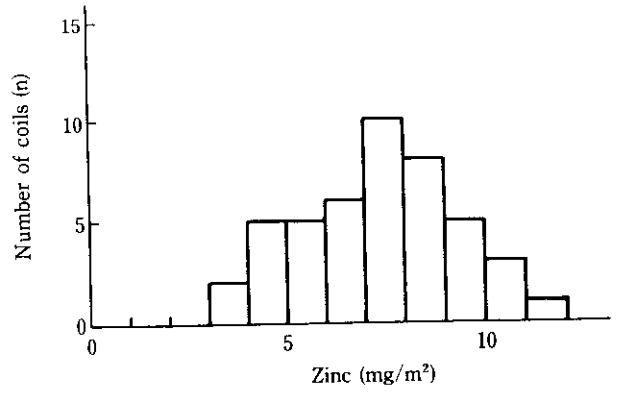
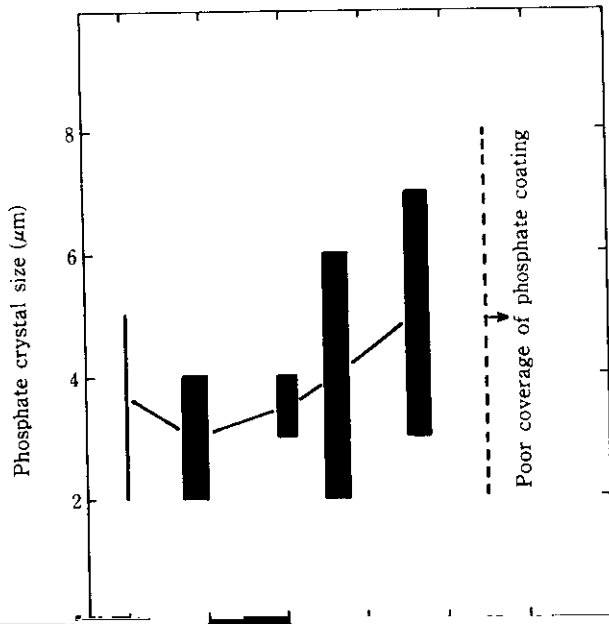
The functions and characteristics required of stop-off





of 800°C or higher. Since these coatings are easily separated by compressive strain, or expansion which results

tional one-side galvanizing-by-grinding technique, zinc





become even more fine and dense than those formed on continuously annealed cold rolled materials and thus

BT3030, manufactured by the Nihon Parkerizing Co., Ltd., and Gr-SD2000, manufactured by the Nippon

lows that adhesion and residues of zinc and magnesium to the extent of several  $\text{mg}/\text{m}^2$  on the ungalvannealed surface subsequent to the removal of the stop-off agent contribute to the formation of phosphate crystal nuclei

after 120-sec treatment in accordance with the treatment specifications for the respective solutions. The results are compared with the corresponding results for continuously annealed cold rolled steel manufactured



