

- 4) Volume fraction control of each phase during the continuous-annealing process step¹⁾.

Based on the above concepts, the volume fraction of the solid-solution hardened ferrite was increased without connections of contiguous ferrite grains. As a result, a new process technology has successfully been implemented which provides a microstructure having martensite finely and homogenously dispersed at ferrite grain boundaries.

balance of the developed and conventional steels. The developed DP type steel exhibits well balanced elongation and in comparison with the conventional steels, with its elongation and consistently falling in the range of $\geq 14\%$ and $\geq 50\%$, respectively.

was held down to the die with a blank holding force of 118 kN to prevent wrinkling. The forming height, to which a sample sheet can be formed without a fracture, was measured for each sample as its index of stretch-formability. The results are shown in . Also included in the figure are the results for conventional DP steel-sheets of bending-type and drawing-type. The developed DP steel exhibits a forming height comparable to that of the conventional bending-type steel, while the new BF steel shows a stretch-formability superior to the conventional drawing-type steel. It should be noted that the BF steel demonstrates superior formability despite of its elongation value which is smaller than that of the conventional drawing type DP steel. This is attributable to the plasticity induced by residual , which increases work hardening coefficient during the equibiaxial deformation and disperses strain

