Newly Developed Steel Sheets with New and Advanced Functions to Meet Customers' Needs*

Synopsis:

Kawasaki Steel has presented newly developed steel sheets with new and advanced functions to each cus-

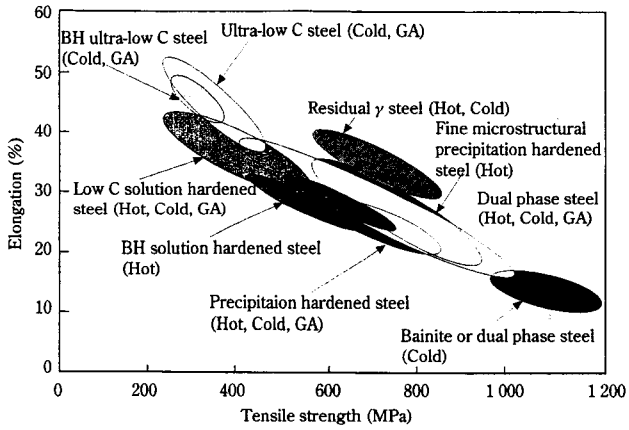

Fig. 1 Kind of steel for automotive use categorized after tensile strength and elongation

the excessive popularity of the automobile as a means of transportation. Reduction of auto body weight is one means of using fuel more efficiently (energy saving)

Table 1 Mechanical properties of surface-coated cold-rolled sheet steels with extra-deep drawability and bake-hardenability

Steel	YS (MPa)	TS (MPa)	El (%)	$\bar{r}$	BH (MPa)
Hot-dip galvannealed	208	357	41	1.9	42
Organic composite coated	196	353	42	2.0	39

Sheet thickness: 0.7 mm

process. This gives them adequate dent resistance for exposed parts.

This type of sheet has been around for a long time. However, no material has offered high strength (tensile strength of 340 MPa or higher) combined with an ultra deep drawing property (Lankford value (r-value), which shows deep drawability, exceeding 2.0). A cold rolled steel sheet with an r-value of 2.0 or higher and bake hardenability (BH) of approximately 40 MPa

while maintaining travel performance. However, auto weight has tended to increase due to the reinforcement of the auto body structure to increase the safety of occu-

obtained by applying high temperature annealing at 850°C or higher and rapid cooling at 30°C/s or higher to a steel material with a carbon content of 0.003% or less

Table 2 Chemical compositions of the developed

C	Mn	P	S	Al	Mo
0.080	2.00	0.010	0.005	0.042	0.15

Table 3 Chemical compositions of newly developed

C	Si	Mn	Ti	P	S	Al
0.08	1.50	1.80	0.10	0.010	0.001	0.030

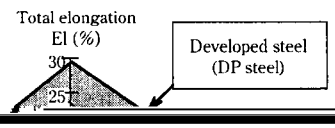

Table 4 Mechanical properties of newly developed 780 MPa TS grade steel

Table 5 Typical mechanical properties of the developed steel

Table 6 Typical mechanical properties of the developed steel comparing with conventional steel

Table 7 Performance of "RIVER ZINC FX"

Test item	Test condition	Result		
		RIVER ZINC FX	RIVER ZINC F*	RIVER ZINC C**
Finger print resistance	Discoloration measurement with artificial sweat solution	1.0 under	0.8 under	3.5 under
Corrosion resistance	Salt spray test 5% NaCl at 35°C (JIS Z 2371)	120 h over***	144 h over***	48 h over***
Chemical resistance	Immersion test in gaseous trichloroethylene at 50°C for 4 min	No change	Slightly changed	No change
	Immersion test in gaseous trichloroethylene at 90°C for 4 min	No change	Slightly changed	No change
Conductivity	Electric resistance measurement on the surface	0.1 Ω under	0.5 Ω over	0.1 Ω under

**Conventional chromate treated steel sheet
***Time to generate white rust covered more than 5% of the surface

to obtain this fingerprint resistance. However, if an organic resin film is applied to a steel surface, the steel

ment and destruction of the ozone layer by the fluorocarbon solvents used in degreasing after press forming,

Table 8 Comparison of performance of RIVER ZINC FE with those of RIVER ZINC FS and FX

Property	Test item	Result

accurate grasping of customers' needs at all times has

3) S. Satoh, S. Okada, T. Kato, O. Hashimoto, T. Hanazawa, and H. Tsunekawa: *Kawasaki Steel Giho*. **23**(1991)4, 293