

Equipment of New Ultra-High Speed Continuous Annealing Line for Tin Mill Black Plates*

Naoya Sato** Shinichiro Muto*** Yuji Shimoyama****

Table 1. Main specification of No. 4 CAL

Recently, customer demand for quality of the tinplate and the tin-free steel used for beverage cans, etc., has been increasing. Reduction of the thickness of sheet steel is being enthusiastically promoted as it leads to cost reduction in the can production process and consequently achieves energy conservation. The establishment of a highly effective production technique for thin tin mill black plates, however, is indispensable to prevent decreases in productivity and increases in energy costs

Strip	Thickness (mm)	0.15 ~ 0.40	
	Width (mm)	600 ~ 1 067	
Coil	Max. weight (t)	22	
	Inner diameter	Entry (mm)	419, 508
		Exit (mm)	406, 419, 508
Maximum speed	Entry (m/min)	1 200	
	Furnace (m/min)	1 000	

greatly as a result of the above-mentioned new technology introduction.

4 Automation Technology

Intensive automation is indispensable to operate process equipments consisting of electrolytic cleaning, annealing, temper rolling, the finishing which are continuously connected stably and at high speeds with a

mat. Moreover, conditions necessary for operating the line are automatically set by organically connecting various controllers including the electrical DDC, the instrumentation DDC, and the shape control DDC with the central process computer as shown in Fig. 5. As a result, steady CAL finishing became possible in a single line of multiple connected processes.

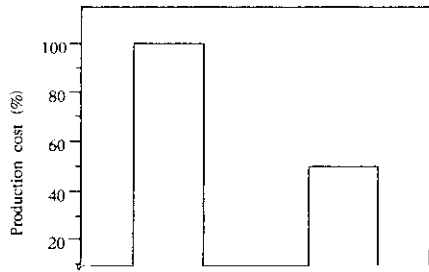
Table 2 including the coil handling and the incidental work which has been especially insufficient, were auto-

Figure 6 shows the changes in production since operation started and Table 3 shows the operating record and

Table 2 Main automated items

Section	Item	Contents
		Band cutting

the strip break frequency in 1995. Moreover, Fig. 7, which compares the production yield with the conventional process, shows the yield has been remarkably improved as a result of integrating the production process.



by consolidating the line. Moreover, the automation of the can production process which results in uniform product quality and thinning of the can wall, is able to help customers save resources.

7 Conclusions

The equipment of the new ultra-high speed continuous annealing line for tin mill black plates was designed