

"Tetsu-to-Hagané" Vol. 70 No. 9, July, 1984

**Special Issue on "Progress in Measurement and Instrumentation
for Manufacturing of Steels in Japan"**

Contents

Important Role of Inspection and Evaluation Techniques in Steel Production [Foreword]	M. MIYAGAWA... 985
The Historical View of Measurement Technology in the Japanese Iron and Steel Industry [Review]	H. TOYOTA... 987
An Expectation of Measurement from the System Control Engineering [Review]	Y. SAWARAGI... 992
Recent Development of Sensing Technology [Commentary]	H. YAMASAKI... 994
Non-destructive Testing and Image Processing [Commentary].....	M. ONOE... 1000
New Methods for Temperature Measurement and Their Applications to Steel Process [Technical Report]	
..... T. YAMADA, N. HARADA, K. IMAI, S. KAWAHATA, H. TEZUKA and S. TERAO...1007	
Temperature Distribution Measurement in the Flue and Its Relation to Operating Conditions of the Coke Oven [Technical Paper]	
..... Y. TAMURA, T. YAMAMOTO, A. KATAYAMA, N. OKUI and S. TAKASE...1014	
Control Method of Secondary Cooling Water for Bloom Continuous Casting on the Basis of Temperature Estimation [Technical Paper]	
..... A. KITAMURA, M. KONISHI, T. SHIMIZU, Y. ONOE and S. KYUTOKU...1022	
Optimal Heating of Ingots in the Soaking Pit Based on Temperature Estimation [Technical Report].....K. NOSE, T. MORITA, T. SHINMURA and K. DOI...1030	
Radiation Thermometry of Cold Rolled Steel Strips in a Continuous Annealing Furnace [Technical Paper].....T. IUCHI, F. TANAKA, K. WATANABE,	
..... A. EZAKI, M. MASUDA, H. HIRATA, T. INOUE and H. TAKAFUJI...1037	
Temperature Pattern Measurement and Weld Control in Electric Resistance Welded Tube Mill [Technical Report]	
..... M. TATSUWAKI, C. TAKAMADATE and K. HOTTA...1045	
Improvement of Traceability for Radiation Pyrometers in the Steel Industry [Technical Report].....K. TAMURA, K. KURITA and T. IWAMURA...1052	
Measurement of Burden Profile in Blast Furnaces and Analysis of Measured Results [Technical Report]T. IWAMURA, H. SAKIMURA, M. KONDOW,	
..... Y. Asano, K. AKIMOTO, Y. MAKI, T. HARU and H. OBATA...1059	
Optical Width Gauge for Hot Radiant Plates [Technical Report]	
..... Y. NAKAI, K. YOSHII, T. NAKADA and I. TAKAHASHI...1066	
Flatness Measurement of Hot Strip by Laser Scanning Method [Technical Report]	T. TOYOTA, A. OGASAWARA, T. MATSUBARA and S. NAKAMURA...1071
Development of Plate Flatness Meter Based on Light Section Method on Hot Rolling [Technical Report]	K. KAWAGUCHI, K. INADA and T. KAWABATA...1078
Development of Plate Sizing Apparatus for Plate Finishing Yard [Technical Report]	H. NAKAZATO, Y. KAWATA, H. IMADA, H. HAYAKAWA and H. KISHIDA...1083

On-line System for Measuring Thickness of Hydrated Chromium Oxide Film on Tin Free Steel [Technical Paper]	K. GOTO, N. YUMIBA, E. ONISHI, J. FUJIWARA, S. FUJII, K. TSUBOI and M. ISHIDA...1088
Analysis of Light Reflection from Cold-rolled Steel Sheets and Its Application to On-line Measurement of Surface Roughness [Technical Paper]	Y. ASANO, M. SHIOZUMI, K. KURITA, T. YABE and S. MORIYA...1095
Measurement of Hot Metal Level in a Torpedo Car by Microwave [Technical Report]	Y. MAKI, H. SAKIMURA, H. SAWADA, T. IWAMURA and K. AKIMOTO...1103
Ultrasonic Displacement Meter with Water Column for Hot Steel Product [Technical Report]	K. MATSUMURA, S. TERAO, K. KUNITA, Y. OKA and I. TSUBOI...1110
Dimension and Shape Measurement Using Water Column Distance Meter [Technical Report]	Y. UNO, N. KITAO, Y. FUKUTAKA, K. KAWAMURA and Y. FUNYU...1116
On-line Measurement of Solidification Shell Thickness and Estimation of Crater-end Shape of CC-slabs by Electromagnetic Ultrasonic Method [Technical Paper]	T. YOSHIDA, T. ATSUMI, W. OHASHI, K. KAGAYA, O. TSUBAKIHARA, H. SOGA and K. KAWASHIMA...1123
Development of the Wall Thickness Measuring System Using the Electromagnetic Acoustic Technique for Hot Seamless Steel Tubes and Pipes [Technical Paper]	H. YAMAGUCHI, K. FUJISAWA, R. MURAYAMA, K. HASHIMOTO, R. NAKANISHI, A. KATO, H. ISHIKAWA, T. KADOWAKI and I. SATO...1131
Hot On-line Wall Thickness Gage System for Seamless Tubes [Technical Report]	Y. FUNYU, T. OKUMURA, F. TOGASHI, M. SHIMIZU and A. MONNO...1139
Measuring Technic of Lumpy Zone in the Blast Furnace and It's Application [Technical Report]	M. YONEDA, T. SYOKYU, M. MATSUI, I. OGATA and T. HINO...1146
Development of Double Sheathed Multiple Thermocouples and Analyzing Method of Lining Erosion of Refractory Wall [Technical Report]	T. HORIUCHI, Y. KAWATE, M. KONISHI and N. NAGAI...1153
The Eddy-current Type Continuous Casting Mold Level Meter [Technical Report]	K. SANO, S. ANDO, Y. KAWASE, I. TAKAHASHI, M. TAKENAKA and K. TSUBOI...1160
Cold Strip Shape Estimation Using Plate Vibration Analysis [Technical Paper]	Y. HAYASHI, M. SAITO, S. FUJII and M. ISHIDA...1167
Non-destructive Inspection [Commentary]	H. MATSUYAMA...1175
On-line Inspection Techniques for Surface Detects of Hot Slabs [Technical Report]	K. IWAI and T. OUCHI...1181
The Development of a Surface Flaw Inspection System for Hot Continuously Cast Slabs [Technical Report]	M. UESUGI, T. YAMAMOTO, K. TSUBOI, H. YAMASHITA, S. KOMORI and K. MATSUMURA...1188
Automatic Surface Inspection System for Hot Rolled Slabs by Real Time Image Processing Method [Technical Paper]	M. IWASAKI, Y. NAKAI, Y. NISHIMOTO, K. TSUJI, I. HIROSE and A. KOBAYASHI...1194
Eddy Current Inspection for Continuously Casted Slabs in a Production Line [Technical Paper]	T. HIROSHIMA, A. NAKANISHI, T. SAKAMOTO and A. TAKAHASHI...1202

Automatic Ultrasonic Inspection for Surface Flaws of Square Billets [Technical Paper]	<i>H. YAMAGUCHI, N. MATSUBARA, K. FUJISAWA and S. MATSUMOTO</i> ...1210
Fully Automatic Inspection and Removal System of the Defects in Square Billets [Technical Report]	
..... <i>T. SHIMMURA, M. IWASAKI, G. TSUDA, N. KIMURA, S. YUUKI and K. USHIO</i> ...1216	
Magnetic Particle Inspection Technique for the Entire Surface of the Large Diameter Pipe [Technical Paper]	
..... <i>E. OHNISHI, A. TAKEKOSHI, T. YAMANE, Y. ISHIZAKA, S. KOTANI and I. TSUBOI</i> ...1222	
The Development of a Moisture Measurement System for Blast Furnace Coke [Technical Paper]	
..... <i>H. AMANO, H. NISHIKAWA, S. HORIUCHI and H. TOMINAGA</i> ...1228	
Development of Quality Control System for Sintered Ore [Technical Report]	
..... <i>K. KAWAGUCHI, K. INADA, S. SATO and S. YUMOTO</i> ...1235	
A Study on an Oscillating-plate Viscometer for Instantaneous and Simultaneous Measurements of the Viscosity of Melts and the Noise with Their Chemical Reactions [Technical Paper]	
..... <i>Z. MORITA, T. IIDA, M. KAWAMOTO and A. MÔRI</i> ...1242	
Effect of Phase Composition in Solid Electrolytes of ZrO_2 -8.1 mol% MgO on Oxygen Activity Measurement in Molten Steel [Technical Paper]	
..... <i>H. NAKAMURA, Y. NAKAJIMA and T. MORIYA</i> ...1250	
An Application of the Optimal Control Theory to the OG Pressure Control System [Technical Report]	
..... <i>T. INOUE, T. FUKUMOTO, S. KAWAI, K. YOSHII and T. TACHIBANA</i> ...1256	
Development of Measuring System for Friction in Continuous Casting Mold [Technical Paper]	
..... <i>Y. NAKAMORI, Y. FUJIKAKE, K. TOKIWA, T. KATAOKA, S. TSUNEOKA and H. MISUMI</i> ...1262	
New Tension Measurement and Control System in Hot Strip Finishing Mill [Technical Paper]	<i>S. TANIMOTO, Y. HAYASHI, T. KATAOKA, H. SASAO, K. TSUCHII and K. YABUCHI</i> ...1269
Apparatus for the On-line Telescopic Color-Spectrophotometry [Technical Paper]	
..... <i>A. TORAO, H. KITAGAWA, T. YOSHIMOTO, K. NAKAMURA and S. SUGITA</i> ...1277	
Progress and Technical Trend of Process Analyzer [Commentary]	
..... <i>Y. TSUKADA and R. FUKUDA</i> ...1285	
The Development of Condition Diagnosis Technology [Technical Report]	
..... <i>T. TAKADA, I. TOYAMA, T. KAWAGUCHI and E. SUMITANI</i> ...1292	
Current Sensors in Industrial Measurement and Control [Commentary]..... <i>I. OHNO</i> ...1299	
A Review of New Measuring Instruments Technologies in Steel [Commentary] <i>Y. INOUE</i> ...1305	
Progress of Measurement and Control in Iron and Steel Industry [Letter] <i>T. ISOBE</i> ...1311	