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Ironmaking Technology, Secondary Refining,
and Center-Segregation Control with Forging in CC

Concept of Continuous Forging Process and Experimental Analysis of Forged Blooms

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Synopsis :
With a view to substantially improving cent erline segregation, the authors developed the continuous forging process, based on a completely new solidific ation mechanism. In the new method, the unsolidifie d bloom is subjected to hea vy reduction at the stage of final solidification by anvils installed in th e strand line. The effectiveness of the method has been confirmed using commercial conti nuous bloom casters, where it was found that centerline segregation can be eliminated and the segregation ratio of carbon C/C0 can be controlled to an aime d value between 0.6 and 1.0 by choosing an appropriate ratio of reduction to the unsolidified thickn ess. It was also found that semi-macro segregation can be redu ced and internal quality is quite stable in spite of deviations in casting conditions during actual operation.

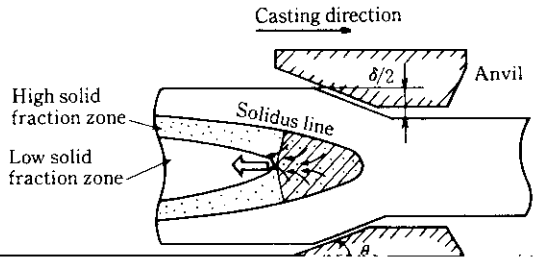
The body can be viewed from the next page.

Concept of Continuous Forging Process and Experimental Analysis of Formed Plane*

Synopsis:

2 Concept of Continuous Forging Process

2.1 Mechanism of Centerline Segregation in Continuous Casting



Steel includes C, Si, Mn, P, S, and other non-ferrous metal and nonmetallic components and demonstrates a

together with the results for δ_1. This δ_2 shows the

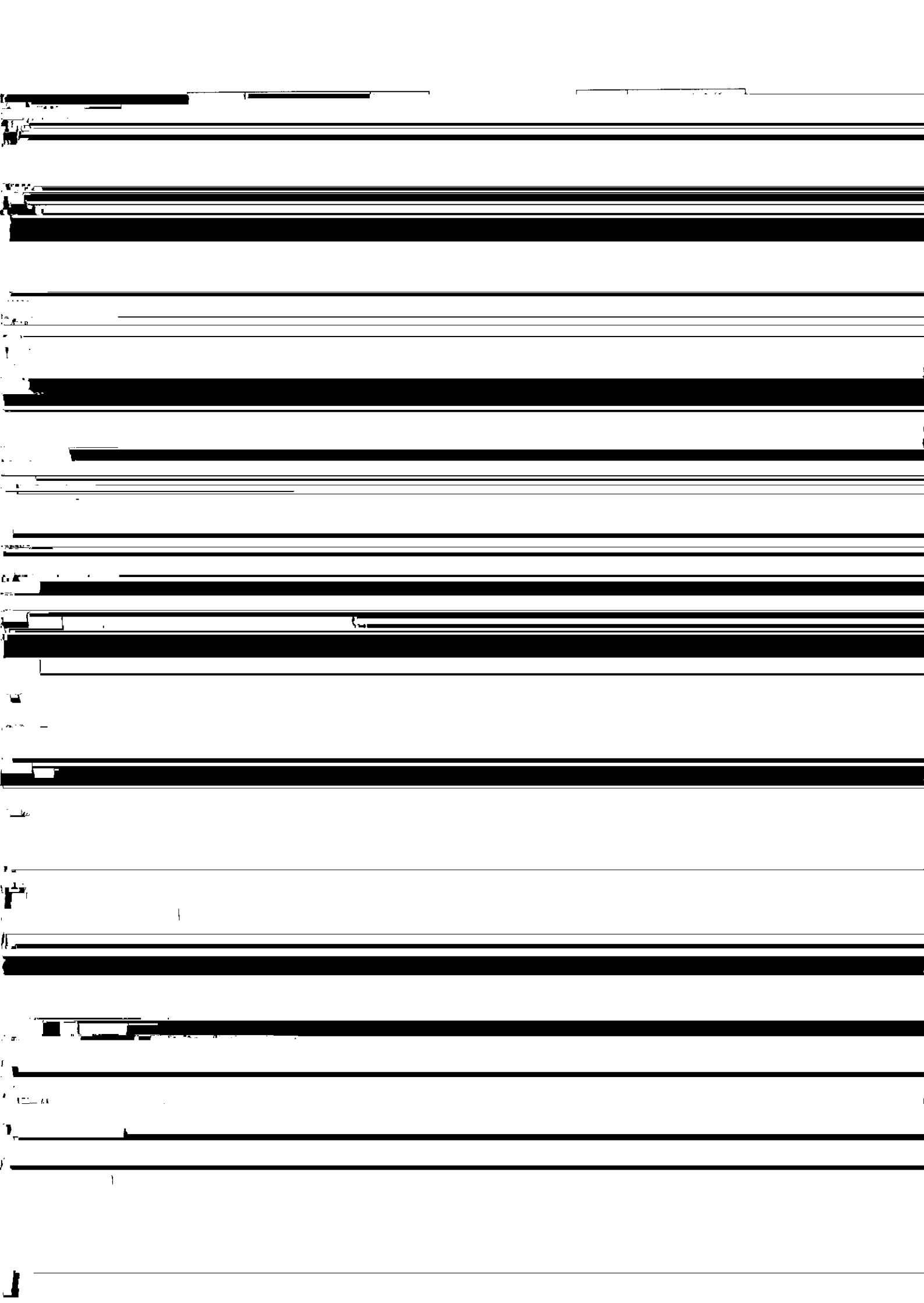
occurs when the amount of center-area reduction is

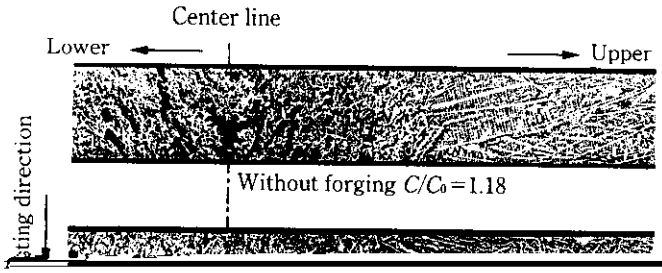
all the solid phase in the apparent unsolidified begins when the amount of reduction exceeds the value

internal cracking, even under high reduction, by forming a compressive stress field. In addition, there are few

is possible without either internal or surface cracks, provided appropriate forging conditi

Table 2 Experimental conditions of




Center line
Lower
Upper
Without forging $C/C_0 = 1.18$
ting direction

carbon segregation at the bloom center shows little

A continuous forging method was developed with the aim of improving centerline segregation in continuously cast blooms. In this method, anvils are used to apply

gation remained virtually unchanged with fluctuations in casting speed equivalent to an approximately 1 min stop of casting, confirming the stability of