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Interested committees:

Title: Draft BS ISO 21224 ISO 21224 Evaluation of Centreline Segregation of Continuously Cast Slabs.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 21224

Evaluation of Centreline Segregation of Continuously Cast Slabs

ICS: 23.040.10; 77.140.80

ISO/TC 17/SC 7

Secretariat: **AFNOR**

Voting begins on:
2025-05-14

Voting terminates on:
2025-08-06

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 7, *Methods of testing (other than mechanical tests and chemical analysis)*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Steel pipes produced from hot-rolled semi-finished products (strip or plate) are often used for the transport of different media (e.g. gas, oil, process- and waste water). Slabs from the continuously casting process are used as blanks for the production of these precursors. The solidification of the steel results in the formation of centreline segregation which is inherently caused by the casting process as well as the specific composition of the steel alloy. Depending on the specific conditions, centreline segregation occurs to varying degrees of severity and can affect the final material properties as well as the properties for further processing of the slab.^[1,2] Several methods for quality monitoring and casting process control of steel grades for the production of pipes as for instance the “Mannesmann rating system” or the “dot technique” have been developed in the past,^[1-3] but none of these methods have the status of a generally accessible standard or directive. In 2018, the industry standard SEP 1611 (Stahl-Eisen-Prüfblatt of German steel association Steel Institute VDEh) was published in order to establish a first, both supplier and customer independent document on evaluation methods.^[4,5] Methods for macrostructure examination rely on the fact that dark zones become visible in the centreline area of a slab after macroetching has been performed.

This document includes various test methods that have been established on a practical level and that reflect the current state-of-the-art for the evaluation of centreline segregation using macroetching techniques followed by visual inspection. For this purpose, the sampling, the sample preparation, the test method, the evaluation of the results as well as the required documentation are specified in this document.

The severity of centreline segregation can be evaluated in the following ways, enabling the choice between different options, addressing the wide range of available laboratory equipment at different testing centres:

- evaluation by comparative charts;
- evaluation by measuring and counting of the dark zones using circular templates;
- area measurement of the dark zones by digital image analysis.

In addition to macroetching and visual inspection, a couple of further methods are available in order to analyse the interior quality of steel slabs using more sophisticated techniques such as electron probe microanalysis (EPMA), X-ray fluorescence (XRF), optical spark emission spectroscopy (OES) or ultrasonic testing (UT).^[1,3] However, these will not be covered by the present document, since an unambiguous correlation between the various methods has not been verified in general.

