

Shtoda, M. (2025). Stress and Strain State of Bar in the Space Between the Stands of a Continuous Shape Rolling Mill. In: Tonkonogyi, V., Ivanov, V., Trojanowska, J., Oborskyi, G. (eds) Advanced Manufacturing Processes VI. Interpartner 2024. Lecture Notes in Mechanical Engineering. Springer, Cham. [https://doi.org/10.1007/978-3-031-82746-4\\_54](https://doi.org/10.1007/978-3-031-82746-4_54)

**Keywords:** System “Oval-Circle”, Rolling Speed, Modeling in QForm

**Abstract:**

The article describes the results of a complex of experimental and theoretical studies of continuous section rolling in calibers of the “oval-circle” system. In the first part of the research, an inverse analysis was performed, which made it possible to choose contact conditions in the simulation of the section rolling process in QForm that corresponded to the real process. In the second part of complex studies, based on a comparison of calculated and practical results, the adequacy of QForm models of the rolling process with front tension is shown. An empirical formula has been obtained to calculate the coefficient of metal broadening when rolling round strips of oval caliber with front tension. Comparison of the results of calculations by the empirical formula and as a result of mathematical modeling in QForm with experimental data showed that in both cases, the error does not exceed the engineering accuracy of the calculations. The last part of the comprehensive study examines the influence of the deformation and speed conditions of rolling on the stressed state of the strip between the mill stands. It has been shown that during continuous rolling in stands with a group drive, the accuracy of setting the gaps between the rolls affects the dimensions of the finished profile to the same extent as the discrepancy in speeds when rolling in stands with an individual drive.

**Published in:** Lecture Notes in Mechanical Engineering (LNME)

**Date of Conference:** 10-13 September 2024

**Date of Published:** 14 February 2025

**ISBN Information:** Online ISBN 978-3-031-82746-4

**Electronic ISSN:**

**DOI:** [https://doi.org/10.1007/978-3-031-82746-4\\_54](https://doi.org/10.1007/978-3-031-82746-4_54)

**Publisher:** Springer, Cham

**Conference Location:** Odesa, Ukraine