

**Abstract:** Effect of alloying elements in wire rods and the pearlite interlamellar spacing for steels with structural applications.

**Author:** Monserrat Sofía López-Cornejo, TECNOLÓGICO NACIONAL DE MÉXICO/Instituto Tecnológico de Morelia

**English Abstract:** A physical model was developed to estimate the thermal history in hypoeutectoid steel under continuous cooling and forced-convection conditions. The thermal histories were acquired at different cooling rates to emulate the forced-convection conditions in a controlled cooling conveyor and compared in every cooling condition with the microstructural evolution of the pearlite. Through Scanning Electron Microscopy (SEM) the pearlite interlamellar spacing was determined, as well as ultimate tensile strength, and the effect of the cooling rate on microstructural parameters such as transformation temperature and pearlite interlamellar spacing. It was found that air velocity increased the undercooling rate and decreased the pearlite interlamellar spacing, as well as the increase in chromium in the steels under evaluation.

**Resumen:** Estudio del efecto de elementos aleantes en el espaciado interlamellar de la perlita en aceros con aplicaciones estructurales.

**Autor:** Monserrat Sofía López-Cornejo, TECNOLÓGICO NACIONAL DE MÉXICO/Instituto Tecnológico de Morelia

**Spanish Abstract:** Aunque el espaciado interlamellar de la perlita es un factor que puede controlar tanto la ductilidad como la resistencia de los aceros perlíticos, en aceros con porcentajes elevados de carbono, el espaciado interlamellar ya no es la única variable que interviene en las propiedades mecánicas. Estas se pueden ser afectadas por la fracción de volumen de otra fase como la cementita, lo que limita la aplicación industrial de este tipo de aceros. Una alternativa que se ha buscado al paso del tiempo para desarrollar y mejorar las propiedades mecánicas en el alambrón de alta resistencia, sin encontrar un alto contenido en la fase cementita, ha sido la adición de elementos de aleación, ya que algunas investigaciones previas han demostrado que la adición de elementos de aleación, como por ejemplo el Cr, es una forma efectiva de mejorar la resistencia del alambrón de acero perlíticos estirados en frío.

**Montserrat Sofía López-Cornejo**  
**TECNOLÓGICO NACIONAL DE MÉXICO/Instituto Tecnológico de Morelia**

Montserrat Sofía López Cornejo is a Member of Mexico's National System of Researchers (SNI) since January 1st, 2022. She has a Bachelor's Degree in Materials Engineering, a Master's Degree in Metallurgy, and PhD Degree in Sciences from Instituto Tecnológico de Morelia. She worked for 5 years in the company Ternium Mexico, enrolled in different processes from HyL process, Scrap Reception, Secondary Metallurgy, and Steelmaking Refractories, to Hot Strip Mill. Since 2020, she has been enrolled as an Assistant Professor at Instituto Tecnológico de Morelia in the Materials Engineering Department. She is part of the Executive Committee for the ASM International Mexico Chapter, Young Professional Chair for the AIST Mexico Chapter, and Material Advantage Student Chapter Advisor. In 2022, she was recognized by the Association for Iron and Steel Technology with the Presidential Citation Award, being the first Mexican woman with such recognition. Since 2022, she has been a Kent D Peaslee Junior Faculty awardee for the same Association, for his unequalled passion for teaching and promoting the steel industry to students.

Her research and development projects are developed in companies in the Steelmaking sector, focused on the simulation of mechanical properties and microstructure in high-carbon wire rods. Her areas of expertise are ferrous metals manufacturing processes, clean steel practices, and heat treatment processes.