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Planar Flow Casting: Crystalline and Non-crystalline Ribbon Formation[1] JOSEPH MATTSON, Cornell University, ERIC THEISEN, Metglas Inc., PAUL STEEN, Cornell University — Planar flow casting (PFC) is a single-stage continuous casting process used in the production of thin metallic sheets. Molten metal is ejected from a reservoir and forced through a small gap to freeze against a translating substrate. The process is typically 'feed limited' which means that an imposed pressure drop determines the flow rate of metal to the solidification front, and thus the ultimate thickness of the solid sheet. Depending on the molten alloy, the substrate heat sink can provide sufficient cooling rates to produce a glassy (amorphous) metal. Otherwise, a crystalline solid is the result. In this talk, by relating ribbon thickness to residence time for both amorphous and crystalline products, we address the question: to what extent is processing 'blind' to the solidification mechanism?

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