Slot coating is one of the preferred precision coating method in the manufacturing of single and two layer coating products. The web can be wrapped around a back-up roll, in what is called fixed gap slot coating, or around a coating die, in what is called tensioned web slot coating. Slot coating belongs to a class of coating method known as premetered coating: the thickness of the coated liquid layer in principle is set by the flow rate fed to the die and the speed of the substrate moving past, and is independent of other process variables. Thus, premetered methods are ideal for high precision coating. The competition among viscous, capillary, pressure and elastic forces sets the range of operating parameters in which the viscous free surface flow of the liquid can be two-dimensional and steady, which is the desired state. The region in the space of operating parameters of a coating process where the delivered liquid layer is adequately uniform is usually referred to as a coating window. Knowledge of coating window’s for different coating methods is needed in order to predict whether a particular method can be used to coat a given substrate at a prescribed production rate. Coating window can be determined by extensive pilot-plant experiments or by a complete analysis of the coating flow and its stability limits.

In this presentation, a summary of the fundamentals of slot coating process and its operability limits is discussed, together with some aspects of advanced research being pursed at PUC-Rio.