Abstract
The logarithmic mean temperature difference (LMTD) has caused inconveniences in several applications like equation-oriented flow sheeting programs. Such inconveniences have arisen from its indeterminate form. This is a consequence of the incomplete model derivation generally developed in the textbooks. Heat exchanger dynamic analysis and control synthesis through lumped-parameter models using the LMTD as driving force (fluid mean temperature difference) may suffer from such inconsistencies too. This paper is devoted to give a solution to such inconveniences by providing a formal mathematical treatment of the LMTD. First, a complete derivation is restated resulting in a complete well-defined expression. Then, several interesting analytical properties of the resulting expression, like continuous differentiability on its domain, are proved. The usefulness of the results is highlighted throughout the text.

Keywords
logarithmic mean temperature difference, heat exchangers.