

Chapter 8

Aspects of Two-Phase Flow Distribution at Header-Channels Assembly

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Flow distribution pattern of two-phase mixture from a header to parallel channels is examined extensively. The first part of this paper introduces the flow configuration at single T-junctions that can be considered as the unit elements of the header-channels assembly of the compact heat exchangers. Experimental observations and appropriate models for prediction of flow split to the branch are reported. Then the effect of the flow interaction between two neighboring channels (branches) on the flow split pattern is considered. Finally, to simulate practical shape of the header-channels assembly of compact heat exchangers, test sections with multiple parallel channels and a partitioned header were tested. Dependence of the flow distribution pattern on various operating conditions and header-channels configurations is presented. As a way to achieve an even distribution of the flow from the header to parallel channels, depth of the channel intrusion to the header wall was adjusted; and 1/8 of the header hydraulic diameter was found to be the optimum value of the intrusion depth.

INTRODUCTION

Problem of flow distribution from a partitioned header to parallel channels, as shown in figure 1, is becoming of interest in predicting heat transfer performance of compact heat exchang-