

EVALUATIONS OF SUPERSONIC HIGH-TEMPERATURE AIR FLOWS PARAMETERS

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The experience of arc-heated flows parameters determination is under consideration. The main of the parameters is central flow-line total enthalpy which defines heat transfer to a test subject. Since there is no plasma enthalpy standard measures or reference means, in practice an arc-heater flow enthalpy determination involves various indirect measures and the chosen method accuracy assessment demands comprehensive approach.

The methods and techniques for arc-heater units flow enthalpy determination which are in use in world experimental practice as well as in practice of TsNIIMash complex of arc-jet units are described. Some of the techniques are developed for operative on-line use and experimental investigations based on different physical principles are periodically carried out to confirm an accuracy of the measurements.

It must be noted that arc-jet facilities are designed for thermal investigations and it is a flight thermal environment but not the flow enthalpy itself that must be reproduced in the tests. Naturally, the thermal loads in the flight and in the arc-jet experiment must be calculated using the same theoretical approaches.

Key words: arc heater, arc-jet facility, flow enthalpy, heat transfer, accuracy of measurement.