

# NASA TECH BRIEF



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## Heat Transfer Coefficients for Liquid Hydrogen Turbopumps

There are numerous complex modes of heat transfer that occur during transient startup operation of liquid hydrogen turbopumps. Empirical equations have been derived to establish the appropriate heat transfer coefficients as functions of the temperature drops and heat transfer rates for a wide range of convective and boiling conditions at different locations in a liquid hydrogen turbopump.

**Note:**

Documentation for the innovation is available from:

Clearinghouse for Federal Scientific  
and Technical Information  
Springfield, Virginia 22151  
Price \$3.00  
Reference: B68-10517

**Patent status:**

No patent action is contemplated by NASA.

Source: W. R. Wagner and W. R. Bissel  
of North American Rockwell Corporation  
under contract to  
Marshall Space Flight Center

(MFS-18345)

Category 02



# NASA TECH BRIEF

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## High Temperature Oxidation of Liquid Hydrocarbon Fuels

This report describes the results of a study conducted to determine the high temperature oxidation characteristics of liquid hydrocarbon fuels. The study was conducted using a flow reactor system which allowed the oxidation of the fuels to be studied under conditions of high temperature and high pressure. The results of the study show that the oxidation of the fuels is a complex process which is influenced by a number of factors, including the fuel composition, the temperature, and the pressure. The study also shows that the oxidation of the fuels is a highly exothermic process, and that the heat released during the oxidation can be used to generate power.

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