

December 1970

Brief 70-10667

NASA TECH BRIEF



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Heat-Transfer Data for Hydrogen

Experimental heat-transfer data have been compiled for the turbulent flow of hydrogen within straight, electrically heated, round cross-section tubes. Tube inner diameters ranged from 0.0945 to 0.480 in. Tube materials were nickel, stainless steel 321 (with or without copper plating), or molybdenum. The data collected during the 276 separate experiments cover the gaseous region (bulk inlet temperature exceeding 135°R). Heat fluxes reached 28.4 Btu/in²-sec, and test-section inlet pressures reached 2500 lb/in.² absolute.

The following information for each run is presented: pressure at the inlet-end bus bar (lb/in², absolute); drop in pressure between the two bus bars (lb/in²); flow rate (lb/sec); total electrical heat generated (Btu/sec); and heat balance (percentage). A heat balance of 0% represents a perfect accounting for the energy transferred in the test section; values lower than about 5% reflect particularly good tests. The

absolute heat balance reported averaged 4.83% for all experiments.

Notes:

Requests for further information may be directed to:

Technology Utilization Officer
Code A&TS-TU
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: TSP70-10667

Patent status:

No patent action is contemplated by NASA.

Source: J. R. McCarthy, W. S. Miller,
A. S. Okuda, and J. D. Seader of
North American Rockwell Corp.
under contract to
Marshall Space Flight Center
(MFS-18754)

Category 03

NASA TECH BRIEF



High-Speed Data Acquisition

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1. Title: High-Speed Data Acquisition

2. Author: [Name]

3. Date: [Date]

4. Report Number: [Number]

5. Contract Number: [Number]

6. Grant Number: [Number]

7. Work Order Number: [Number]

8. Project Number: [Number]

9. Other Identifying Numbers: [List]

10. Distribution Statement: [Statement]

11. Abstract: [Abstract]

12. Key Words: [List]

13. Subject Terms: [List]

14. Availability Statement: [Statement]

15. Price: [Price]

16. Order Number: [Number]

17. Order Description: [Description]

18. Order Source: [Source]

19. Order Date: [Date]

20. Order Status: [Status]

21. Order Comments: [Comments]

22. Order History: [History]

23. Order Tracking: [Tracking]

24. Order Management: [Management]

25. Order Support: [Support]

26. Order Feedback: [Feedback]

27. Order Evaluation: [Evaluation]

28. Order Improvement: [Improvement]

29. Order Innovation: [Innovation]

30. Order Research: [Research]

31. Order Development: [Development]

32. Order Production: [Production]

33. Order Distribution: [Distribution]

34. Order Marketing: [Marketing]

35. Order Sales: [Sales]

36. Order Service: [Service]

37. Order Customer Satisfaction: [Satisfaction]

38. Order Customer Retention: [Retention]

39. Order Customer Loyalty: [Loyalty]

40. Order Customer Advocacy: [Advocacy]

41. Order Customer Engagement: [Engagement]

42. Order Customer Interaction: [Interaction]

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46. Order Customer Touchpoints: [Touchpoints]

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49. Order Customer Insights: [Insights]

50. Order Customer Analytics: [Analytics]

51. Order Customer Segmentation: [Segmentation]

52. Order Customer Targeting: [Targeting]

53. Order Customer Personalization: [Personalization]

54. Order Customer Retention Strategies: [Strategies]

55. Order Customer Acquisition Strategies: [Strategies]

56. Order Customer Lifetime Value: [Lifetime Value]

57. Order Customer Churn Rate: [Churn Rate]

58. Order Customer Satisfaction Score: [Score]

59. Order Customer Net Promoter Score: [Score]

60. Order Customer Effort Score: [Score]

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