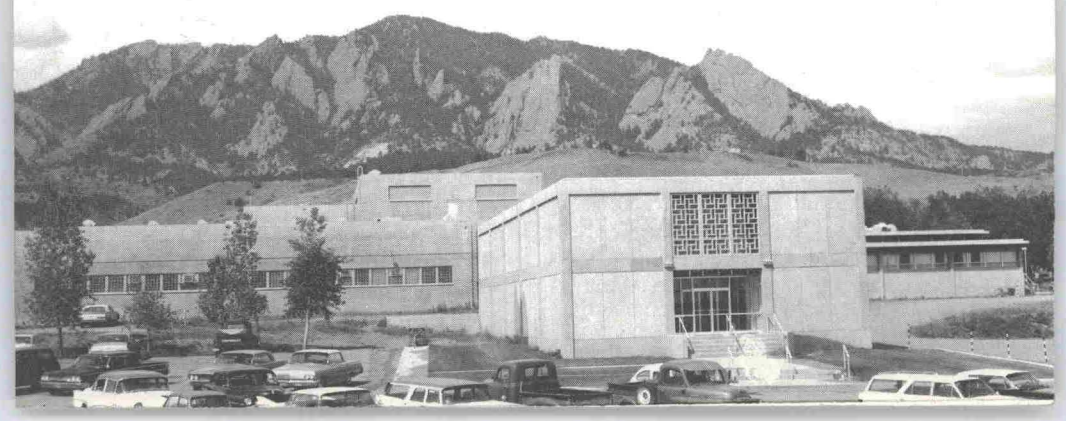
CRYOGENIC DATA CENTER

RESUME OF ACTIVITIES

AND SERVICES

NBS

NATIONAL BUREAU OF STANDARDS
INSTITUTE FOR MATERIALS RESEARCH
BOULDER, COLORADO



DATA COMPILATION ACTIVITIES

The Cryogenic Data Compilation Unit is engaged in the critical evaluation and compilation of data on the properties (thermodynamic, transport, and other thermophysical properties) for the principal fluids (and common mixtures of these fluids) used at low temperatures; namely:

Helium	Nitrogen	Carbon Monoxide	Methane
Hydrogen	Oxygen	Fluorine	Xenon
Neon	Air	Argon	Krypton

The scope of the compilation program also includes the properties of metallic elements, selected alloys, and element dielectrics as follows:

Electrical Resistivity	Thermal Conductivity	Specific Heat
Dielectric Constant	Thermal Expansion	Enthalpy

Ultimately it is expected that data will be compiled for the mechanical properties of structural materials; however, it may be some time yet before tasks are started.

The thermodynamic properties of fluids being pursued are:

Pressure-Volume-Temperature
Vapor Pressure, Latent Heat, Saturation Densities
Isothermal Compressibility, Volume Expansivity
Entropy, Enthalpy, Internal Energy
Specific Heats (C_p. C_v, C_{sat})
Velocity of Sound

The transport properties of fluids included in the program are:

Thermal Conductivity	Prandtl Number	Thermal Diffusion
Viscosity	Diffusion Coefficients	Coefficients

Other thermophysical properties include:

Dielectric Constant, Refractive Index	Electrical Resistivity	Magnetic Properties
Dielectric Breakdown	Surface Tension	Optical Properties

The literature is monitored on a continuing basis for all phases of the above program. As specific tasks are undertaken, comprehensive bibliographies are prepared and sometimes published. Task notebooks are made for preliminary selection of data and, where feasible, preliminary data sheets are issued. Critical evaluation is done by the senior staff consisting of two physicists, one engineer (thermodynamic), chemist, and physical chemist. The staff collaborates with theoretical groups within NBS and with consultants for better development of the theory where pertinent. The Data Compilation Unit operates as part of the National Standard Reference Data Program. The work is currently sponsored by the National Aeronautics and Space Administration.

DOCUMENTATION ACTIVITIES

Literature Searching. An awareness of publications and reports of cryogenic interest is maintained by the regular review of a hundred or more periodicals subscribed to by the Data Center, by a weekly review of the "Current Contents" service, by reviewing some fifteen abstract journals, and by noting references in cryogenic documents. 150 to 200 items are noted weekly.

Literature Procurement. Published literature is obtained from local, national, and foreign libraries. A sizable portion is obtained on microfiche from the Technical Library at Delft, Holland. (The service from Delft is economical, fast, and quite comprehensive.) Report literature is procured mostly from the large national centers (NASA, DDC, and the Clearinghouse). Many new reports are obtained directly from the corporate source as a part of the Data Center's program of information exchange.

Cataloging, Coding, and Machine Processing. In addition to standard library cataloging of pertinent literature selected for the system, it is coded into nine main subject categories such as properties of solids and of fluids, cryogenic processes and equipment, instrumentation and laboratory apparatus, cryogenic techniques, etc. Further characteristic coding is then assigned as to the type of document, temperature range, type and range of the data, etc. This is followed by comprehensive subject coding based on the Data Center's thesaurus or dictionary of terms.

Bibliographic Storage and Retrieval. All cataloging and coding is converted to machine readable form for automated processing on the Boulder Laboratories' Control Data Corporation 3600 computer. The principal programs used are for searching, dictionary term identification, and for catalog tape output. Smaller programs are also in use for additional indexing, tape updating, corrections, etc. Custom bibliographies are prepared for specific subjects or for broad subject areas. Indexing follows from the nature of search queries and can be quite detailed. An average of 1 or 2 major searches are made each week plus a number of small ones for answers to single questions.

Distribution of Literature and Data. Announcements and abstract cards of new literature evolving from the Cryogenic Laboratory's Research Program are sent to nearly 3000 persons and institutions periodically. Nearly five hundred separate items of literature are now available. Fifteen to twenty thousand documents a year are distributed in response to some two thousand orders. Plans are underway with the Clearinghouse to take over much of this distribution.

SERVICES

Current Awareness Service. Weekly lists of new literature of cryogenic interest are prepared and distributed to anyone desiring them. A subscription may be entered simply by filling out the accompanying postal reply card.

Custom Bibliographies. Over 36,000 accessions of cryogenic literature have been entered into the Data Center's system. Approximately 15.000 of these on properties of materials (for both fluids and solids) have been processed for machine searching. Detailed and/or extensive bibliographies can be prepared with computer facilities. Likewise, some 1500 patents, 1300 articles on processes and equipment, and 500 articles on instrumentation have now been processed for machine retrieval. The cost of custom searches is based on a rate of $12 per minute of computer time plus 15¢ per reference for listing and indexing. Simple searches can be made for as little as $15 to $20. More extensive searches are proportionately higher. The feasibility and estimated cost of a search can be obtained from Mr. Neil A. Olien, Project Leader for the Documentation Group. His telephone number is 443-2161, Ext. 3834, Area Code 303.

Preliminary Data and Advice on the thermodynamic and transport properties of cryogenic fluids and selected solids can be obtained from Dr. R. B. Stewart, Project Leader for the Data Compilation Group. His telephone number is 442-2161, Ext. 3528, Area Code 303.

Announcements of Cryogenic Laboratory Publications and Reports are available to anyone wishing to be placed on the mailing list. Request can be made for inclusion on the mailing list by completing and returning the postal reply card. Distribution of this literature is currently being handled from the Cryogenic Data Center; however, it is expected that this function will soon be transferred to the government Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia, 22151.

Local Use of the Data Center. Visitors are invited to use the Center's library, world literature file, catalog and abstract files, microfilm facilities, etc., whenever it is convenient for them to do so. The staff of both the Data Compilation and the Documentation units are happy to help with answers to questions, to aid with hard-to-find type of literature, or to offer advice as to best sources of information.

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