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## **Technology**

**(Classes T, TA, TC, TD, TE, TF, TG, TH, TJ, TK, TL, TN, TP, TR, TS, TT, and portions of Z)**

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### **I. Scope**

This Collections Policy Statement covers class T. For purposes of this statement, technology is not synonymous with engineering - which it includes - nor is it defined as strictly applied science. Rather it is a much wider concept encompassing the totality of the means, processes, and machines that contribute to the creation of material objects with a practical purpose. This statement for Technology covers the subclasses: T (Technology, General.), TA (Engineering--General. Civil Engineering.), TC (Hydraulic Engineering. Ocean Engineering.), TD (Environmental Technology. Sanitary Engineering.), TE (Highway Engineering. Roads and Pavements.), TF (Railroad Engineering and Operation.), TG (Bridge Engineering.), TH (Building Construction.), TJ (Mechanical Engineering and Machinery.), TK (Electrical Engineering. Electronics. Nuclear Engineering.), TL (Motor Vehicles. Aeronautics. Astronautics.), TN (Mining Engineering. Metallurgy.), TP (Chemical Technology.), TR (Photography.), TS (Manufactures.), TT (Handicrafts. Arts and Crafts.) and associated materials classed in bibliography, indexes, and abstracting services in class Z. The following Collections Policy Statements also cover selected areas within the T class: Biotechnology; Chemical Sciences; Computer Science, Telecommunication and Artificial Intelligence; Earth Science; Environmental Science; History of Science and History of Technology; Human Nutrition and Food Technology; Standards; Technical Reports, Working Papers, and Preprints as well as the Statements for Electronic Resources, Dissertations and Theses, and Web Capture & Archiving for a more complete picture of the Library's collecting policies in technology.

### **II. Research Strengths**

#### **A. General**

The Library's holdings in applied science and technology are strong, as befit the national library of a nation that has been known for technological accomplishments since colonial days. The Library's

collections are particularly strong for doing historical research and for tracing developments in technology and the physical infrastructure of the nation. Titles number over 650,000. Areas of current strength include engineering mathematics; materials science; surveying; structural engineering; structural analysis; structural design; applied optics and lasers; hydraulic engineering; harbors and coast protective works; river, lake, and water supply engineering; environmental technology and sanitary engineering; water supply; water and wastewater treatment; solid waste management; air pollution; railroad engineering; bridge engineering; building construction; mines, mining, and mineral resources; practical mining operations, safety measures, ore deposits and mining of particular metals, ore dressing and milling, metallurgy, metallography, physical metallurgy, metallurgy of ferrous metals, coal, petroleum, natural gas; chemical technology: chemical engineering, manufacture and use of chemicals, industrial electrochemistry, fuel, food processing and manufacture, low temperature engineering, oils, fats, and waxes, polymer and polymer manufacture; most areas of photography; and clothing manufacture.

## **B. Areas of distinction**

For many areas of these subclasses the great strength of the collection is in the wide variety of its monographs, domestic and foreign journals, society publications, congresses, and monographs. Also of significant note are the many works that parallel the history and development of various fields of knowledge, such as surveying, railroad engineering, motor transport, electronics, rocket propulsion, industrial electrochemistry, color photography, and clothing manufacture.

The Library's collections related to technology are distinctive in number, language, scope, and level of comprehensiveness. Holdings of 19<sup>th</sup>-century technological journals are particularly remarkable. There are long runs of such important titles as *Iron Age*, *Scientific American*, the *Franklin Institute Journal*, the *London Journal of the Arts*, and *English Mechanic*. The Library's holdings of materials on exhibitions and world's fairs are admirable in quantity and variety. Long runs of journals in many areas are common and include the *United States Patent Office Official Gazette*, *American Railroad Journal*, *Railroad Gazette*, *American Machinist*, *Electrical World*, *Flight*, *Aeroplane*, *Coal Age*, and *Chemical Age*. Journals, conference proceedings, transactions, and other publications of learned and professional societies, research institutes, major universities, and government agencies, and numerous other institutions, both foreign and domestic, are well represented. These include the American Society for Testing and Materials, Bell Laboratories, the American Society of Mechanical Engineers, the Institute of Electrical and Electronics Engineers, Institution of Electrical Engineers, the American Society of Civil Engineers, National Advisory Committee for Aeronautics, and the National Aeronautics and Space Administration. Foreign publications, especially in Russian, German, and French as well as bilingual and multilingual dictionaries are found throughout the collections. Biographical material from all periods, in many languages and in widely-ranging formats, from print to electronic, provide historians of technology, scholars, biographers, and researchers with unparalleled resources related to technology. Formed and shaped by the research needs of Congress, government agencies, scientists, engineers, historians, and the public, the Library's collections related to technology are notable for their broad appeal and usefulness. Emphasis has been placed on collecting materials that support research on current issues, legislation, and public policy as well as to support scientific and technical literacy, literature reviews, scholarly research, and Congressional debate. Beginning with the last quarter of the 20<sup>th</sup> century, a variety of electronic resources have provided improved bibliographical access to many of the Library's materials related to technology. Since the 1990s, electronic journals, conference papers, born-digital materials, web sites, and other electronic resources related to

technology were added to the Library's collections, using these same collection policies. The Selection Guidelines for Electronic Resources provide additional direction and guidance.

For many areas of these subclasses, the great strength of the collection is in its long unbroken runs of domestic and foreign serials, society publications, conference proceedings, and monographs often dating back to the 19<sup>th</sup> century. Materials recording the history of American infrastructure and public works as well as those chronicling the history of the world's infrastructure throughout time are important, extensive and diverse. The *LC Science Tracer Bullet: Infrastructure and Public Works* highlights titles that provide information on the men, materials, and engineering feats that went into the building of bridges, dams, elevated railways, power and pipe lines, waterways, and the highway system. The construction of the Brooklyn Bridge, the Hoover Dam, and the Panama Canal are always of interest to engineering students and armchair engineers. The Library's collections of reports of commissions and exploring expeditions, personal narratives, newspaper accounts, groundwater reports, survey data, maps, photographs, coupled with the papers of engineers and government officials involved in public works, such as Alexander Robey "Boss" Shepherd, Montgomery C. Meigs, and Benjamin Brown French, provide a plethora of resources for the scientist, engineer, and historian of science.

Books such as *Death Rode the Rails: American Railroad Accidents and Safety, 1828-1965* (Baltimore, Johns Hopkins University Press, 2006), *The Parking Garage: Design and Evolution of a Modern Urban Form* (Washington, Urban Land Institute, 2007), and *One Time Fits All: The Campaign for Global Uniformity* (Stanford, Stanford University Press, 2007) were written using the Library's technology collections which are superb in 19<sup>th</sup> and 20<sup>th</sup> century technology. Communication technology, transportation technology, machine tools, mass production, and building of the nation's infrastructure are chronicled in the journals, conference proceedings, transactions, and other publications of the American Society for Testing and Materials, the Bell Laboratories, the American Society of Mechanical Engineers, the Institute of Electrical and Electronics Engineers, Institution of Electrical Engineers, the American Society of Civil Engineers, National Advisory Committee for Aeronautics, and the National Aeronautics and Space Administration.

The Library's holdings in aeronautics and astronautics are arguably the strongest of any library in the world and are fully described in *Aeronautical and Astronautical Resources of the Library of Congress: A Comprehensive Guide* (Washington, Library of Congress, 2007). Here one finds references to the German/Japanese aeronautical documents, the editorial morgue of the French aeronautical journal *L'Aérophile*, and a section on aeronautics and astronautics by country and region. Len Bruno's *The Tradition of Technology: Landmarks of Western Technology in the Collections of the Library of Congress* (Washington, Library of Congress, 1995) highlights unknown classics as well as seminal works in technology from Greco-Roman times to the 20<sup>th</sup> century. The history of technology is the history of the invention of tools and techniques and examples of science-driven technology and technology-pushed science abound in the collections of the Library of Congress.

T. R. Reid's *The Chip: How Two Americans Invented the Microchip and Launched a Revolution* (New York, Random House, c2001) was written in the Science Reading Room using the Library's collections, The works of Tesla, Henry, Faraday, Morse, and Edison, the multi-volume *History of Engineering and Science in the Bell System*, the papers of American technologists, inventors, and engineers, Lee DeForest, Andrew Ellicott, George Washington Goethals, John A. B. Dahlgren, John Ericsson, Frederic E. Ives, Mahlon Loomis, and many others, provide a cornucopia of sources for the scientist, historian,

and author.

As previously mentioned, the Library's collections of the records of government-sponsored research, development, and invention are enormous and well-documented in its collections of technical reports, standards, and gray literature. It holds documents issued during and immediately following World War II by the Office of Scientific Research and Development (OSRD) and other government bodies, an extensive collection of foreign technical reports, federal and military standards as well as international standards. The OSRD, which superseded the work of the National Defense Research Committee (NDRC), whose documents are also in the Library, coordinated scientific research for military purposes during the war and was run by Vannevar Bush, whose papers are held in the Library's Manuscript Division. Since the research was widely varied and included projects devoted to new and more accurate bombs, radar, early-warning systems, more versatile vehicles, and gave rise to the Manhattan Project, it is an important component of the Library's history of technology collections.

Areas of greatest strength are materials science (TA401-492); surveying (TA501-625); sewage collection and disposal systems, sewerage (TD511-780); municipal refuse, solid wastes (TD785-812); highway engineering, roads (TE1-155); aeronautics (general) TL500-TL777); aeronautics--aerodynamics (TL570-577); chemical technology (general) (TP1-TP154); chemical engineering (TP155-156); fuel (TP315-360); food processing and manufacture (TP368-TP465); polymers and polymer manufacture (TP1101-TP1185); and clothing manufacture (TT490-TT695). Subject areas that are scattered over various subclasses and elsewhere in the collections include materials science, nanotechnology, and infrastructure.

In addition to the over 650,000 titles (1+ million volumes) in the T class, the Science, technology and Business Division has custody of an extensive collection of standards, specifications, and technical reports in print, microform, and electronic format in its technical reports and standards collections. The Library's electronic resources are also accessible from staff and public terminals throughout the Library.

### **III. Acquisition Sources, Current and Future**

The Library acquires materials in technology in all formats and languages, e.g., print materials, microforms, audio, video, and electronic, from a variety of sources, e.g., copyright deposit, Cataloging in Publication (CIP), the Library's field offices, purchase, gift, and exchange. The Collections Policy Statement for Electronic Resources, the Selection Guidelines for Electronic Resources, the Collections Policy Statements for Web Capture & Archiving, the Policy Statement for Dissertations and Theses, and the Copyright Office's "Best Edition Statement" are used in conjunction with this policy statement to maintain the Library's collecting strengths in technology and to support the work of Congress, scientists, engineers, scholars, educators, and citizens throughout the country and the world. The Library acquires materials in foreign languages that reflect the science and governmental policy of other nations and their natural resources and infrastructure. As e-prints, podcasts, webcasts, and new technologies for creating material related to technology proliferate, these will be collected primarily either at the comprehensive level or the research level. Textbooks, laboratory manuals, and study guides will be collected at the instructional support level. Laboratory manuals and study guides to accompany an existing text are generally not acquired. Laboratory manuals that function as standalone works may be acquired for the collection.

The challenge is to keep up with the volume of publications in technology, to keep current, to capture those publications that are born digital before they disappear, to keep track of print titles that suddenly turn digital, and to acquire e-journals that are not purchased through an aggregated database. As more publications are issued digitally, the Library must ensure that all important and appropriate information is added to the collections and that the data formats represented in the collections of the Library of Congress in the area of technology are maintained to assure continued access to digital information. Electronic obsolescence is not an option for science and technology materials.

As certain materials migrate from print to digital-only format, these are frequently collected into the Electronic Resources area of the Library, within the online public access catalog and/or through an electronic link. These sources may be freely available, or may require a subscription, as in the case of many electronic resources. Both are actively collected, and will continue to be collected in the future.

Digital formats have increasingly blurred the line among databases of abstracts, citations and full-text materials, so that a given database may provide what is essentially an electronic journal for one title, while providing a citation with no text for another journal. Differences in periods of coverage also contribute to making a precise assessment of the number and nature of available electronic resources somewhat difficult. Reliably strong sources for electronic materials in the area of technology include the subscription databases *Applied Science and Technology Full Text*, *Conference Papers Index*, *CSA Technology Research Database*, *Digital Dissertations*, *ECO: Electronic Collections Online*, *EI Compendex (Engineering Index)*, *INSPEC*, *Knovel Library*, *National Technical Information Service*, *Papers First*, *Proceedings First*, *Proquest Databases*, *Readers' Guide Retrospective*, and *Web of Science*.

Freely available electronic resources collected by the Library, that often have materials of interest in the area of the technology include *Canada Institute for Scientific and Technical Information (CISTI)*, *Cold Regions Bibliographies*, *Corps of Engineers Library Information Online*, *Department of Transportation Digital Special Collections*, *Directory of Published Proceedings*, *Energy Citations Database*, *IEEE Conference Search*, *NACA Technical Reports Server*, *NASA Technical Reports Server*, *National Academies Press*, *NIST Scientific and Technical Databases*, *Office of Technology Assessment Archive*, *SCIRUS*, *Thomas Register*, and *STINET MultiSearch*. Freely available resources such as these sometimes demonstrate that the overlap between web sites and online databases can again blur distinctions. Part of the process of collection development and maintenance is to properly link these resources together, and to take into account the issues related to the capture and archiving of web sites.

Received through copyright deposit and other sources are many books, conferences, and even journals that are accompanied with CDs. These include many of the standard reference tools related to technology. Since the technology for viewing these CDs is not generally supported in most of the Library's reading rooms, materials with CDs must be viewed in the Main Reading Room. Podcasts and webcasts produced by the Library are currently collected on the Library of Congress web site. Increasingly, links to these materials at other web sites are being collected, and these materials can be expected to become more integral to the electronic resources collections in the future.

#### **IV. General Collecting Policy and Collecting Levels**

The Library of Congress endeavors to acquire for its permanent collections all important as well as an extensive and representative sample of the less important materials in the following areas of applied science and technology at a research level: general technology, patents, trademarks, civil engineering, materials science, hydraulic engineering, ocean engineering, environmental engineering, highway and transportation engineering, bridge engineering, building construction, mechanical engineering and machinery, energy, electrical engineering, nuclear engineering, motor vehicles, mining engineering, metallurgy, chemical engineering, photography, and clothing manufacture. The Library endeavors to acquire materials at a comprehensive level in general technology (most areas of subclass T with the exception of foreign patents and trademarks), railroad engineering (subclass TF), aeronautics and astronautics (subclass TL550 onwards), chemical technology (subclass TP). In areas where the collecting level is less than a research level, the Library strives to collect periodical and society publications, conference proceedings, congresses, dictionaries, and the most important monographs and electronic resources.

In addition to materials published in the United States, the Library of Congress endeavors to acquire both materials from other nations that contain new knowledge developed or discovered around the world, materials that provide an analysis about science and technology in the United States and other nations, materials that represent original research or are written by recognized authors. There will be less emphasis on acquiring materials that are treated uniformly in all countries and languages. Examples of desired materials are those about natural resources (e.g., works containing information or data on mineral resources, energy resources, hydrological resources and data, climate and climatological data; nuclear engineering; resources of mineral, petroleum, and gas); environment; infrastructure (e.g., transportation, water supply, electrical power, energy, etc.); and other areas of science, engineering, and technology (e.g., aeronautics, nanotechnology, materials sciences, and manufacturing).

## V. Collection Levels

<u>LC Subclass</u>	<u>Subject</u>	<u>Level</u>
T	Technology, General	5
TA	Engineering—General. Civil Engineering.	4
TC	Hydraulic Engineering. Ocean Engineering.	4
TD	Environmental Technology. Sanitary Engineering.	4
TE	Highway Engineering. Roads and Pavements.	4
TF	Railroad Engineering and Operation	5
TG	Bridge Engineering	4
TH	Building Construction	4
TJ	Mechanical Engineering and	4

	Machinery	
TK	Electrical Engineering. Electronics. Nuclear Engineering.	4
TL	(Motor Vehicles. Aeronautics. Astronautics.) Motor Vehicles Aeronautics. Astronautics.	4 5
TN	Mining Engineering. Metallurgy.	4
TP	Chemical Technology	5
TR	Photography	4
TS	Manufactures	4
TT	Handicrafts. Arts and Crafts.	4
Z		5

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