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## A E R O N A U T I C S

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Washington, D. C.

Publications by the Staff of the National Bureau of Standards.

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GENERAL INFORMATION

This Letter Circular is a list of papers on aeronautics and closely related subjects by members of the staff of the National Bureau of Standards. Some of these have appeared in the regular series of the Bureau, others in the publications of the National Advisory Committee for Aeronautics, and still others in scientific and technical journals.

Unless specifically stated, the papers herein listed are not obtainable from the Bureau. Those marked "OP" are out of print, but, in general, may be consulted at the larger technical libraries. Those marked "Restricted" are not available for general distribution. Questions regarding copies should be taken up with the issuing agency.

Where the price is stated, the publication can be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C. The prices quoted are for delivery to addressees in the United States and its territories and possessions and in certain foreign countries which extend the franking privilege. In the case of all other countries, one-third the cost of the publication should be added to cover postage. Remittances should be made either by coupons (obtainable from the Superintendent of Documents in sets of 20 for \$1.00 and good until used), or by check or money order payable to the "Superintendent of Documents, Government Printing Office" and sent to him with order.

The Bureau's publications and those of the National Advisory Committee for Aeronautics are designated by a series letter followed by a number. The meanings of the letters are as follows:

RP = "Research Paper." These are reprints of articles appearing in the "Journal of Research of the National Bureau of Standards." (Prior to July 1934 this was known as "Bureau of Standards Journal of Research.") When applying at a library, the Journal should be asked for, using the volume number given in the reference.

S = "Scientific Paper" of the National Bureau of Standards. This series has been superseded by the "Journal of Research."

T = "Technologic Paper" of the National Bureau of Standards. This series has likewise been superseded by the "Journal of Research."

C = "Circular" of the National Bureau of Standards.

CS = "Commercial Standard" of the National Bureau of Standards.

H = "Handbook" of the National Bureau of Standards.

M = "Miscellaneous Publication" of the National Bureau of Standards.

TM = "Technical Memorandum" of the National Advisory Committee for Aeronautics, Washington, D. C. (Mimeographed.)

'TN = "Technical Note" of the National Advisory Committee for Aeronautics, Washington, D.C. (Mimeographed.) Unless marked "OP" or "Restricted," these are obtainable without charge from the Committee.

TR = "Technical Report" of the National Advisory Committee for Aeronautics. These reports are published separately and also in the annual volumes of the Committee. These volumes are available for reference in certain technical libraries and in the Office of Aeronautical Intelligence, National Advisory Committee for Aeronautics, Washington, D.C. A table showing the Technical Reports included in each annual volume up to Vol. 25 (1939), the last one printed, will be found below. Beginning with TR 683 (June 1, 1940), the distribution of Technical Reports has been placed on a "Restricted" basis.

Annual volume	Fiscal year	Containing Technical Reports Nos.	Price	Annual volume	Fiscal year	Containing Technical Reports Nos.	Price
1st	1915	1-7	OP	13th	1927	257-282	OP
2nd	1916	8-12	OP	14th	1928	283-308	\$ 1.25
3rd	1917	13-23	OP	15th	1929	309-336	2.35
4th	1918	24-50	OP	16th	1930	337-364	3.00
5th	1919	51-82	OP	17th	1931	365-400	3.00
6th	1920	83-110	OP	18th	1932	401-440	2.50
7th	1921	111-132	OP	19th	1933	441-474	2.50
8th	1922	133-158	OP	20th	1934	475-507	2.75
9th	1923	159-185	OP	21th	1935	508-541	2.75
10th	1924	186-209	OP	22nd	1936	542-576	2.50
11th	1925	210-232	OP	23rd	1937	577-611	OP
12th	1926	233-256	OP	24th	1938	612-644	2.25
				25th	1939	645-680	OP

In the case of papers in scientific or technical journals, the name of the journal or of the organization publishing the article is given in abbreviated form, with address in parentheses, together with the volume number (underscored), page, and year of publication in the order named. These journals are, in general, available at technical libraries or may be obtained from the publishers direct. The Bureau can not supply copies of these journals, or reprints from them, and it is unable to furnish information as to their availability or price.

## AERODYNAMICS

Title	<u>Series</u>	<u>Price</u>
Air forces on circular cylinders, axes normal to the wind, with special reference to dynamical similarity. H.L. Dryden. Sci. Pap. BS, <u>16</u> , 489 (1920).	S394	OP
Wind pressure on structures. H.L. Dryden and G.C. Hill. Sci. Pap. BS, <u>20</u> , 697 (1926).	S523	20c
The characteristics of two-blade propeller fans. H.L. Dryden and P.S. Ballif. BS J. Research, <u>5</u> , 185 (1930).	RP193	10c
Wind pressure on circular cylinders and chimneys. H. L. Dryden and G.C. Hill. BS J. Research, <u>5</u> , 653 (1930).	RP221	OP
Further measurements of propeller fan characteristics. H. L. Dryden and P. S. Ballif. BS J. Research, <u>6</u> 387 (1931).	RP283	10c
Wind pressure on a model of a mill building. H. L. Dryden and G. C. Hill. BS J. Research, <u>6</u> 735 (1931).	RP301	10c
Wind pressure on a model of the Empire State Building. H. L. Dryden and G. C. Hill. BS J. Research, <u>10</u> 493 (1933).	RP 545	5c
Aerodynamic characteristics of automobile models. R. H. Heald. BS J. Research, <u>11</u> 285 (1933).	RP591	5c
Influence of neighboring structures on the wind pressure on tall buildings. C.L. Harris. BS J. Research, <u>12</u> , 103 (1934).	RP637	5c
Comparison of the ground-plane and image methods for representing ground effect in tests on vehicle models. R. H. Heald. J. Research NBS, <u>13</u> , 863 (1934).	RP 748	5c
Air forces and yawing moments for three automobile models. R. H. Heald. J. Research NBS, <u>13</u> , 871 (1934).	RP749	5c
Effect of humidity in hot-wire anemometry. G. B. Schubauer. J. Research NBS, <u>15</u> , 575 (1935).	RP850	5c
Performance characteristics of a water current meter in water and in air. G. B. Schubauer and M. A. Mason. J. Research NBS, <u>18</u> , 351 (1937).	RP 981	5c

<u>Title</u>	<u>Series</u>	<u>Price</u>
Effect of yaw on vane anemometers. R.H. Heald and P. S. Bellif. J. Research NBS, <u>19</u> , 685 (1937).	RP1056	10c
Aerodynamic characteristics of airfoils at high speeds. L. J. Briggs, G. F. Hull, and H. L. Dryden. (1924).	TR207	10c
Investigation of turbulence in wind tunnels by a study of the flow about cylinders. H.L. Dryden and R. H. Heald. (1926).	TR231	OP
Pressure distribution over airfoils at high speeds. L. J. Briggs and H. L. Dryden. (1927).	TR255	15c
Effect of variation of chord and span of ailerons on rolling and yawing moments in level flight. R. H. Heald and D. H. Strother. (1928).	TR298	10c
Aerodynamic characteristics of twenty-four airfoils at high speeds. L.J. Briggs and H. L. Dryden. (1929).	TR319	OP
The measurement of fluctuations of air speed by the hot wire anemometer. H.L. Dryden and A. M. Kuethe. (1929).	TR320	OP
Effect of turbulence in wind tunnel measurements. H. L. Dryden and A. M. Kuethe. (1930).	TR342	10c
Effect of variation of chord and span of ailerons in rolling and yawing moments at several angles of pitch. R. H. Heald, D. H. Strother, and B. H. Monish. (1930).	TR343	OP
Aerodynamic characteristics of circular-arc airfoils at high speeds. L. J. Briggs and H. L. Dryden. (1930).	TR365	10c
Effect of variation of chord and span of ailerons on hinge moments at several angles of pitch. B. H. Monish. (1930).	TR370	OP
Reduction of turbulence in wind tunnels. H. L. Dryden. (1931).	TR392	10c
The effect of area and aspect ratio on the yawing moments of rudders at large angles of pitch on three fuselages. H. L. Dryden and B. H. Monish. (1932).	TR437	5c

<u>Title</u>	<u>Series</u>	<u>Price</u>
Improved apparatus for the measurement of fluctuations of air speed in turbulent flow. W.J. Mock, Jr. and H. L. Dryden. (1932).	TR448	OP
Computation of the two-dimensional <sup>flow</sup> in a laminar boundary layer. H. L. Dryden. (1934).	TR497	5c
A turbulence indicator utilizing the diffusion of heat. G.B. Schubauer. (1935).	TR524	5c
Air flow in a separating laminar boundary layer. G. B. Schubauer. (1935).	TR527	OP
The effect of turbulence on the drag of flat plates. G. B. Schubauer and H. L. Dryden. (1936).	TR546	5c
Air flow in the boundary layer near a plate. H. L. Dryden. (1936).	TR562	OP
Measurements of intensity and scale of wind tunnel turbulence and their relation to the critical Reynolds number of spheres. H. L. Dryden, G.B. Schubauer, W. C. Mock, Jr. and H. K. Skramstad. (1937).	TR581	15c
Alternating-current equipment for the measurement of fluctuations of air speed in turbulent flow. W. C. Mock, Jr. (1937).	TR598	10c
Notes on aerodynamic forces on airship hulls. L. B. Tuckerman. (1923).	TN129	OP
Rolling, yawing, and hinge moments produced by rectangular ailerons. R. H. Heald. (1933).	TN441	OP
Effect of aileron displacement on wing characteristics. R. H. Heald. (1933).	TN448	OP
Section on "Aerodynamics". L. J. Briggs and H. L. Dryden. International Critical Tables, 1, 402 (1926) McGraw-Hill Publishing Co. 7330 West 42nd St., New York, N.Y.)		
Control of airplanes at low speeds by means of conventional ailerons. Anonymous. Aero Branch, Dept. of Commerce, Aero. Bul. 15 (July 1, 1931).		

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The pressure of the wind on large chimneys. H. L. Dryden and G. C. Hill. Proc. Nat. Acad. Sci. (Washington, D.C.) (November, 1930).

Side winds abate performance gains hoped for from streamlining. R. H. Heald. SAE Journal (29 West 39th St., New York, N.Y.), 33, 18 (1933).

Turbulence, companion of Reynolds number. H. L. Dryden. J. Aero. Sciences, (30 Rockefeller Plaza, New York, N.Y.), 1, 67 (1934). (Reprints available on application to the National Bureau of Standards).

Frontiers of aerodynamics. H. L. Dryden. J. Wash. Acad. Sci. (c/o Wm. W. Diehl, Bureau of Plant Industry, Dept. of Agriculture, Washington, D.C.), 25, 101 (1935).

Aerodynamics of cooling. H. L. Dryden. Division T, vol. VI of Aerodynamic Theory, published by J. Springer, Berlin, Germany (1936).

The theory of isotropic turbulence. H. L. Dryden. J. Aero. Sciences, 4, 273 (1937).

Recent developments of the theory of turbulence. H. L. Dryden. J. Applied Mech. (29 West 39th St., New York, N.Y.), 4, A-105 (1937).

Turbulence investigations at the National Bureau of Standards. H. L. Dryden. Proc. Fifth Internat'l. Cong. Applied Mech. (c/o J. C. Hunsacker, Mass. Inst. Tech., Cambridge, Mass.), (1938).

Turbulence and the boundary layer. H. L. Dryden. J. Aero. Sciences, 6, 85 (1939).

Isotropic turbulence in theory and experiment. H. L. Dryden Applied Mechanics (Book privately printed by Calif. Inst. Tech., Pasadena, Calif. to commemorate the sixtieth birthday of Theodore von Kármán), 85 (1941).

AIRCRAFT MATERIALS AND CONSTRUCTION - Design and Strength  
of Structures

<u>Title</u>	<u>Series</u>	<u>Price</u>
Investigation of the compressive strength of spruce struts of rectangular cross section and the derivation of formulas suitable for use in airplane design. J. E. Boyd. Tech. Pap. BS, T152 (1920).	T152	OP
Strength of steel tubing under combined column and transverse loading, including tests of columns and beams. T.W. Greene. Tech. Pap. BS, <u>18</u> , 243 (1924).	T258	OP
An analysis of the deformation of the mooring spindle of the SHENANDOAH. L. B. Tuckerman and C. S. Aitchison. Tech. Pap. BS, <u>18</u> , 609 (1925).	T270	10c
Design of specimens for short-time "fatigue" tests. L. B. Tuckerman and C. S. Aitchison. Tech. Pap. BS, <u>19</u> , 47 (1924).	T275	OP
Physical properties of electrically welded steel tubing. H. L. Whittemore, J.S. Adelson, and E. O. Seaquist. BS J. Research, <u>4</u> , 475 (1930).	RP161	OP
The relation of torque to tension for thread-locking devices. H. L. Whittemore, G. W. Nusbaum and E. O. Seaquist. BS J. Research, <u>1</u> , 945 (1931).	RP386	30c
A method of exciting resonant vibrations in mechanical systems. L. B. Tuckerman, H. L. Dryden, and H. B. Brooks. BS J. Research, <u>10</u> , 659 (1933).	RP556	OP
The determination of stresses from strains on three intersecting gage lines and its application to actual tests. W. R. Osgood and R. G. Sturm. BS J. Research, <u>10</u> , 685 (1933).	RP559	OP
A propeller vibration indicator. H. L. Dryden <sup>and</sup> L. B. Tuckerman. BS J. Research, <u>12</u> , 537 (1934)	RP 678	OP
Contribution to the design of compression members in aircraft. W. R. Osgood. J. Research NBS, <u>13</u> , 157, (1934).	RP698	OP

<u>Title</u>	<u>Series</u>	<u>Price</u>
Impact and static tensile properties of bolts. H.L. Whittemore, G. W. Nusbaum, and E. O. Sequist. J. Research NBS, <u>14</u> , 139 (1935).	RP763	10c
A method for determining stresses in a nonrotating propeller blade vibrating with a natural frequency. W. Ramberg, P. S. Ballif, and M. J. West. J. Research NBS, <u>14</u> , 189 (1935).	RP764	5c
An extensometer comparator. A.H. Stang and L.R. Sweetman. J. Research NBS, <u>15</u> , 199 (1935).	RP822	5c
Determination of principal stresses from strains on four intersecting gage lines $45^\circ$ apart. W.R. Osgood. J. Research NBS, <u>15</u> , 579 (1935).	RP851	5c
Compensation of strain gages for vibration and impact. W. M. Bleakney. J. Research NBS, <u>18</u> , 723 (1937).	RP1005	5c
Calibration of testing machines under dynamic loading. B. Wilson and C. Johnson. J. Research NBS, <u>19</u> , 41 (1937).	RP1009	OP
Graphical computation of stresses from strain data. A.H. Stang and M. Greenspan. J. Research NBS, <u>19</u> , 437 (1937).	RP 1034	10c
Calculation of stresses and natural frequencies for a rotating propeller blade vibrating flexurally. W. Ramberg and S. Levy. J. Research NBS, <u>21</u> , 639 (1938).	RP1148	10c
Rectangular plate loaded along two adjacent edges by couples in its own plane. W.R. Osgood, J. Research NBS, <u>28</u> , 755, (1942).	RP1450	5c
Relief of residual stress in streamline tierods. R.E. Pollard and F. M. Reinhart, J. Research NBS, <u>28</u> , 755 (1942).	RP1477	10c
Screw-thread standards for Federal services. Handb. NBS (1942).	H28	35c
Gage blanks. Com. Std. NBS (1941).	CS8-41	15c

<u>Title</u>	<u>Series</u>	<u>Price</u>
Screw threads and tap-drill sizes Com. Std. NBS (1943).	CS24-43	In press 10c
The strength of one-piece, solid, built-up, and laminated wood airplane wing beams. J. H. Nelson. (1918).	TR35	OP
Parker variable camber wing. H.F. Parker. (1919).	TR77	OP
Inertia factors of ellipsoids for use in air- ship design. L. B. Tuckerman. (1925).	TR210	OP
Water model tests for semirigid airships. L .B. Tuckerman. (1925).	TR211	OP
Strength of welded joints in tubular members for aircraft. H. L. Whittemore and W . C. Brueggeman. (1930).	TR348	OP
Strength of rectangular flat plates under edge compression. L. Schuman and G. Back. (1930).	TR356	OP
Strength of welded aircraft joints. W. C. Brueggeman. (1937).	TR584	OP
Torsion tests of tubes. A. H. Stang, W. Ram- berg, and G. Back. (1937).	TR601	10c
Column strength of tubes elastically re- strained against rotation at the ends. W. R. Osgood. (1938).	TR615	15c
The crinkling strength and the bending strength of round aircraft tubing. R. Osgood, (1938). W.	TR632	10c
The "pack" method of compression <sup>v.e</sup> tests of thin specimens of materials used in thin wall structures. C.S. Aitchison and L. B. Tuckerman. (1939).	TR649	10c
The column strength of two extruded aluminum- alloy H-sections. W. R. Osgood and Holt. (1939). M.	TR656	10c

<u>Title</u>	<u>Series</u>	<u>Price</u>
Mechanical properties of flush-riveted joints. W. C. Brueggeman and F. C. Roop. (1940).	TR701	Restricted NACA
Strength of tubing under combined axial and transverse loading . L. B. Tuckerman, S. N. Petrenko and C. D. Johnson. (1929).	TN307	OP
Fatigue testing of wing beams by the resonance method. W. Bleakney. (1938).	TN660	OP
Experimental study of deformation and of effective width of sheet stringer panels. W. Ramberg, A. E. McPherson and S. Levy, (1939).	TN68 <sup>4</sup>	Free NACA
Compressive tests of a monocoque box. W. Ramberg, A. E. McPherson, and S. Levy.	TN721	Free NACA
Extension of pack method for compressive tests. C. S. Aitchison. (1940).	TN789	Restricted NACA
Tensile and pack compressive tests of some sheets of aluminum alloy, 1025 carbon steel, and chromium-nickel steel. C. S. Aitchison, and A. Miller. (1942).	TN840	Restricted NACA
Bending of rectangular plates with large deflections. S. Levy. (1942).	TN846	Restricted NACA
Square plate with clamped edges under normal pressure producing large deflections. S. Levy. (1942).	TN847	Restricted NACA
Normal-pressure tests of circular plates with clamped edges. A. E. McPherson, W. Ramberg and S. Levy. (1942).	TN848	Restricted NACA
Normal-pressure tests of rectangular plates. W. Ramberg, A. E. McPherson and S. Levy. (1942).	TN849	Restricted NACA
Bending with large deflection of a clamped rectangular plate with length-width ratio of 1.5 under normal pressure. S. Levy and S. Greenman. (1942).	TN853	Restricted NACA

<u>Title</u>	<u>Series</u>	<u>Price</u>
Effect of rivet and spot-weld spacing on the strength of axially-loaded sheet-stringer panels of 24S-T aluminum alloy. S. Levy, A. E. McPherson, and W. Ramberg. (1942).	TN856	Restricted NACA
Test of specimen of wood of longerons of the S.E.5 Airplane after seven years' service. By Bureau of Standards. (1922).	TM129	OP
Report on dirigible design. Eng. News-Record (330 W. 42nd St., New York, N.Y.), <u>59</u> , 1137. (1922).		
Tests of ball bearings for rotating beam fatigue machines. L. B. Tuckerman, and C. S. Aitchison. Am. Machinist (330 W. 42nd St., New York, N. Y.) <u>61</u> , 369. (1924).		
Metal airplane wing patent. H. L. Whittemore. Patent <u>1,516,480</u> . (1924). Patent Office, Dept. of Commerce, Washington, D. C. 10c	<u>1,516,480</u>	<u>1,516,480</u>
The investigation of welded joints for aircraft by the Bureau of Standards. I. W. Gaston. Aviation Eng. (Lyon Block, Albany, N.Y.), <u>1</u> , 9 (1928).		
Testing joints for aircraft structures welded under procedure specifications. H. L. Whittemore. J. Am. Welding Soc. (33 W. 39th St., New York, N.Y.), <u>1</u> , 31 (1928).		
Testing welded joints for aircraft structures. H. L. Whittemore. Airway Age (34 N. Crystal St., E. Stroudsburg, Pa.), <u>10</u> , 161. (1929).		
Physical properties of electrically welded steel tubing. H. L. Whittemore, J. S. Adelson, E. O. Seaquist. J. Am. Welding Soc., <u>2</u> , 17. (1930).		
Strength of welded joints in tubular members for aircraft. H. L. Whittemore and W. C. Brueggeman. J. Am. Welding Soc., <u>2</u> , 107. (1930).		
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Tests of cellular sheet-steel flooring. H. L. Whittemore and J. M. Franklin. J. Am. Welding Soc., <u>12</u> , 4 (1933).		

From material to structure. L. B. Tuckerman. J. Wash. Acad. Sci. (c/o Wm. W. Diehl, Bureau of Plant Industry, Dept. of Agriculture, Washington, D. C.), 23, 5 (May 15, 1933).

The double modulus theory of column action. W. R. Osgood. Civil Engineering (33 West 39th St., New York, N. Y.), 5, 173 (1935).

An interesting case of submultiple resonance. L. B. Tuckerman, and W. Ramberg. Phys. Rev. (11 East 38th St., New York, N. Y.), 49, 862 (1936).

Speed control for screw-power testing machines driven by direct current motors. A. H. Stang, and (R. L.) Sweetman. ASTM Bul. 87, (Amer. Soc. Test. Mtrls., 260 S. Broad St., Philadelphia, Pa.), 15 (August, 1937).

Note on plane strain. W. R. Osgood. J. Applied Mechanics (29 West 39th St., New York, N. Y.), 2, A-26 (1942).

Proposed method of verification and classification of strainometers. B.L. Wilson. ASTM Bul. 117, 83 (1942).

#### AIRCRAFT MATERIALS AND CONSTRUCTION - Metals

<u>Title</u>	<u>Series</u>	<u>Price</u>
Constitution and metallography of aluminum and its light alloys with copper and with magnesium. P. D. Merica, R. G. Waltenberg, and J. R. Freeman, Jr. Sci. Pap. BS, <u>15</u> , 105 (1919).	S337	OP
The heat treatment of duralumin. P. D. Merica, R. G. Waltenberg, and H. Scott. Sci. Pap. BS, <u>15</u> , 271 (1919).	S347	OP
Thermal expansion of nickel, monel, metal, stellite, stainless steel, and aluminum. W. H. Souder and P. Hidnert. Sci. Pap. BS, <u>17</u> , 497 (1922).	S426	10c
Thermal expansion of aluminum and various important aluminum alloys. P. Hidnert. Sci. Pap. BS, <u>19</u> , 697 (1925).	S497	OP

<u>Title</u>	<u>Series</u>	<u>Price</u>
Thermal expansion of beryllium and aluminum-beryllium alloys. P. Hidnert, and W. T. Sweeney. Sci. Pap. BS, <u>22</u> , 533 (1927).	S565	10c
Some tests of light aluminum casting alloys-The effect of heat treatment. P. D. Merica, and C. P. Karr. Tech. Pap. BS, T139 (1919).	T139	OP
Electrodeposition of chromium from acid baths. H. E. Haring, and W. P. Barrows. Tech. Pap. BS, <u>21</u> , 413 (1927).	T346	15c
Thermal expansion of magnesium and some of its alloys. P. Hidnert, and W. T. Sweeney. BS J. Research, <u>1</u> , 771 (1928).	RP29	OP
Thermal expansion of copper-beryllium alloys. P. Hidnert. J. Research NBS, <u>16</u> , 529 (1936).	RP890	5c
Deterioration of chromic acid baths used for anodic oxidation of aluminum alloys. R. W. Buzzard, and J. H. Wilson. J. Research NBS, <u>18</u> , 53 (1937).	RP961	OP
Anodic coating of magnesium alloys. R. W. Buzzard, and J. H. Wilson. J. Research NBS, <u>18</u> , 83 (1937).	RP964	5c
Anodizing of aluminum alloys in chromic acid solutions of different concentrations. R. W. Buzzard. J. Research NBS, <u>18</u> , 251 (1937).	RP975	5c
Outdoor exposure tests of electroplated nickel and chromium coatings on steel and nonferrous metals. W. Blum, and P. W. C. Strausser. J. Research NBS, <u>24</u> , 443 (1940),	RP1293	5c
Corrosion of metals used in aircraft. W. Mutchler. J. Research NBS, <u>25</u> , 75 (1940).	RP1316	10c
Effect of low temperatures on the properties of aircraft metals. S.J. Rosenberg. J. Research NBS, <u>25</u> , 673 (1940).	RP1347	10c

<u>Title</u>	<u>Series</u>	<u>Price</u>
The tee-bend test to compare the welding quality of steels. G. A. Ellinger, A. G. Bissell, and M. L. Williams. J. Research NBS, <u>28</u> , 1 (1942).	RP1444	30c
Solders for aluminum. Cir. BS (1923).	C78	OP
The structure and related properties of metals. Cir. BS. (1922).	C113	OP
Light metals and alloys; aluminum; magnesium. Cir. BS. (1927).	C346	OP
Aluminum and its light alloys. P.D. Merica. (1918)	TR34	OP
The weathering of sheet aluminum alloys used in aircraft. W. H. Mutchler. (1934).	TR490	OP
Effect of service stresses on impact resistance, X-ray diffraction patterns, and microstructure of 25-S aluminum alloy. J. A. Kies, and G. W. Quick. (1939).	TR659	10c
The weathering of light-metal alloys used in aircraft. W. H. Mutchler. (1939).	TR663	15c
Tensile-elastic properties of 18:8 chromium-nickel steel as affected by plastic deformation. D. J. McAdam, and R. W. Mebs. (1939).	TR670	15c
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Corrosion embrittlement of duralumin. I. Practical aspects of the problem. H. S. Rawdon. (1928).	TN282	OP
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Corrosion embrittlement of duralumin. III. Effect of the previous treatment of sheet materials on the susceptibility to this type of corrosion. H. S. Rawdon. (1928).	TN284	OP

<u>Title</u>	<u>Series</u>	<u>Price</u>
Corrosion embrittlement of duralumin. IV. The use of protective coatings. H. S. Rawdon. (1928).	TN285	Free NACA
Corrosion embrittlement of duralumin. V. Results of weather-exposure tests. H. S. Rawdon. (1929). (Also appeared as Tech. Pub. 173, Am. Inst. Mining & Metallurgical Engineers, 29 West 39th St., New York, N. Y., Feb. 1929 meeting.)	TN304	Free NACA
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Rapid chemical test for the identification of chromium-molybdenum steel aircraft tubing. J. C. Redmond. (1932).	TN411	Free NACA
Mechanical properties of aluminum-alloy rivets. W. C. Brueggeman. (1936).	TN585	Free NACA
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<u>Title</u>	<u>Series</u>	<u>Price</u>
Relief of residual stress in streamline tierods by heat treatment. R. E. Pollard, and F. M. Reinhart. (1941).	TN832	Restricted NACA
<sup>d</sup> Tensile water and weather-exposure tests of metals used in aircraft. II. W. H. Mutchler, and W. G. Galvin, (1942).	TN842	Restricted NACA
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AIRCRAFT MATERIALS AND CONSTRUCTION - Plastics

<u>Title</u>	<u>Series</u>	<u>Price</u>
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Organic plastics. G. M. Kline. Cir. NBS (1936).	C411	5c
Plastics as structural materials for aircraft. G. M. Kline. (1937).	TN628	Free NACA
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<u>Title</u>	<u>Series</u>	<u>Price</u>
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Determination of permeability of balloon fabrics. J. D. Edwards. Tech. Pap. BS, T113 (1918).	T113	OP
A portable instrument for measuring air permeability of fabrics. H. F. Schiefer, and A. S. Best. BS J. Research, <u>6</u> , 51 (1931).	RP261	10c
Effect of weave on the properties of cloth. H. F. Schiefer, R. S. Cleveland, J. W. Porter, and J. Miller. BS J. Research, <u>11</u> , 441 (1933). Textile Weekly (49 Deansgate, Manchester 3, England), <u>12</u> , 498 and 524 (1934).	RP600	OP
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Improved instrument for measuring the air permeability of fabrics. H. F. Schiefer, and P. M. Boyland. J. Research NBS, <u>28</u> , 637 (1942).	RP1471	10c
Fabrics for aeronautic construction. Part 1. Cotton airplane fabrics. E. D. Walen. (1917). Part 2. Balloon fabrics. Bureau of Standards Balloon Fabrics Committee. (1917).	TR22	OP
The structure of airplane fabrics. E. D. Walen. (1918).	TR36	OP

<u>Title</u>	<u>Series</u>	<u>Price</u>
Fabric fastenings. E. D. Walen, and R. T. Fisher. (1918).	TR37	OP
Airplane dopes and doping. W. H. Smith. (1918).	TR38	OP
The testing of balloon fabrics. J. D. Edwards, and I. L. Moore. (1918).	TR39	OP
Part 1. Characteristic exposure tests of balloon fabrics.		
Part 2. Use of ultraviolet light for testing balloon fabrics.		
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Mercerization of cotton for strength with special reference to aircraft cloth. J. B. Wilkie. (1933).	TN450	Free NACA
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#### AIRCRAFT MATERIAL AND CONSTRUCTION - General

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Soundproofing of airplane cabins. V. L. Chrisler and W. F. Snyder. BS J. Research, <u>2</u> , 897 (1929).	RP63	OP

<u>Title</u>	<u>Series</u>	<u>Price</u>
Physical Properties of materials. I. Strength and related properties of metals and wood (with list of references). Cir. BS (1924).	C101	40c
Supplement to above circular.(1937).	C101 Supplement	5c
Synthetic rubbers - a review of their compositions, properties, and uses. L. A. Wood. Cir. NBS (1940).	C427	10c
Safe handling of radioactive luminous com- pound. Handb. NBS (1941).	H27	10c
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Discussion: Aircraft materials. L. B. Tuckerman. Proc. Am. Soc. Test. Mtrls. (260 South Broad St., Philadelphia, Pa.), <u>30</u> , 175 (1930).		
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AERONAUTIC POWER PLANTS - Engine Tests

<u>Title</u>	<u>Series</u>	<u>Price</u>
Correcting engine tests for humidity. D. B. Brooks. BS J. Research, <u>2</u> , 795 (1929).	RP118	10c
Some factors influencing the performance of diaphragm indicators of explosion pressures. F. R. Caldwell and E. F. Flock. J. Research NBS, <u>26</u> . 175 (1941).	RP1368	15c
Effect of altitude on knock rating in CFR engines. D. B. Brooks. J. Research NBS, <u>28</u> , 713 (1942).	RP1475	10c
Aeronautic power-plant investigations. By the sub-committee on power plants. Part I. Performance of aeronautic engines at high altitudes. H. C. Dickinson. (1917).	TR23	OP
The altitude laboratory for testing of aircraft engines. H. C. Dickinson and H. G. Boutell. (1918).	TR44	OP
Effect of compression ratio, pressure, temperature, and humidity on power. (1918). Part 1. Variation of horsepower with altitude and compression ratio. H. C. Dickinson, W. S. James and G. V. Anderson.	TR45	OP
Part 2. Value of supercharging. H. C. Dickinson and G. V. Anderson.		
Part 3. Variation of horsepower with temperature. H. C. Dickinson, W. S. James, and G. V. Anderson.		
Part 4. Influence of water injection on engine performance. V. W. Brinkerhoff.		
A study of airplane engine tests. V. R. Gage. (1918).	TR46	OP
Performance of a Liberty 12 airplane engine. S. W. Sparrow and H. S. White. (1920).	TR102	OP
Performance of a 300-horsepower Hispano-Suiza airplane engine. S. W. Sparrow and H. S. White. (1920).	TR103	OP
A high-speed engine pressure indicator of the balanced diaphragm type. H. C. Dickinson and F. B. Newell (1920).	TR107	OP

<u>Title</u>	<u>Series</u>	<u>Price</u>
Some factors of airplane engine performance. V. R. Gage. (1920).	TR108	OP
Performance of Maybach 300-horsepower airplane engine. S. W. Sparrow. (1922).	TR134	OP
Performance of B.M.W. 185-horsepower airplane engine. S. W. Sparrow. (1922).	TR135	OP
Relation of fuel-air ratio to engine performance. S. W. Sparrow. (1924).	TR189	OP
Correcting horsepower measurements to a standard temperature. S. W. Sparrow. (1924).	TR190	OP
The effect pf changes in compression ratio upon engine performance. S. W. Sparrow. (1924).	TR205	OP
The effect of humidity on engine power at altitude. D. B. Brooks and E. A. Garlock. (1932).	TR426	OP
A variable speed fan dynamometer. K. D. Wood. (1920).	TN26	OP
Instrument for measuring engine clearance volumes. S. W. Sparrow. (1920).	TN27	OP
The testing of aviation engines under approximate altitude conditions. R. W. DuBois. (1924).	TN210	OP
Correcting engine tests for humidity. D. B. Brooks. TN309 (1929).		OP
The effect on engine performance of change in jacket-water outlet temperature. E. A. Garlock and G. Ellis (1933).	TN476	OP
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#### AERONAUTIC POWER PLANTS - Ignition Systems

<u>Title</u>	<u>Series</u>	<u>Price</u>
Thermal expansion of (electrical) insulating materials. W. H. Souder and P. Hidnert. Sci. Pap. BS, <u>15</u> , 387 (1919-20).	S352	10c
Mathematical theory of induced voltage in the high-tension magneto. F. B. Silsbee. Sci. Pap. BS, <u>17</u> , 407 (1921).	S424	15c
A study of deterioration of nickel spark-plug electrodes in service. H. S. Rawdon and A. I. Kryniitsky. Tech. Pap. BS, T143 (1920).	T143	10c
Cements for spark-plug electrodes. H. F. Staley. Tech. Pap. BS, T155 (1920).	T155	OP
Electrical character of the spark discharge of automotive ignition systems. M. F. Peters, G. F. Blackburn, and P. T. Hannen. J. Research NBS, <u>19</u> , 401 (1937).	RP1032	10c

<u>Title</u>	<u>Series</u>	<u>Price</u>
Determination of optimum voltage for airplane electric systems. V. H. Grant and M. F. Peters. J. Research NBS, <u>22</u> , 485 (1939).	RP1247	5c
Note on the effects of cobalt and tungsten in storage batteries. G. W. Vinal, D. N. Craig and C. L. Snyder. J. Research NBS, <u>25</u> , 417 (1940).	RP1335	5c
Aeronautic power-plant investigations. By the subcommittee on power plants. H. C. Dickinson. (1917) Part 3. Spark plugs.	TR23	OP
Spark plug defects and tests. (1919). Part 1. Causes of failure of spark plugs. F. B. Silsbee. Part 2. Gas leakage in spark plugs. L. B. Loeb, L. G. Sawyer and E. L. Fonseca. Part 3. Methods for testing spark plugs. H. C. Dickinson, F. B. Silsbee, and P. G. Agnew.	TR51	OP
Temperatures in spark plugs having steel and brass shells. C. S. Cragoe. (1929). <sup>1919</sup>	TR52	OP
Properties and preparation of ceramic insulators for spark plugs. (1919). Part 1. Methods of measuring resistance of insulators at high temperatures. F. B. Silsbee and R. K. Honoman. Part 2. Electrical resistance of various insulating materials at high temperatures. R. K. Honoman and E. L. Fonseca. Part 3. Preparation and composition of ceramic bodies for spark-plug insulators. A. V. Bleininger. Part 4. Cements for spark-plug electrodes. H. F. Staley.	TR53	OP
Effect of temperature and pressure on the spark- ing voltage. L. B. Loeb and F. B. Silsbee. (1919).	TR54	OP
Heat energy of various ignition sparks. (1919). Part 1. Method of measuring heat energy of ignition sparks. F. B. Silsbee, L. B. Loeb and E. L. Fonseca. <sup>ement</sup> Part 2. Measuring of heat energy per spark of various ignition systems. F. B. Silsbee and E. L. Fonseca.	TR56	OP

<u>Title</u>	<u>Series</u>	<u>Price</u>
Characteristics of high-tension magnetos. F. B. Silsbee. (1919). Part 1. Cycle of operation of jump-spark ignition systems. Part 2. Transformation ratio and coupling in high-tension magnetos.	TR58	OP
Simplified theory of the magneto. F. B. Silsbee. (1921).	TR123	OP
The effect of electrode temperature on the sparking voltage of short spark gaps. F. B. Silsbee. (1923).	TR179	OP
Flame speed and spark intensity. D. W. Randolph and F. B. Silsbee. (1924).	TR187	OP
The sparking voltage of spark plugs. F. B. Silsbee. (1924).	TR202	OP
Electrical characteristics of spark generators for automotive ignition. R. B. Brode, D. W. Randolph, and F. B. Silsbee. (1926).	TR241	OP
An investigation of the effectiveness of ignition sparks. M. F. Peters, W. L. Summerville, and M. Davis. (1930).	TR359	10c
The automotive ignition coil. T. H. Darnell. Note by F. B. Silsbee. (1931).	TR374	25c
Causes of cracking of ignition cable. F. B. Silsbee. (1921).	TN32	OP
Deterioration of nickel spark plug terminals in service. H. S Rawdon and A. I. Krynnitsky. Bul. 152, Am. Inst. Mining & Metallurgical Engineers (29 W. 39th St., New York, N. Y.) (1919).		
Preignition and spark-plugs. S. W. Sparrow. SAE Journal (29 W. 39th St., New York, N. Y.) <u>6</u> , 129 (1920).		

## AERONAUTIC POWER PLANTS - Radiators

<u>Title</u>	<u>Series</u>	<u>Price</u>
Radiators for aircraft engines. S. R. Parsons and D. R. Harper 3d. Tech. Pap. BS, <u>16</u> , 431 (1922).	T211	50c
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Part 1. Power characteristics of aviation gasoline. E. W. Roberts.		
Part 2. Power characteristics of Sumatra and Borneo gasolines. E. W. Roberts.		
Part 3. Power characteristics of 20 per cent benzol mixtures. E. W. Roberts.		
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A constant-pressure bomb. F. W. Stevens. (1923).	TR176	OP
Fuels for high-compression engines. S. W. Sparrow. (1925).	TR232	OP
The gaseous explosive reaction -- The effect of inert gases. F. W. Stevens. (1927).	TR280	OP
The gaseous explosive reaction -- A study of the kinetics of composite fuels. F. W. Stevens. (1928).	TR305	15c
The gaseous explosive reaction <sup>at</sup> constant pressure -- The reaction order and reaction rate. F. W. Stevens. (1930).	TR337	10c
The gaseous explosive reaction -- The effect of pressure on the rate of propagation of the reaction zone and upon the rate of molecular transformation. F. W. Stevens. (1931).	TR372	OP
Flame movement and pressure development in an engine cylinder. C. F. Marvin, Jr. and R. D. Best. (1931).	TR399	OP

<u>Title</u>	<u>Series</u>	<u>Price</u>
The mechanism of atomization accompanying solid injection. R. A. Castleman, Jr. (1932).	TR440	5c
Infrared radiation from explosions in a spark-ignition engine. C. F. Marvin, Jr., F. R. Caldwell, and S. Steele. (1934).	TR486	OP
The effect of water vapor on flame velocity in equivalent CO-O <sub>2</sub> mixtures. E. F. Flock and H. K. King. (1935).	TR531	5c
The soap-bubble method of studying the combustion of mixtures of CO and O <sub>2</sub> . E. F. Flock and C. H. Roeder. (1935).	TR532	5c
Some effects of argon and helium upon explosions of carbon monoxide and oxygen. E. F. Flock and C. H. Roeder. (1936).	TR553	10c
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The resistance to the steady motion of small spheres in fluids. R.A. Castleman. (1926).	TN231	OP

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Appendix III. - Detonation tests on aviation fuels. H. K. Cummings and D. B. Brooks. (p 200).

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A new electrical telemeter. B. McCollum and O. S. Peters. Tech Pap. BS, <u>17</u> , 737 (1922-1924).	T247	OP

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A course-shift indicator for the double-modulation type radiobeacon. H. Diamond and F. W. Dunmore. BS J. Research, <u>3</u> , 1 (1929).	RP77	5c
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Applying the visual double-modulation type radio range to the airways. H. Diamond. BS J. Research, <u>4</u> , 265 (1930).	RP148	10c
A 12-course radio range for guiding aircraft with tuned reed visual indication. H. Diamond and F. G. Kear. BS J. Research, <u>4</u> , 351 (1930).	RP154	OP
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Engine-ignition shielding for radio reception in aircraft. H. Diamond and F. G. Gardner. BS. J. Research, <u>4</u> , 415 (1930).	RP158	OP
Development of the visual type airway radio-beacon system. J. H. Dellinger, H. Diamond and F. W. Dunmore. BS J. Research, <u>4</u> , 425 (1930).	RP159	OP
A tuned-reed course indicator for the 4 and 12 course aircraft radio range. F. W. Dunmore. BS J. Research <u>4</u> , 461 (1930).	RP160	OP
A radio beacon and receiving system for blind landing of aircraft. H. Diamond and F. W. Dunmore. BS J. Research, <u>5</u> , 897 (1930).	RP238	OP
Characteristics of airplane antennas for radio range-beacon reception. H. Diamond and G. L. Davies. BS J. Research, <u>6</u> , 901 (1931).	RP313	OP
Automatic volume control for aircraft radio receivers. W. S. Hinman, Jr. BS. J., Research, <u>7</u> , 37 (1931).	RP330	OP
A course indicator of pointer type for the visual radio range-beacon system. F. W. Dunmore. BS J. Research, <u>7</u> , 147 (1931).	RP336	OP

<u>Title</u>	<u>Series</u>	<u>Price</u>
Theory of design and calibration of vibrating reed indicators for radio range beacons. G. L. Davies. BS J. Research, <u>7</u> , 195 (1931).	RP338	10c
A simultaneous radiotelephone and visual range beacon for the airways. F. G. Kear and G. H. Winternute. BS J. Research, <u>7</u> , 261 (1931).	RP341	20c
The cause and elimination of night effects in radio range beacon reception. H. Diamond. BS J. Research, <u>10</u> , 7 (1933).	RP513	10c
Phase synchronization in directive antenna arrays with particular application to the radio range beacon. F. G. Kear. BS J. Research, <u>11</u> , 123 (1933).	RP581	OP
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