Origins of ASTM

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Education

1991 - 1996 ❑ **Shiraz University**
B.Sc., Materials Engineering - Metal Forming

1998 - 2001 ❑ **Shiraz University**
M.Sc., Materials Engineering - Characterization and Selection of Materials

Career Timeline

❑ **Sistan & Balouchestan University**
Laboratory Expert and Instructor, 1996 - 1998

❑ **Niroo Research Institute**
Researcher, Test Engineer and Laboratory Manager, 2002 - 2005

❑ **Moshanir Consultants**
Senior Materials and Welding Engineer, 2005 - 2016

❑ **Nargan Co.**
Senior Materials and Corrosion Engineer, 2016 – Present

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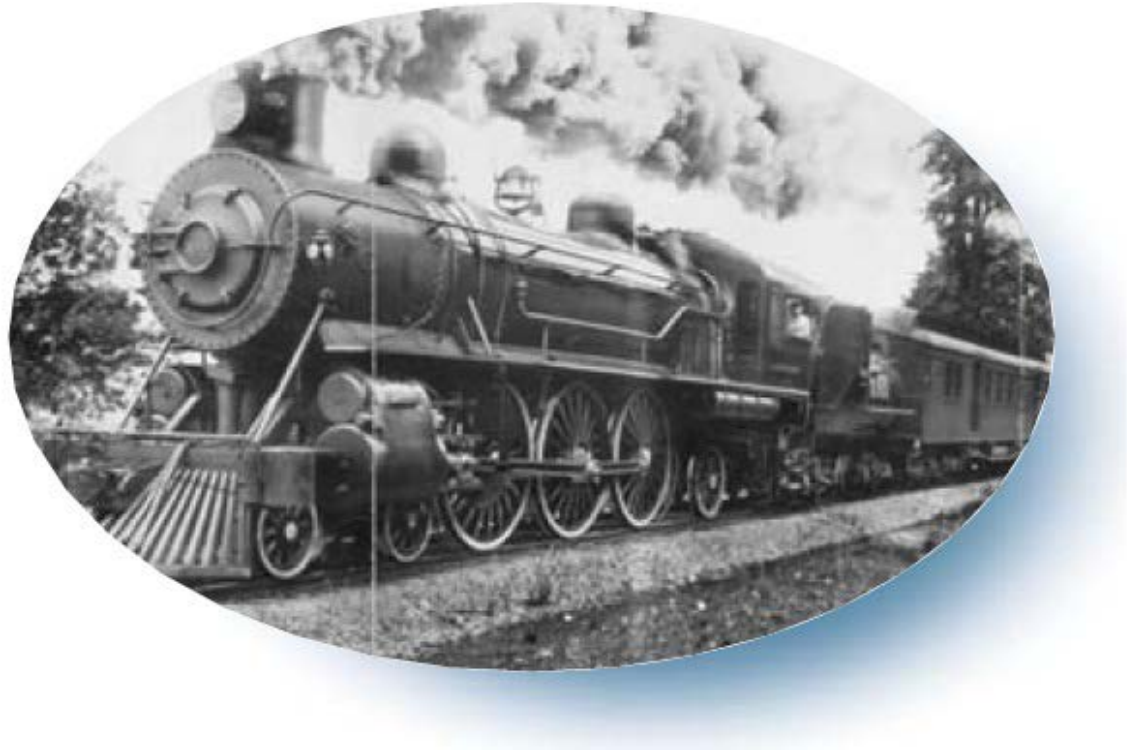
Many codes and standards have an interesting history.
Let’s take a brief look at origins of ASTM.

American Society for Testing and Materials (ASTM) is one of the pioneers of standard development in the world.

But how was ASTM founded?

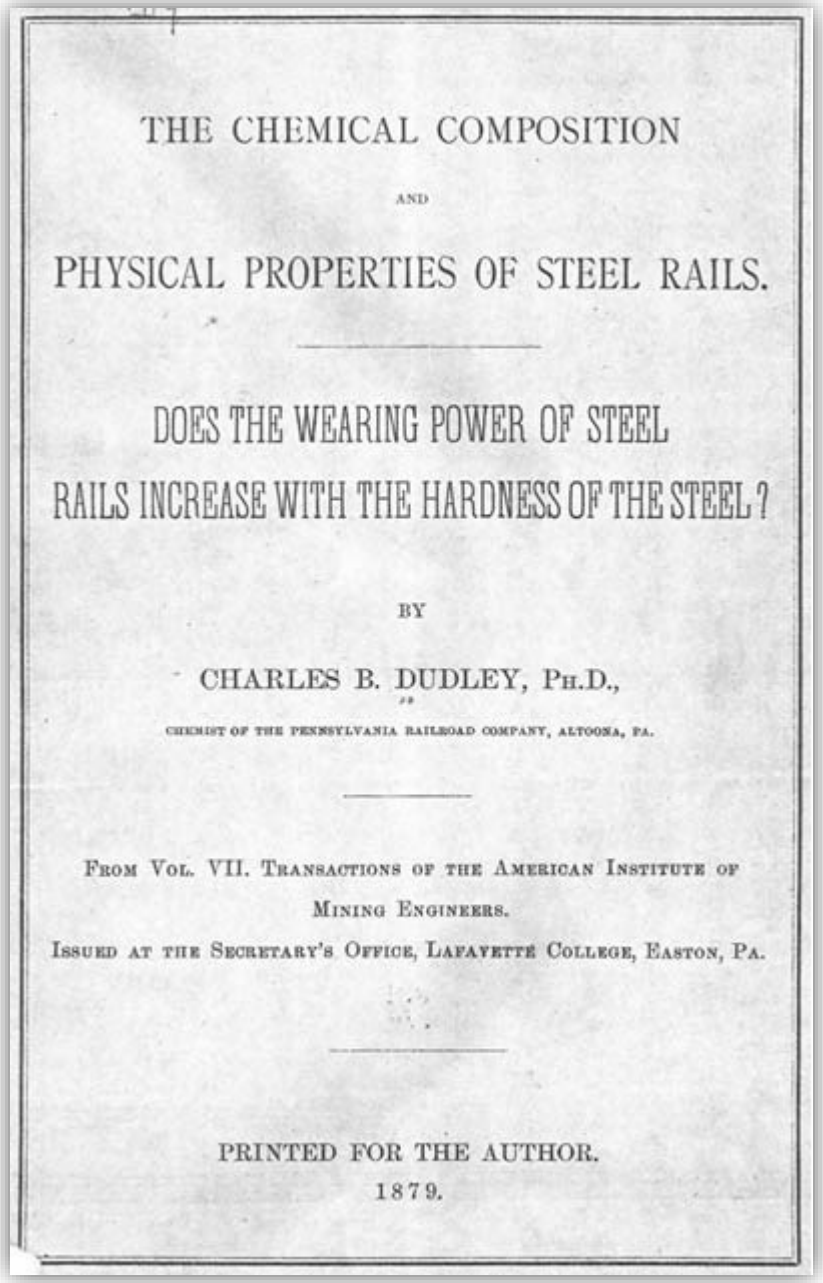
Charles Benjamin Dudley, who was born in New York, received his Ph.D. from Yale University in 1874.

In 1875, he became a chemist for the Pennsylvania Railroad and organized the railroad's new chemistry department, where he investigated the technical properties of oil, paint, steel, and other materials the Pennsylvania Railroad had bought in large quantities. Based on his research, Dudley issued standard material specifications for the company's suppliers.



In 1878, he published his first major report, “The Chemical Composition and Physical Properties of Steel Rails,” in which he analyzed the durability of different types of steel rails.

It was concluded that using mild steel resulted in a longer-lasting rail than hard steel, and Dudley recommended an improved formula for mild steel for rails to be applied.



THE CHEMICAL COMPOSITION

AND

PHYSICAL PROPERTIES OF STEEL RAILS.

DOES THE WEARING POWER OF STEEL RAILS INCREASE WITH THE HARDNESS OF THE STEEL?

BY

CHARLES B. DUDLEY, PH.D.,

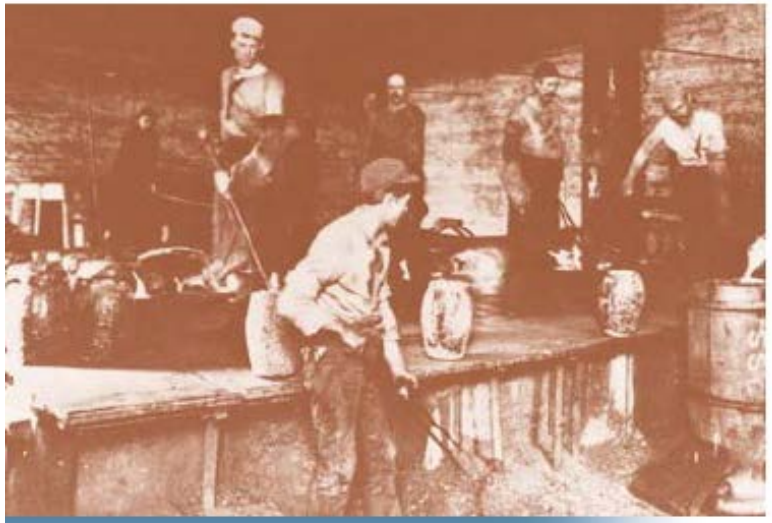
CHEMIST OF THE PENNSYLVANIA RAILROAD COMPANY, ALTOONA, PA.

FROM VOL. VII. TRANSACTIONS OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

ISSUED AT THE SECRETARY'S OFFICE, LAFAYETTE COLLEGE, EASTON, PA.

PRINTED FOR THE AUTHOR.

1879.



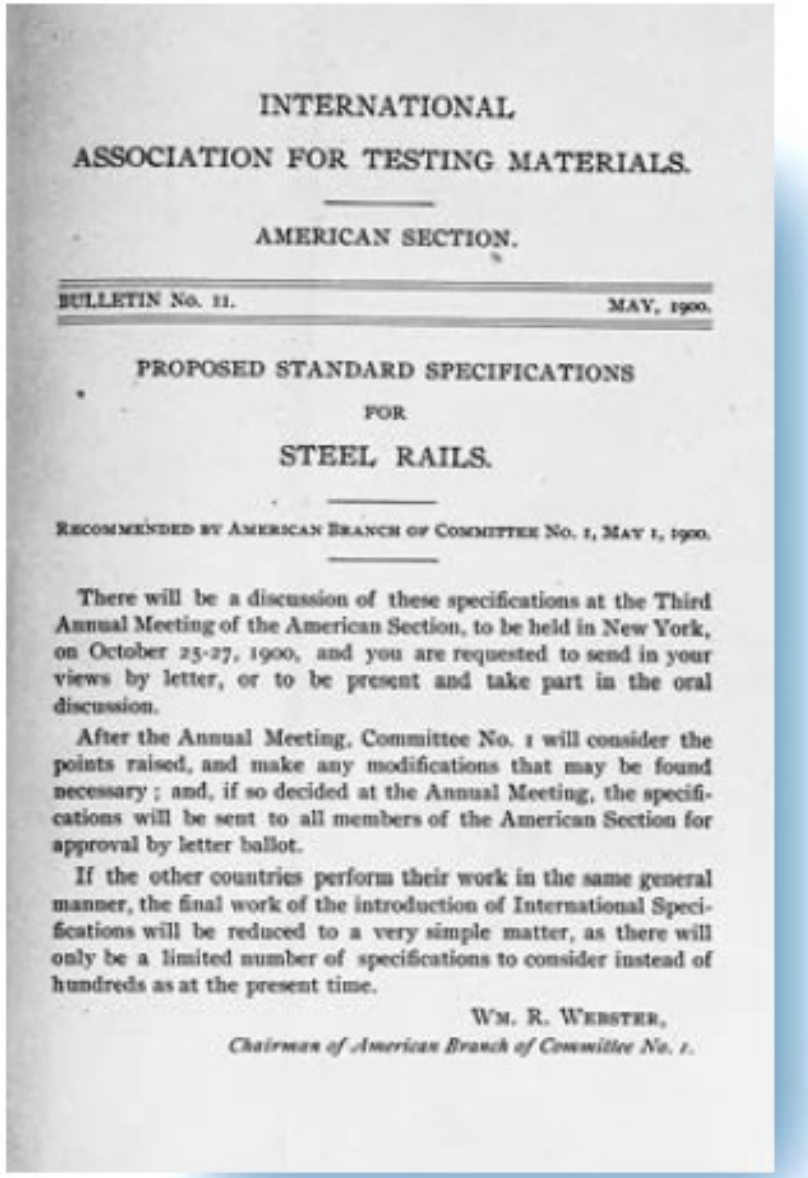
His report raised a firestorm among steel masters, who disputed its findings. The application of Dudley's new formula, produced unnecessary expenses that increased production costs. Steel producers, determined to keep full control over output and quality control, believed that standard specifications issued by their customers were an unacceptable meddling.

Dudley later reported that steel companies often told the railroads that “if they did not take the rails offered [by the manufacturers], they would not get any.”

The disappointing response to his first report left Dudley with no choice but to initiate a constructive dialogue between suppliers and their customers. Each party had much to learn from the other. Steel makers knew more about practical production issues and the industry's cost management than their customers, while railroads, locomotive builders, and other users of steel products had better knowledge of a material's long-term performance, the knowledge that could help manufacturers improve the quality of rails, plates, and beams.

Dudley concluded that “a good specification needs both the knowledge of the product’s behavior during manufacture and knowledge of those who know its behavior while in service.”

Dudley’s efforts to find a solution to these seemingly intractable problems facilitated the formation of ASTM, which was committed to build a consensus on standards for industrial materials.



INTERNATIONAL
ASSOCIATION FOR TESTING MATERIALS.

AMERICAN SECTION.

BULLETIN No. 11. MAY, 1900.

PROPOSED STANDARD SPECIFICATIONS
FOR
STEEL RAILS.

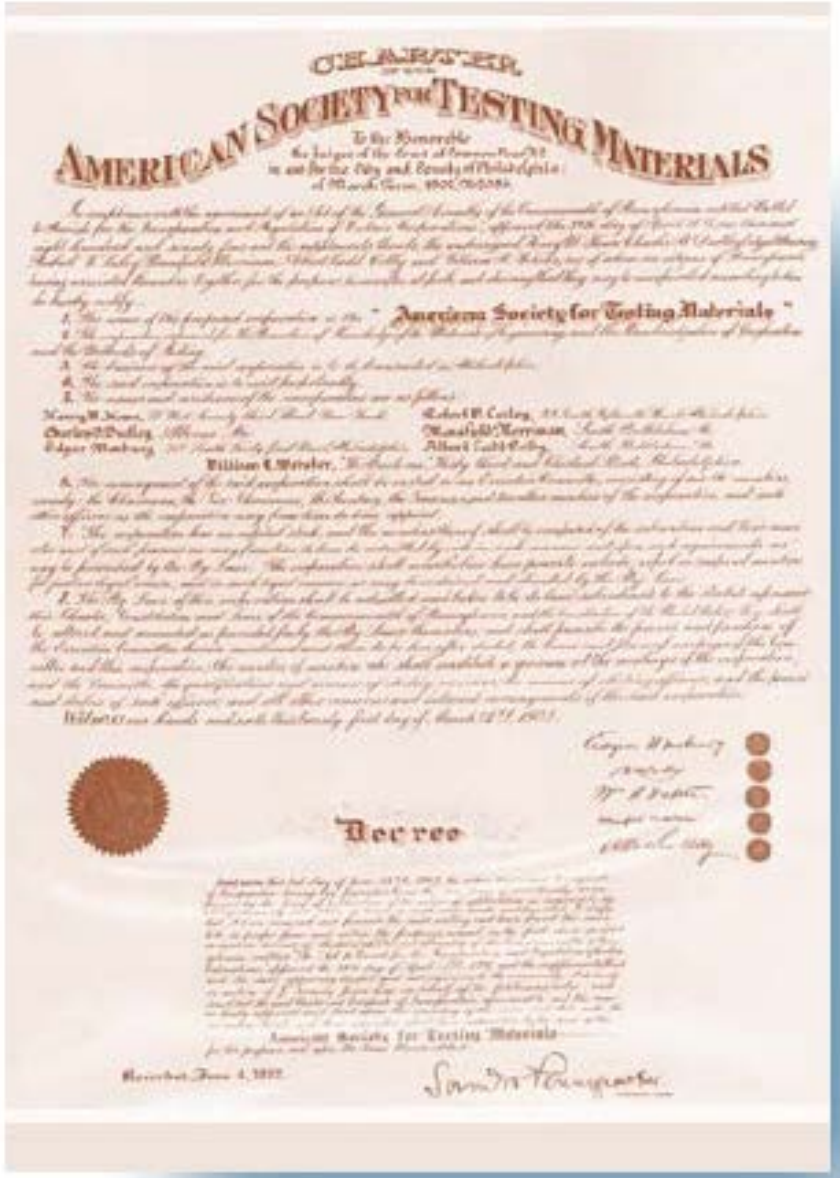
RECOMMENDED BY AMERICAN BRANCH OF COMMITTEE No. 1, MAY 1, 1900.

There will be a discussion of these specifications at the Third Annual Meeting of the American Section, to be held in New York, on October 25-27, 1900, and you are requested to send in your views by letter, or to be present and take part in the oral discussion.

After the Annual Meeting, Committee No. 1 will consider the points raised, and make any modifications that may be found necessary; and, if so decided at the Annual Meeting, the specifications will be sent to all members of the American Section for approval by letter ballot.

If the other countries perform their work in the same general manner, the final work of the introduction of International Specifications will be reduced to a very simple matter, as there will only be a limited number of specifications to consider instead of hundreds as at the present time.

WM. R. WEBSTER,
Chairman of American Branch of Committee No. 1.


CHARTER
OF THE
AMERICAN SOCIETY FOR TESTING MATERIALS
Decree

His ideas contributed to the formation of the International Association for Testing Materials (IATM), which organized working committees to discuss testing methods for iron, steel, and other materials.

On June 16, 1898, seventy IATM members met in Philadelphia to form the American Section of the International Association for Testing Materials.

Designation: A1 – 00 (Reapproved 2010)

Standard Specification for Carbon Steel Tee Rails [1]

This standard is issued under the fixed designa
adoption or, in the case of revision, the year of
epsilon (ε) indicates an editorial change since

This standard has been approved for use by ag

1. Scope

1.1 This specification covers carbon steel tee rai
nal weights of 60 lb/yd (29.8 kg/m) and over for use
track, including export and industrial applications.

1.2 Supplementary requirements S1 and S2 shall
when specified by the purchaser in the order.

1.3 The values stated in inch-pound units are to be
as standard. The values given in parentheses are mat
conversions to SI units that are provided for informa
and are not considered standard.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

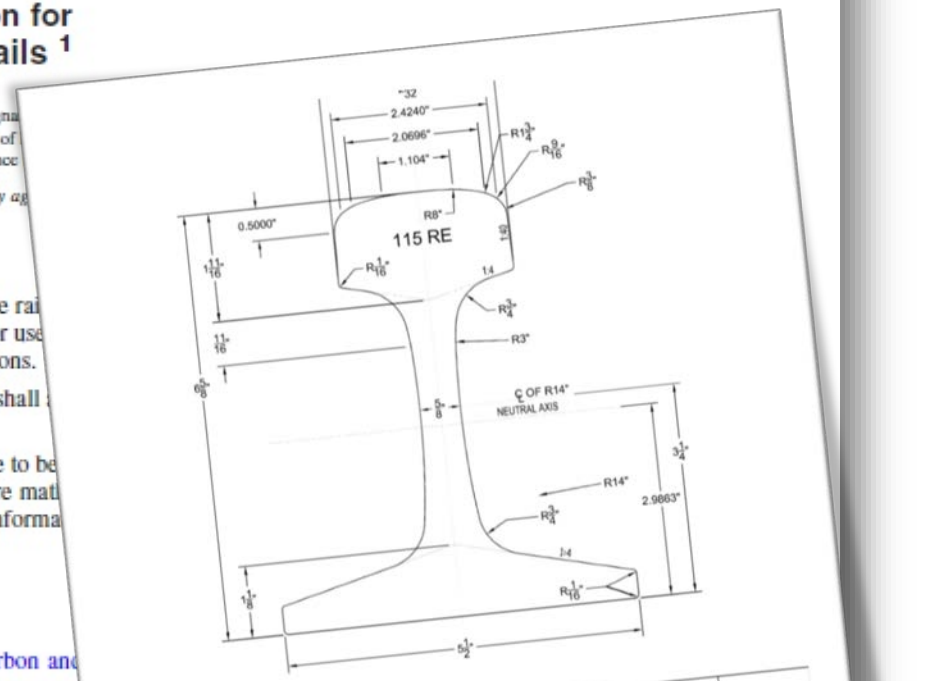
A29/A29M Specification for Steel Bars, Carbon an
Hot-Wrought, General Requirements for

A700 Practices for Packaging, Marking, and Loading
ods for Steel Products for Shipment

E10 Test Method for Brinell Hardness of Metallic Ma

E127 Practice for Fabricating and Checking Aluminu
loy Ultrasonic Standard Reference Blocks

E428 Practice for Fabrication and Control of Metal,
than Aluminum, Reference Blocks Used in Ultra
Testing



1. Rail Area (square inch)	Head	3.8861
	Web	3.0362
	Base	4.2947
	Whole Rail	11.2171
2. Rail Weight (lb/yd) (based on specific gravity of rail steel = 7.84)		114.3757
3. Moment of Inertia about the neutral axis		65.5
4. Section modulus of the head		18.0
Section modulus of the base		21.9
5. Height of neutral axis above base		2.99
6. Lateral moment of inertia		10.7
7. Lateral section modulus of the head		7.88
Lateral section modulus of the base		3.89

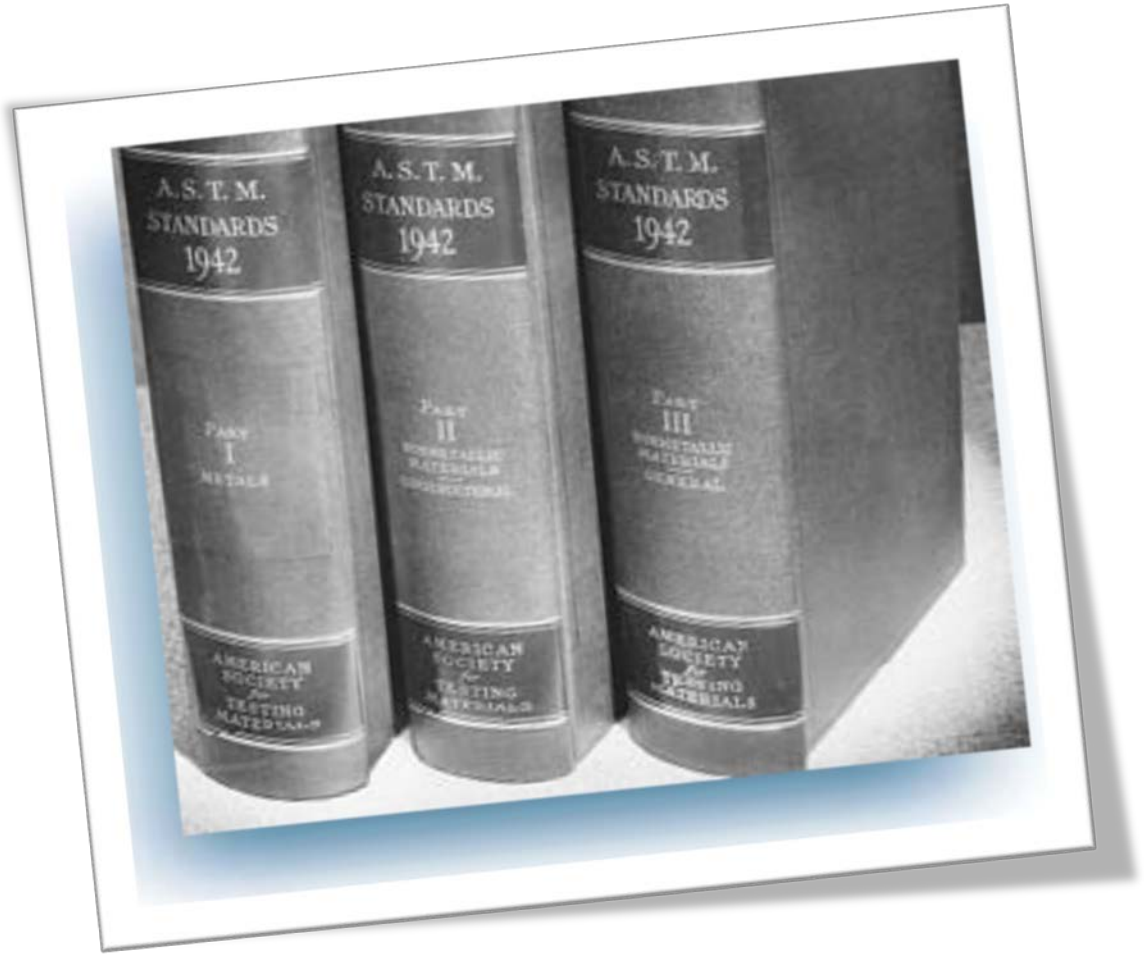
At the fifth annual meeting of the American Section in 1902, they renamed the organization: “American Society for Testing Materials” and elected Dudley as its first president.

He died in 1909.

ASTM A1 is still dedicated to the characteristics of steel rails and is constantly being updated.

Currently, 13,000 ASTM standards cover more than 140 different industries.

In 2001, the name was changed to ASTM International.



Hopefully reading this history was interesting for you and I wish that all of us would try to make the world a better place to live.

This presentation was developed by Kamran Khodaparasti.

Publication date: August 2023

References:

A Century of Progress, ASTM publication
https://en.wikipedia.org/wiki/Charles_Benjamin_Dudley