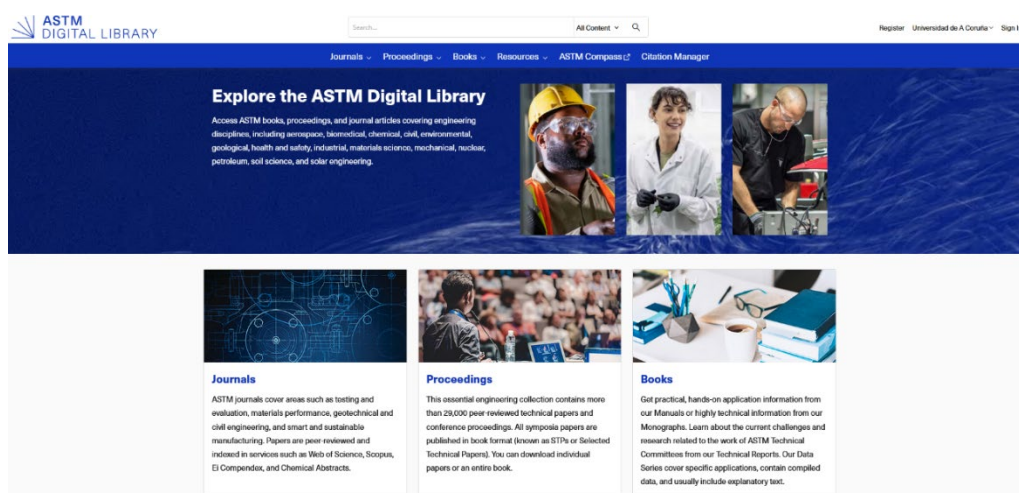


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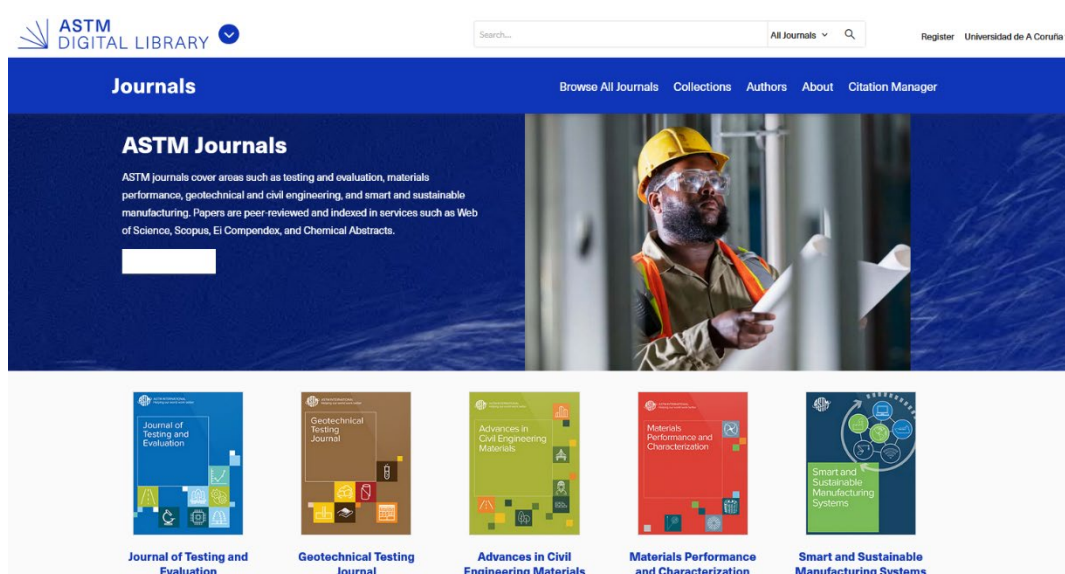
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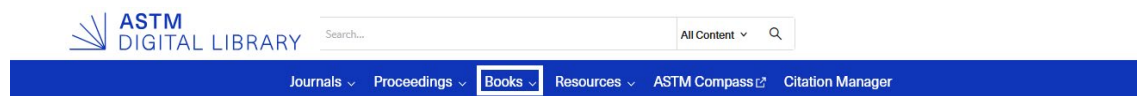


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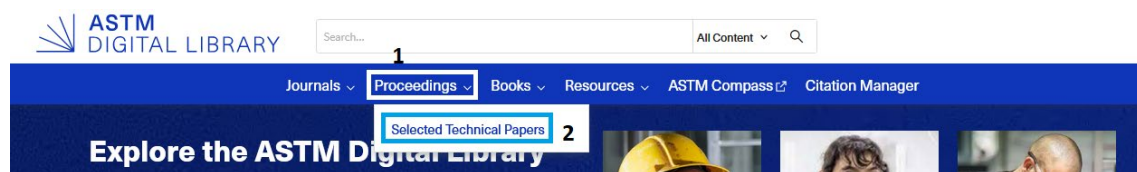
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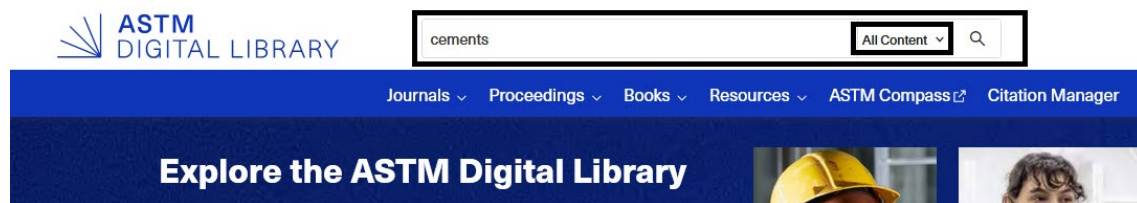


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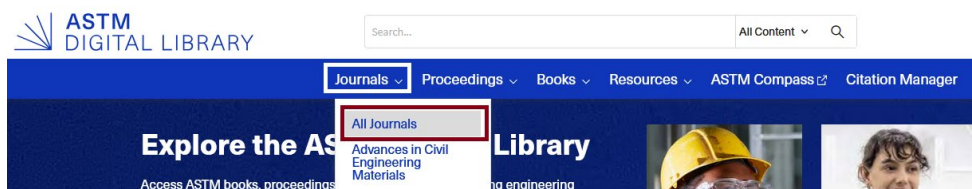
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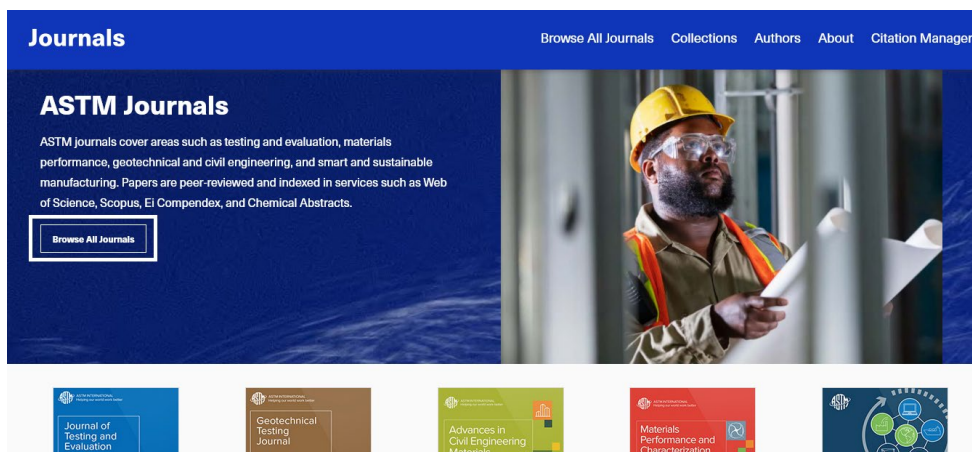
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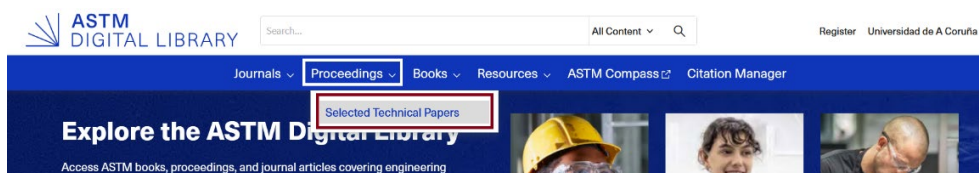


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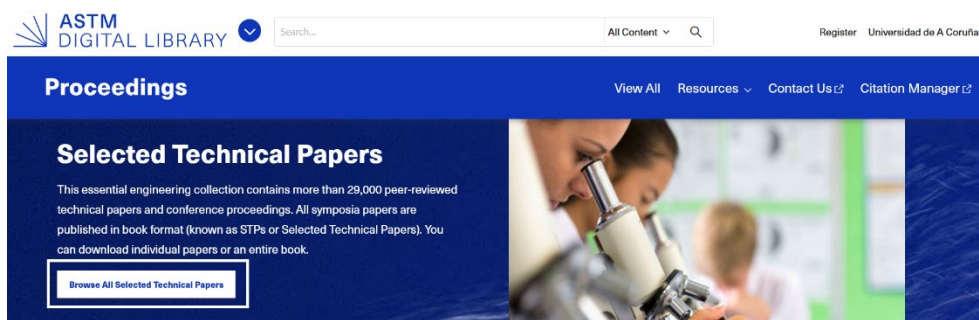


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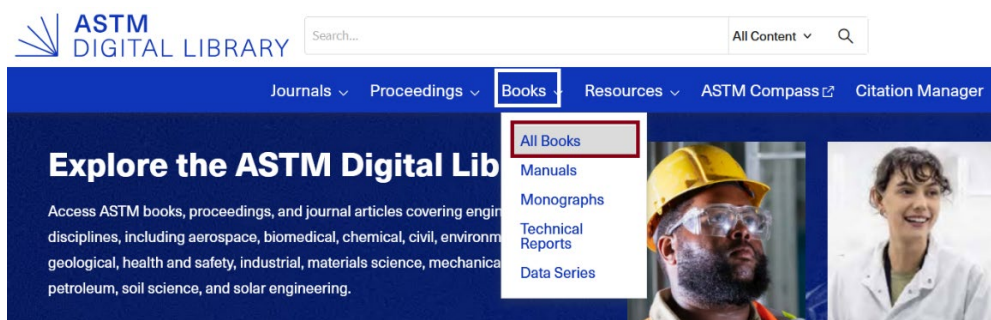


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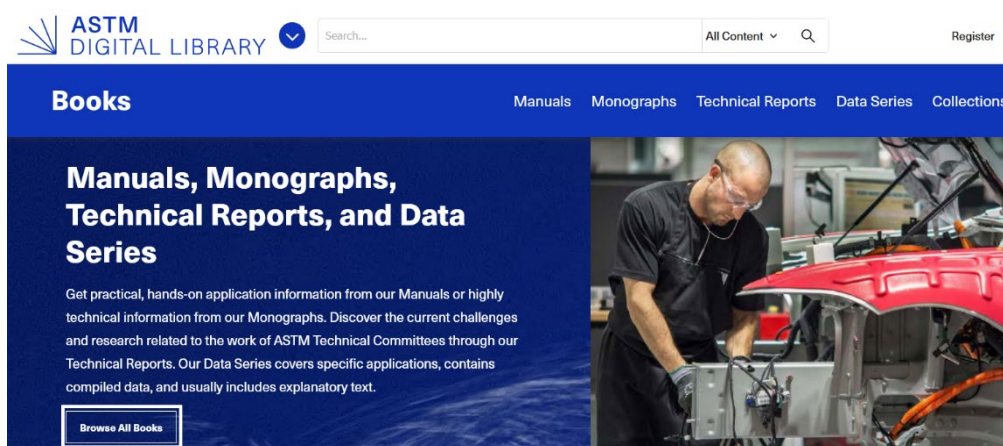


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Faping Li, Huan Wang, Lisheng Liu

Journal: *Journal of Testing and Evaluation*

Article Type: Technical Papers

J. Test. Eval. (January 0001) <https://doi.org/10.1520/JTE20250060>

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First Look Papers

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Published: 01 July 2026

... puts forward higher requirements for the performance of **concrete**. The article explored the effects of different super absorbent polymers (SAPs) contents (0.2 %, 0.4 %, 0.6 %, 0.8 %, and 1.0 % of total cement) with strong absorption capabilities on various properties of the seawater sea-sand cement...

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With the increasing shortage of freshwater river sand, sea water and sea sand will play an important role in marine construction engineering. However, because of the extreme influence of raw materials of marine sand and the external environment, marine construction puts forward higher requirements for the performance of concrete. The article explored the effects of different super absorbent polymers (SAPs) contents (0.2 %, 0.4 %, 0.6 %, 0.8 %, and 1.0 % of total cement) with strong absorption capabilities on various properties of the seawater sea-sand cement matrix (SSCM), including density, fluidity, water absorption, mechanical properties, and sulfate resistance. Mechanical properties were

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- ABSTRACT
- Introduction
- Fusion-Based AM Processes for Steels Used in Construction
- Ferrous Alloys in AM Used in Construction
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- AM of Steels and the Construction Industry

REVIEW ARTICLES | SEPTEMBER 10 2024

Review of Opportunities and Challenges for Additive Manufacturing of Steels in the Construction Industry 

Christopher Paul , Dikshita Nath, Lisa Tobber, Michael Benoit

[Author & Article Information](#)

Adv. Civ. Eng. Matls. (December 2024) 13 (1): 232–247.

<https://doi.org/10.1520/ACEM20230097> [Article history](#)

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ABSTRACT

Additive manufacturing (AM), or 3-D printing, encompasses a range of technologies that “print” material layer by layer to create the final part. Though there is significant interest in the AM of concrete in the construction sector, opportunities for the AM of steel still need to be explored. This review focuses on the AM of low-alloy steels, stainless steels, duplex stainless steels (DSSs), precipitation-hardened (PH) stainless steels, and tool steels, highlighting the challenges and opportunities of employing AM technology for construction applications. Fusion-based AM technologies, such as wire arc additive manufacturing (WAAM), laser powder bed fusion (LPBF), and laser-directed energy deposition (LDED), are the core technologies that have been tested in the industry so far. WAAM has seen the most exploration for construction applications because of its higher deposition rate, larger build volume, and lower cost than other AM technologies. The mechanical performance of low-alloy steel, stainless steel, and tool steel shows increased tensile strengths after AM processing compared with wrought counterparts. Although AM is not economical for geometrically simple metal components or geometries, there is potential for AM to fabricate unique structural connections or joints, optimized load-bearing columns, and even entire bridges, as highlighted in this paper. AM’s digital nature (i.e., using computer-aided design (CAD) to create G-code paths for printing) can increase structural efficiency if coupled with topology optimization.

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BOOK CHAPTER

Nondestructive Estimation of Compressive Strength of Concrete Masonry and Related Units Using Acoustics



Book: [Masonry 2022: Advancing Masonry Technology](#)

Series: ASTM Selected Technical Papers

Published: 2022

10.1520/STP164020210081

EISBN: 978-0-8031-7728-4

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...This is an evaluation of the performance of a new nondestructive method for measuring the compressive strength of isolated **concrete masonry** units (CMUs) and related units using acoustics. The method, called the acoustic impulse response resonance (AIRR) method, involves gently striking the unit...



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BOOK CHAPTER

Nondestructive Estimation of Compressive Strength of Concrete Masonry and Related Units Using Acoustics

By Neil Cox, Nicholas Huttemann, Spencer Cox, Jason Thompson, Monika Nain

DOI: <https://doi.org/10.1520/STP164020210081>

Page Count: 29

Published: 2022

This is an evaluation of the performance of a new nondestructive method for measuring the compressive strength of isolated concrete masonry units (CMUs) and related units using acoustics. The method, called the acoustic impulse response resonance (AIRR) method, involves gently striking the unit being tested with a pendulum and analyzing the resulting sound. It requires little extra time and effort to use the AIRR method in conjunction with standard strength-testing projects, where it is useful for corroborating compression test results and identifying sources of variation in the measurements. Precise measurement of strength maturation can be quickly achieved through repeated testing of individual units. The AIRR method can be quickly performed virtually anywhere, which makes it possible to engage in a variety of useful testing scenarios. The AIRR method is also suitable for use in regions where standards are lax or where trusted compression-testing facilities are not accessible, not feasible, or not used. The present paper extends the AIRR method to accommodate variations in the shape of the unit being tested. Finite element analysis was used to

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By Gourish Sirdeshpande

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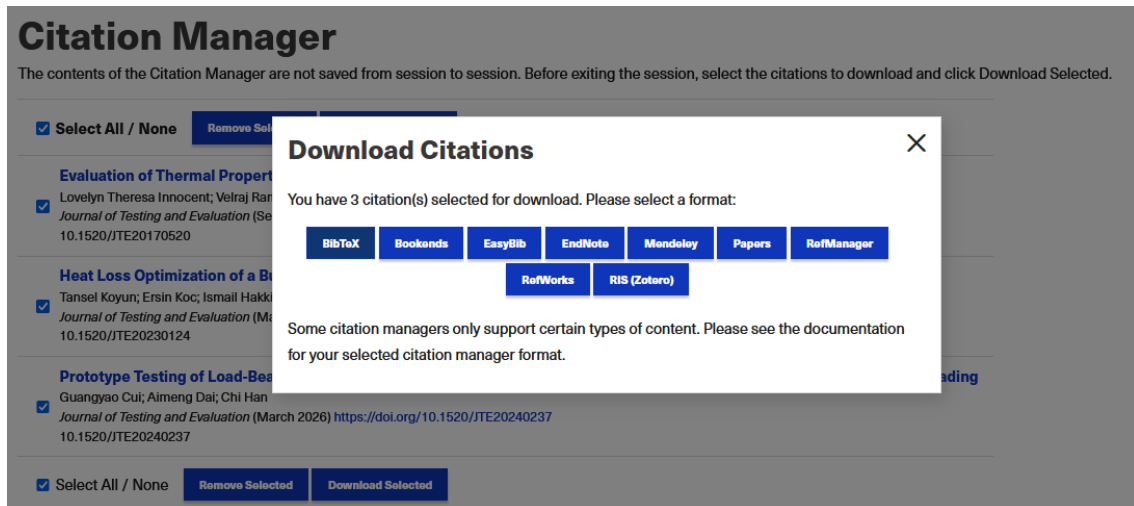
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