



1. Product Name

Troy System® for Soundproofing Indoor and Outdoor Shooting Ranges

2. Manufacturer

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3. Product Description

BASIC USE

The Troy System® is a custom designed blend of materials that has been developed specifically for sound attenuation for indoor and outdoor firearms training/practice facilities and other applications requiring special acoustical designs, including golf courses, broadcast studios, home theaters and highway noise barrier projects. Patented, certified and standardized, Troy System® sound treatments are cost effective, install quickly and easily and provide excellent acoustical ratings.

Firing range use can expose occupants to dangerous noise levels during live fire. The muzzle blast of a discharged firearm can produce impulse noise levels of over 165 dB, exceeding OSHA's 140 dB peak sound pressure limit by 25 dB. Because prolonged exposure to these peak sound levels will result in hearing loss, the incorporation of properly designed acoustical systems in firing range projects is critical. In fact, range facilities without sufficient sound control systems in place can face closure.

Installed over exposed wall surfaces, overhead baffles and safety ceilings, the Troy System delivers superior sound control, achieving guaranteed reverberation times as low as 1.25 seconds. Each Troy System is custom designed according to project specifications and OSHA requirements, and meets acoustical objectives by eliminating reverberation from otherwise hard steel and concrete surfaces. As an added benefit, the system provides increased thermal protection, thereby improv-



The Troy System® provides guaranteed reverberation times as low as 1.25 seconds.

ing a shooting range facility's overall energy efficiency.

COMPOSITION & MATERIALS

Impact resistant and bullet absorptive, the Troy System is comprised of 2 primary components that absorb, trap and muffle sound energy: Troy Board®, a composite wood fiber cement matrix board, and Troy Wool®, a high density mineral wool. Troy Board is composed of dimensionally stable, unfaced rigid cement wood fiber board containing only natural materials. Board density is 3.5 psf minimum per 1" (25.4 mm) section. Troy Board and Troy Wool contain no asbestos, urea-formaldehyde or CFC blown agents.

Troy Board structural acoustical boards are rugged, strong and waterproof. The natural components that make up Troy Board material are impregnable to the elements, thus enabling the system's use for both interior and exterior applications.

TYPES

Troy System for Indoor Firing Range Installation

- Load weight of 3.5 psf for typical 1" (25.4 mm) Troy Board with Troy Wool safety ceiling, baffle and ceiling treatment
- Load weight of 6.5 psf for typical 2" (51 mm) Troy Board with Troy Wool sidewall treatment

Troy System for Outdoor Firing Range Installation

- Modular walls can be constructed onsite and

are available in heights to 32' (9.8 m)

- Sidewalls meet 3500 PSI concrete industry standard for pistol, rifle and 0.50 caliber firing
- Sidewalls designed without exposed edges; thicknesses from 8" - 12" (203 - 305 mm) according to ammunition types used; absorb unintentional fire without ricochet or splatter

SIZES

The Troy System is typically designed to meet specific size and sound level isolation or reverberation requirements. Modular walls to 32' (9.8 m) can be constructed onsite.

The Troy System is also available in standard sizes as detailed below.

Troy Board

- Thickness - 1" or 2" (25.4 or 51 mm)
- Width - 24" (610 mm)
- Length - 102" (2590 mm)

Troy Wool

- Thickness - 1 1/2" (38 mm)
- Width - 24" (610 mm)
- Height - 48" (1219 mm)

COLOR

The Troy Board finish comes in a natural wood tone or a gray natural tone. Exposed interior surfaces can be covered with fabric or painted with acrylic latex, and edges can be trimmed for a beveled or squared appearance.

BENEFITS

- Satisfies OSHA sound level requirements; guaranteed reverberation time of 1.25 seconds or less equates to low overall sound exposure and noise levels
- Provides full sound spectrum absorption
- Compatible with ballistic baffle systems
- In acute or near-acute angle strikes, bullets penetrate or pass without ricochet or splatter, and without noticeable system deformation
- Thermal value of R5 for every inch of Troy Wool used
- Waterproof; does not support mold or fungi growth
- Custom designed to project specifications; standard designs available
- System components can be shipped directly to the jobsite, ready for installation
- Fast, easy installation; multiple contractors not required

4. Technical Data

APPLICABLE STANDARDS

- ASTM C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- ASTM C423 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
- ASTM C612 Standard Specification for Mineral Fiber Block and Board Thermal Insulation
- ASTM C665 Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
- ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
- ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- ASTM E413 Classification for Rating Sound Insulation

PHYSICAL PROPERTIES

- Cement wood fiber board - To ASTM C612, Type IA or Types IA and IB
- Sound transmission class (STC) - 45, ASTM C423
- Reverberation time - 1.25 seconds or less, ASTM C423
- Sound absorption coefficients - Type B and A mountings, to ASTM C423
- Thermal value - R5 per inch, ASTM C612

Note - Noise reduction coefficient (NRC) is not

included as it has little to no value with regard to firing ranges. The NRC testing process is limited to sound within the speech frequencies and is an inadequate indicator for full spectrum noise generated by firearms.

ENVIRONMENTAL CONSIDERATIONS

- Meets GREENGUARD criteria for IEQ Credit 3
- May contribute points toward LEED® certification

FIRE PERFORMANCE

The system is UL classified as noncombustible per ASTM C136 and complies with ASTM C665, Type I.

Surface burn characteristics:

- Flamespread - 5 or less, ASTM E84
- Smoke developed - 0, ASTM E84

5. Installation

PREPARATORY WORK

Comply with manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage and handling. Protect panel edges from crushing and impact. Deliver materials and panels in manufacturer's original, unopened, undamaged bundles with identification labels intact. Store materials protected from exposure to harmful environmental conditions in a temperature-controlled dry space with adequate air circulation.

Verify that site conditions are acceptable for installation. Do not proceed with installation until unacceptable conditions are corrected.

METHODS

Install acoustical wall system in accordance with manufacturer's written instructions. Install after exterior spaces are enclosed and weatherproof, wet work is complete and dry and work above ceilings is complete.

Install with vertical surfaces and edges plumb, top edges level and in alignment with other boards, and faces flush and scribed to fit adjoining work accurately at borders and at penetrations. Cut units to at least 50% of width, with facing material extended over the cut edge to match the uncut edge. Scribe the acoustical wall panels to fit adjacent work. Butt joints tightly. Anchor panels securely to supporting substrate.

PRECAUTIONS

- Maintain ambient temperature and humidity at levels specified for project when it is occupied for its intended use
- Install acoustical wall panels only when a mini-

mum lighting level of 50 fc (583 lux) is provided on surfaces to receive acoustical wall systems

- Install panels under conditions free from odor contamination of ambient air
- No special material cutting devices are necessary, although use of carbide blades is recommended

BUILDING CODES

Installation must comply with the requirements of all applicable local, state and federal code jurisdictions.

6. Availability & Cost

AVAILABILITY

Products are available from certified distributors. Contact manufacturer for information concerning local availability.

COST

Consult the manufacturer for pricing information.

7. Warranty

Troy System material and acoustical performance is warranted for 5 years when installed in accordance with manufacturer's recommendations and written instructions. Complete warranty terms and conditions are available from the manufacturer. For details, consult Troy Acoustics Corporation.

8. Maintenance

None required.

9. Technical Services

Technical assistance, including more detailed information, product literature, test results, project lists, onsite evaluations, assistance in preparing project specifications and arrangements for application supervision, is available by contacting Troy Acoustics Corporation.

10. Filing Systems

- Reed First Source®
- First Source CAD
- MANU-SPEC®
- Additional product information is available from the manufacturer upon request.

Troy Acoustics Corporation hopes the information here will be helpful. It is based upon data and knowledge considered to be true and accurate and is offered for the users' consideration, investigation and verification, but we do not warrant the results to be obtained unless provided in a written proposal for a specific project based on Troy's engineered solution. Please read all statements, recommendations or suggestions in conjunction with our general conditions of sale, which apply to all goods supplied by us. No statement, recommendation or suggestion is intended for any use which would infringe any patent or copyright. Troy Acoustics Corporation, 26332 Ferry Court, Santa Clarita, CA 91350. Troy Board, Troy Wool and Troy System are registered trademarks of Troy Acoustics Corporation.

