

## **RADIATION PROTECTION MATERIALS**



**“WHEN PROTECTION IS REQUIRED,  
THERE IS NO SUBSTITUTE FOR SKILL AND EXPERIENCE”**

**RAY-BAR ENGINEERING CORPORATION**

**[www.raybar.com](http://www.raybar.com)**

**TOLL FREE: (800) 567-XRAY (9729)**



## MR-MANUFACTURER BROAD SCOPE RADIATION PROTECTION

RAY-BAR ENGINEERING CORPORATION is a leading manufacturer of Radiation Protection Materials supplying primarily the United States including Alaska and Hawaii for over 65 years. Maintaining perhaps the largest inventory of shielding materials in the U.S. allows RAY-BAR a continuing reputation of prompt deliveries for all our products worldwide. Our knowledge of custom requirements is continually kept in tune by the installation of our products on literally thousands of projects by our own crews. *"WHEN PROTECTION IS REQUIRED, THERE IS NO SUBSTITUTE FOR SKILL AND EXPERIENCE."*

## RADIATION PROTECTION MATERIALS

### LEAD BACKED MATERIALS

Lead backed gypsum wallboard, drywall, plywood and shielding panels.

### LEAD LINED MATERIALS

Lead lined solid core doors and control screens, barriers, and view windows with radiation protection glazing, and lead lining of hollow metal frames. Most products also available as fire-rated.

### SHEET LEAD

Sheet lead in all commercial thicknesses for backing at wall penetrations, lead at floors and miscellaneous shielding.

### UA-USES, APPLICATIONS

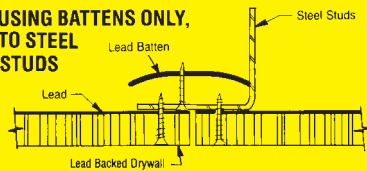
#### NEW AND RETROFIT

- Hospitals
- Clinics
- Imaging Centers
- Medical Office Buildings
- Radiation Therapy/Oncology
- Industrial X-Ray Rooms NDT
- Medical Suites
- Medical Schools
- Individual Doctors Offices
- University Medical Centers
- Cancer Centers
- Nuclear Applications
- CT Scanners
- Angiography / Cath Labs
- Radiology / Fluoroscopic / X-Ray
- Linear Accelerators / Simulators
- Tomo Therapy / Gamma Camera
- PET Scanners
- Uptake Injection Rooms
- Hot Labs
- Cyclotron
- Proton Beam Room
- Nuclear Medicine Rooms

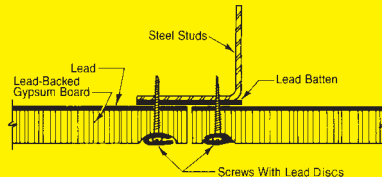
## RAY-BAR LEAD BACKED DRYWALL DETAILS

RAY-BAR Lead Backed Drywall is furnished as 1/2" and 5/8" Fire Code gypsum board, with lead meeting Federal Specification QQL201f, Grade, C, factory laminated to the backside. Also available, RAY-BAR fire-rated Lead Backed 5/8" gypsum board (RB-LBG), labeled as U.L. classified to U.S. and Canadian safety standards for fire-resistance for 1 hour and 2 hour fire-rated partition requirements. (See complete Classification marking for additional information). Contact RAY-BAR for current fire-rated lead lined partition designs.

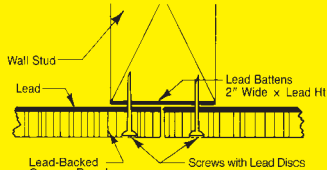
### USING BATTENS ONLY, TO STEEL STUDS



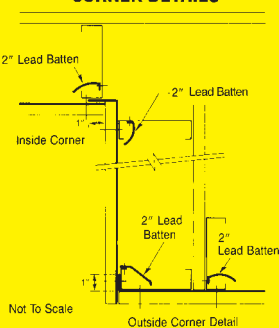
### USING BATTENS & DISCS TO STEEL STUDS



### USING BATTENS & DISC COVERED SCREWS TO WOOD STUDS

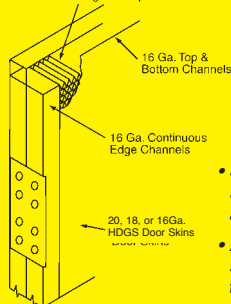


### CORNER DETAILS



## RAY-BAR LEAD LINED HOLLOW METAL DOORS

Honeycomb or Polystyrene Core With Lead Lining As Req'd

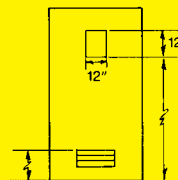


Notes: Also available up to 90 min fire-rated. (B & C label)

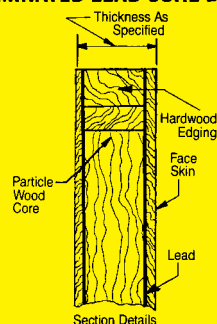
- **Special Lead Lined Security Doors also available.**
- **Available in 12 standard lead thicknesses.**

## RAY-BAR LEAD LINED DOORS & FRAME LINING

RAY-BAR Lead Lined Solid Core Doors are manufactured to national wood working standards, constructed with the finest core, edging and a large variety of natural wood or plastic laminate face veneers available. Door frames are lead lined with the same lead thickness as lead in doors.



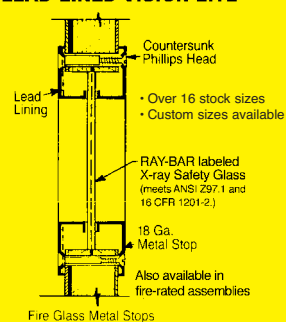
### LAMINATED LEAD CORE DOOR



#### Notes:

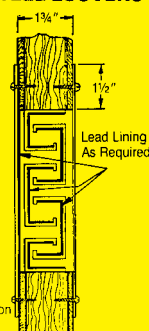
1. 1/64" to 5/64" lead on one side, 3/32" to 3/16" lead use half value on each side of core.
2. 20 minute fire-rating also available.

### LEAD GLASS WINDOW LEAD LINED VISION LITE



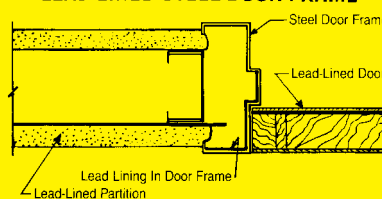
Fire Glass Metal Stops

### LEAD LINED LIGHT PROOF STEEL LOUVERS



Vertical Section Of Louvre

### LEAD LINED STEEL DOOR FRAME



Notes: Also available fire-rated.

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# RADIATION PROTECTION

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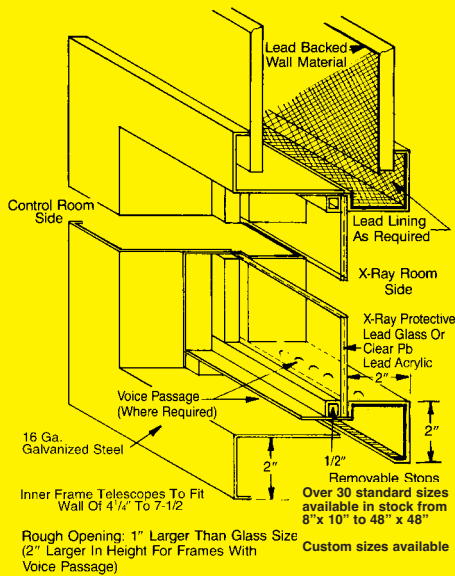
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## RAY-BAR TELESCOPIC VIEW WINDOW

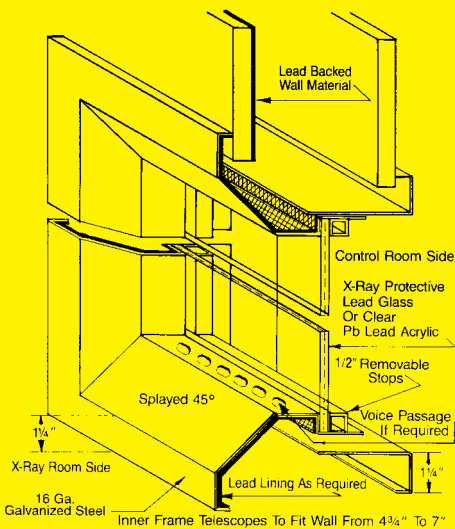
RAY-BAR Lead Lined Telescopic Steel View Windows are manufactured for ease of installation in rough opening after wallboard is installed, with over 30 standard sizes "good in stock". Available with X-Ray protective lead glass, or RAY-BAR labeled X-Ray Safety Glass for impact resistance, standard 2.1 mm lead equivalency single layer. Higher lead equivalencies available upon request. It is also available in clear Pb Lead acrylic in 0.3mm, 0.5mm, 0.8mm, 1.0mm, 1.5mm and 2.0mm lead equivalencies.

### RAY-BAR TELESCOPIC LEAD LINED VIEW WINDOW



• Frames also available in Stainless Steel or Aluminum

### RAY-BAR SPLAYED TELESCOPIC LEAD LINED VIEW WINDOW



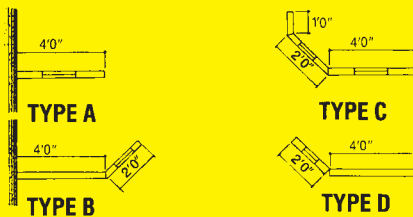
• Frames also available in Stainless Steel or Aluminum

## RAY-BAR LEAD LINED CONTROL SCREENS

RAY-BAR Lead Lined Control Screens are manufactured of similar construction to RAY-BAR Lead Lined Doors, and are available in single or multiple sections to meet varied layout applications. Screens are available with a large variety of natural wood and plastic laminate face veneers.

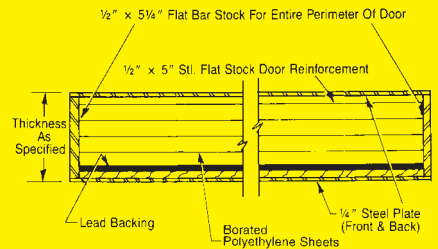


ELEVATION



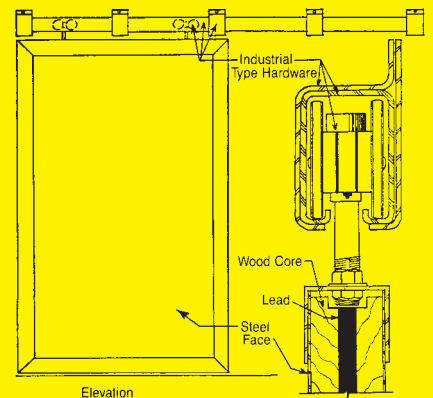
## RAY-BAR NEUTRON SHIELDED DOOR

RAY-BAR has been manufacturing lead lined and/or borated polyethylene neutron shielded doors to customer specifications for high energy gamma and neutron shielding applications for over thirty years. These doors are fabricated to suit each individual project requirement as sliding or hinged doors in new and retrofit applications in compliance with the requirements of NCRP report #51 for radiation oncology linear accelerators.



## RAY-BAR INDUSTRIAL LEAD LINED DOORS

RAY-BAR industrial Type lead lined doors are custom manufactured to meet heavier lead requirements associated with X-ray or Non Destructive Testing (NDT) rooms and can be furnished with complete top hung industrial capacity type sliding track, guides and hardware.



Available in Various Lead Values To Meet Individual Protective Requirements for Industrial Non-Destructive Testing or High Energy X-ray and Gamma Radiation Shielding Applications.

## RAY-BAR X-RAY LEAD GLASS

RAY-BAR X-Ray Lead Glass provides a clear view and a standard radiation protection from 1.8mm and up to 3.7mm. Available good in stock for immediate shipment in sizes ranging from 6" x 6" to 48" x 96" for medical imaging, nuclear medicine, radiation therapy and Industrial X-Ray applications.

## RAY-BAR X-RAY SAFETY GLASS

RAY-BAR X-Ray Safety Glass is for use in applications needing both a radiation protection and a safety requirement and is permanently labeled meeting ANSI Z97.1 and CPSC 16 CFR 1201 CAT II requirements for impact resistance and is available for prompt delivery.

• This glass is not tempered, fire-rated or impact proof / shatter proof.

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TS-TECHNICAL SUPPORT

**SUGGESTED SPECIFICATION**

**LEAD LINED GYPSUM WALLBOARD**

Lead lined gypsum wallboard shall be as manufactured by RAY-BAR ENGINEERING CORPORATION, and shall be \_\_\_" thick type "X" fire code drywall, factory laminated with unpierced \_\_\_# sheet lead to \_\_\_' high, unless otherwise noted. U.L. classified and labeled for fire-resistance where required for one hour and two hour lead lined partition designs. (UL) US LISTED

**VIEWING WINDOWS**

RAY-BAR lead lined telescopic steel view window frames shall be as manufactured by RAY-BAR ENGINEERING CORPORATION. \_\_\_" x \_\_\_" with (or without) voice passage. Lead lining shall be the same as lead specified in wall where window is located.

**LEAD GLASS**

RAY-BAR X-Ray lead glass 5/16" thick, equivalent to 2.1mm (5/64" thick) sheet lead, shall be installed in single or multiple layers as required to equal lead value as specified for wall or partition where located. Utilize RAY-BAR labeled X-Ray Safety Glass where impact resistance is required.

**RAY-BAR SHEET LEAD**

All sheet lead is manufactured per Federal Spec. QQL201f, Grade C.

**THICKNESS, WEIGHTS AND STOCK SIZES**

THICKNESS FRACTIONS	DECIMAL EQUIVALENT	mm. EQUIVALENT	LBS. PER SQ. FT. APPROXIMATELY	STD. ROLL SIZES
1/64"	.0156"	0.3969mm	1#	4' x 20'
1/32"	.0312"	0.7937mm	2#	8' x 20'
5/128"	.0391"	0.9922mm	2-1/2#	8' x 20'
3/64"	.0469"	1.1906mm	3#	8' x 20'
1/16"	.0625"	1.5875mm	4#	8' x 20'
5/64"	.0781"	1.9844mm	5#	8' x 20'
3/32"	.0937"	2.3812mm	6#	8' x 20'
1/8"	.1250"	3.1750mm	8#	8' x 20'
5/32"	.1562"	3.9687mm	10#	8' x 20'
3/16"	.1875"	4.7625mm	12#	8' x 20'
1/4"	.2500"	6.3500mm	16#	8' x 20'
3/8"	.3750"	9.5250mm	24#	8' x 20'
1/2"	.50"	12.7000mm	30#	4' x 8'
3/4"	.75"	19.0500mm	46#	4' x 8'
1"	1.00"	25.4000mm	60#	4' x 8'
1-1/2"	1.50"	38.1000mm	90#	4' x 8'
2"	2.00"	50.8000mm	120#	4' x 8'

**LEAD LINED DOORS & LEAD LINED FRAMES**

Lead lined solid particle board laminated core doors with \_\_\_# unpierced sheet lead extending to all hardwood edges, lead thickness shall not be less than lead thickness in walls surrounding door. Also available fire-rated when required.

Face veneer to match doors specified in Division 08200. Sheet lead for lining H.M. frames shall be the same thickness as lead in doors and shall be shipped to H.M. frame manufacturer for installation.

As an alternate, the H.M. frames can be shipped to RAY-BAR ENGINEERING CORPORATION for lead lining.

**NEUTRON SHIELDED DOORS**

Neutron shielded doors shall be as manufactured by RAY-BAR ENGINEERING CORPORATION comprised of sheet lead and borated polyethylene core incased in steel as detailed.

CP-COMPONENTS, PARTS  
**TECHNICAL DATA**

**RAY-BAR X-Ray Lead Glass**

Thickness: 5/16"+  
Lead Equiv. (mm) nominal: 2.1  
Lead Equiv. (in) nominal: .078+  
Lbs. lead equiv./ft<sup>2</sup> (min): 5.0+  
Wt.—lbs. glass/ft<sup>2</sup>: 6.1  
Thickness tolerance (in): ±.060  
Refractive index: 1.76  
Light transmission: 85%  
Strain point (°C): 523°  
Softening temp (°C): 673°  
\* Also available in RAY-BAR labeled X-Ray Safety Glass for impact resistance, security, higher shielding ratings or in Special laminated products.

**STOCK SIZES**

8" x 8"	24" x 24"	40" x 40"
8" x 10"	24" x 30"	40" x 48"
10" x 10"	24" x 36"	40" x 60"
10" x 12"	24" x 48"	40" x 72"
12" x 12"	24" x 60"	40" x 84"
12" x 16"	24" x 72"	40" x 96"
12" x 24"	30" x 30"	42" x 42"
12" x 36"	30" x 36"	42" x 48"
12" x 48"	30" x 48"	42" x 60"
16" x 16"	30" x 60"	42" x 72"
16" x 24"	30" x 72"	42" x 84"
16" x 36"	36" x 36"	42" x 96"
16" x 48"	36" x 42"	48" x 48"
18" x 18"	36" x 48"	48" x 60"
18" x 24"	36" x 60"	48" x 72"
18" x 30"	36" x 72"	48" x 84"
18" x 36"	36" x 84"	48" x 96"
18" x 48"	36" x 96"	

\* Also available in circular discs to your specified diameter.

CC-CODE ACCEPTABILITY, CERTIFICATION

All RAY-BAR sheet lead meets Fed. Spec. QQ-L-201f, Grade C.

All RAY-BAR Gypsum wall board meets Classification ASTM C 36.

All RAY-BAR X-ray lead glass meets Fed. Spec. DD-G-451.

All RAY-BAR labeled X-Ray Safety Glass meets ANSI Z97.1 and 16 CFR 1201 CAT II requirements for impact resistance. All materials and radiation shielding systems meet the requirements of the National Council of Radiation Protection (NCRP) Report #49 and #147.

All calculations for lead requirements should be determined by a health physicist currently recognized by the state in which the project occurs.

THESE MATERIALS ARE FOR MEDICAL OR INDUSTRIAL USE ONLY. THESE MATERIALS ARE NOT TO BE UTILIZED IN RESIDENTIAL APPLICATIONS.

AC-AVAILABILITY, COST

Because of our extensive inventory we are typically able to ship stock sizes within 3 days from receipt of order.

**RAY-BAR ENGINEERING CORPORATION**

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**OTHER PRODUCTS**

- Special Lead Parts for X-Ray Equipment Manufacturers
- Lead Shot • Lead Wire • Lead Brick
- Custom Portable Lead Shields
- Lead Tube • Lead Rod • Lead Wool
- Lead Isotope Containers/Barriers
- Specialty Shielding Materials



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