

## Beam Blocks / Beam Dumps Information

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### Disclaimer

This document was prepared in attempt to compile information useful for LBNL laser users and is not meant to endorse or recommend any particular product or manufacturer.

### Traps

| Lasers Input | Wavelength Range     | Max Aver Power | Max Power Density     | Max Energy Density    | Type  | Advantages/Comments                            | Picture(s)  | Part Number | Vendor   |
|--------------|----------------------|----------------|-----------------------|-----------------------|-------|--|---|-------------|----------|
| CW           | 200 nm - 3 $\mu$ m   | 80 W           | 150 W/cm <sup>2</sup> | 30 mJ/cm <sup>2</sup> | Trap  | Anodized Aluminum absorb a laser beam's energy |    | BT600(/M)   | THORLABS |
| CW & Pulsed  | 400 nm - 2.5 $\mu$ m | 30 W           | 15 W/cm <sup>2</sup>  | 40 J/cm <sup>2</sup>  | Trap  | Absorptive Neutral Density Glass               |    | BT610(/M)   | THORLABS |
| CW & Pulsed  | 1 - 12 $\mu$ m       | 50 W           | 25 kW/cm <sup>2</sup> | 25 J/cm <sup>2</sup>  | Trap  | Graphite                                       |   | BT620(/M)   | THORLABS |
| CW           | 200 nm - 3 $\mu$ m   | 5 W            | 150 W/cm <sup>2</sup> | 30 mJ/cm <sup>2</sup> | Trap  | quick-release trap                             |  | BTC30       | THORLABS |
| CW           | Visible              | 10 W           |                       | N/A                   | Block | large absorptive target area, Steel            |   | LB1(/M)     | THORLABS |
| CW & Pulsed  | 1 - 12 $\mu$ m       | 80 W           | 25 kW/cm <sup>2</sup> | 25 J/cm <sup>2</sup>  | Block | Graphite                                       |  | LB2(/M)     | THORLABS |

| Max Aver Power Watts | Aperture Diameter Inches | Cooling    | Composition | Type | Picture   | Part Number Trap-it | Vendor |
|----------------------|--------------------------|------------|-------------|------|---|---------------------|--------|
| ≤ 50                 | 0.75                     | convection | aluminum    | Trap |  | ABD-075             | Kentek |
| ≤ 50                 | 0.75                     | convection | aluminum    | Trap |   | ABD-075NP           |        |
| ≤ 50                 | 2                        | convection | aluminum    | Trap |   | ABD-2               |        |
| ≤ 50                 | 2                        | convection | aluminum    | Trap |   | ABD-2NP             |        |
| ≤ 1000               | 2                        | water      | aluminum    | Trap |   | ABD-2C              |        |
| ≤ 1000               | 2                        | water      | aluminum    | Trap |   | ABD-2CNP            |        |
| ≤ 1000               | 2                        | water      | brass       | Trap |   | ABD-2CBP            |        |
| ≤ 1000               | 4                        | water      | aluminum    | Trap |   | ABD-4C              |        |
| ≤ 1000               | 4                        | water      | aluminum    | Trap |   | ABD-4CNP            |        |

## Dumps

| Wavelength Range | Max Aver Power Watts | Max Power Density    | Aperture Diameter | Cooling    | Damage Thresholds  | Type | Picture   | Part Number                       | Vendor    |
|------------------|----------------------|----------------------|-------------------|------------|--|------|---|-----------------------------------|-----------|
|                  | 4000<br>12000        |                      | 100 mm            | water      | Up to 16 kW/cm <sup>2</sup> (at 500 W)   | dump |   | BD-4KW-HE<br>BD-12KW-HD           | Gentec-eo |
| 400-700 nm       |                      | 30 W/cm <sup>2</sup> |                   |            |  | dump |  | PL15                              | Newport   |
| 0.19 to 20μm     | 500                  | 7kW/cm <sup>2</sup>  | 50 mm             | Fan cooled | Max Energy Density (for <100ns) 0.3J/cm <sup>2</sup><br>Max Energy Density (for 2ms) 10J/cm <sup>2</sup> | dump |  | BDFL500A-<br>BB-50 P/N<br>7Z17200 | Ophir     |

| Wavelength Range | Max Aver Power Watts   | Max Power Density     | Aperture Diameter                | Cooling                        | Damage Thresholds   | Type | Picture   | Part Number                                  | Vendor                |
|------------------|------------------------|-----------------------|----------------------------------|--------------------------------|---|------|---|--|-----------------------|
| 0.19 to 20μm     | 1500                   | 1.5kW/cm <sup>2</sup> | 65 mm                            | Fan cooled                     | <ul style="list-style-type: none"> <li>• Max Energy Density (for &lt;100ns) 0.3J/cm<sup>2</sup></li> <li>• Max Energy Density (for 2ms) 10J/cm<sup>2</sup></li> </ul> | dump |    | BDFL1500A-BB-65                              | Ophir                 |
| 0.19 to 20μm     | 5000                   | 3kW/cm <sup>2</sup>   | 50 mm                            | Water                          | <ul style="list-style-type: none"> <li>• Max Energy Density (for &lt;100ns) 0.3J/cm<sup>2</sup></li> <li>• Max Energy Density (for 2ms) 10J/cm<sup>2</sup></li> </ul> | dump |    |  | Ophir                 |
| 0.8 to 20μm      | 11000                  | 10kW/cm <sup>2</sup>  | 450 mm                           | Water                          | Max Energy Density (for 2ms) 18J/cm <sup>2</sup>  | dump |    | BD10K-W                                      | Ophir                 |
| 0.1 to 30 μm     | 1000                   |                       |                                  | Water                          |   | dump |    | 990-0820                                     | EKSMA Optics          |
| 0.1 to 30 μm     | 50                     |                       |                                  | Air                            |   | dump |   | 990-0800                                     | EKSMA Optics          |
|                  | 10<br>30<br>100<br>500 |                       | 15 mm<br>15 mm<br>15 mm<br>19 mm | Air<br>Water<br>Water<br>water |   |      |  | N1039 -1<br>N1039 -2<br>N1039 -3<br>N1039 -4 | U.S.Laser Corporation |
|                  | 2000                   |                       | 19 mm                            | 3-5 GPM of coolant water       |   |      |  | N1031-5                                      | U.S.Laser Corporation |

## Screens

| Type                         | Damage Threshold   | Dimensions   | Picture(s)  | Item #  | Vendor                                 |
|------------------------------|--|--|---|---|--|
| Straight Laser Safety Screen | >350 J/cm <sup>2</sup> (1064 nm, 20 ns, 20 Hz, Ø1.14 mm) | 8" x 6" (203 mm x 152 mm)                                |    | TPS4  | THORLABS                               |
| Straight Laser Safety Screen |  | 12" x 6" (305 mm x 152 mm)                               |    | TPS13   | THORLABS                               |
| Straight Laser Safety Screen |  | 12" x 12" (305 mm x 305 mm)                              |    | TPS5  | THORLABS                               |
| Straight Laser Safety Screen |  | 24" x 6" (610 mm x 152 mm)                               |    | TPS14   | THORLABS                               |
| Straight Laser Safety Screen |  | 24" x 12" (610 mm x 305 mm)                              |    | TPS6  | THORLABS                               |
| Curved Laser Safety Screen   |  | >350 J/cm <sup>2</sup> (1064 nm, 20 ns, 20 Hz, Ø1.14 mm) | 8" x 6" (203 mm x 152 mm)<br>12" x 6" (305 mm x 152 mm)<br>12" x 12" (305 mm x 305 mm)<br>24" x 6" (610 mm x 152 mm)<br>24" x 12" (610 mm x 305 mm) |  | TPS8<br>TPS15<br>TPS7<br>TPS16<br>TPS9 |

| Type   | Damage Threshold  | Comments  | Picture(s)  | Item #                  | Vendor  |
|--|---|---|---|-------------------------|---------|
| Light Shield System, Cable Port, 8 in. (203.2) Height                | Not listed  | Designed for optical table enclosure/ perimeter guards  |    | <a href="#">ELS-CP</a>  | Newport |
| Light Shield System, Connector, Shield Plate, 8 in. (203.2) Height   | Not listed  |   |    | <a href="#">ELS-CS</a>  | Newport |
| Light Shield System, Adjustable Light Port, 8 in. (203.2) Height     | Not listed  |   |    | <a href="#">ELS-LP</a>  | Newport |
| Light Shield System, 8 in. (203.2 mm) Height, 12 in. (304.8 mm) Long | Not listed  |   |    | <a href="#">ELS-P12</a> | Newport |
| Light Shield System, 8 in. (203.2 mm) Height, 24 in. (609.6 mm) Long | Not listed  |   |    | <a href="#">ELS-P24</a> | Newport |
| Light Shield System, 8 in. (203.2 mm) Height, 6 in. (152.4 mm) Long  | Not listed  |   |    | <a href="#">ELS-P6</a>  | Newport |
| Bench-Guard™ Laser Protective Barrier System Panel                   | 1200 watts/cm <sup>2</sup> in excess of 100 seconds                                 | Available in 4 widths and 2 heights.  |   | PT-EBxxxx               | KENTEK  |
| Laser Protective Barrier System Panels<br>6", 12", 24", 36"W x 12" H | 1200 watts/cm <sup>2</sup> in excess of 100 seconds                                 | Ever-Guard® enable quick construction of a 12-inch high wall or curb around optical table                                       |  | PT-TGxx                 | KENTEK  |
| Large Laser Enclosure  | Compliant with ANSI Z136 standards, CDRH certification for integrated laser systems | double-doors and high-powered laser windows for viewing infrared laser work area, removable rear panels, interlocks and wiring. |  |                         | KENTEK  |

## Blocks

| Type  | Damage Threshold   | Comments   | Picture(s)  | Item #                 | Vendor   |
|---|--|--|---|------------------------|----------|
| Beam Block/Tool Holder, Magnetic-Base, front surface of the black anodized stand has a grid pattern for easy aligning | Not listed   |  |  | BB-S<br>BB-M<br>BB-L   | Newport  |
| Aluminum Laser Safety Screen with Laser-Engraved Target Grid  | >350 J/cm <sup>2</sup> (1064 nm, 20 ns, 20 Hz, Ø1.14 mm) | 7.87" x 2.95" (200.0 mm x 75.0 mm),<br><br>11.81" x 2.95" (300.0 mm x 75.0 mm) |  | TPSM1(/M)<br>TPSM2(/M) | THORLABS |

## Laser Safety Barriers and Curtains

| Type                 | Damage Threshold             |                        | Dimensions                             | Picture(s)   | Item # | Vendor   |
|----------------------|------------------------------|------------------------|--|--|--------|----------|
| Laser Safety Barrier | 1064 nm (CW)                 | 80 W/cm <sup>2</sup>   | 5' x 6' (1.5 m x 1.8 m)<br>Fixed Panel |  | SB5x6  | THORLABS |
|                      | 1064 nm (CW)                 | 120 W/cm <sup>2</sup>  |  |  |        |          |
|                      | 1064 nm (CW)                 | 131 W/cm <sup>2</sup>  |  |  |        |          |
|                      | 1064 nm, 20 ns Pulses, 20 Hz | 28.3 W/cm <sup>2</sup> |  |  |        |          |
|                      | 1064 nm, 20 ns Pulses, 20 Hz | 1.42 J/cm <sup>2</sup> |  |  |        |          |
|                      | 1064 nm, 20 ns Pulses, 20 Hz | 40 W/cm <sup>2</sup>   |  |  |        |          |
|                      | 2 J/cm <sup>2</sup>          |                        |  |  |        |          |
|                      | 90 W/cm <sup>2</sup>         |                        |  |  |        |          |
|                      | 4.5 J/cm <sup>2</sup>        |                        |  |  |        |          |

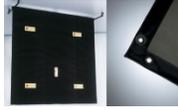
| Type   | Damage Threshold   | Dimensions/ Comments  | Picture(s)  | Item #   | Vendor                           |
|--|--|---|---|--|----------------------------------|
| Laser Safety Curtain Barrier in Plus Power Black Flex-Guard™ material with Velcro® on vertical ends. | Laser-rated at 250W/cm <sup>2</sup> for 100 seconds.<br>Certified to ANSI and NFPA-701 standards   | Dimensions: 7 feet High; Width choice of 4, 6 feet, or 9 feet.  |    | SLC250WB   | KENTEK                           |
| Standard Laser Safety Curtains   | 200 W/cm <sup>2</sup> for 100 seconds  | Size: 58" x 96"   |    | BC0.F5P01.5000                                     | Laservision                      |
| Custom Laser Safety Curtains   | 20 - 300 W/cm <sup>2</sup> for 100 seconds   | Layouts: Straight, L-Shape, U-Shape, and Rectangle<br>Mounting: Direct Ceiling, Ceiling-Suspended, Along-the-wall, and Floor<br>Options: Valances, Cleanroom-Rated Curtains, and More   |    |  | Laservision                      |
| Single & Double Laser Curtain and Track Assembly Specifications                                      | fabric passes the flame resistance requirements specified by the State of California test - # FA-40602, and in accordance with the NFPA Standard No. 701-99 test methods 1 and 2.<br><b>! need to request damage threshold</b>                     | 38% SEF Modacrylic, 30% Saran Flat Monofilament, 26% Viscose Rayon and 6% Polyester   |   | Catalog No's. LDCT & LDCTD                         | PL Systems, Inc.                 |
| Laser Safety Curtains – The Orca range   | Black or White Side<br>2.2 MW/m <sup>2</sup> per 100s, 4mm <sup>2</sup><br>0.35 MW/m <sup>2</sup> per 100s, 2000mm <sup>2</sup>  | When irradiated with greater than 0.5 MW/m <sup>2</sup> it will emit a non-hazardous smoke and may glow, thus indicating that a stray beam is present.  |  |  | Lasermet /Laser safety Solutions |
| Laser Curtain Materials  | 100 W/cm <sup>2</sup> for 100 seconds<br>200 W/cm <sup>2</sup> for 100 seconds<br>300 W/cm <sup>2</sup> for 100 seconds<br>20 W/cm <sup>2</sup> for 100 seconds<br>200 W/cm <sup>2</sup> for 100 seconds<br>1000 W/cm <sup>2</sup> for 100 seconds | Charcoal-black color fiberglass-based fabric with rubberized silicone coating<br><br>F5P03/05 Black PTFE-coated fiberglass-based fabric with anti-static properties for cleanroom<br><br>M5P06 Two layers of aluminum bonded with corrugated polyallomer core |  | F5P06<br>F5P01<br>F5P02<br>F5P03<br>F5P05<br>M5P06 | Laservision                      |

| Type                              | Damage Threshold    |   |   | Picture(s)  | Item # | Vendor          |
|-----------------------------------|---------------------|---|---|---|--------|-----------------|
| Laser Blocking Curtains           | White Side          | Irradiated Area<br>1mm <sup>2</sup><br>500mm <sup>2</sup> | PEL (T2) 100s<br>3 MW/m <sup>2</sup><br>0.7 MW/m <sup>2</sup> |  |        | RT Technologies |
|                                   | Black Side          | 1mm <sup>2</sup><br>500mm <sup>2</sup>                    | 1 MW/m <sup>2</sup><br>0.5 MW/m <sup>2</sup>                  |   |        |                 |
| Standard Laser-Blocking Screens   | White Side          | Irradiated Area<br>1mm <sup>2</sup><br>500mm <sup>2</sup> | PEL (T2) 100s<br>3 MW/m <sup>2</sup><br>0.7 MW/m <sup>2</sup> |  |        | RT Technologies |
|                                   | Black Side          | 1mm <sup>2</sup><br>500mm <sup>2</sup>                    | 1 MW/m <sup>2</sup><br>0.5 MW/m <sup>2</sup>                  |   |        |                 |
| Heavy-Duty Laser Blocking Screens | Irradiated Area     | PEL (T3) 10 s   | PEL (T2) 100 s  |  |        | RT Technologies |
|                                   | 4mm                 | 61 MW/m <sup>2</sup>                                      | 34 MW/m <sup>2</sup>  |   |        |                 |
|                                   | 2000mm <sup>2</sup> | 2.7 MW/m <sup>2</sup>                                     | 1.5 MW/m <sup>2</sup>   |   |        |                 |

## Barriers and Panels

| Type  | Damage Threshold  | Dimensions/ Comments   | Picture(s)  | Item #         | Vendor      |
|---|---|--|---|----------------|-------------|
| All-metal laser barriers and curtains   | High Power Ratings<br><br>Certified to ANSI and NFPA-701 standards                    | Ever-Guard® all-metal laser barriers and curtains are constructed from uniquely patterned aluminum panels with a special coating that helps block, absorb, and diffuse scattered and direct laser radiation. |    |                | KENTEK      |
| Free-Standing Laser Barriers  | 1200 Watts per square centimeter<br><br>Certified to ANSI and NFPA-701 standards      | aluminum panels with a special coating   |    |                | KENTEK      |
| Portable Laser Safety Curtain Barrier - Plus Power                              | 250W/cm <sup>2</sup> for 100 seconds.<br><br>Certified to ANSI and NFPA-701 standards | Accepted in clean room.<br>3-panel design 3 feet W x 6.5 feet H connecting with snaps  |    | PT-SRTRI3-CR   | KENTEK      |
| Portable Laser Safety Curtain Barrier in Regular Duty Blue Flex-Guard™ material | 100W/cm <sup>2</sup> for 100 seconds<br><br>Certified to ANSI and NFPA-701 standards  | 3 panels 3 feet W x 6.5 feet H connecting with Velcro®.  |   | PT-SRTRI3      | KENTEK      |
| Foldable Laser Safety Panels – 3; 5; 7; 9-panel system                          | 1000 W/cm <sup>2</sup> 100 seconds  | Size: 8'6" x 6'10"<br>Size: 14' x 6'10"<br>Size: 19'6" x 6'10"<br>Size: 25' x 6'10"  |  | BM0.M5P06.500x | Laservision |
| Portable Barriers - Extendable Laser Safety Panels 3; 5; 7-panel system         | 1000 W/cm <sup>2</sup> 100 seconds  | Size: 7'1.5" x 6'10"<br>Size: 11'3.75" x 6'10"<br>Size: 15'6" x 6'10"  |  | BM2.M5P06.5003 | Laservision |

| Type  | Damage Threshold   | Dimensions/ Comments  | Picture(s)  | Item #         | Vendor                    |
|---|--|---|---|----------------|---------------------------|
| Custom Portable Barriers - Framed Panels and Curtains | 20 - 1000 W/cm <sup>2</sup> for 100 seconds  |   |    |                | Laservision               |
| Framed Laser Safety Curtain                           | 20-1000 W/cm <sup>2</sup> 100 seconds<br>1000 W/cm <sup>2</sup> 100 seconds                                  | Size: 6' x 8' Anodized Steel<br>Size: 7' x 8'<br>Size: 8' x 8'<br>Size: 4' x 8' Anodized Aluminum |    | BC0.F5P01.500x | Laservision               |
| Laser Safety Barrier                                  | 200W/cm <sup>2</sup> for 100 seconds   | Different sizes   |    | LC-xx          | Phillips Safety           |
| Flex-Guard Metal Barrier                              | 250W/cm <sup>2</sup> for 100 seconds   | Clean Room Friendly   |    | LC-FLEX        | Phillips Safety           |
| Ever-Guard Metal Barrier                              | 1200W/cm <sup>2</sup> for 100 seconds  | Clean Room Friendly   |   | LC-EVER        | Phillips Safety           |
| Laser Safety Barriers Systems                         | 200W, 300W, 2500W per cm <sup>2</sup> with beam site of 5mm for 100 seconds                                  |   |  |                | Laser safety Industries   |
| High Energy Laser Barriers Systems 10,000W            | 10,000W per cm <sup>2</sup> with beam site of 5mm for 100 seconds  |   |  |                | Laser safety Industries   |
| LAZ-R-SHROUD™ laser barrier                           | 2 W/cm <sup>2</sup> per 100s, 5mm<br>100 W/cm <sup>2</sup><br>200 W/cm <sup>2</sup><br>300 W/cm <sup>2</sup> | Different sizes   |  |                | Rockwell Laser Industries |

| Type   | Damage Threshold  | Dimensions/ Comments   | Picture(s)  | Item #                               | Vendor                          |
|--|---|--|---|--------------------------------------|---------------------------------|
| Laz-R-Barriers™<br>(formerly<br>manufactured by<br>Wilson)   | 70 W/cm <sup>2</sup> per 100s, 5mm<br>Single Layer construction   |  |  |                                      | Rockwell<br>Laser<br>Industries |
| Roll-up shades   | 25W/cm <sup>2</sup> for 100 seconds<br>50W/cm <sup>2</sup> for 100 seconds<br>100W/cm <sup>2</sup> for 100 seconds<br>250W/cm <sup>2</sup> for 100 seconds<br>1200W/cm <sup>2</sup> for 100 seconds | Flex-Guard™ laser barrier  |  | SLW<br>SLS                           | KENTEK                          |
| Custom Window<br>Laser Roller Shades   | 20 - 200 W/cm <sup>2</sup> for 100<br>seconds   | Frame: Aluminum  |  |                                      | Laservision                     |
| Custom Window<br>Laser Safety Covers   | 20 - 300 W/cm <sup>2</sup> for 100<br>seconds   |  |  |                                      | Laservision                     |
| Vertical Blackout Blind<br>Vertical Blackout Blind<br>Vertical Blackout Blind<br>Vertical Blackout Blind |   | 600 mm x 1700 mm (23.6" x 66.9")<br>900 mm x 1700 mm (35.4" x 66.9")<br>1200 mm x 1700 mm (47.2" x 66.9")<br>1500 mm x 1700 mm (59.1" x 66.9") |  | VBB060<br>VBB090<br>VBB120<br>VBB150 | THORLABS                        |

## Blackout materials NOT intended to be used for laser safety as beam dumps

| Type  | Dimensions   | Picture(s)  | Item #               | Vendor   |
|---|--|---|----------------------|----------|
| Black Rubberized Fabric,                                      | 5' x 9' (1.5 m x 2.7 m) x 0.005" (0.12 mm) Thick   |  | BK5                  | THORLABS |
| Black Hardboard<br>Black Posterboard                          | 24" x 24" (610 mm x 610 mm), 5 mm Thick, 3 Sheets<br>20" x 30" (508 mm x 762 mm), 1/16" (1.6 mm) Thick, 5 Sheets |  | TB4<br>TB5           | THORLABS |
| Black Flocked Paper   | 30" x 30" (762 mm x 762 mm) Sheet  |  | BFP1                 | THORLABS |
| Matte Black Aluminum Foil                                     | 1' x 50' (305 mm x 15.2 m) x .002" (50 μm) Thick   |  | BKF12                | THORLABS |
| Black Masking Tape,<br>High-Performance Black<br>Masking Tape | 2" x 180' (50 mm x 55 m) Roll<br>2" x 180' (50 mm x 55 m) Roll   |  | T137-2.0<br>T143-2.0 | THORLABS |

## Welding Curtains

| Type  | Damage Threshold  | Advantages/Comments   | Picture(s)  | Item # | Vendor                             |
|---|---|---|---|--------|------------------------------------|
| Blankets<br>Different sizes and duties  | <ul style="list-style-type: none"> <li>• Spark Control</li> <li>• Oil Resistant</li> <li>• Chemical Resistant</li> <li>• Flame Resistant</li> </ul> | Fiberglass<br>Momentary Service 1,000°F (538°C)<br><input type="checkbox"/> Low thermal conductivity<br><input type="checkbox"/> Will not burn or smolder<br><input type="checkbox"/> Resistant to sparks and welding spatter |  |        | TMO<br>Thermostatic<br>Industries  |
| Wilson Quality Safety Products,<br>Wilson brand, Steiner brand<br>Trade Name: Wilson Industries |   |   |  |        | MSC Industrial<br>Supplies<br>Enco |