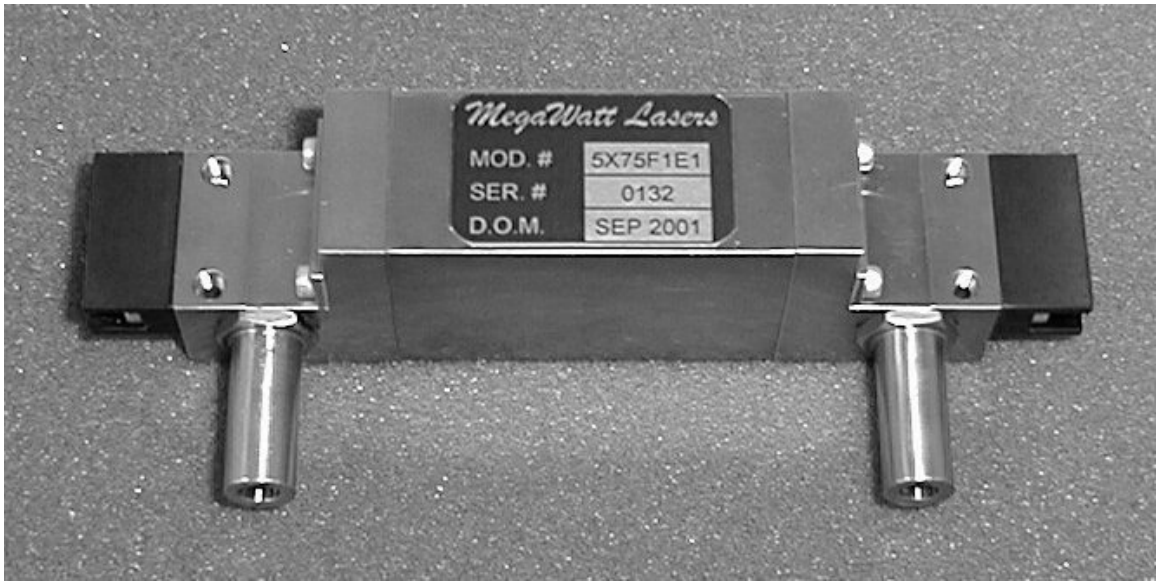
MegaWatt Lasers, Inc.

Single Flashlamp Solid-State Laser Pumping Chambers



- Configurations Available for all CW and Pulsed Solid-State Laser Media
- Close-Coupled Diffuse Reflector Design for Highest Efficiency and Pump Uniformity
- Radially Uniform Coolant Flow Reduces Aspheric Thermal Lensing in High Average Power Applications
- Available with Synthetic Fused Silica and Fluorescent Converting Doped Glass Filter Tubes
- Multi-Rod, Multi-Lamp Configurations
- Constructed from Materials that are Compatible with High Purity Coolants
- Standard, Custom, and OEM Configurations are Available

MegaWatt Lasers, Inc.

Nomenclature for Standard Size Pump Chambers

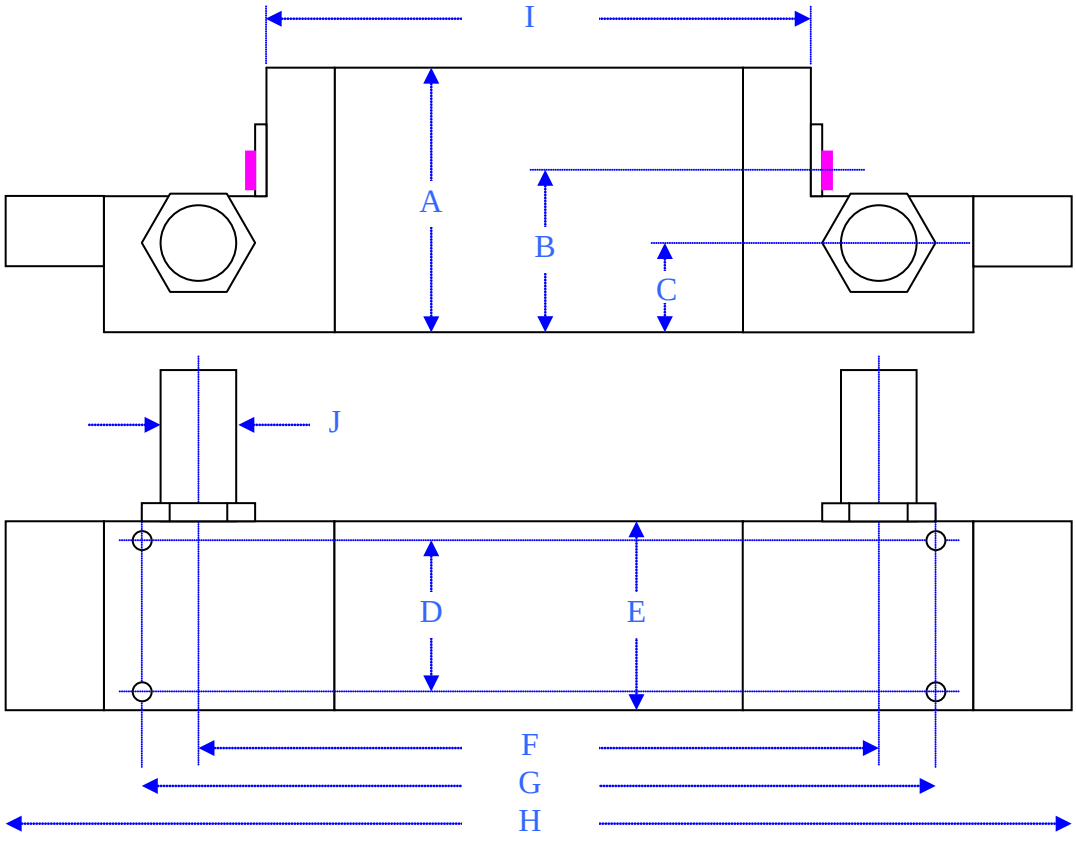
Format: ϕF-ϕRXLC#E#F#

ϕF is the lamp diameter, in mm.	If "-ϕF" is absent, the lamp diameter is the same as the rod diameter. For rod diameters 5mm or smaller, the default lamp diameter is 5mm.
ϕR is the rod diameter, in mm.	Standard Sizes: 3, 4, 5, 6, 6.4, 7, 8, 9, 9.5, 10, 12.7, 13
L is the minimum laser rod length. Usually, we recommend using a rod length several mm longer for ease of insertion and the possibility of rework.	Standard Sizes: 50, 75, 100, 125, 150, 200
C# is the configuration	None - single rod, single lamp, coolant port on side C1 - single rod, two lamps C2 - Single rod, two lamps, bottom coolant port C3 - two rods, single lamp
E# is the end cap material	None - clear anodized aluminum E1 - Titanium E2 - SS 316L E3 - Plastic
F# is the flow or filter tube material	None - clear F1 - doped with Ce & Sm (for Nd:YAG) F2 - clear strengthened silicate glass F3 - Ce doped (for Alexandrite) F4 - 5% Sm doping (for Nd:YAG) F5 - 10% Sm doping (for Nd:YAG)

Examples:

4X125 ϕ4mm diameter rod, ϕ5mm flashlamp diameter, 125mm minimum rod length, single rod, single lamp, coolant port on side, clear anodized aluminum end caps, clear flow tube.

6-9.5X100C1F5 ϕ9.5mm diameter rod, ϕ6mm flashlamp diameter, 100mm minimum rod length, single rod, two flashlamps, clear anodized aluminum end caps, filter tube with 10% Sm doping.



Single Flashlamp Solid-State Laser Pumping Chambers

Standard Size Side-Port Configuration

Dimensions in millimeters

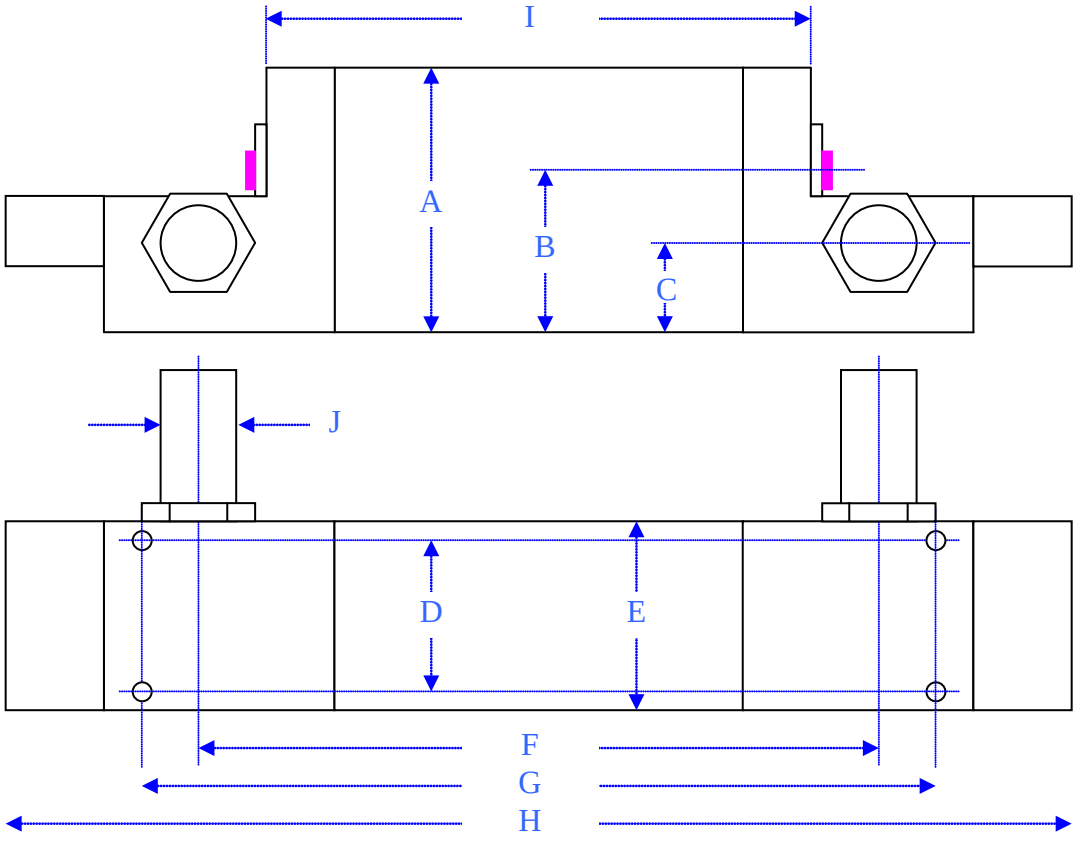
Model	A:	B:	C:	D:	E:	F:	G:	H:	I:	J:*	Lamp
3X50	34.0	20.5	11.8	18.0	25.0	65	80	116	47	ϕ10.0	ϕ5.0
3X75	34.0	20.5	11.8	18.0	25.0	90	105	141	72	ϕ10.0	ϕ5.0
4X75	34.5	21.0	11.8	18.0	25.0	90	105	141	72	ϕ10.0	ϕ5.0
4X100	34.5	21.0	11.8	18.0	25.0	115	130	166	97	ϕ10.0	ϕ5.0
4X125	34.5	21.0	11.8	18.0	25.0	140	155	191	122	ϕ10.0	ϕ5.0
5X75	35.0	21.5	11.8	18.0	25.0	90	105	141	72	ϕ10.0	ϕ5.0
5X100	35.0	21.5	11.8	18.0	25.0	115	130	166	97	ϕ10.0	ϕ5.0
5X125	35.0	21.5	11.8	18.0	25.0	140	155	191	122	ϕ10.0	ϕ5.0
5X150	35.0	21.5	11.8	18.0	25.0	165	180	216	147	ϕ10.0	ϕ5.0
6X75	35.0	22.0	10.8	19.0	26.0	90	105	141	72	ϕ10.0	ϕ6.0
6X100	35.0	22.0	10.8	19.0	26.0	115	130	166	97	ϕ10.0	ϕ6.0
6X125	35.0	22.0	10.8	19.0	26.0	140	155	191	122	ϕ10.0	ϕ6.0
6X150	35.0	22.0	10.8	19.0	26.0	165	180	216	147	ϕ10.0	ϕ6.0

Continued

* - Pump chambers sold to customers in the United States will be equipped with 0.375” (9.53 mm) diameter coolant ports. Add suffix “–M” if 10 mm diameter coolant ports are desired in the US.

MegaWatt Lasers, Inc.

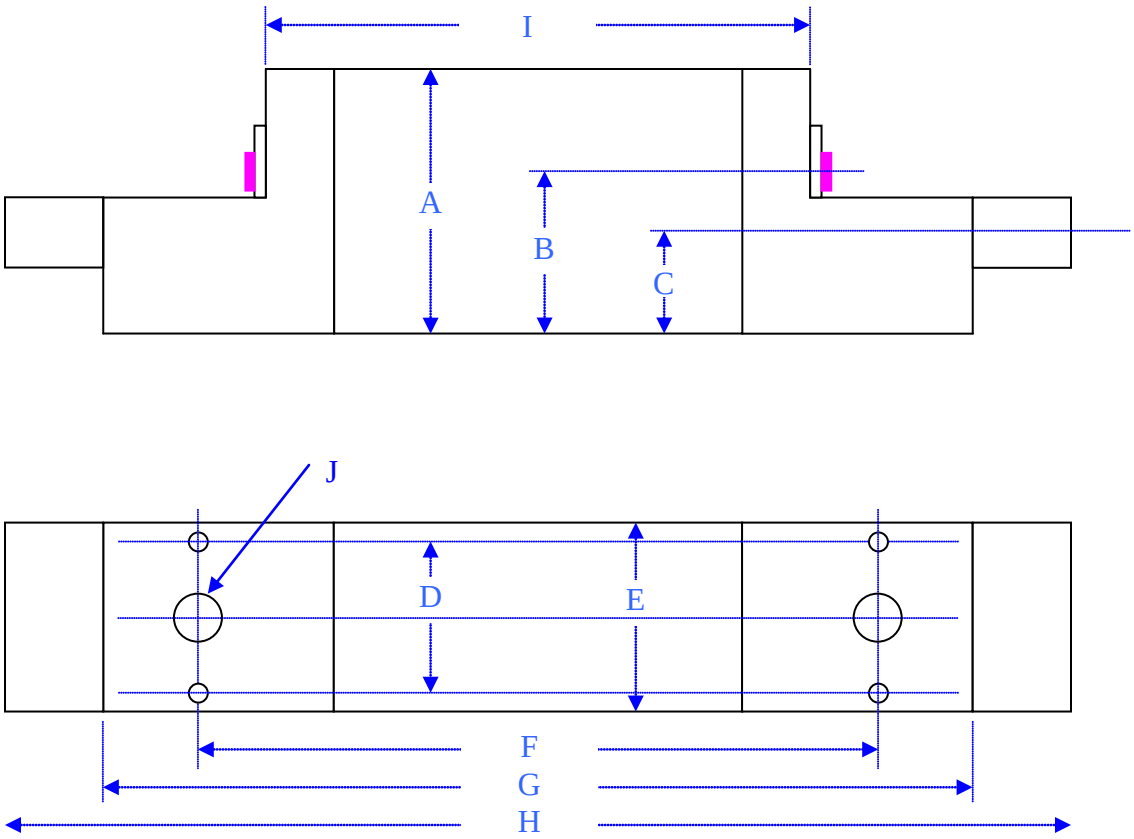
Pump Chamber Dimensions



Model	A:	B:	C:	D:	E:	F:	G:	H:	I:	J:*	Lamp
6.35X75	37.0	23.5	11.8	20.0	27.0	90	105	141	72	ϕ10.0	ϕ7.0
6.35X100	37.0	23.5	11.8	20.0	27.0	115	130	166	97	ϕ10.0	ϕ7.0
6.35X125	37.0	23.5	11.8	20.0	27.0	140	155	191	122	ϕ10.0	ϕ7.0
6.35X150	37.0	23.5	11.8	20.0	27.0	165	180	216	147	ϕ10.0	ϕ7.0
7X75	37.0	23.5	11.8	20.0	27.0	90	105	141	72	ϕ10.0	ϕ7.0
7X100	37.0	23.5	11.8	20.0	27.0	115	130	166	97	ϕ10.0	ϕ7.0
7X115	37.0	23.5	11.8	20.0	27.0	130	145	171	112	ϕ10.0	ϕ7.0
7X125	37.0	23.5	11.8	20.0	27.0	140	155	181	122	ϕ10.0	ϕ7.0
7X150	37.0	23.5	11.8	20.0	27.0	165	180	216	147	ϕ10.0	ϕ7.0
8X75	38.5	25.0	12.3	23.0	30.0	90	105	141	72	ϕ10.0	ϕ8.0
8X100	38.5	25.0	12.3	23.0	30.0	115	130	166	97	ϕ10.0	ϕ8.0
8X125	38.5	25.0	12.3	23.0	30.0	140	155	191	122	ϕ10.0	ϕ8.0
8X150	38.5	25.0	12.3	23.0	30.0	165	180	216	147	ϕ10.0	ϕ8.0
9X75	38.5	25.0	12.3	23.0	30.0	90	105	141	72	ϕ10.0	ϕ8.0
9X100	38.5	25.0	12.3	23.0	30.0	115	130	166	97	ϕ10.0	ϕ8.0
9X125	38.5	25.0	12.3	23.0	30.0	140	155	191	122	ϕ10.0	ϕ8.0
9X150	38.5	25.0	12.3	23.0	30.0	165	180	216	147	ϕ10.0	ϕ8.0

Other sizes available.

* - Pump chambers sold to customers in the United States will be equipped with 0.375” (9.53 mm) diameter coolant ports. Add suffix “–M” if 10 mm diameter coolant ports are desired in the US.



Single Flashlamp Solid-State Laser Pumping Chambers

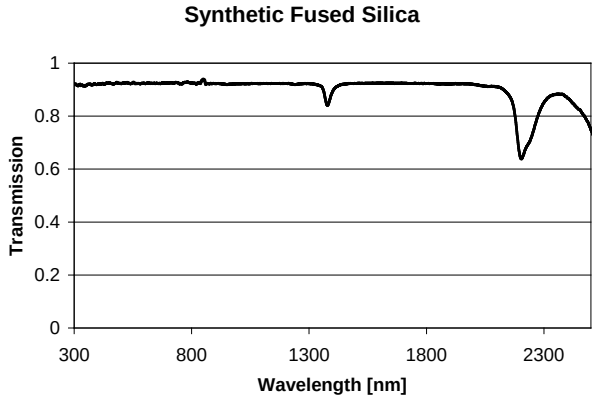
Standard Size Bottom Port "C2" Configuration

Dimensions in millimeters

Model	A:	B:	C:	D:	E:	F:	G:	H:	I:	J:	Lamp
3X50C2	34.0	20.5	13.5	18.0	25.0	65	80	116	47	ϕ6.4	ϕ5.0
3X75C2	34.0	20.5	13.5	18.0	25.0	90	115	141	72	ϕ6.4	ϕ5.0
4X75C2	34.5	21.0	13.5	18.0	25.0	90	115	141	72	ϕ6.4	ϕ5.0
4X100C2	34.5	21.0	13.5	18.0	25.0	115	140	166	97	ϕ6.4	ϕ5.0
4X125C2	34.5	21.0	13.5	18.0	25.0	140	165	191	122	ϕ6.4	ϕ5.0
5X75C2	35.0	21.5	13.5	18.0	25.0	90	115	141	72	ϕ6.4	ϕ5.0
5X100C2	35.0	21.5	13.5	18.0	25.0	115	140	166	97	ϕ6.4	ϕ5.0
5X125C2	35.0	21.5	13.5	18.0	25.0	140	165	191	122	ϕ6.4	ϕ5.0
7X100C2	37.0	23.5	13.5	20.0	27.0	90	115	141	72	ϕ6.4	ϕ7.0
7X100C2	37.0	23.5	13.5	20.0	27.0	115	140	166	97	ϕ6.4	ϕ7.0
7X125C2	37.0	23.5	13.5	20.0	27.0	140	165	191	122	ϕ6.4	ϕ7.0

Other sizes available.

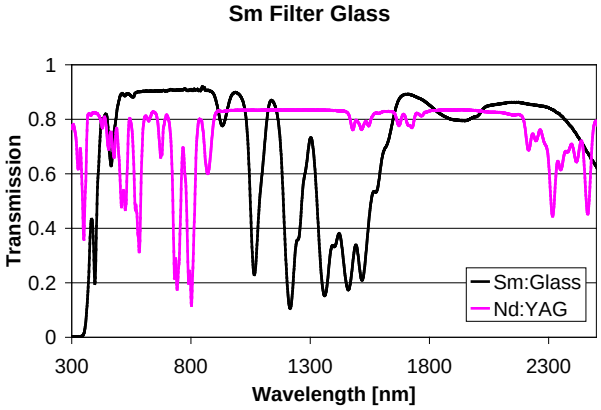
Mounting holes clear M3 socket head cap screws.



Synthetic Fused Silica

Recommended for use with high peak power laser media that is not susceptible to UV solarization. (Er:YAG, CTH:YAG, Cr-Nd:GSGG, Ruby, Er:Glass, etc.)

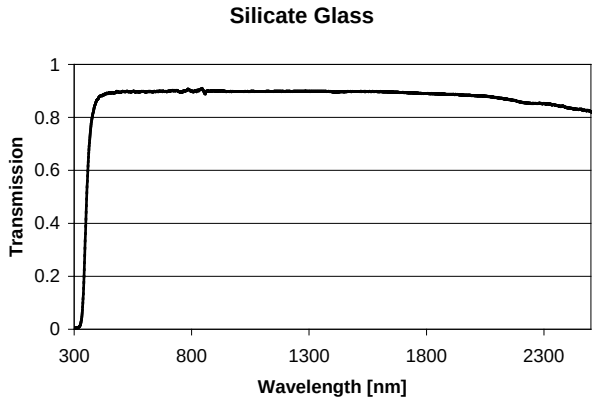
Suffix: None



Strengthened Samarium Doped Silicate Glass

Recommended for use with Nd:YAG

Suffix: F1

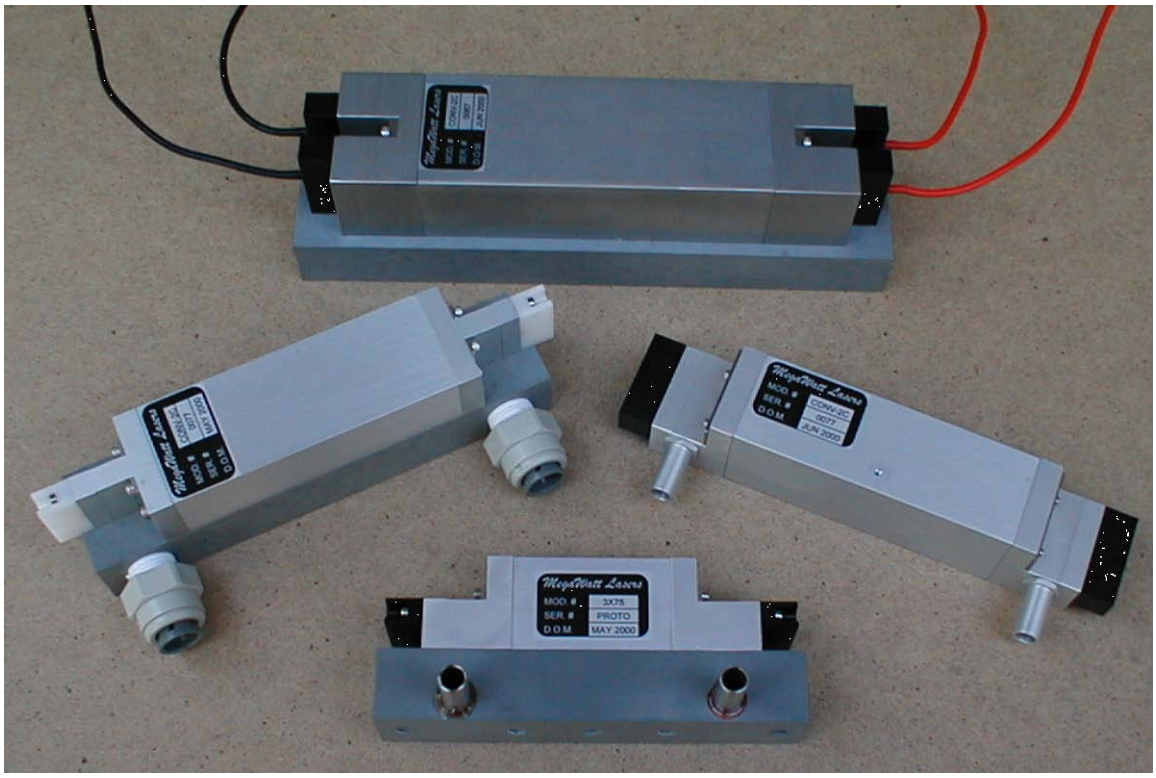


Strengthened Clear Silicate Glass

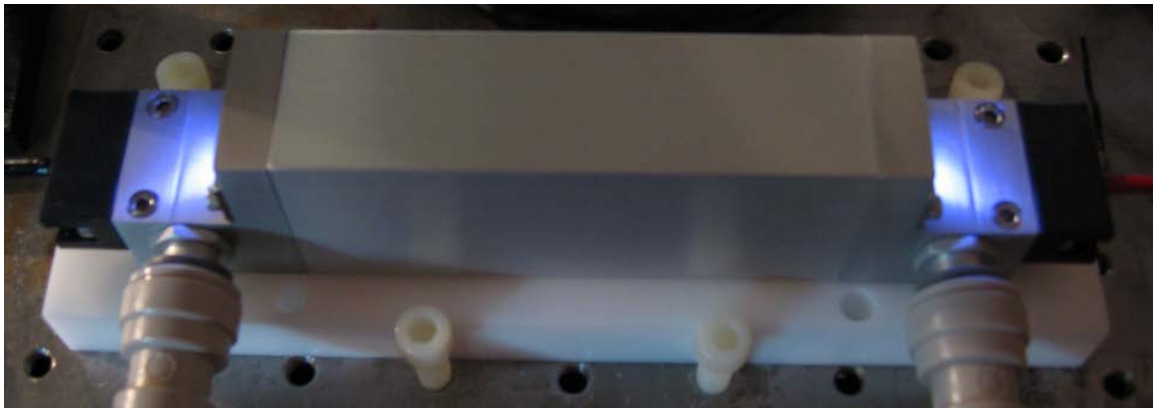
Recommended for use with low peak power lasers (This material is somewhat UV solarization susceptible.)

Suffix: F2

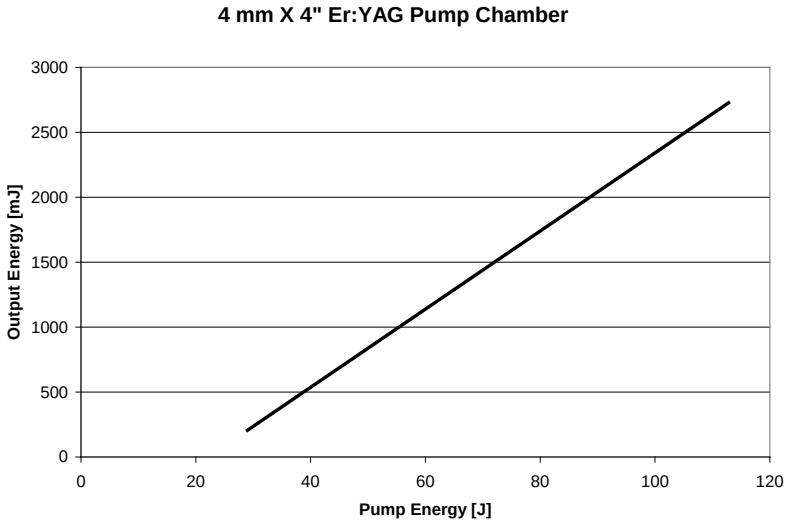
Custom Pump Chambers for a Medical Application
Using 4 mmϕ X 127 Cr, Tm, Ho:YAG Laser Rods



From Top: 6.4X150C1F3 Pump Chamber for Alexandrite, 4X125C3 Pump Chamber for Dual CTH:YAG Rods, Custom Design for 4 mmϕ X 127 mm CTH:YAG, and 3X75C2 Prototype Pump Chamber for Er:Glass

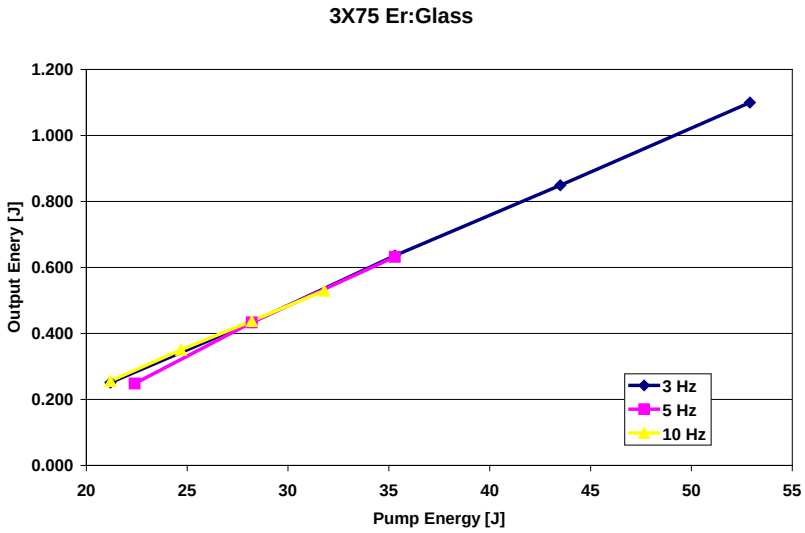


HE7X115F1 Pump Chamber. This pump chamber is specially designed for high energy applications such as material processing or dermatology. Similar in size to our standard pump chambers, the High Energy “HE” line uses our high density composite aloxite diffuse reflector. The HE7X115F1 pump chamber can produce output energies up to 100J.



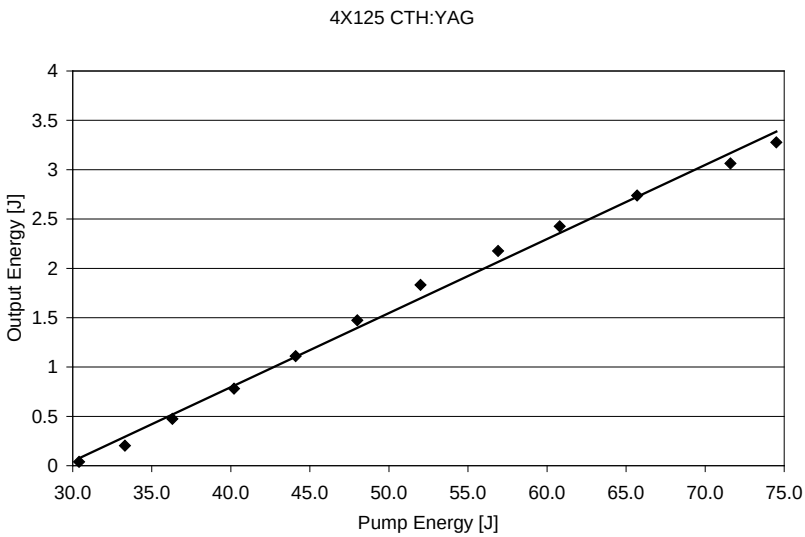
Model 4X100

Er:YAG 2.94µm
80%R Output Coupler
25° C Coolant
10 Hz
3.0% Slope Efficiency



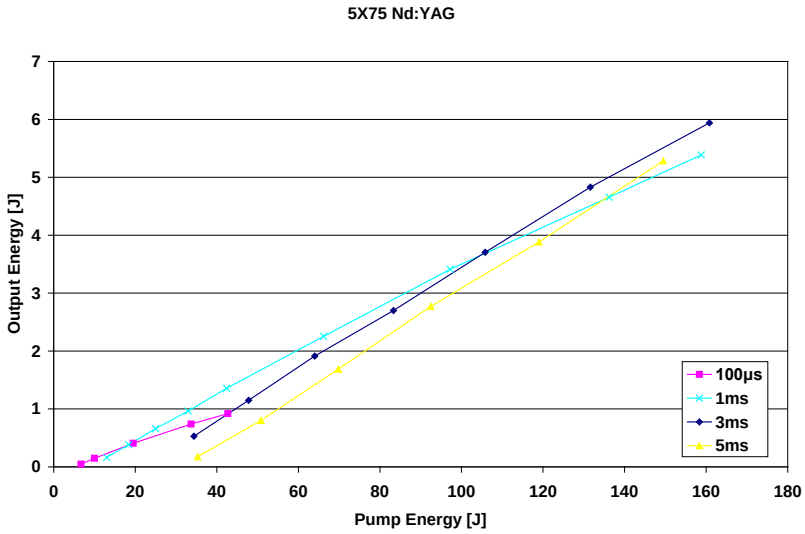
Model 3X75

Er:Glass 1.535 µm
Kigre QX/Er Glass
80%R Output Coupler
25° C Coolant
2.7 % Slope Efficiency



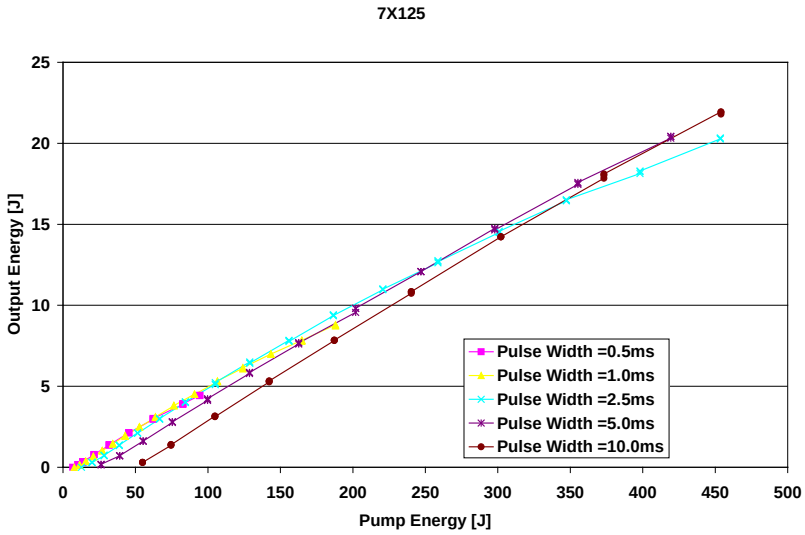
Model 4X125

Cr,Tm,Ho:YAG 2.1 µm
75%R Output Coupler
25° C Coolant
10 Hz
7.5 % Slope Efficiency



Model 5X75

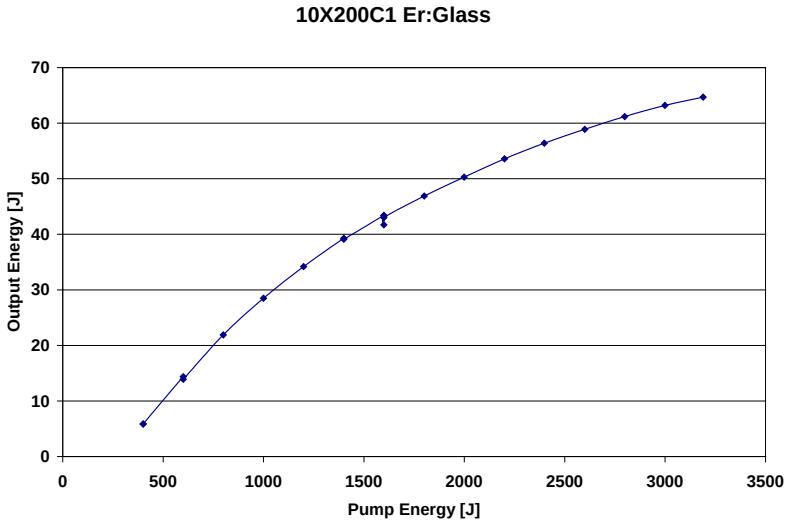
Nd:YAG 1.064µm
30%R Output Coupler
25° C Coolant
5 Hz
4.5% Slope Efficiency



Model 7X125

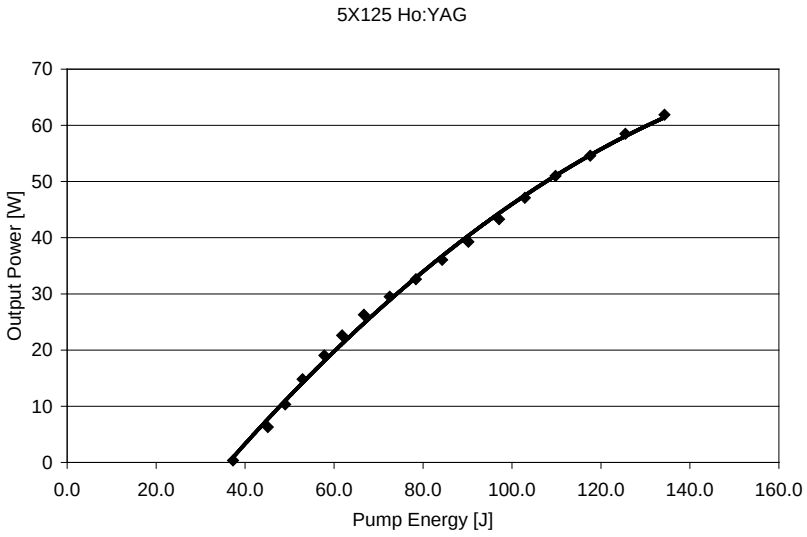
Nd:YAG 1.064µm
50%R Output Coupler
20° C Coolant

Through 800 µm Fiber



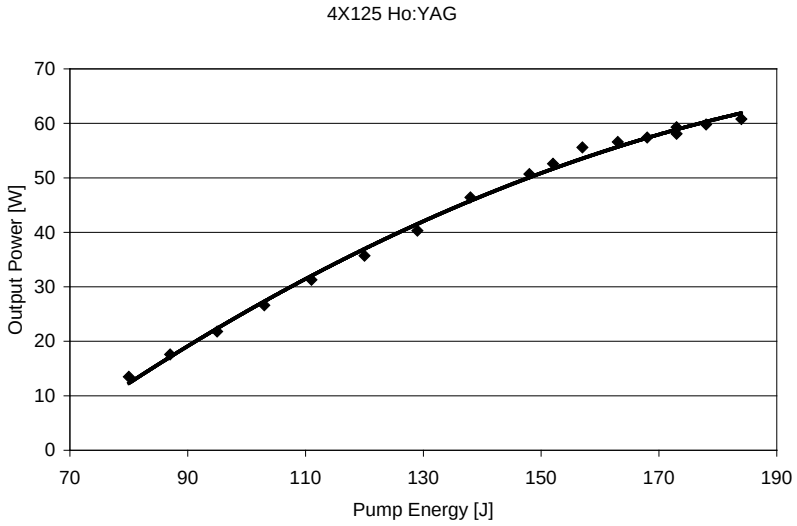
Model 10X200C1

Er:Glass 1.535µm
Dual Flashlamps
40%R Output Coupler
25° C Coolant



Model 5X125

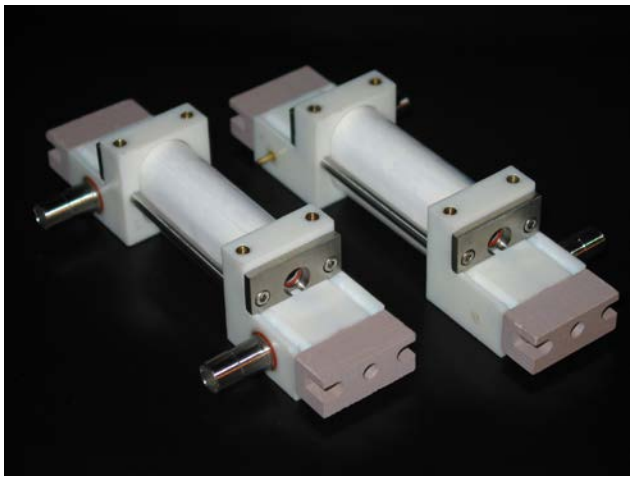
CTH:YAG 2.1 μm
75%R Output Coupler
10° C Coolant
10 Hz
350 μs pulse



Model 4X125

CTH:YAG 2.1 μm
60%R Output Coupler
15° C Coolant
10 Hz
800 μs pulse

LEGACY PUMP CHAMBERS

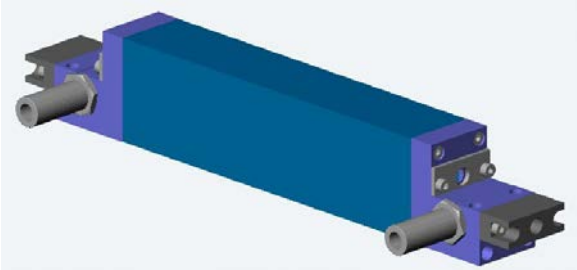


REPRODUCTIONS OF LEGACY KIGRE PUMP CHAMBER DESIGNS

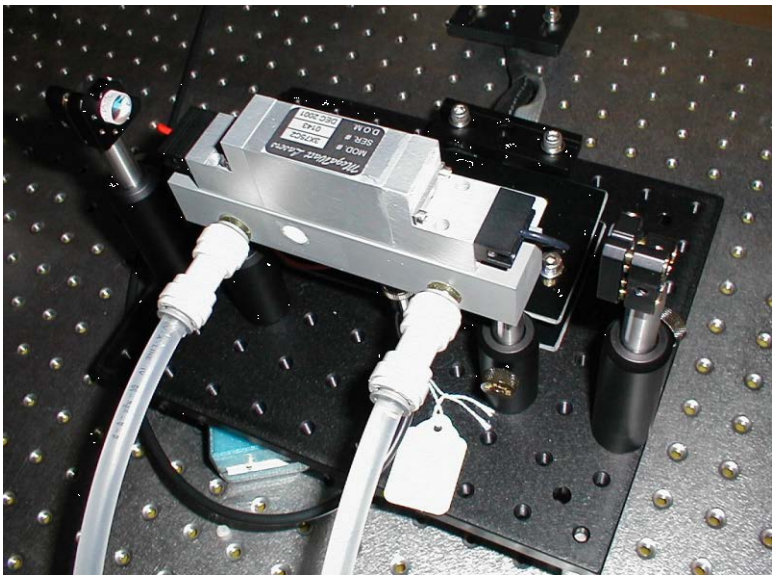
During the 1980's, scientists and engineers at Kigre, Inc. pioneered the development of diffuse reflector solid-state laser pump chambers. In comparison to specular reflector pump chambers, Kigre's pump chambers were much smaller and offered nearly double the efficiency. Kigre's Barium Sulfate based diffuse reflector offered much higher reflectivity and pumping uniformity than any other pump chamber on the market.

The heart of Kigre's pump chamber design is the filter tube, which was fabricated from Kigre's strengthened rare-earth-doped silicate glasses. Doped with Ce^{3+} and/or Sm^{3+}, these filter tubes filter UV, unusable visible and IR regions of the flashlamp spectra, reducing thermal induced lensing and birefringence and in some cases eliminating ASE and parasitic oscillations. A portion of the absorbed energy is re-emitted in useful pump bands, further improving efficiency. The "FC" in Kigre's nomenclature stands for Fluorescent Converting.

Although Kigre discontinued its pump chamber line several years ago, MegaWatt Lasers now offers exact reproductions of Kigre's popular pump chamber designs. Manufactured using Kigre's drawings and specifications, these pump chambers are ideal replacements for existing laser systems. For new laser designs, we recommend using MegaWatt Lasers current pump chambers.



MegaWatt Lasers manufactures high quality laser pump chambers for a variety of laser applications covering all solid-state laser wavelengths. Our pump chamber designs provide unsurpassed performance, reliability and leak integrity to meet the demanding needs of your laser system design. Through many years' experience, we have optimized our pump chamber designs to provide features such as high efficiency diffuse reflectors and symmetric radial cooling. Standard pump chambers can be delivered off-the-shelf while the modular design allows for cost effective custom solutions. Contact us today to learn more about improving your performance and reducing cost of your solid state pump chamber needs!



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