

# Altered States: A Fresh Look at Laser Safety Products

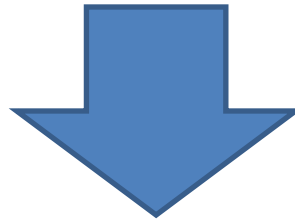
Kentek Corporation  
August 2011



Change your perception of your laser eye protection (LEP) supplier.



Eyewear: Products



Filters: Knowledge



Consider 4 “states” of laser safety filter products.

1. Known Products
2. Combinations of Known Products
3. Combinations with Non-laser Applications
4. New Configurations



Custom fit will result in improved operator comfort and increased use of LEP.

- Request a sample kit of stock frames and try them on your technicians.



Fit Kit Frame Selection

- Consider adjustable frame styles to maximize fit for a variety of facial types.



Ratcheting and adjustable temples

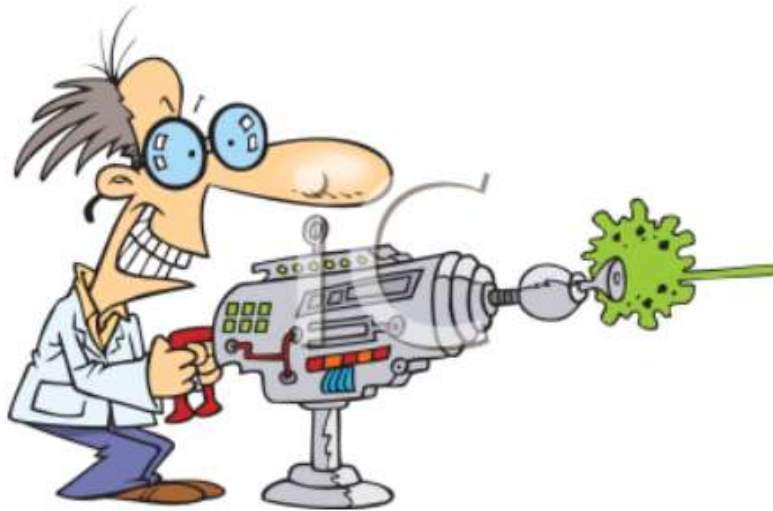
- **Your Frame** can be reviewed for laser lens installation!



Lockwood tactical frames with 7101 filter

Markings on most products can be customized.

**NEW LASER INVENTED  
AT 662nm!!**



Optical Density Chart

Page 1 of 2

Filter Number: 20C  
Filter Color: Blue  
VLT (%): 50

NOTE: OD values below are average minimum values of representative lots of filter material according to manufacturer specifications. They are not guaranteed minimums for every lens. Minimum protection values will be specified on each product.

Laser Filter:  
OD Values: Product Markings: See page 2 for product markings

mm	OD	mm	OD	mm	OD	mm	OD	mm	OD	mm	OD	mm	OD	mm	OD	mm	OD	mm	OD		
200	7+	295	7+	310	7+	365	0.27	420	0.04	475	0	530	0	585	0.36	640	2.02	695	6.65	750	7+
201	7+	295	7+	311	7+	365	0.26	421	0.04	476	0	531	0	585	0.38	641	2.07	696	5.73	751	7+
202	7+	297	7+	312	7+	367	0.25	422	0.03	477	0	532	0	587	0.39	642	2.11	697	5.83	752	7+
203	7+	298	7+	313	7+	368	0.24	423	0.03	478	0	533	0	588	0.41	643	2.16	698	5.91	753	7+
204	7+	299	7+	314	7+	368	0.24	424	0.03	478	0	534	0	588	0.43	644	2.22	699	6.00	754	7+
205	7+	260	7+	315	6.70	370	0.23	425	0.03	480	0	535	0	590	0.44	645	2.27	700	6.10	755	7+
206	7+	261	7+	316	6.03	371	0.22	426	0.02	481	0	536	0	591	0.46	646	2.32	701	6.20	756	7+
207	7+	262	7+	317	5.44	372	0.22	427	0.02	482	0	537	0	592	0.48	647	2.37	702	6.29	757	7+
208	7+	263	7+	318	4.88	373	0.21	428	0.02	483	0	538	0	593	0.50	648	2.43	703	6.38	758	7+
209	7+	264	7+	319	4.57	374	0.20	429	0.02	484	0	539	0	594	0.52	649	2.48	704	6.48	759	7+
210	7+	265	7+	320	4.17	375	0.20	430	0.02	485	0	540	0	595	0.54	650	2.53	705	6.58	760	7+
211	7+	266	7+	321	3.79	376	0.19	431	0.01	486	0	541	0	596	0.56	651	2.58	706	6.67	761	7+
212	7+	267	7+	322	3.41	377	0.19	432	0.01	487	0	542	0	597	0.58	652	2.64	707	6.77	762	7+
213	7+	268	7+	323	3.13	378	0.18	433	0.01	488	0	543	0	598	0.60	653	2.70	708	6.86	763	7+
214	7+	269	7+	324	2.87	379	0.18	434	0.01	489	0	544	0	599	0.62	654	2.75	709	6.96	764	7+
215	7+	270	7+	325	2.63	380	0.17	435	0.01	490	0	545	0	600	0.65	655	2.81	710	7+	765	7+
216	7+	271	7+	326	2.41	381	0.17	436	0.01	491	0	546	0.00	601	0.67	656	2.87	711	7+	766	7+
217	7+	272	7+	327	2.21	382	0.16	437	0.00	492	0	547	0.01	602	0.69	657	2.93	712	7+	767	7+
218	7+	273	7+	328	2.04	383	0.16	438	0.00	493	0	548	0.01	603	0.71	658	2.99	713	7+	768	7+
219	7+	274	7+	329	1.87	384	0.15	439	0.00	494	0	549	0.02	604	0.74	659	3.05	714	7+	769	7+
220	7+	275	7+	330	1.73	385	0.15	440	0	495	0	550	0.02	605	0.76	660	3.11	715	7+	770	7+
221	7+	276	7+	331	1.61	386	0.14	441	0	496	0	551	0.03	606	0.79	661	3.17	716	7+	771	7+
222	7+	277	7+	332	1.49	387	0.14	442	0	497	0	552	0.03	607	0.82	662	3.23	717	7+	772	7+
223	7+	278	7+	333	1.38	388	0.13	443	0	498	0	553	0.04	608	0.85	663	3.30	718	7+	773	7+
224	7+	279	7+	334	1.28	389	0.13	444	0	499	0	554	0.04	609	0.87	664	3.36	719	7+	774	7+

OD 3 @ 662nm

Review Optical Density charts and request additional OD and nm lines to be marked on your eyewear to meet your new requirements.



Consider integrating the markings across all products in the laser environment.

laser key



warning sign



multiple eyewear case holder



laser eyewear



Example:  
Laser  
protection  
kit for a  
portable  
medical  
laser.

Simple markings  
safely identify proper  
LEP

Some applications require 2 filters.



Example: Flip – Up Frame used in a medical laser procedure.

Base lens  
015C filter

Flip lens  
8801 filter

**015C base lens**

OD 6+ @ 1064nm  
OD 5+ @ 2940nm  
OD 5+ @ 10600nm



**8801 Flip lens**

OD 5+ @ 597 nm



**015C & 8801 filter**

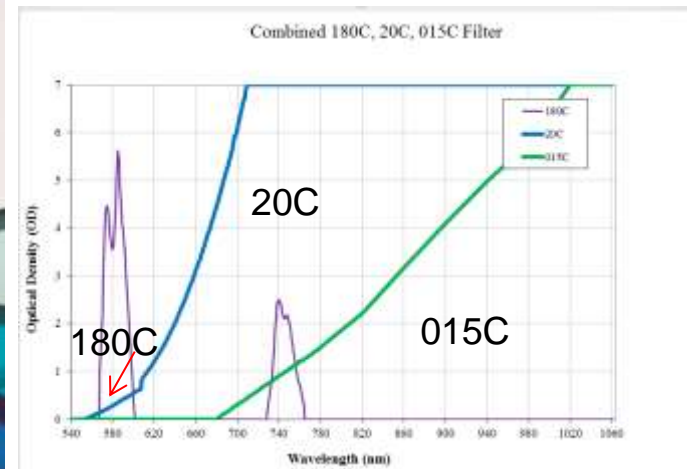
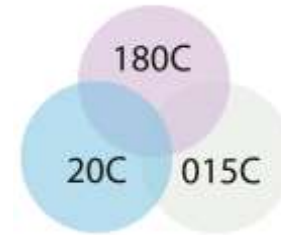
OD 5+ @ 597 nm  
OD 6+ @ 1064nm  
OD 5+ @ 2940nm  
OD 5+ @ 10600nm

Note: Combine poly and glass filters with this approach!

# Combinations of Known Products

Some applications require multiple filters.

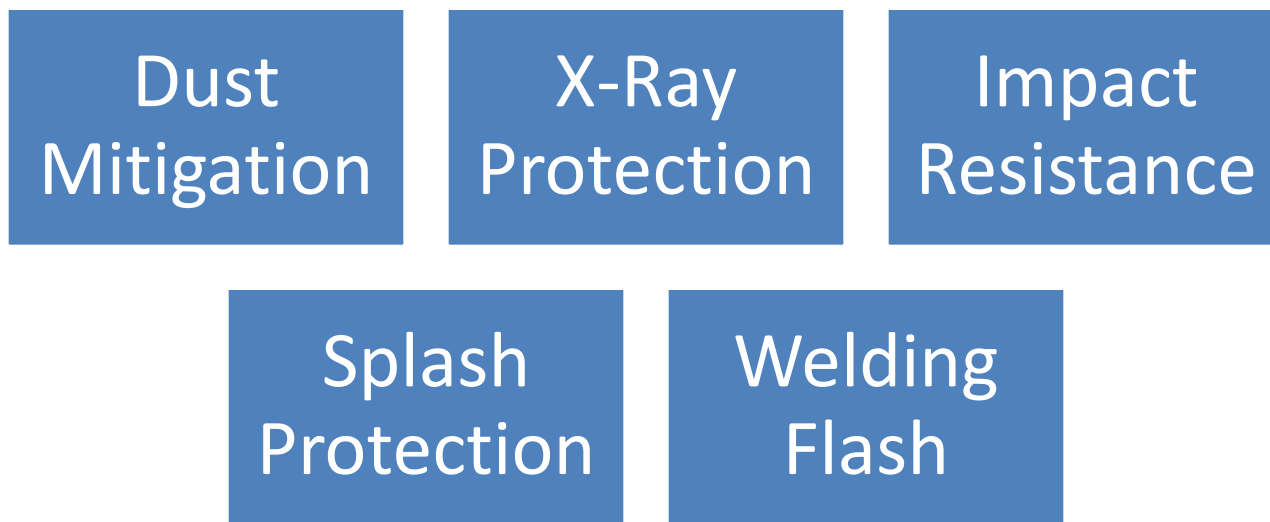
Example: One pair of Laminated LEP replaces three pairs of eyewear in a lab.



Combined filter OD & nm graph



Your LEP supplier should be able to help solve non-laser issues that commonly occur in laser environments.



Prescriptions are available in laser eye protection.



In the lens configuration



Rx in  
laser  
lens

Flip-up



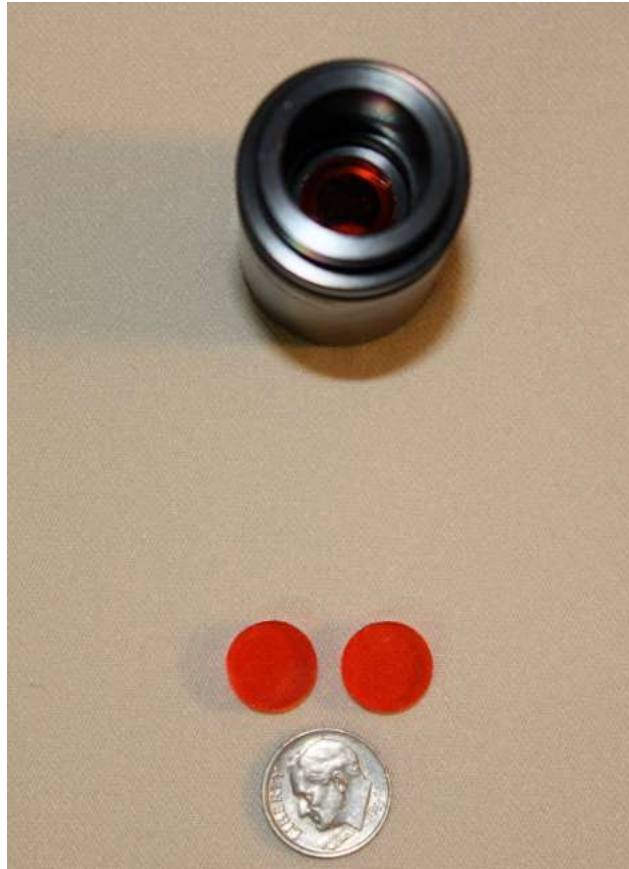
Rx base  
8801  
laser lens  
in flip

Clip-in

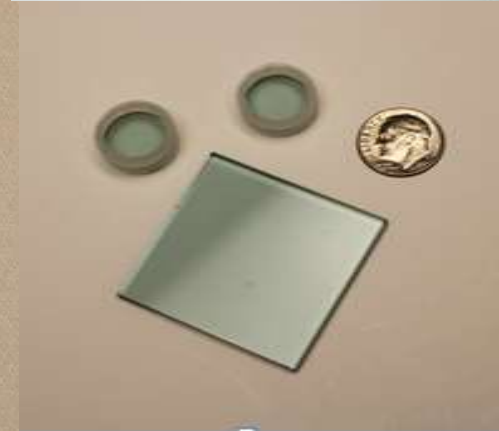


Rx insert behind  
laser lens

Optical scope lenses can be replaced with laser protective filters.



Microscope

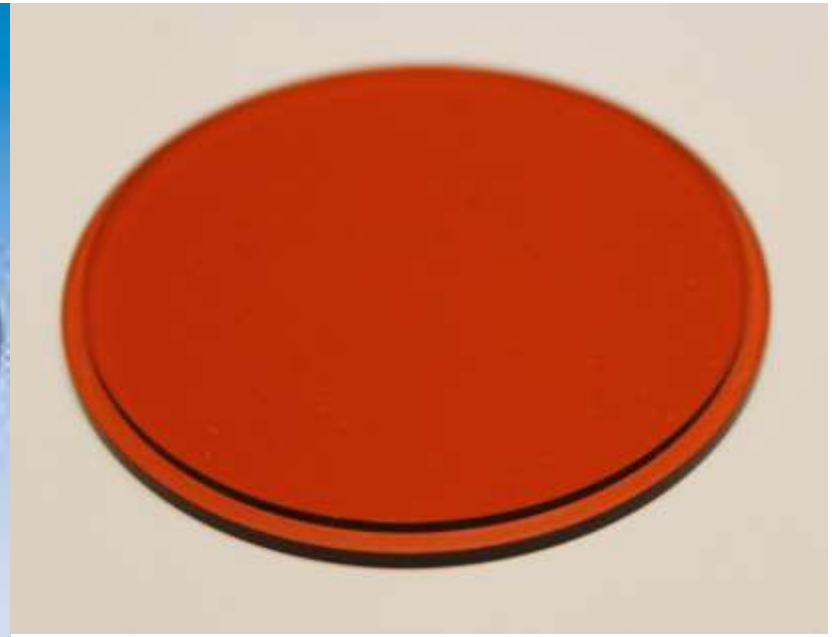


Medical Scopes

Vacuum chamber port hole cover can be replaced with a laser protective lens.

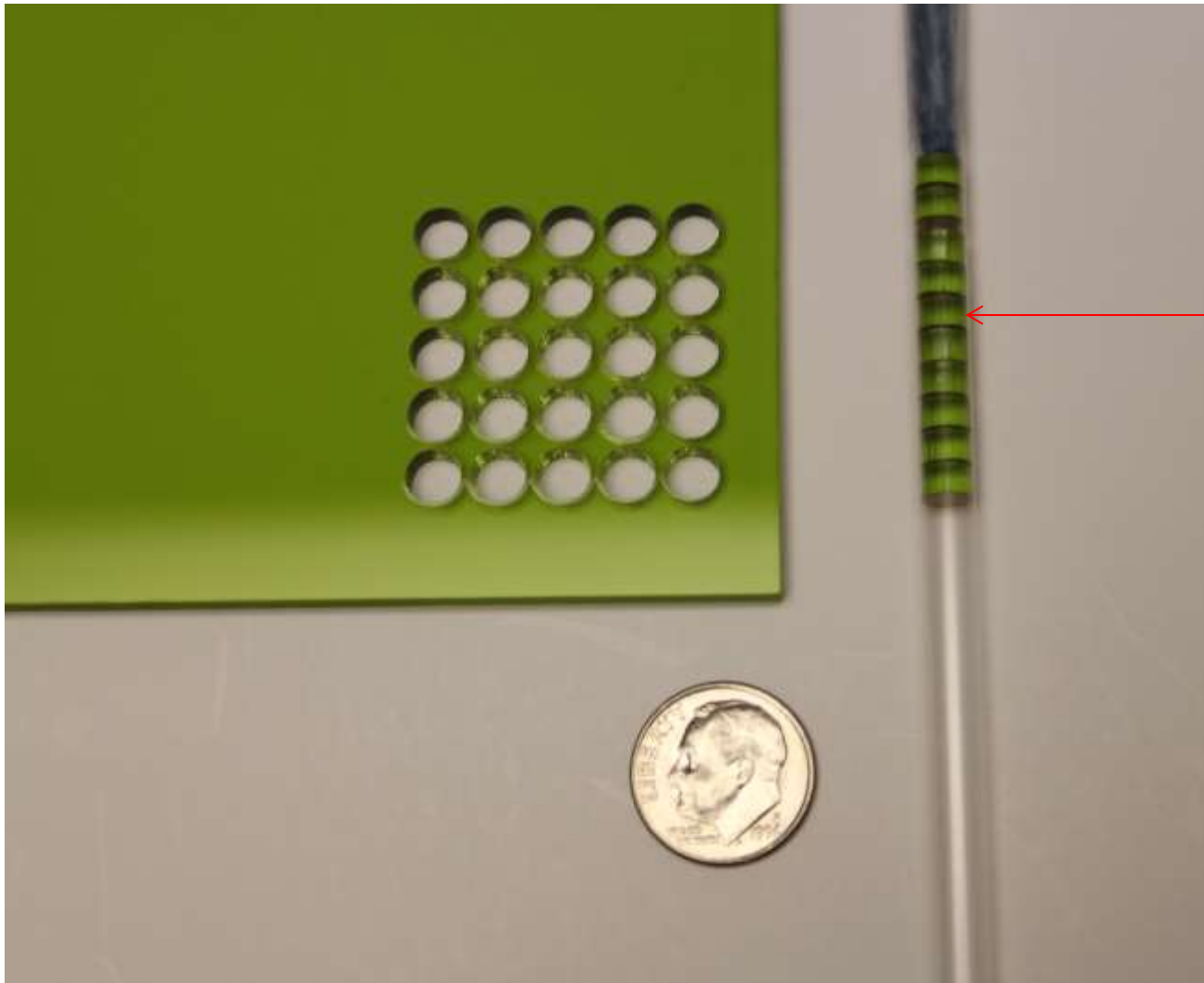


Port Hole



10" flash filter and Nd:YAG lens

Tiny filters for scientific requirements can be made out of LEP materials.



Filters packaged  
inside a straw!

## New Configurations

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Flashlight or camera lens filters requiring more specialized T% or illuminate values can be made from LEP materials.



Examples: Fluorescing and color enhancing filters

Visors/clip-on windows for tactical purposes are suitable for LEP technologies.



Example: Laser Pointer Protection

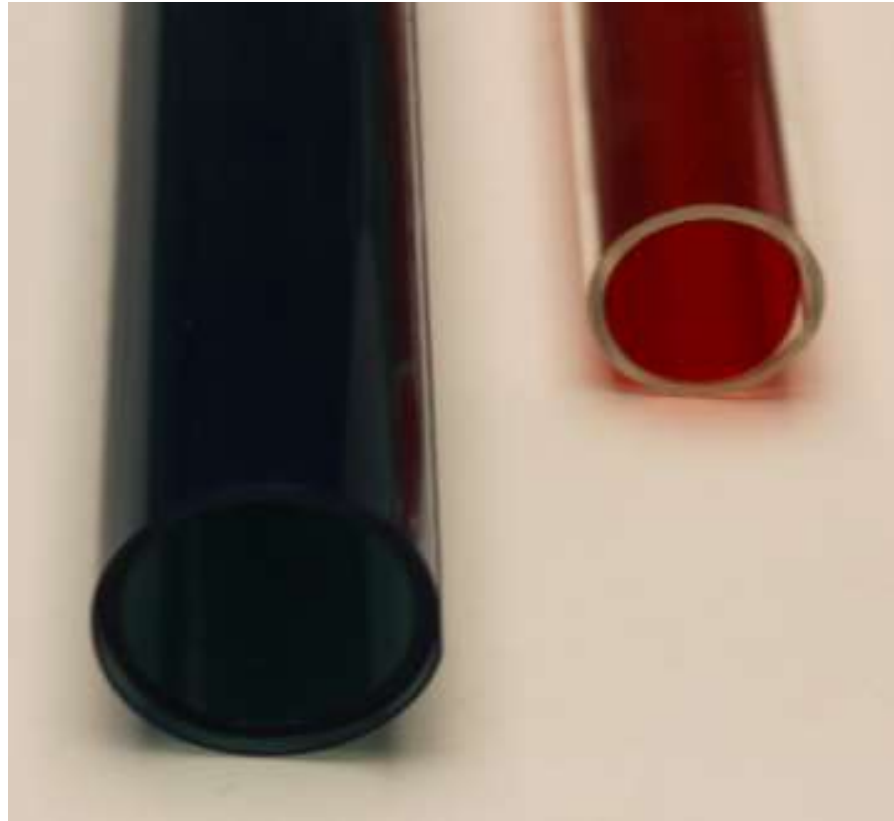
Paddles and hand held filters made from LEP materials solve complex medical issues.



Example: Laser filter paddle

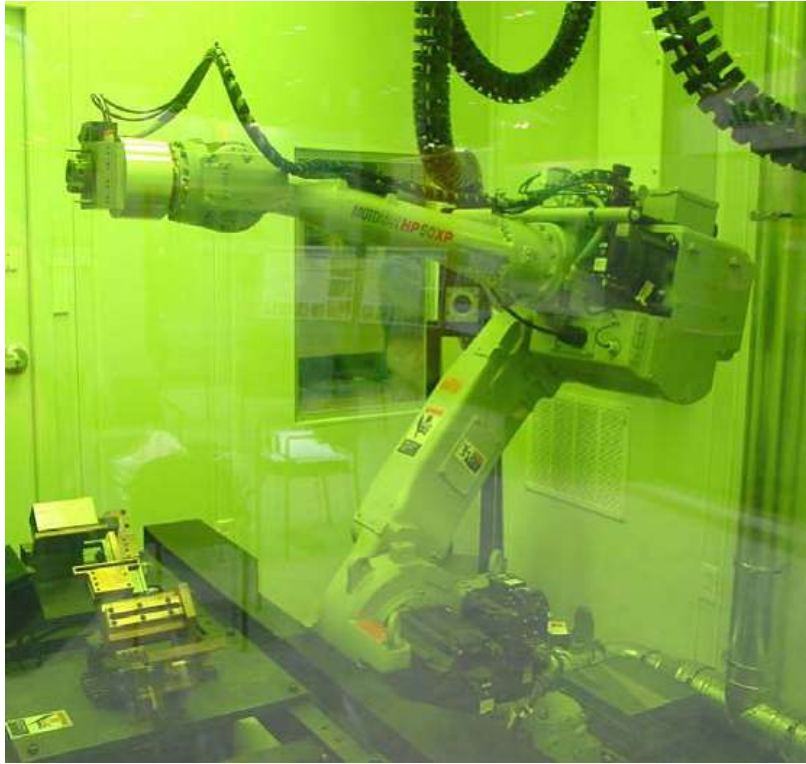


Beam tubes made from or lined with LEP materials are possible.

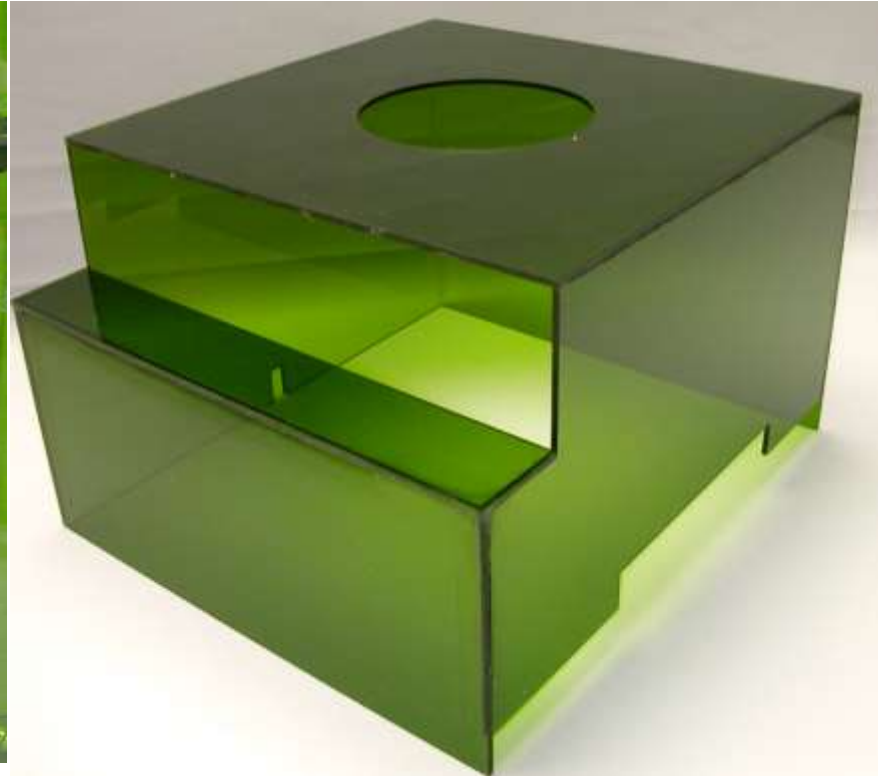


Note: Whenever possible - enclose your beam!

Seamless windows and acrylic glove boxes can be made with LEP technologies.



View into laser work cell



Example: Glove box on conveyer

Face shields can be designed with in-the-lens LEP technologies.



Example: Respirator mask shield



Example: Splash and scope shield

## Conclusion

Creative application of LEP knowledge can solve many laser safety problems.



Altered states of LEP materials