

WELDING AND COATING RECOMMENDATIONS FOR THE CLEARWELD PROCESS

CLEARWELD 900 SERIES: For 940-1100nm Diode Lasers - For Industrial and Medical Applications

Please read prior to welding:

The suggestions below are only to provide a starting point. The parts to be welded may differ from the samples tested, for example, the parts may be different grade of plastic, coloration, or thickness. Your specific application may also have different requirements, such as hermetic seal rather than parent strength. Testing of the specific part is highly recommended to obtain the desired results.

Nomenclature:

LD920-Acetone based, LD930-MEK based, LD940-ethanol based
Concentration from lowest to highest A<B<F<C<E<J

Rules of Thumb:

- 1) Coating series LD920 and LD930 provide faster drying times than LD940.
- 2) LD940 coatings generally have less coloration than LD920 and LD930.
- 3) Energy density was calculated as follows: Energy Density = Power/(Beam Size*Weld Speed)
- 4) Welding parameters were determined using a 2mmx2mm beam size. If a larger beam size is required, use the equivalent energy density for the larger beam size.

- 5) For semi-crystalline plastics, if the part is thicker than 3mm, a higher energy density may be required. If the part is thinner, a smaller energy density may be required.
- 6) Use of lower powers may require a higher energy density than suggested.
- 7) The coating was applied using a paint brush. The brush applies more coating than a felt tip marker and less coating than a liquid dispenser. When using a felt tip marker, a higher energy density (i.e. higher power or slower speed) may be required. Liquid dispensing may require a lower energy density due to the higher amount of coating applied.
- 8) Faster speeds can be achieved by increasing power, increasing the amount of coating applied or using a higher concentration coating (in addition to increasing speed). An increase in clamping pressure may also be required to achieved high strengths at fast speeds.
- 9) In order to evaluate welding parameters, generally change one parameter at a time. As a last resort, change the coating concentration appropriately.

PLASTIC	COATING	POWER (W)	WELD SPEED (mm/sec)	CLAMP PRESSURE (psi)	ENERGY DENSITY (J/mm ²)	COMMENTS
ABS	LD 920B LD 930B LD 940B	100	4.0	350	12.50	MEK and Acetone cause plastic to swell but do not affect strength. Dry rapidly with heat lamp to reduce swelling
Acetal	LD 920C LD 930C LD 940C	100	2.0	350	25.00	
Acrylic, PMMA	LD 920B LD 930B LD 940B	100	2.0	350	25.00	
Cellulose Acetate	LD 920B LD 930B LD 940B	100	8.0	350	6.25	MEK and Acetone cause hazing. Haziness will be eliminated in weld zone.
Cyclic Olefin Copolymers	LD 920B LD 930B LD 940B	100	8.0	350	6.25	Some formulations of COP can have hazing or crazing, ensure uniform coating when this occurs.
Ethylene Vinyl Acetate	LD 920B LD 930B LD 940B	100	8.0	350	6.25	
Fluoropolymers: FEP, ETFE, PFA, THV, ECTFE	LD 920B LD 930B LD 940B	100	2.0	350	25.00	Surface should be abraded or treated with corona/ozone for even coating application.
HDPE	LD 920B LD 930B LD 940B	100	2.0	350	25.00	
Ionomer: Surlyn	LD 920B LD 930B LD 940B	100	4.0	350	12.50	
LDPE	LD 920B LD 930B LD 940B	100	6.0	350	8.33	
PEEK	LD 920J	100	2.0	350	25.00	Apply to both sides of weld area.
Polyamide: Nylon 6	LD 920C LD 930C LD 940C	100	2.0	350	25.00	

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Polyamide: Nylon 6,6	LD 920C LD 930C LD 940C	100	2.0	350	25.00	Coating may have to be applied to both sides
Polyamide: Glass Reinforced	LD 920C LD 930C LD 940C	100	2.0	350	25.00	Coating may have to be applied to both sides
Polycarbonate	LD 920B LD 930B LD 940B	80	8.0	350	5.00	MEK and Acetone cause swelling/hazing. Will clear in areas welded.
Polyethylene Terephthalate (PET)	LD 920C LD 930C LD 940C	100	2.0	350	25.00	
PETG	LD 920B LD 930B LD 940B	100	2.0	350	25.00	MEK and Acetone cause swelling
Polyetherimide (PEI)	LD 920C LD 930C LD 940C	100	2.0	350	25.00	Apply coating to both sides.
Polyether Block Amide (PEBAX)	LD 920B LD 930B LD 940B	100	6.0	350	8.33	
Polyphenylene Oxide Modified (PPO)	LD 920C LD 930C LD 940C	100	2.0	350	25.00	
Polypropylene	LD 920B LD 930B LD 940B	100	4.0	350	12.50	
Polystyrene	LD 940B	100	4.0	350	12.50	Ethanol causes some hazing that is removed when welding
Polysulfone	LD 920C LD 930C LD 940C	100	2.0	350	25.00	MEK and Acetone may cause crazing
Polyurethane	LD 920B LD 930B LD 940B	100	4.0	350	12.50	
Polyvinylidene Fluoride (PVDF)	LD 920B LD 930B LD 940B	100	4.0	350	12.50	
Polyvinyl Chloride (PVC)	LD 920B LD 930B LD 940B	100	16.0	350	3.13	Burning may occur if surfaces are not clean.



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