LASER WELDABLE COMPOUNDS

Thermoplastics with Enhanced Laser Weldability

- Weld Three-Dimensional Geometries of Varying Complexity
- Contact-Free Welding using State-of-the-Art Laser Technology
- Obtain Strong Hermetic Welds with only Single-Sided Access to Part

KEY BENEFITS

- Ideal for applications with complex shapes, including those with sensitive electronics or fragile parts
- High precision joints can be produced; gas-tight, hermetic seals are possible
- No contact necessary with plastic part
- Clean process; no flash is produced, and harmful fumes associated with solvents and glues are eliminated
- Minimal thermal distortion
- High speed process; less time needed than traditional weld methods
- Laser transparent or laser absorbing compounds can also be customized to include other properties, such as color

Imagine a compound that can be welded with shorter cycle times than traditional welding methods, in thin parts, without human contact, and in complex 3-dimensional shapes. One that offers strong, hermetic welds and can be welded with only single sided access to a part. At RTP Company, we not only imagined it, we made it a reality.

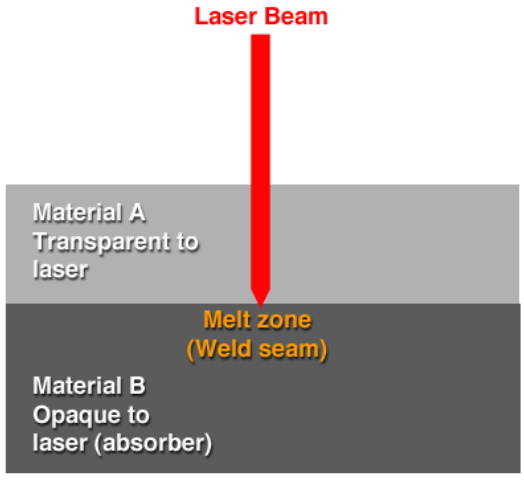
RTP Company compounds laser-absorbing dyes or pigments in combination with our other compounding technologies to offer a customized solution to your laser welding needs.

Laser weldable compounds are ideal for applications where sensitive electronics or other delicate parts could be damaged by traditional methods such as ultrasonic welding. It is a clean process that eliminates harmful fumes associated with solvents and glues.

Laser weldable compounds are designed to work with state-of-the-art laser technology. When joining thermoplastics utilizing high-powered diode laser radiation, one of two joining parts is transparent to the laser beam, while the second joining part absorbs the laser radiation.

The laser beam passes through the transparent part and is fully consumed by the second, causing temperatures to rise quickly to the melting point (see Figure 1). The resulting heat conduction causes the transparent part to become molten and the two are joined. Because the absorbing layer fully consumes the laser beam, the integrity of inner components, such as electronic items, is maintained.

Figure 1



RTP Company manufactures a broad range of both laser transparent and laser absorbing compounds available in many resin systems.

Laser welding of thermoplastics allows greater design freedom for parts that previously were not possible to weld. It is an easily automated process that can be done robotically in the manufacture of automotive, medical, aerospace and consumer products.

Laser Weldable Compounds from RTP Company…another innovation from the leader in specialty compounding.

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ISO 9001 REGISTERED FACILITIES

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Answers to Frequently Asked Questions

Q: ***What are the advantages of laser welding?***

A: Laser welding can be done with single-sided access, is wear free, contact free, capable of rapid welding speeds, easy to automate and allows for welding of 3-dimensional geometries. Laser welding can be used where traditional methods of joinin materials may cause damage to sensitive electronics. It is a clean process that elimiates harmful fumes associated with solvents and glues.

Q: ***How strong of a weld can be made with a laser?***

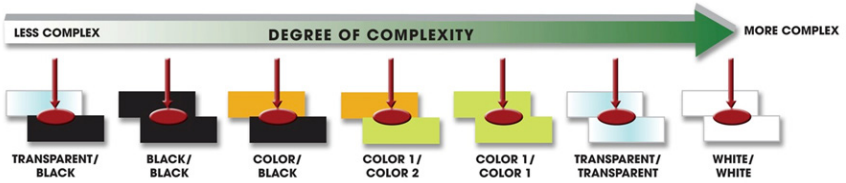
A: Laser welding produces welds that are as strong as the material being welded and can sometimes be even stronger.

Q: ***What polymers and combinations are available?***

A: Most resin systems can be laser welded (see Figure 2). Only compatible resins should be welded together, as it is important that both the transparent layer and the absorbing layer have similar melt points.

Figure 2
Did you know? The most common requests for laser welding are either black or clear. However, RTP Company can create compounds of increasing complexity, depending on your requirements.

For more information, call 1-507-454-6900.



Resins that can be Laser Welded

Polypropylene (RTP 100 Series)
Nylon 6/6 (RTP 200 Series) - See Figure 2
Polycarbonate (RTP 300 Series)
Polystyrene (RTP 400 Series)
Styrene Acrylonitrile (RTP 500 Series)
Acrylonitrile Butadiene Styrene (RTP 600 Series)
Polyethylene (RTP 700 Series)
Acetal (RTP 800 Series)
Polysulfone (RTP 900 Series)
Polybutylene Terephthalate (RTP 1000 Series)
Polyethylene Terephthalate (RTP 1100 Series)
Polyphenylene Sulfide (RTP 1300 Series)
Polyether Sulfone (RTP 1400 Series)
Acrylic (RTP 1800 Series)
Polyetheretherketone (RTP 2200 Series)
Polycarbonate/ABS Alloy (RTP 2500 Series)
Polymethylpentene (RTP 3000 Series)
Polyphthalamide (RTP 4000 Series)

Note: Compounds can vary significantly in their appearance and their performance during laser welding. Our engineers will work closely with you to develop and test an optimum formulation that produces the results you desire. These are standard resin systems; other compounds can be formulated for your application. Product data sheets for these compounds are available on RTP Company's website at www.rtpcompany.com/info/data/index.htm.

Figure 3
Automotive sensor housing with RTP Company structural Nylon 6:6 laser welding color.

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