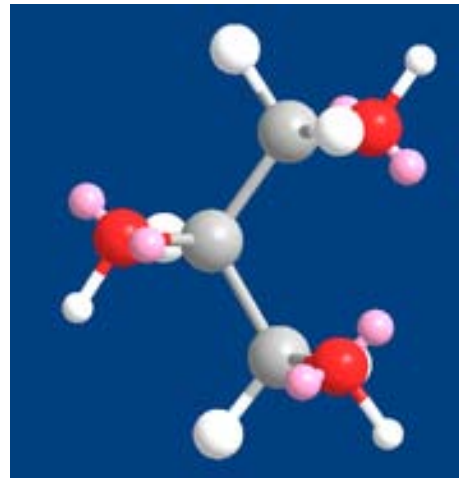


What is Glycerin?

Glycerin (Glycerol) is a clear, odorless, viscous liquid with a naturally sweet taste. It is derived from both natural and petrochemical feedstocks. Glycerin occurs in combined form (triglycerides) in animal fats and vegetable oils and is obtained from these fats and oils during transesterification, such as in biodiesel production.

Glycerin currently has over 1500 known uses in many different industries ranging from foods, pharmaceuticals, and cosmetics (USP grade glycerin) to paints, coatings and other industrial types of applications (technical grade glycerin). It continues to be one of the most versatile and valuable byproducts created during biodiesel production.



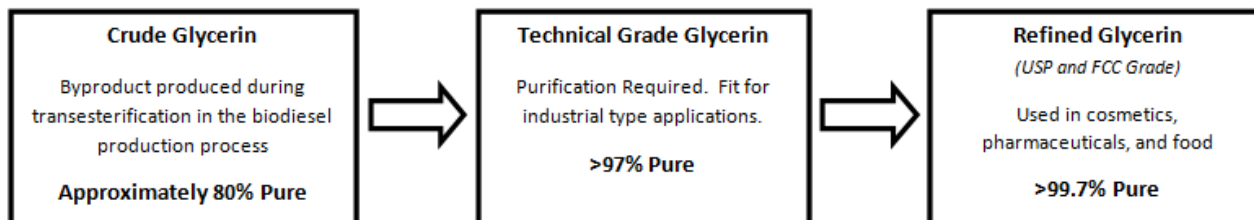
Glycerin in Biodiesel

Glycerin naturally occurs during the biodiesel production process and is specifically produced in the transesterification process. The glycerin produced at this stage is crude glycerin and is about 80% pure still containing contaminants like soap, methanol and water. In order to turn this crude glycerin into a usable state for existing or emerging uses, a purification process must take place. During this refinement process residual organic matter, water, salt, methanol, and odors are removed.

There are many different types of glycerin grades ranging from crude glycerin to refined glycerin (pharmaceutical grade).

Other names for glycerin:

- glycerol
- glycerine
- propane-1,2,3-triol
- 1,2,3-propanetriol
- 1,2,3-trihydroxypropane
- glyceritol
- glycyol alcohol





**Stage 1
Crude Glycerin**



**Stage 2
Glycerin**



**Stage 3
Glycerin**

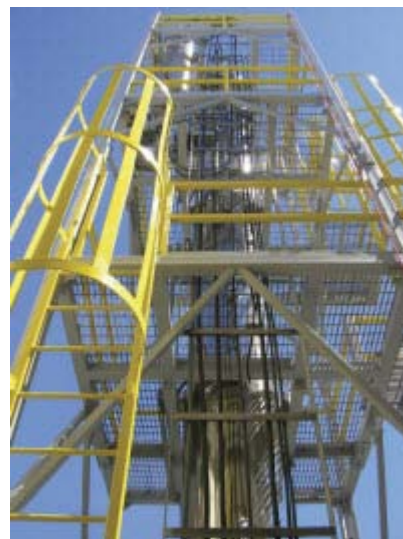


**Stage 4
Tech Grade Glycerin**

Glycerin Purification

The increase in biodiesel production over the past ten years has resulted in substantial increases in glycerin production throughout the world. Because of the large supply of crude glycerin in particular, biodiesel production facilities are looking for alternative ways to purify this glycerin to maximize their profits.

SRS Engineering Corporation has designed a high-purity glycerin purification system (The SRXG-Series distillation column) giving biodiesel plants the ability to create additional profits through purification of their crude glycerin. Glycerin's value is based on its purity range so the purer the glycerin, the higher the market value. SRS Engineering's SRXC-Series can produce high-purity glycerin in high yield, while maximizing energy efficiency. The system can take crude glycerin with an approximate purity rating of 80% to a technical grade glycerin of >97%.



Turn Glycerin into Profit

With the rise in renewable fuel production over the years, particularly biodiesel, comes an overabundance of off-grade glycerin. This type of glycerin, also referred to as “crude glycerin” is a byproduct of biodiesel and is about 80% pure. It accounts for one-tenth of every gallon of biodiesel produced. While the demand for glycerin in general has remained stable, the oversupply within the global market has created volatile pricing throughout the industry. The abundant supply of crude glycerin is a direct result of the increase in biodiesel production and without refinement, this impure form of glycerin must either be disposed of in a certain amount of time, according to the EPA, or it is sold off to market for a minimal amount due to the water, methanol, and salt content.



The current price volatility of glycerin, primarily brought on by biodiesel production, has resulted in tremendous changes in the glycerin refining sector. The demand for refined glycerin, technical grade and higher, has risen and is starting to stabilize. It is for this reason that we at SRS Engineering have focused much of our attention on glycerin refinement, helping biodiesel plants turn a stronger profit with their finished glycerin, thus avoiding high disposal fees or minimal returns from their crude glycerin. By further refining the glycerin to a >97% purity range, plants can now sell off their glycerin for a much higher return and create a new profit center for their plant.

Disposing of crude glycerin can not only be costly but wasteful. Why not utilize all of your glycerin and turn a profit rather than paying high disposal fees or accept minimal payment for it? Incorporating SRS' high-purity glycerin purification system (the SRXG-Series distillation column) into your plant, can do just that. Because the SRXG-Series system produces high-purity glycerin in high yield, there is no need for disposal of your glycerin since it now meets technical grade glycerin standards and can be sold to market for a higher profit. The system will actually take your crude glycerin with an approximate purity rating of 80% to a technical grade glycerin of >97%.

Technical grade glycerin provides multiple advantages to the biodiesel plant owner by:

- Eliminating the high cost of toxic waste disposal or if selling the glycerin, increasing the value of the end product (now a technical grade rather than crude)
- Freeing the plant owner of potential EPA issues
- Creating a new profit center for the plant

The Following are trial runs done by SRS Engineering for Glycerin Purification



....these are REAL PHOTOS of technical grade glycerin produced.



With the domestic crude glycerin market reaching its saturation point and the prices of crude glycerin currently at an all time low, glycerin purification will no longer be an option for biodiesel plants but rather more of a business necessity. Further purification and refinement of crude glycerin, increases it's market value thus making it more appealing to potential buyers. Unlike many of our competitor's biodiesel process equipment, SRS' glycerin refining system will produce technical grade glycerin (>97% purity) as opposed to the average in the biodiesel industry which ranges between an 80 and 90% purity range.

SRS Engineering Corporation is dedicated to creating extremely efficient and highly profitable biodiesel plants. We show our customers how to generate profits by refining their glycerin on site rather than selling crude glycerin on the open market.

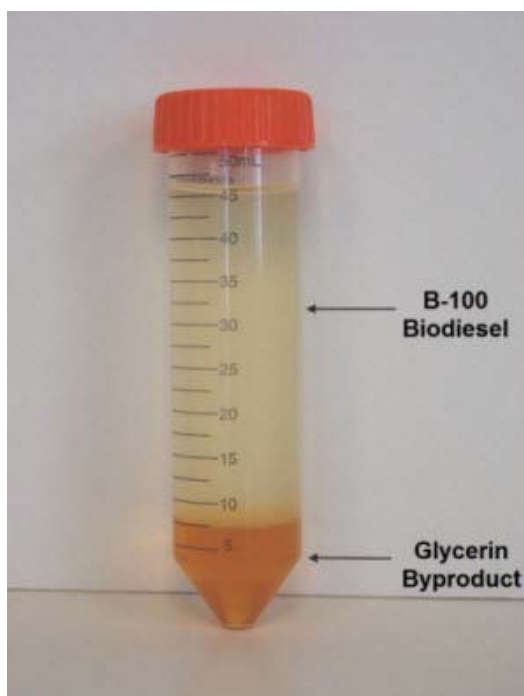
Glycerin Specifications:

Properties	Crude Glycerin	Technical Grade Glycerin	99.7 -USP Grade Glycerin
Glycerol Content	40 - 88%	98.0 Min	99.70%
Ash	2.0% Max	N/A	N/A
Moisture Content	N/A	2.0% Max	0.3% Max
Chlorides	N/A	10 ppm Max	10 ppm Max
Color	N/A	40 Max (Pt - Co)	10 Max. (APHA)
Specific Gravity	N/A	1.262 (@25C)	1.2612 Min
Sulfate	N/A	N/A	20 ppm Max
Assay	N/A	N/A	99.0 - 101.0% (on dry basis)
Heavy Metals	N/A	5 ppm Max	5 ppm Max
Chlorinated Compounds	N/A	30 ppm Max	30 ppm Max
Residue on Ignition	N/A	N/A	100 ppm Max
Fatty Acid & Ester	N/A	1.00 Max	1.000 Max
Water	12.0% Max	5.0% Max	0.5% Max
pH (10% Solution)	4.0 - 9.0	4.0 - 9.1	N/A
DEG and Related Compounds	N/A	N/A	Pass
Organic Volatile Impurities	N/A	N/A	Pass
Organic Residue	2.0% Max	2.0% Max	N/A

What are the differences between Crude Glycerin, Technical Grade Glycerin, and 99.7 - USP Grade Glycerin?

Crude Glycerin - Crude glycerin contains a significant amount of methanol, water, soaps, and salts and typically has a glycerol content of anywhere between 40 to 88%. Crude glycerol is a natural by-product produced during the biodiesel production process, specifically taking place during transesterification.

Technical Grade Glycerin - Technical grade glycerin is a refined, high-purity product that is water white with most of its contaminants completely removed. Technical grade glycerin contains no methanol, soaps, salts, and other foreign matter. Biodiesel plants purchased from SRS Engineering, unlike many of our competitor's plants, produce technical grade glycerin right from the start.



USP Grade Glycerin - USP Grade Glycerin is a pharmaceutical grade glycerin suitable for food, personal care, cosmetics, pharmaceuticals, and other specialty applications. All of these products have met the US Pharmacopeia specifications (USP 30).

PLEASE NOTE: Be leery of any company claiming to produce USP Grade glycerin as these companies MUST be registered and controlled by the FDA. Many companies make false claims of producing USP grade glycerin when in fact, they cannot and should not make such claims without being governed by the Federal Government.

What classifies glycerin as USP Grade?

To be called USP Grade Glycerin companies are closely regulated with regards to their manufacturing facility, testing methods, inspections, distribution, and warehousing. True USP Grade Glycerin follows strict rules and guidelines set forth by the FDA. The FDA requires that all domestic companies distributing USP Grade Glycerin must be registered and listed unless they qualify for exemption. The same applies for USP Glycerin originating from a foreign manufacturing facility going to an importer in the states. In this instance, FDA compliance by both parties is still a requirement.

FDA regulations also require systematic and complete record keeping by all USP glycerin manufacturers. They must have supporting documentation at all times for every shipment providing lot numbers and permits tracing back to the plant it was produced in.

USP Grade Glycerin assures buyers of the product's integrity which cannot be achieved through physical and chemical testing alone. On the flip side, Technical Grade Glycerin is not subject to such governmental regulatory control. Although produced by similar processes, Technical Grade Glycerin does not need to comply with USP and FCC requirements or FDA regulations. This grade of glycerin only needs to conform to the specifications mutually agreed upon by the buyer and seller.