Precision

IN our daily conversations with customers we always get the same questions.

1. What sets your Precision Units apart from all the other units?
2. Am I asking all the right questions – What am I missing?

We wanted to put a helpful guide together to help our customers know why the Precision Units are the best on the market and at the same time help them with the questions they should be asking a Biodiesel Equipment Manufacturer.

Stainless Steel Piping

– We use only high grade 304 Stainless Steel piping on every unit we produce. This ensures that there will never be an issue with rust, corrosion or depreciation. We use stainless steel because carbon steel will be corroded over time by the catalyst you use in making biodiesel. It is also prone to rusting shortening its life span.

Ask Others – Are you using stainless steel on all of your piping?

Flanged Piping

– This is a method that is highly common and looked for in the industrial world. You weld flange heads to the ends of the pipe and bolt them together. All flange gaskets are Teflon to prevent leaking over long periods. This MUST be done in the biodiesel application. Biodiesel will eventually leak through threaded ends especially if they are carbon steel. We do not use NPT (threaded piping) - This is much cheaper than flanges but not worth the hassle. A unit with thread will typically leak.

Ask Others – Are they using flanges for all connections?

Stainless Steel Ball Valves

– All Precision units have three (3) piece, 316 stainless steel ball valves with Teflon seals. Again this ensures there is no corrosion and an extremely long life.
– Others may use a two (2) piece threaded brass ball valves, again a cheaper material and valves. Brass valves will deteriorate over time and has the ability to Oxidize the biodiesel. Oxidization of biodiesel means it will make the biodiesel shelf life much shorter and effect the Acid Number on the ASTM test.

Ask Others – Are they using all three (3) piece 316 stainless steel ball valves with Teflon seals?

Stainless Steel Centrifugal pumps

These pumps will last the test of time. They are high quality 1 HP pumps. The pumps are stainless steel to resist corrosion and rust. The motors on the pumps are a NEMA CLASS 1 DIV 2 motor. If you have fire marshals you better hope you have a pump like this.

Others may use cheap pumps made in brass. Again we run into the problems with brass Oxidizing and raising the Acid number in Biodiesel. Pumps are the Hearts of your machine, pumping material where it needs to go. Do you really want to rely on cheap, brass pump?

Ask Others – Do they use Stainless Steel pumps and what is the HP? Is it NEMA CLASS 1 DIV 2?

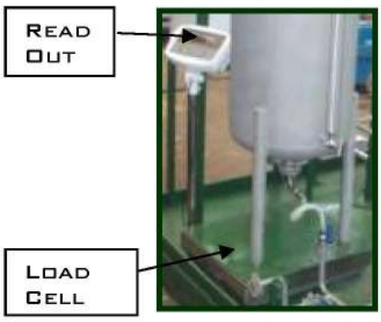
Ours VS Others

Stainless Steel Methoxide Mixer

– This is where you mix your methanol and catalyst. Methanol is highly flammable and should always be stored or mixed in a metal container. In addition, stainless steel eliminates you having to worry about corrosion. We use an Air Diaphragm pump to mix the two materials together. This is 100% EXPLOSION PROOF because it only uses air. We stay away from any plastic tanks they are extremely dangerous. Any mixer or agitator just stuck into a Methoxide tank is highly dangerous as well.

Ask Others – Is your Methoxide mixer Stainless Steel? Is it completely closed with no fumes? How do you mix? Does it use a 100% explosion proof pump AND mixer?

Load Cells



- All our units Methoxide mixers come on load cells (a fancy word for industrial scale). The customer is able to measure the precise amount of catalyst into the Methoxide mixer and close the top. Eliminating the danger of measuring on another scale and putting caustic into mixer. You are able to load both caustic and methanol, by weight (the correct method). This ensures every time that an accurate amount is being used and the safest methods for Methoxide mixing are being practiced.
- Others may use a unit that needs to be filled to a line and basically guess how much methanol is in the unit. This is an issue because if the customer is adding 1 gallon extra than they need per batch that can end up to a lot of money over 2, 5 10+ Years. Then you have to weigh the catalyst some where else, bring it over to the unit, try to dump it in a little hole and probably spilling some, while all this time your methanol and catalyst are soaking moisture from the air. This is highly inefficient and dangerous.

Ask Others

– Do you have load cells? How do you weigh the methanol and catalyst? How do you load the methanol and catalyst?

Control Panel

– The Precision control panel includes a 7" Color Touch screen. This will guide you step by step through the entire process!

Ask Others - Does your unit include a Touch screen? Do I have to pay extra for one?

Stainless Steel Reactor – The Precision units come with a Stainless Steel Reactor equipped with a vigorous vortex inline mixer (mixing similar to a high shear mixer). Material heating is provided by powerful 18 or 36 kW heater. Heaters are inline and not in the side or bottom of tank. We use inline heaters because they are more efficient and less dangerous. If you put a heater in the bottom of a tank and pour oil or methanol on it you will have an explosion. Our heaters are low watt density heaters, specifically designed for the biodiesel process. This ensures that the material is evenly heated and will not burn. In addition, the heating elements are NEMA CLASS 1 DIV 2 electrical specifications for safety. To get a complete reaction the key is to let the Methoxide and oil mix together, the better, quicker and more efficient the mixing the same will be true for your biodiesel. Just circulating is not enough.

Ask Others – Is your heater inline? What happens if you heater is at the bottom of the tank and your sensor fails leaving heater on while you fill? Is your reactor Stainless Steel? How does it mix? What is the size of the heater? Is the Heater Low Watt density – or for water applications (ask to see the sheet)? How long does it take to heat? Is the heater NEMA CLASS 1 DIV 2?

CENTRIFUGE – The Precision systems has the option to add a centrifuge to eliminate the long settling time. The centrifuge mechanically separates biodiesel and glycerin. The centrifuge can be added to your Precision unit now or at a later date.

ASK OTHERS – Do you have a centrifuge option? Can you add one on at a later date and all the connections are there? Do you have centrifuge references?

Dry Wash – The Precision systems come with dry wash towers. We have the option of using an Ion Exchange resin like Purolite, Amberlite, Thermax or others like Eco2Pure. Again they are stainless steel and are designed with an easy access top, bottom and side port. They are also already piped to the methanol supply. This allows you to easily wash them with methanol when they have exhausted. A drain valve has been added for easy draining of biodiesel or methanol.

Ask Others – Are your columns stainless steel? Do they have an easy access top, bottom and side port? Is it piped directly to the methanol input for washing? Does it have a specific drain directly out for the methanol and biodiesel? Can the unit use ALL ion exchange resin and does it have the option of Eco2Pure?

Methanol Recovery – One of the best features on the Precision units is an engineered methanol recovery. This unit has an oversized stainless steel tank. The biodiesel is re-circulated through a powerful 18 or 36kW low watt NEMA CLASS 1 DIV 2 electric heater capable of raising temperature to level for efficient vaporization of methanol. Pumping the biodiesel through a special nozzle, into the tank, and allowing the material to atomize thus releasing methanol into a vapor. This vapor is then pulled via vacuum pump thru an air cooled condensing unit. The condensing unit turns it back into liquid methanol and is collected in a separate stainless steel tank. The methanol can then drained and reused in the reaction or used for other purposes (Acid Esterification). After the methanol has been removed the material can then be pumped from the unit into storage.

then be pumped from the unit into storage.

Ask Others – Do you have a unit specifically designed by an engineer to remove methanol? Do you have a vacuum pump? Do you have a specific tank for methanol collection? What does your condensing unit look like? How is the condensing unit cooled? Is it all built to NEMA CLASS 1 DIV 2? What size is the heater and what temperature? Do you re-circulate the material?

Spill Proof Skid – The Precision Skids are built with a spill lip. The skid is solid on the bottom and has angle iron around the sides with a drain hook up on the end. If there is ever a spill the material will end up contained on the unit and drain to where you see fit. This is a big concern for permitting issues (spill containment).

Ask Others – What do you have for spill containment?

Automation The Precision systems are also available with an option for complete automation. This automation will perform all the tasks necessary on the unit to make high quality biodiesel without human interaction.

Ask Others – Can you fully automate your unit?

Acid Esterification – The Precision Units also have the option to add Acid Esterification. In this process we are able to handle very high FFA (Free Fatty Acid) levels. The Units include a stainless steel tank, powerful low watt density heater, stainless steel circulation pump, air diaphragm pump (methanol) and a metering pump (acid). This is a pre-process to the main Precision Unit. If you do not treat biodiesel with a 2% or greater FFA, you will make soap and a low quality biodiesel. This will also result in a greater loss in overall yield.

Ask Others – Do you have an Acid Esterification System? How do you deal with High FFA's? What is the yield?

Water and Solids Removal

– The Precision Units also have the option to add a Water and Solids removal unit. This unit includes a Self Cleaning Centrifuge, heater, control panel and all piping. This is a turnkey unit to remove water and solids from incoming feedstocks like yellow grease, animal fats and the like. This system runs on a continuous flow of 5 gallons per minute. This ensures that we can keep up with the production of any Precision Unit.

Ask Others How do you remove water and solids? How long does it take you unit? Are there limitations to the unit?

Process Knowledge

– The Precision systems come with a day of start up included. Our technicians will come to your location and teach you how to operate the unit. We also have a vast knowledge about the complexity of the biodiesel chemistry and proper processes. We built the Precision Units around the chemistry and process, not around what was cheapest.

Ask Others – Do you have any Chemist on your staff? Do you provide start up? Who do I call when I have trouble?

The overall design of the Precision Units is to provide our customers with the highest quality and safest product on the market. There are units that are cheaper now, but will cost you much more in the long run. Please contact us if you have any questions!

Precision