

Condition and Commissioning of the Standardized Modular Bio Diesel Plant

All kinds of animal fats and vegetable oils can be processed in our biodiesel plant. An unproblematic processflow is guaranteed by using oils, fats with the following parameters:

Free Fatty Acids:	< 3 %
Phosphorus Content:	< 30 mg/kg
Water Content:	< 0.2 %

Feed Water Parameters:

Feed Water Pressure:	3 bar
Magnesium Oxid:	< 71.9 mg
Conductance:	< 1000 ms/cm

Should the oils/fats and water not fulfil the a.m. requirements the serviceability must be tested in our laboratory.

A test esterification will be made in which the correct mixing ratio of methanol, fat/oil and catalyst will be assessed.

Miscellaneous

- In case the air temperature should exceed 40°C or humidity should exceed 90%, buyer must provide for climatisation system of control cabinets
 - Due to remote monitoring of the plant one responsible contact person (with English or German language knowledge) situated close to the installation location must be appointed.
 - Erection site of container must have a bearing capacity of 20 tons. Container must be adjusted horizontally. We recommend a concrete foundation with a floating screed.
 - Plant must be equipped with lightning protection
 - Internet connection must be provided by buyer for remote maintenance
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Tank Unit:

Tank unit (not included in scope of supply) must be erected by a qualified tank plant manufacturer(engineer)

Following requirements must be fulfilled:

- one tank each for oil, glycerine, washing water, methanol, methylate and biodiesel
- all tanks must be erected within max. 5 meters from biodiesel plant
- Maximum level indicators must be existent for biodiesel-, washing water- and glycerinetank
- Minimum level indicators must be existent for oil-, methylate-, and methanoletank
- Methylate must be stored within temperatures of 10°C and 30°C. Should any heating or cooling unit be necessary to keep this temperatures it must be provided by the client
- Nitrogen admission of methylate must be ensured by the client
- oil must be stored in that way that viscosity reaches max. 100cSt (centi Stokes)
- vegetable oil or biodiesel tanks may not contain any non-ferral heavy metal materials (fittings and valves included). We recommend high grade steel methylate tanks and steel tanks
- according to seller's connecting diagram media connections must be completed by client himself
- Tank exit must be constructed in that way that sampling of raw and auxiliary materials at tank exit is possible.
- All feeders and outlets must be equipped with stop valves directly before connection to the containers
- Waste water pipe must be equipped with a pipe tee outside of plant by which defective batches can be pumped into an IBC container.

Security Standards

We herewith declare that the plant was constructed under terms of the following standards:

- low voltage directive
- ATEX directive
- EU-machinery directive
- EMV-directive

Exceeding requirements due to national/local regulations, (esp. imposed by employers' liability insurance association or similar) must be reported to seller before placing of order.

Parts and aggregates for this plant are according to the standards mentioned above.

Commissioning

Scope of commissioning is divided into three phases:

Phase 1 (Duration approx. 8 working days):

- Removal of transport protection
- Connection to the client's main supply and grounding
- Test of container adjustment on the foundation
- Crosslinkung of control units
- Flushing of Water Feeder
- Test of media links (internet, ...)
- Installation of compressor
- Start of control unit and configuration of remote maintenance connection
- Parameterization of control unit
- Test of adjustment of single components (air condition, heating, osmotic station)
- Dry run of plant for test of aggregate functions
- Examination of raw materials regarding process capability (test esterification in laboratory)
- Test run of esterification
- First sampling of produced biodiesel und analysis in certified laboratory
- Start of biodiesel production with capacity below maximum output
- Optimization of process according to analysis result
- Instruction of staff (4 days at 8 hrs, selectively in German or English language, client must arrange for interpreter if required and must bear the costs)
- Second sampling and departure of service-staff

Phase 2 (Duration 2-3 Weeks):

- regular sampling through client's service staff in accordance with service partner
- optimization of process parameters based on analysis results via remote maintenance

Phase 3 (Duration approx. 1 week):

- Seller will propose a date for inspection and acceptance in written form. Buyer must confirm this date in written form. At this particular time all meter readings in the control unit of the biodiesel plant will be reset by remote for the purpose of capacity proof.
 - Service staff will arrive at appointed date
 - Buyer is responsible for the availability of staff that is entitled to do the final inspection and sign the acceptance report during the presence of the service technicians
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- After successful capacity proof buyer must sign acceptance report
- From this on buyer will get full access to system control
- An additional training of the service staff can be arranged upon client's request.
- Commissioning takes approx. 5 weeks, then the regular production capacity will be reached. An extension of this duration is possible in case of fluctuating quality of the raw materials as additional analyses would be necessary.
- Even in case of good quality of raw materials the first batches may not be of the quality as contracted. In this case (seller's) liability is excluded.
- In case it is not clear if the biodiesel quality is according to the quality agreed upon in the contract the contractual partners agree that the analysis results of ASG Analytik-Service Gesellschaft mbH, Trentiner Ring 30, 86356 Neusäss will be accepted by both sides.

Safety Measures during Commissioning

In case of faults or leakage during commissioning, client must provide the following protective clothing:

- ASB respirator mask
- acidoresistant gloves
- Safety goggles

Buyer's Scope of Delivery and Services

Unless otherwise agreed buyer will render the following deliveries and services:

Auxiliaries and Tools for Commissioning:

- lockable room close to the site with simple table and shelves
 - work bench with bench vise
 - electricity, compressed air, water as well as illumination of construction site
 - our service technicians possess special tools and measuring equipment, but only to a limited extent. Client's assembly personnel shall possess general tools and be equipped with personal tools: one set of special tools for metal workers and electricians respectively.
 - WIG welding apparatus for welding of high-grade steel
 - Angle grinder
 - Lockable, dry and clean glass jars for sampling (min. 500ml)
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Client's Staff / Personnel

Following specialists must be provided by client for commissioning free of charge:

- One electrician
- One machinist
- One plant operator

Software Use

- As far as software is included in the scope of delivery, buyer is granted a non-exclusive right to use this software including its documentation. This software delivered on one special system. Use of the software on others than this one system is prohibited.
 - Buyer may copy, revise, translate or convert only to an extent legally permitted (acc. To §§68 a ff. UrhG). Buyer obligates himself not to delete or convert manufacturer information without approval of seller.
 - Seller, resp. Software supplier possesses all other software and documentation rights incl. copies. Sublicences are forbidden.
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