

# BIODIESEL PRODUCTION

## STATIC MIXERS

Ways to improve operations and profitability

### CASE STUDY

#51

With a PRIMIX static mixer processing can be most efficient for continuous processes. Often a chemical reaction is part of these processes. Biodiesel production is a good example.

### THE RESULT

- Controlled process
- Better quality
- Good cleaning

**PRIMIX**<sup>TM</sup>  
PERFORMANCE BY DESIGN

## Background

Biodiesel refers to a diesel-equivalent, processed fuel derived from biological sources. Though derived from biological sources, it is a processed fuel that can be readily used in diesel engine vehicles, which distinguishes biodiesel from the straight vegetable oils (SVO) or waste vegetable oils (WVO) used as fuels in some modified diesel vehicles. Processing of vegetable oils to biodiesel requires mixing, heating, ageing and separation steps.

## The Challenge

Often customers ask for PRIMIX support to design or brainstorm for effective systems for this conversion process of vegetable oil to biodiesel.

## Design

First process step is to mix vegetable oil from different sources (i.e. rapeseed, algae, soybean and palm oil) with methanol and sodiummethanolate. Mixing and heating can be done simultaneously, but in most cases a separate heater is required to heat up to the reaction temperature at about 90 °C. The chemical process of transesterification is catalyzed by the addition of sodiummethanolate and takes about 1 hour for sufficient conversion. Product is biodiesel and glycerine. The latter has to separate from the biodiesel.

## Solution

Primix offers complete solutions and parts for these systems. Mixing of vegetable oil with methanol and sodiummethanolate is a relative easy mixing process and in general our standard range of static mixers can be used for this. A jacket is sometimes used for pre-heating. The heat exchangers that can be used for these processes are part of the Primix product portfolio.



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