

Producing Biodiesel From Used Cooking Oil

Team: 88

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Introduction

Problem statement:

The project aims to create a cost-effective, scalable system for converting waste cooking oil into biodiesel, addressing environmental issues and energy demands, applicable across households, businesses, and organizations to promote sustainability and reduce reliance on fossil fuels.

Constraints:

- Operation time < 120 min.
- Purity > %95 Pure impurities.
- Budget cost < 6,000 SAR.
- Temperature > 60 C°.
- Safety First.
- Resist Corrosion

Target Specification:

- Tank Capacity
- Temperature
- Time
- Pipes Length & Diameter
- Prototype Dimensions
- Heating Elements
- Stainless Steel Agitator Heat
- Methoxide Tank Hight

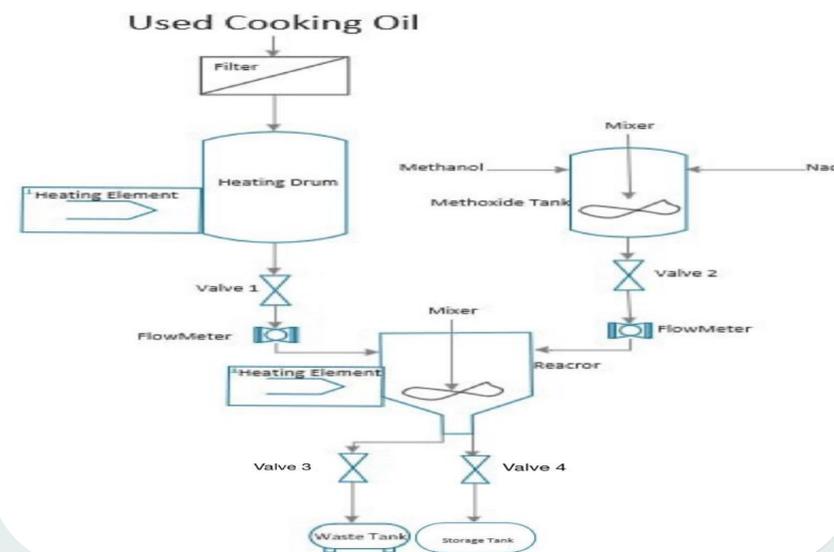
Prototype Parts:



Prototype Design:



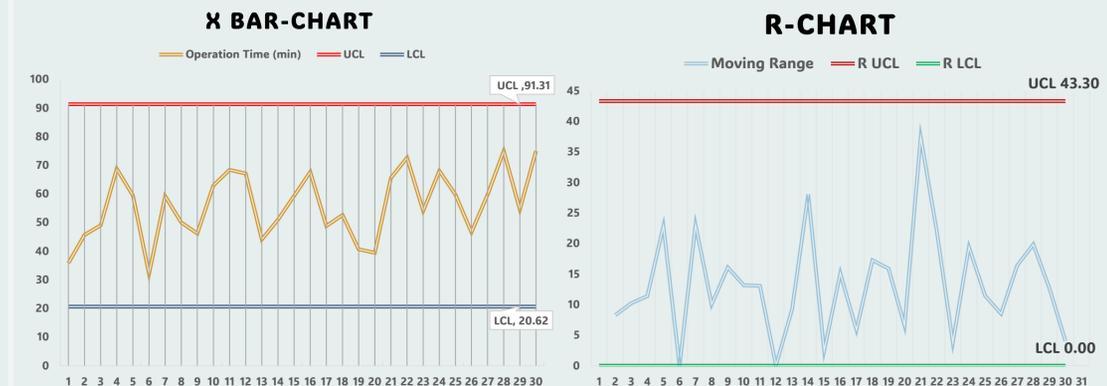
Process Flow Diagram:



Testing / Validation

- ✓ PVC and stainless steel materials are used for key components.
- ✓ Heating elements and insulation ensure consistent temperature control.
- ✓ Achieved through multi-stage filtration with 13-micron and 5-micron filters.
- ✓ Efficient heating and mixing reduce process time.
- ✓ Sufficient for handling 40 liters of oil per batch.

Charts



Conclusion

The biodiesel project effectively addresses waste disposal and renewable energy challenges by converting used cooking oil into eco-friendly fuel (biodiesel). It promotes sustainability, reduces environmental harm, and offers cost-effective energy solutions for multi-scale applications. By integrating educational and practical benefits, this project aligns with global and local goals for cleaner energy and environmental stewardship.

Project future impact:

- Support Vision 2030
- Reduced Emissions and Waste
- Health and Education Benefits
- Economic Savings and Jobs

