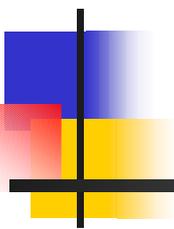
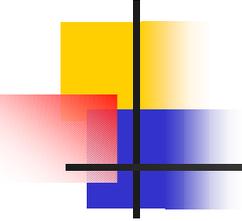


California Air Resources Board Alternative Diesel Fuels Symposium



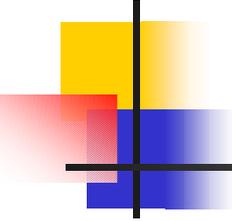
Presentation of the
Engine Manufacturers Association

Sacramento, California
August 20, 2003



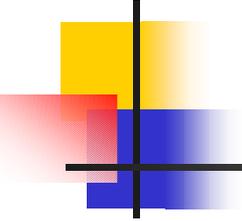
EMA Objectives

- Achieve air quality improvements through cost-effective, technologically feasible measures
- Promote/maintain global alignment of standards, programs, and procedures: design once, certify once, sell worldwide
- Maintain customer satisfaction and product acceptability



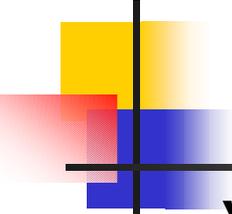
Rationale For Biodiesel Fuels

- Reduce energy dependency on petroleum-based fuels
- Potential to provide emission reductions
 - Direct emission advantages for current engines
 - Retrofit of older technology engines
- Provides lubricity improvement
- Boost domestic industries, (e.g. farming, fuel production facilities)



Biodiesel Feedstocks

- Vegetable Oils
 - Soybean
 - Rape Seed (canola)
 - Sunflower
 - Peanut
- Animal Fats
 - Beef tallow
 - Pork lard
- Recycled Products
 - Cooking oil
 - Grease



Composition

- **“Neat” Biodiesel or B100**

Accepted industry-wide standards evolving

- ASTM D6751
- DIN 51606
- EN 14214

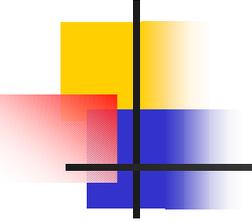
- **Biodiesel Blends**

- **Up to B5: 5% blend of B100 with diesel fuel**

- Approved for engine use by EMA and fuel injection equipment manufacturers if B100 meets accepted industry standards
- Included in World Wide Fuel Charter

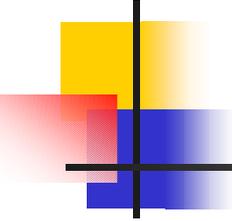
- **B20: 20% blend of B100 with diesel fuel**

- Approved for E Pact biodiesel fuel credits
- ASTM specification under development



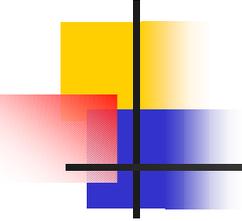
Benefits of Biodiesel Use

- Good blending stock for diesel fuel
- Good lubricity
- Similar energy content to diesel fuel
- Low sulfur
- High cetane
- Lower PM and HC emissions
- Renewable feedstock sources



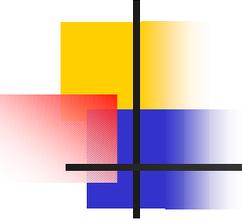
Concerns with Biodiesel Use

- Increased NO_x emissions at higher blend levels
- Poor oxidation stability
- Potential performance problems
 - Filter plugging (gums, microbial growth, solvent properties)
 - Crankcase oil dilution
 - Elastomer compatibility
- Problematic use in cold weather conditions
- Manufacturers' commercial warranties
- Long-term use implications unknown



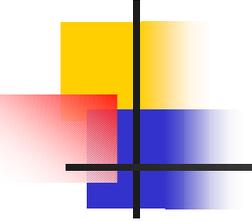
Public Policy Considerations

- Energy independence
- Incentives and subsidies acceptable
- Legislative and regulatory mandates not appropriate



Status of Biodiesel

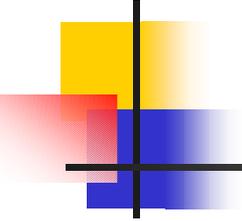
- Several large fleets using B20 to identify long-term effects
- Annual use has increased to approximately 25 million gallons
- Several states considering or have incentives or mandates



EMA Position Statement

For a complete version of EMA's position statement on the use of Biodiesel fuel and Biodiesel fuel blends please see:

<http://www.enginemanufacturers.org/admin/library/upload/297.pdf>



Conclusions

- Engines are designed to operate on specified fuels
- Significant effort is required to conduct performance/emission testing on multiple feedstocks and concentrations
- Incentives and subsidies are acceptable but mandates are not appropriate
- EMA is committed to working with other stakeholders in industry and government to develop a common understanding of the role of biodiesel fuels in California's overall air quality strategy