

Lube Design, Inc.

Technical Presentation

Lube Designer 4.0

Today's Purpose

- Present an overview of LubeDesign's software application, Lube Designer 4.0.
- Determine where and how it might provide added value within your lube plants Technical and Production needs.

Lube Designer 3.0 Overview

- **Mathematical Prediction Model**
 - Physical and Chemical properties
- **Relational Database**
 - Tables of Specifications, Materials, Formulas
- **Windows Forms**
 - Easy to use Windows Forms for data entry/updates
 - Working Forms for Formulation design
- **Import/Export Facility**

Application

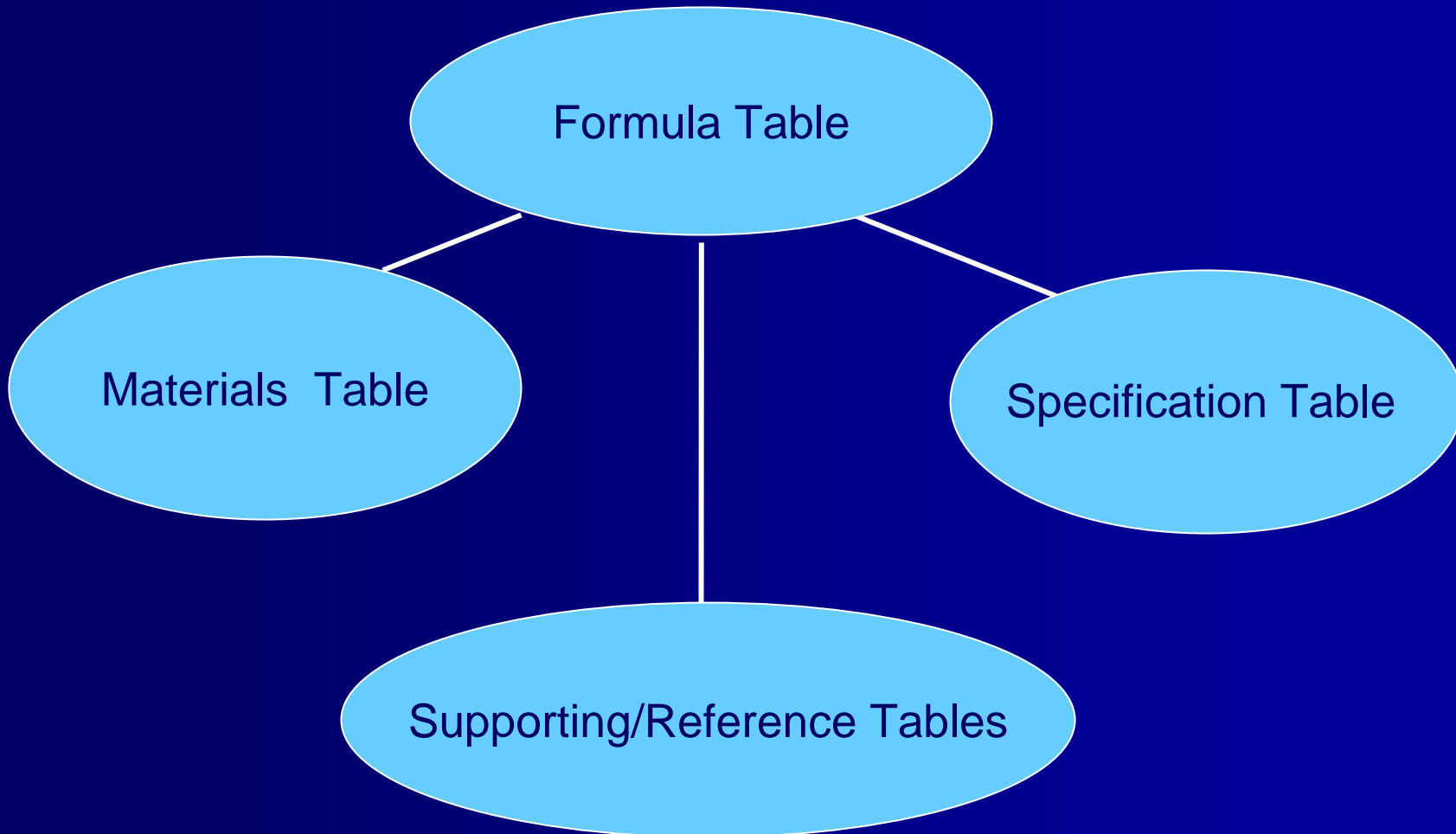
■ Research and Development:

- Formula development is fast and easy.
- Relational Databases hold current data.
- Formula validation.

■ Plant Production:

- Blend management; Blend no., Tank, Volume.
- Handles in-house oils and additive variations.
- Formula validation prior to Production.
- Can be designed with controls for Component and/or volume changes within predefined limits.

Data Tables



Primary Data Tables

■ Formulas

- formula identifiers, ingredients, and links to other tables.

■ Materials

- ingredients with individual descriptions, properties, values, and blend exponents.

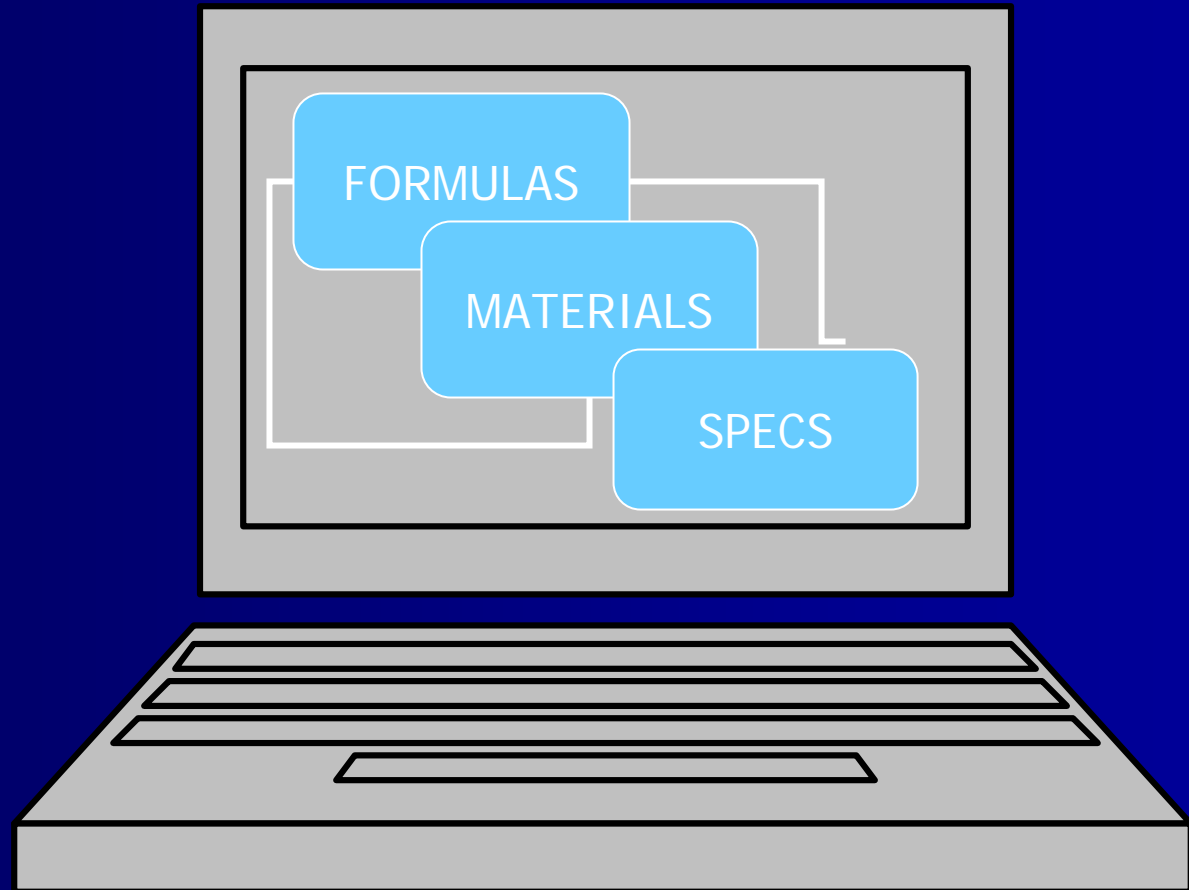
■ Specifications

- Typical, Mini, Max, and selected targets.

Support/Reference Tables

- Drop down Selection tables
 - Easy choices of pre-selected options.
- Instructions/Materials Inventory
 - Reference data.
- Calculation Tables
 - API coefficients.

Windows Forms



Solving the Blend Model

■ Viscosity:

- Model based on volume %.
- Non-linear, Exponential relationships.
- Material Exponents based on Lab data.
- Formula Exponents computed.
- “artificial intelligence” to help determine math model coefficients
- Examples: Kinematic Viscosity at 40C, 100C, Cold Cranking Simulator, Brookfield Viscosity.

Solving the Blend Model (cont.)

■ Other Non-Linear Models:

- Pour Point
- Flash Point
- Noack Volatility
- Color

Solving the Blend Model (cont.)

■ Linear Models:

- Based on wt %.
- Additive Elements, (Zn, Ca, P, Mg, S, Mo, B, Ba)
- TBN, TAN, Sulfated Ash
- Density
- Water

■ Math Utilities and Conversions:

- Density (API, Sp.Gr., Lbs/gal)
- Viscosity Index, Temperature, SUS Viscosity.

Blend Plant Operations

■ Separate Blend Form

- Same model calculations.
- Import access to Reserved Formulas.
- Copies moved to Working Table.
- Modifications allowed/limited, as required.
- History file may be produced.
- Export final modifications.

Adjustments....

■ Adjustment Form

- Allows accurate adjustment for blended formulas.
- Requires Volume, Test Data, desired Results.
- Allows up to 3 adjustment ingredients.
- Has both Fixed and Automatic Corrections.
- Set up with printed instructions to blending.
- Can be adapted to Lab Blends.

Key Issues

■ Near term

- Define Computer Format that most closely matches your companies experience and needs.
- Define Input/Output criteria for system communications between existing data platforms.

■ Long term

- Provide training and support to Technical and Blend Plant Users.
- Continue support via updates as technical needs and model requirements change.

Risks & Rewards

■ Risks

- Math Models always contain error.
- Data Tables must be maintained and accurate.

■ Addressing risk

- Lab analysis and testing.
- Lab Blends fine tune and reduce error.
- Utilize SQL located tables.

■ Rewards

- Minimum formula development time.
- More accurate formulas over many variables.
- Proactive initial Blending/Fast Blend Corrections.

Resource Recommendations

- Windows XP Professional.
- Microsoft Access 2000.
- Links to Server
 - Lube Designer Program Application.
 - ODBC to SQL Server.
- SQL Server 2000.
 - SQL Tables allow access by different users, simultaneously, even at different locations.
- External Communications.
 - Import/Export links

Lube Design, Inc.

Our applications are tailor-made
to your individual needs.

Our applications are continually
evaluated for improvement.