Renewable, Non-toxic and Cost Competitive Solvents and Plasticizers

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Overview

• Renewable Products Company
  – xF Technologies licenses IP and process technology
  – Potential partners include ethanol, chemical and consumer products companies

• Versatile Product Platform
  – Novel combinations of sugar derivatives with alcohols or diols
  – Granted patents cover production and use

• Target Markets
  – Cleaning and processing solvents, plasticizers, coatings, personal care
  – Gasoline and diesel fuel oxygenate

• Economics
  – CapEx and OpEx competitive with petrochemical based products
  – Chemical surrogate approved by WHO and EFSA
• Cost Advantaged, 2-Step Thermochemical Process
  – Biomass feedstock agnostic
  – Recycles processing chemicals
  – Alcohol feedstock determines final product
408™ Family of Solvents

Methyl Furoate

Ethyl Furoate

Isopropyl Furoate

Butyl Furoate

Note: ‘408’ is a phonetic spelling of furoate
xF Family of di-408™ Plasticizers

Key Attributes

High solvating
Fast fusing
Low volatility
Nontoxic

Bridge

Propylene Glycol

Dipropylene Glycol

Triethylene Glycol

PG di-408

DPG di-408

TEG di-408
xF’s 408™ Product Platform

These molecules are examples of what is possible with our platform chemistry.
Pilot Plant in Albuquerque, NM
Summary

• New process to produce safe and nontoxic renewable chemicals
• Feedstocks include cellulosic biomass, sugars and starches
• Granted patents cover production and use
• Target applications include:
  – Cleaning and processing solvents
  – Plasticizers for the soft PVC market
  – Coalescing and leveling aids for paints and coatings
  – Emollients and fragrance carriers for personal care products
• CapEx and OpEx competitive with petrochemical based products