

Crown Iron Works Company

Edible Lecithin Processing



Lecithin Uses

Number One: Food Products

- Chocolate
- Margarine
- Baking



Lecithin Uses

Number Two: Health Supplement

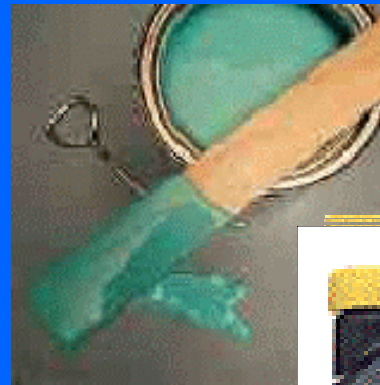
- 16% Phosphatidycholine (PC)
- 14% Phosphatidylethanolamine (Cephalin or PE)
- 12% Inositol Phosphatides



Lecithin Uses

Number 3: Industrial Applications

- Textiles
- Paints
- Insecticides



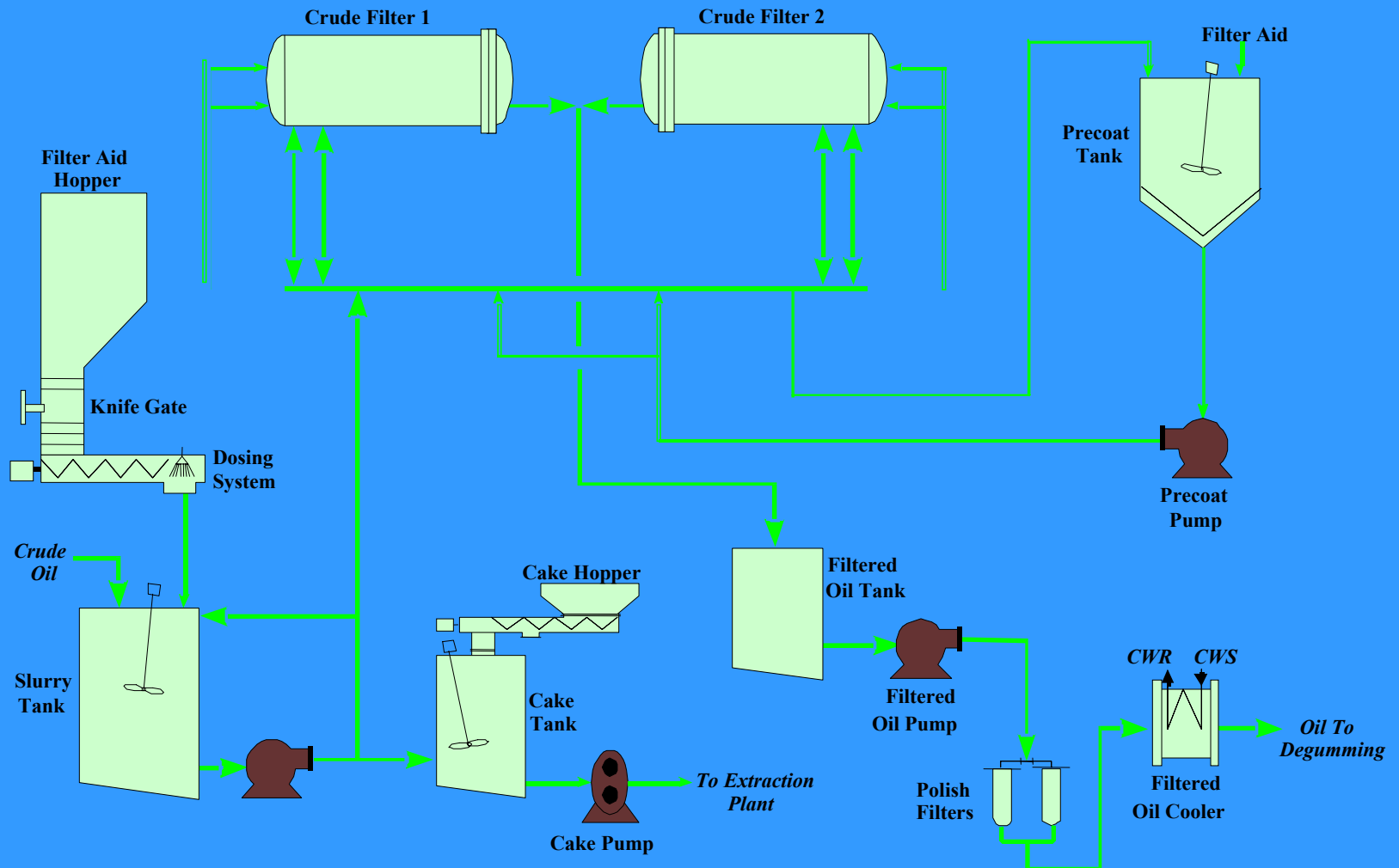
Basic Lecithin Production

- **Oil Filtration**
- **Special Degumming**
- **Lecithin Processing**

Filtration

- **Removes Hexane Insoluble (HI) materials.**
- **Commonly performed in extracted oil stage.**

Filtration



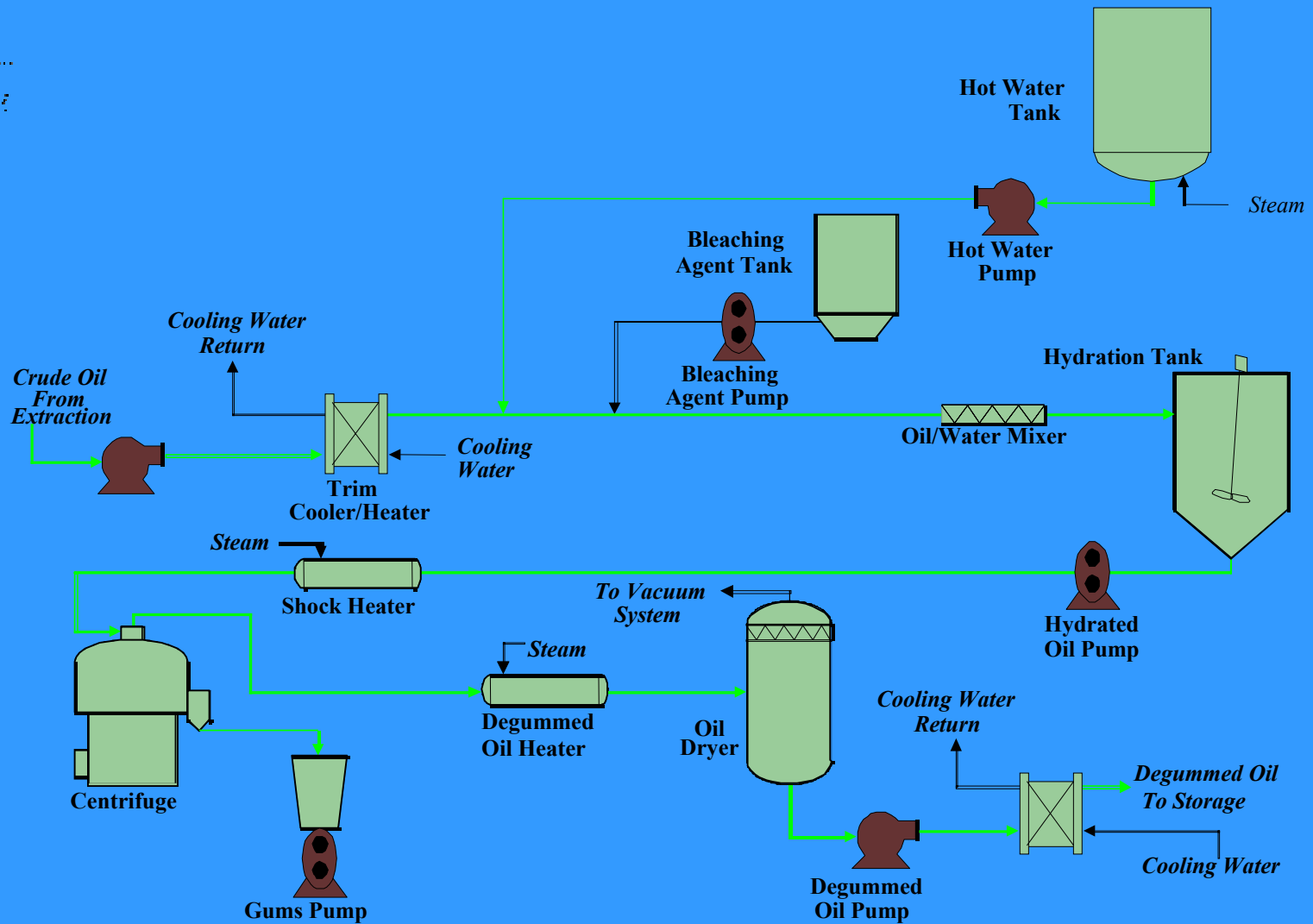
Filtration



Degumming

- **Removes phosphatides (gums) from oil**
- **Normally includes bleaching agent addition**
- **Lecithin quality considerations**

Wet Degumming



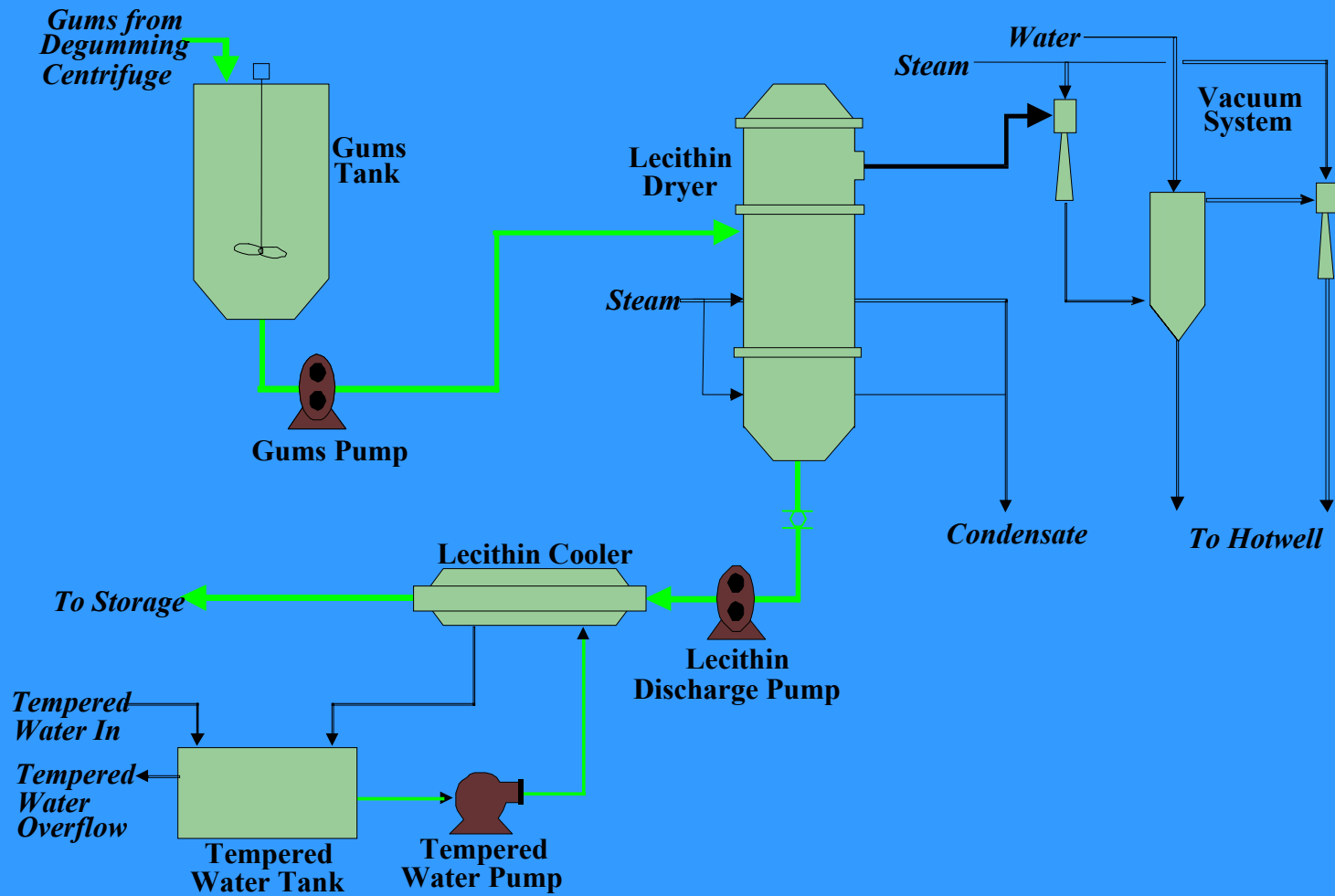
Degumming



Lecithin Processing & Storage

- Removes moisture
- Dark color, high viscosity, AV concerns
- Viscosity & acid value correction

Lecithin Drying



Lecithin Dryer



Lecithin Dryer



Lecithin Commercial Specifications

	Fluid Natural Lecithin	Fluid Bleached Lecithin	Fluid Double- Bleached Lecithin
Acetone-insolubles, min (%)	62	62	62
Moisture, max (%)	1	1	1
Hexane-insolubles, max (%)	0.3	0.3	0.3
Acid value, max	32	32	32
Color, Gardner, max (diluted)	10	7	4
Viscosity, poises, @ 77F, max	150	150	150
	Plastic Natural Lecithin	Plastic Bleached Lecithin	Plastic Double- Bleached Lecithin
Acetone-insolubles, min (%)	65	65	65
Moisture, max (%)	1	1	1
Hexane-insolubles, max (%)	0.3	0.3	0.3
Acid Value, max	30	30	30
Color, Gardner, max (diluted)	10	7	4
Penetration, max (mm)	22	22	22

Additional Lecithin Uses and Processes

- **Blended lecithins**
- **Deoiled lecithin**
- **Fractionated lecithins**

Economics of Lecithin Production

- **Lecithin value**
- **Increased hull use value**

Lecithin Value

- **Operating costs plus meal opportunity costs around \$0.19/lb.**
- **Fluid lecithin market value \$0.28/lb**
- **Economic benefit of \$800,000 annually for 3,000 TPD crush**

“Hidden” Meal Value

- **In protein control situation, 1.23 lbs hulls can be added per lb of gums removed**
- **Provides substantial benefit equal or greater than lecithin alone**

Crown Iron Recent Lecithin Installations

- **ADM Helena (600 tpd oil, 29 tpd lecithin).
Helena, Arkansas, USA**
- **Chai Tai Harbin (60 tpd oil, 6 tpd lecithin).
Harbin, China**
- **Chai Tai Jiamusi (60 tpd oil, 6 tpd lecithin).
Jiamusi, China**
- **Southseas Oil (200 tpd oil, 8 tpd lecithin).
Shenzhen, China**
- **CF Processing (200 tpd oil, 5 tpd lecithin).
Creston, Iowa USA**