

# High Viscosity Thermal Processor & Discharge System

## LCI Corporation

LCI propose to provide a refurbished 2 square metre cheese base processor with discharge system and ancillary equipment for the application.

The processor is currently owned by a third party and was originally supplied by LCI in 1981. It was in use as a pilot plant on a dairy service until early 2001.

Supply and refurbishment of a special thin-film evaporator designed for dairy service, discharge system, vapor pipe, condenser, and drives.

### EQUIPMENT SUPPLIED

The equipment to be supplied is as follows:

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Item	Qty	Description
1	1	<p>LCI CBP, Serial No: 0200/57, Nominal 2 sq.m. heat transfer surface area.</p> <p><u>Pressure Rating</u> Process area: full vacuum to atmospheric Thermal Section jacket: 165 psig @ 370 deg F 120 psig @ 650 deg F</p> <p><u>Materials of Construction</u> All product wetted parts: T316L SS or 316 Ti Heating Jacket: Stainless Steel Heating Flanges: Carbon Steel</p> <p><u>Mechanical Seal</u> Rotating Rings: SS with chromium oxide faces Upper Seat: Carbon Lower Seat: Carbon Wedge Rings: Teflon Lower Bearing: special floating needle bearing Lower Bearing Pin: 316 SS with special wear surface</p> <p>Gaskets: Thermal Body: Gylon Fawn Heating nozzles: Gylon Fawn</p>

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### Major Components

Thermal Section: special heating bodies with ASME U-stamp

Separator: special with sanitary top cover

Rotor: special sanitary design

Spider: inverted cone adapter with enlarged spider

Top Bearing Assembly: special with large bearing

Lower Bearing Assembly: special journal type with pin mounted in a centering spider with needle bearing mounted in the rotor

Mechanical Seal: Crane 151

Drive Support

Bottoms Tank

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|---|---|--|
| 2 | 1 | Motor Sheave: 5" dia., 5-groove, "A" section.  |
| 3 | 1 | Rotor Drive Belts: Matched anti-static V-belts, "A" section, pitch length 79"  |
| 4 | 1 | Bottoms Pump: Allweiler-Seeberg Type SNBP 100.2 VI PI K22 LL 4003, with special auger for product removal from bottom cone; drive 3 hp, 460 volt, 3-phase, 60 hertz. |

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5	I	Vapor Pipe: 12" with special flange to bolt to LCI CBP-0200, connections for pressure transmitter, temperature indicator and spray ball. Materials of construction 304 SS, constructed per 3-A sanitary standards, designed for full vacuum to atmos. @ 200 deg F.
6	I	Condenser: Approximately 167 sq. ft. 12 %" O.D. x 6' long with product on tube side, cooling water on shell; shell – 3" inlet and outlet, 5/8" 18 BWG tubes. Material of construction 304 SS Design conditions: tube side FV to atmos @ 200 deg F; shell side 150 psig @ 200 deg F, per 3-A sanitary standards and ASME code with code stamp.
7	I	Condenser Bottom Bonnet: 12" I.D. x 36" straight side tank; 1 W' discharge, 2" vacuum connection with vacuum baffle, connection for temperature indicator, special nozzle for mounting liquid level transmitter

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Note that supply of the Rotor Drive Motor is not included in the agreement.  
(The motor is a 30 hp 1800 rpm, 230/460 volts, 3-phase, 60 hertz, TEFC frame 286TD, "D" flange for vertical mounting shaft up.)

3. **REFURBISHMENT SERVICES**

The following services were provided in the reconditioning:

- I. Upon receipt of the unit at the LCI repair facility, remove the rotor and disassemble the upper bearing and seal.
3. Inspect visibly the rotor shaft bearing and seal surfaces for excessive wear and/or service damage. Visibly inspect the rotor for any excessive rotor to wall contact and suspicious surface conditions. Air and soap test and/or die check any suspicious areas for cracks.
4. Confirming no problems with steps 2 and 3, place rotor on lathe and check for straightness and proper clearance.
5. Inspect thermal wall surfaces for unusual wear, erosion and/or corrosion.
6. Hydro-test heating jacket.
7. Clean and inspect upper bearing and housings for excessive wear or service damage.
8. Disassemble Allweiler progressive cavity pump. Inspect rotor, auger, shaft surface in mechanical/seal area, and bearing housing.

9. Report on Item 3 to 8 above prior to proceeding with the refurbishment work.
10. Correct any out of tolerance conditions of step 4 and/or dynamically balance.
11. Based on a positive step 7, inspect and replace existing bearings with new bearings and proper grease. Replace existing grease seals with new seals.
12. Rebuild mechanical seal with rebuilt and/or new parts.
13. Inspect spider for any service damage and repair any minor defects.
14. Replace lower bearing pin based on satisfactory step 9 inspection.
15. Correct any minor scratches on the thermal wall surfaces by hand polishing.
16. With positive inspection in step 8, reassemble pump using new stator, mechanical seal, bearing and gaskets.
17. Check Allweiler motor and gear drive by providing power and doing a mechanical vibration analysis. This will detect bad gear teeth and bearings.
18. Should vibration analysis not detect defects, drain oil for shipment and/or grease bearings.
19. Disassemble vapor pipe and bottom bonnet from condenser. Hydro-test shell and inspect for leaks and cleanness.
20. Sandblast all external mild steel surfaces and paint with white food grade paint.
21. Reassemble using Gylon Fawn (food grade) gaskets and check vacuum test process area for tightness.