

1. Procedure summary

This procedure describes Maintenance of the Decanter.

Related Procedures

Decanter and Load Out System Description	CB-02-006-002
Decanter Harvest Monitoring	CB-02-006-003
Transfer Slurry for Transport	CB-02-007-003

Procedure impacts and concerns

Safety	Observe all safety precautions in Chapters 1, 4.1 and 4.1.1 of the Decanter Instruction Manual	<Additional notes>
Quality	An incorrectly maintained or assembled decanter poses a safety risk for Harvest Area personnel.	<Additional notes>
Delivery	Decanter maintenance will be performed with Westfalia approved service and spare parts.	<Additional notes>
Environmental	Algae material spills will be recorded and cleaned up as soon as possible.	<Additional notes>
Cost	If equipment is not maintained properly malfunctions can occur and there can be significant damage to equipment. Properly maintaining the equipment will keep the decanter working reliably and prevent undesirable shutdowns.	<Additional notes>
Compliance	Failure to maintain equipment can lead to large amount of product that is not efficiently processed (too high of a moisture content) and/or large amounts of centrate that would have to be sent to the evaporation pond.	<Additional notes>

Responsibilities and owners

Document Owner	Manage content and distribution	Timothy Langer
Process Owner	Responsible for content and process validation	Marcos Delgado
Site Manager	Responsible for implementation and conformance	Rebecca White

2. Process

2.1 Process description

Timely maintenance and replacement of worn or damaged machine parts are essential for safe operation of the decanter. Westfalia recommends having the decanter serviced by their Service Technicians at regular intervals.	<Additional notes>
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2.2 Process diagram: Work Instruction

<Additional notes>



2.3 Maintenance

2.3.1 Avoiding accidents

Before all maintenance and servicing:

- 2.3.1.1 Observe the safety precautions in Chapter 1 of the Decanter Instruction Manual.
- 2.3.1.2 Perform a controlled shut-down of the decanter as described in the Decanter and Load Out procedure (CB-02-006-002).
- 2.3.1.3 Switch off all electrical apparatus via the main switch.
- 2.3.1.4 Secure the installation against unintended restarting with locking devices. It is not sufficient to switch off the machine via "Emergency Stop". Systems and control components required to safely bring the complete machine to a standstill carry voltage. A voltage cutoff during operation automatically triggers an "Emergency Stop" circuit.
- 2.3.1.5 Do not loosen any part of the machine before the decanter bowl has come to a standstill. The run-down time of the decanter bowl is approximately 15 minutes.
- 2.3.1.6 Do not start maintenance work until all machine parts have adequately cooled down.
- 2.3.1.7 Load carrying equipment such as lifting devices for bowl or scroll may only be used for work routines as described in the Decanter Instruction Manual.
- 2.3.1.8 Do not use damaged or incomplete load carrying equipment.

"Emergency Stop" does switch off the main motor and auxiliary units, but they are not necessarily completely de-energized.

Important: Danger to life through high-speed rotating machine parts!
Important: Danger of injury through falling machine parts.

2.3.2 Safely using hoists

- 2.3.2.1 Use only hoists with factory nameplates.
- 2.3.2.2 Use the hoists only as described in the Decanter Instruction Manual.
- 2.3.2.3 Pay attention to the load limit.
- 2.3.2.4 Check hoists for visible damage before each use. Do not use damaged

hoists.

2.3.2.5 Screw in the threaded rods always as far as they will go.

2.3.2.6 Firmly tighten all nuts.

2.3.2.7 Do not stand under suspended loads.

2.3.2.8 Check all hoists at least once a year.

2.3.3 Lubrication and maintenance schedule

2.3.3.1 Check the Lubrication and Maintenance Schedule document from Westfalia for all maintenance work to be performed at regular intervals, maintenance intervals, and lubricants to be used.

2.3.4 Demands relating to service personnel and spare parts

2.3.4.1 Use only genuine spare parts from Westfalia Separator.

2.3.4.2 Deploy only well trained personnel for maintenance work, e.g. the service personnel from Westfalia Separator or personnel trained by Westfalia Separator.

2.3.5 Scroll

2.3.5.1 Check the scroll for wear at regular intervals.

2.3.5.2 Check the Lubrication and Maintenance Schedule provided by Westfalia Separator for detailed service direction.

2.3.5.3 Check the Decanter Instruction Manual provided by Westfalia Separator for details on permissible wear to scroll (Chapter 4, Section 7.1, page 56).

2.3.5.4 Check the Decanter Instruction Manual provided by Westfalia Separator for details on removing the scroll (Chapter 4, Section 7.2, page 57).

2.3.6 Bowl

2.3.6.1 Check the bowl for signs of wear at regular intervals.

2.3.6.2 Check the Lubrication and Maintenance Schedule provided by Westfalia Separator for detailed service direction.

2.3.6.3 Check the Decanter Instruction Manual provided by Westfalia Separator for details on removing the bowl (Chapter 4, Section 8.1, page 57).

2.3.7 Drive Belts

2.3.7.1 Check the condition and position of the drive belts. The inspection and replacement intervals are given in the Lubrication and Maintenance Schedule provided by Westfalia Separator.

2.3.7.2 Check the Decanter Instruction Manual provided by Westfalia Separator for details on signs of insufficient belt tension or worn belts (Chapter 4, Section 10, page 67)

2.3.8 Gearbox

2.3.8.1 The gearbox is filled with oil. Oil quantity and oil change intervals are specified in the Lubrication and Maintenance Schedule provided by Westfalia Separator.

**An incorrectly
maintained/assembled
machine poses a safety
risk for the operators.**

<Additional notes>

3. Required documents

Input documents

Decanter P&ID

Decanter Instruction Manual

Lubrication and Maintenance Schedule

<Input document
number>

Output documents

Preventative Maintenance Log

<Output document
number>**4. Document control****Revision history**

R0 – Initial Release – Marcos Delgado	May 10, 2012
R1 – Updated Procedures – Marcos Delgado	August 15, 2012
R3- Updated- Leo Willis	December 23, 2014

Document approval

<Name>

<Approval date>

Document reviewers

<Name>

<Last reviewed date>

<Name>

<Last reviewed date>

5. Risk analysis

<Risk name>

<Mitigation plan>

<Owner>

<RPN>