

Slurry tanks

PROCESS CHROMATOGRAPHY

Slurry tanks help to generate a homogenous slurry and thus play a critical role in ensuring a well-packed column and a robust and efficient purification process. A well-packed column is characterized by high resolution (with positive impacts on purity and yield) and high bed stability, characteristics that help to avoid costly repacking due to poor HETP and asymmetry.

Advantages of a well-designed slurry tank include:

- Simplified buffer exchange (from transport liquid to packing buffer and to preservative when storing media) and adjustment of slurry concentration
- Generation of a homogenous slurry
- Supports all packing methodologies, including pressure packing of brittle media
- Simplified, more ergonomic, and safer operator working conditions

By gently generating an even particle size distribution throughout the slurry, the slurry tank can help prevent excessive shear forces that may otherwise lead to media degradation, clogged nets, and increased back pressure. Slurry tanks also support a range of additional process steps when packing and unpacking media. The ability to transfer media/buffer via pressure results in time and material savings as well as improved operating conditions.



Fig 1. A 1600 L slurry tank with control panel is easily moved for simplified and safer packing.

Tank characteristics

Characteristics of all slurry tanks are summarized in Tables 1 and 2. Slurry tanks are composed of stainless steel tubing and piping, with EPDM gaskets, and are pressure rated to 3 bar g (maximum operating pressure). Tanks are easily and safely operated from the control panel (Fig 2). The tank interior can be accessed from a manhole on the top of the tank (Fig 3).

Table 1. Basic characteristics of Cytiva slurry tanks

| | |
|--|-----------------------|
| Operating pressure | -1 to 3 bar g |
| Process air consumption | 200 NL/min |
| Instrument air consumption | 50 NL/min |
| Pressure requirement, process air/instrument air | 5-10/6-10 bar g |
| Number of inlets | 3 |
| Number of outlets | 2 |
| Tank bottom valve | 1 |
| Sprayballs | 2 |
| Protection class | IP55 |
| Tank, piping material | 316 L |
| Process wetted gaskets and elastomers | EPDM |
| Design temperature range | 4°C to 40°C |
| Power supply | 3 × 400 VAC, 50-60 Hz |

Table 2. Slurry tank size and volume characteristics

| Tank characteristic | Tank size | | | |
|---------------------------------|--------------------|--------------------|--------------------|--------------------|
| | 500 L | 1000 L | 1600 L | 2000 L |
| Dimensions (W × H × D, mm) | 1300 × 1850 × 1500 | 1421 × 1900 × 1700 | 1750 × 1960 × 1920 | 1750 × 2150 × 1920 |
| Dry weight, kg (fully equipped) | 800 | 1000 | 1200 | 1250 |
| Minimum operating volume, L | 26 | 30 | 35 | 35 |
| Maximum operating volume, L | 500 | 1000 | 1600 | 2000 |



Fig 2. Tank front showing control panel (see inset right) and major components.

Operation

Slurry tanks are designed to allow a single operator to easily perform all the steps necessary for packing and unpacking a column. To minimize the potential for confusing connections, all connections (TC for hoses and Quickfit for pressurized air) are clearly labeled and easily accessed. The control panel (Fig 2) allows for simple and safe control of most tank functions.

To minimize exposure of the operator to ethanol fumes, NaOH storage solution, or other preservatives (and also to minimize the exposure of media to the environment — reduced risk for contamination), slurry tanks are designed to be operated as a closed system.

A number of optional configurations (Table 3) are available to facilitate more advanced methods.

- 1 CIP
- 2 Manhole
- 3 Pressure relief valve
- 4 Slurry inlets
- 5 Vent filter manually controlled

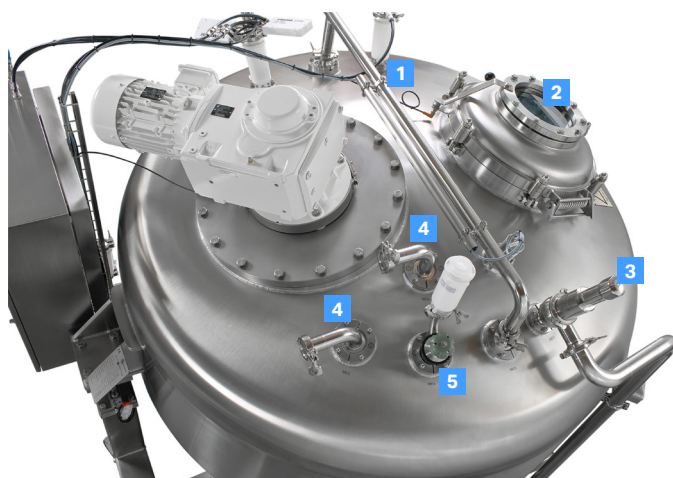


Fig 3. Tank top showing major components.

Table 3. Optional configurations available for slurry tanks*

Option

Load cells

Pressure/Vacuum

Air blow/buffer drain (In combination with the pressure/vacuum option)

Sample valve

Methodology

To determine volume by weight. Most slurries have a density around 1 kg – 1 L. It is possible to enter density for the actual slurry and thereby get the correct correlation between volume and weight. The display will only show kg.

Allows for a vacuum function to remove gas from the slurry. Also allows for more rapid slurry concentration.

This option allows the user to blow air/nitrogen into the slurry for loosening up settled media, before the stirrer is started. In addition, the filters will also function to concentrate the slurry. This can be used to ensure the proper concentration before column packing, or for minimizing the storage volume. As the gravity flow through the filters is not sufficient on its own, the pressure option is also required.

Valve for withdrawal of slurry samples. Can also be used for other measuring instruments.

* Note: All options have to be ordered when ordering the tank.

Ordering

For information on ordering slurry tanks, please contact your local Cytiva representative or visit: www.cytiva.com

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