

Biogen Specific Teaching Material

Basic Principles of Process Control Systems and Automation –
Measurement of Variables Critical to Controlling Processes





Questions & Answers

Basic Principles of Process Control Systems and Automation – Measurement of Variables Critical to Controlling Processes

1. What does “working volume” of a bioreactor mean?

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1. It is the amount of total tank-volume taken up by a cell culture.

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2. What does “headspace” of a bioreactor refer to?

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2. It is the remaining tank-volume above the cell culture.

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3. Why is it important for air (positive pressure) to be pumped into the bioreactor?

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3. Because high-pressure air ensures (1) that oxygen is ‘pushed’ into the vessel, maintaining air flow in the event of an air leakage (in the headspace).

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4. Which stage(s) of the process in the bioreactor is crucial, in reducing the risk of contamination, for positive (high) pressure in the bioreactor of the cell culture process?

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4. The positive pressure in the bioreactor is crucial throughout all stages of the process.

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5. Which two types of sparge tips are used in manufacturing processes?

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5. Both porous tips and drilled-hole tips are used in the manufacturing process.

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6. Which tips (tool) allow for easier sterilising and are more efficient at stripping out by-products, such as CO₂ ?

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6. Drilled-hole tips allow for easy and efficient for sterilising and for stripping out by-products.

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7. Which tips (tool) provide efficient air distribution and minimise shear (when tripping)?

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7. Porous tips provide efficient air distribution and minimise shear (when stripping).

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8. How is oxygen (CO_2) transferred, from its introduction into the bioreactor to its dissolution in the media and subsequent uptake by the cells, in the bioreactor?

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8. It is transferred through a sparge tube.

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9. What types of pressure gauges does the company use?

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9. Both mechanical and electrical ones.

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10. What is a 'diaphragm' used for in a pressure gauge of a bioreactor?

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10. It consists of a disk made of flexible material that bends and moves a pointer on a scale thereby showing the pressure.

Thank you for your attention!

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