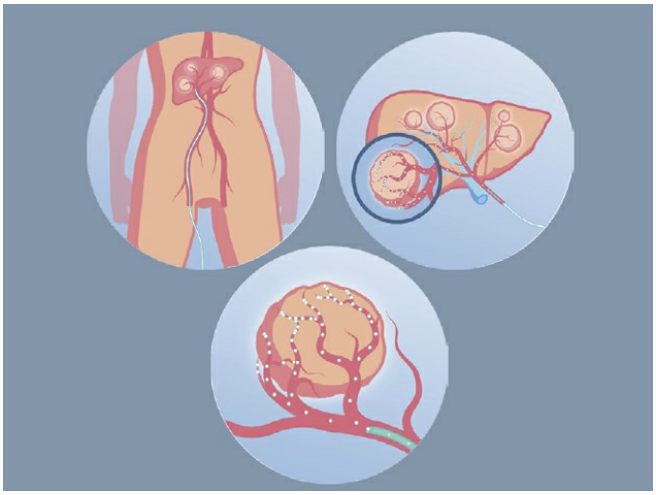
DATASHEET APPLICATION NOTE A072-ME01 MICROSPHERES FOR LIVER CANCER TREATMENT

APPLICATION NOTE

Microspheres for liver cancer treatment

Vapor flow solution for a stable gas flow rate

Patients who suffer from liver tumours that cannot be surgically removed nor respond to chemotherapy, may benefit from a local treatment with radioactive particles.



Quirem Medical manufactures polylactic acid microspheres containing radioactive holmium, suitable for such treatment. These microspheres are injected in the hepatic artery and are carried along by the blood flow. The radioactive microspheres will lodge within the small blood vessels near the liver tumour where they deliver their radiation locally, with the aim to kill the tumour cells. Quirem Medical manufactures the non-radioactive microspheres. Subsequently, the microspheres are enriched by neutron bombardment. An essential step in the synthesis is the controlled **evaporation** of a solvent that has been used in a previous step. Bronkhorst mass flow controllers deliver the nitrogen flow to enhance and control the solvent evaporation.

Application requirements

Nitrogen is needed to evaporate the solvent, as it acts as an inert carrier gas that sweeps off the evaporated solvent and accordingly determines the evaporation rate. So the correct nitrogen flow is a very important parameter in the production process to obtain the right size of the microspheres.

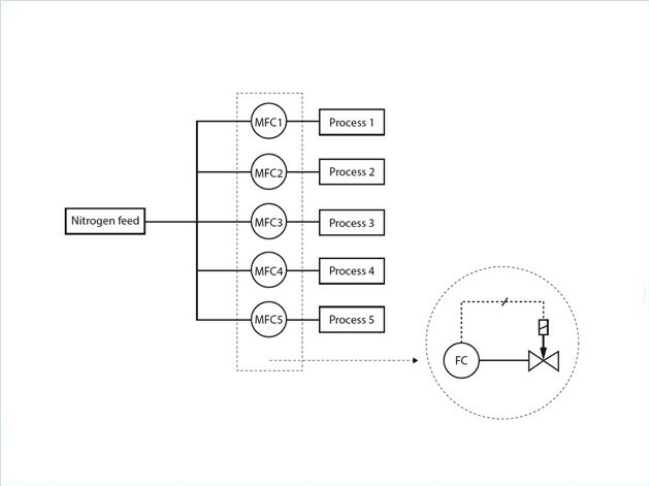
Important topics

- Correct and stable nitrogen flow rate
- Monitoring of process conditions
- FDA approved seals
- Cleanroom production

Bronkhorst evaporation solution

To evaporate the solvent in the microsphere synthesis, classic type EL-FLOW mass flow controllers are used. There are five batch processes in parallel, each with its own mass flow controller and with a Hepa filter upstream. All of these mass flow controllers have FDA approved seals, to anticipate future use of the product in the USA. These mass flow controllers were manufactured in the cleanroom, and were double packed and sealed delivered. The delivery included all necessary certifications, including a TSE/BSE declaration to demonstrate that no animal fats have been used in the device.

Moreover, Bronkhorst MASS-VIEW has been included, to monitor if the mass flow controllers will deviate in due time, which may be a trigger to send the devices to Bronkhorst for recalibration. The correct nitrogen flow is a very important parameter in the production process. The scale of the flow is for Quirem Medical more important than its accuracy. Furthermore, a high quality flow controller (and meter) is necessary: to establish **a stable flow**, and also to be able to monitor the process conditions - for read out and data storage. They are pleased with the mass flow controller, and satisfied with Bronkhorst's fast service.



Flow scheme

Recommended Products



EL-FLOW SELECT F-201CV

Min. flow 0,16…8 mln/min
Max. flow 0,5…25 ln/min
Pressure rating 64 bar
Compact design
High accuracy and repeatability



MASS-VIEW® MV-104

Min. flow 0,04...2 ln/min
Max. flow 0,2...20 ln/min
Pressure rating 10 bar
Bright, graphical OLED display
10 pre-installed gases

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