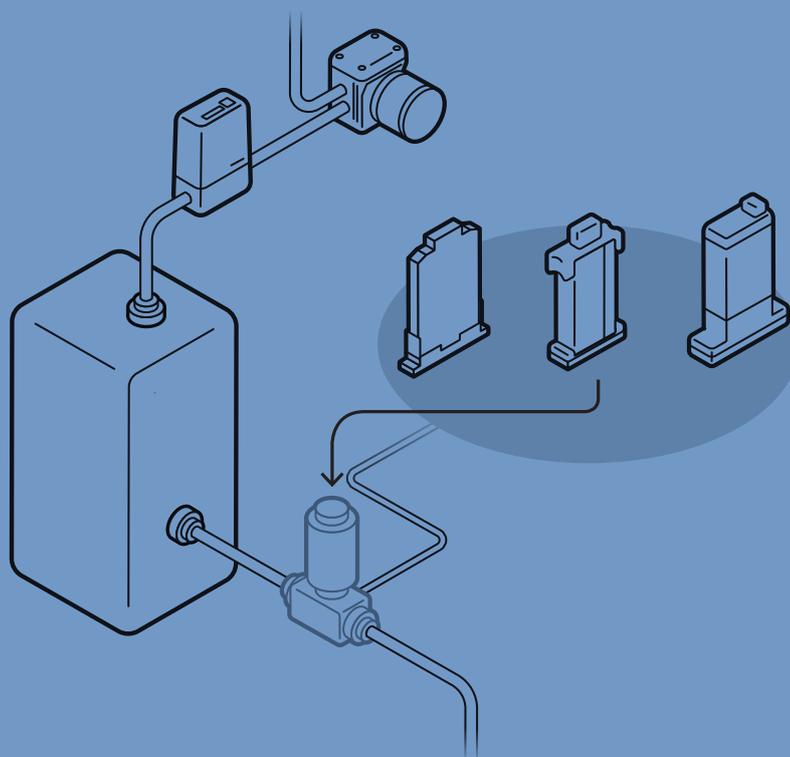




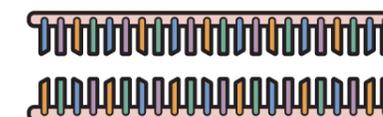
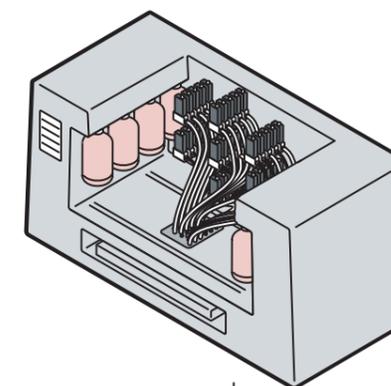
Exact and efficient dosing for high synthesis quality





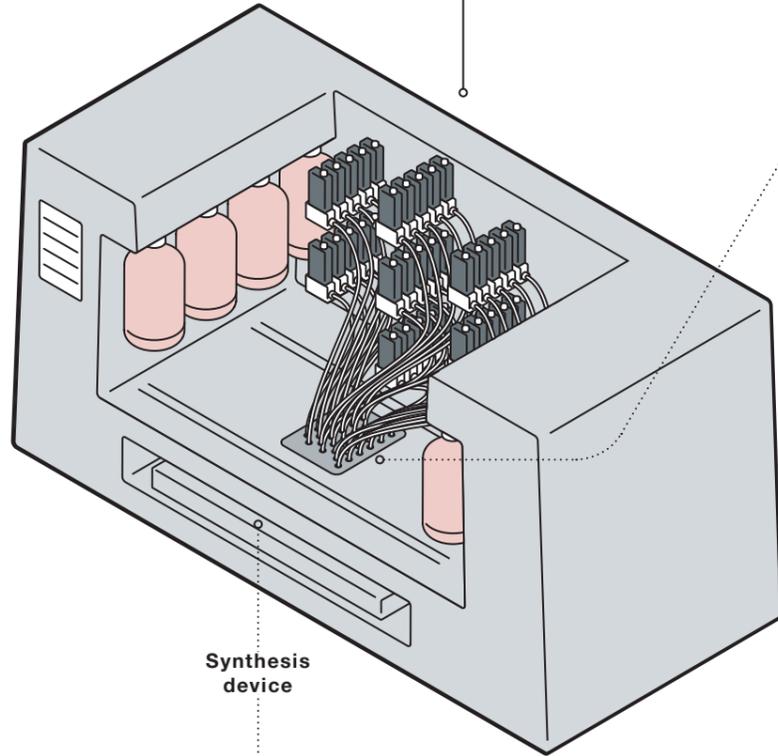
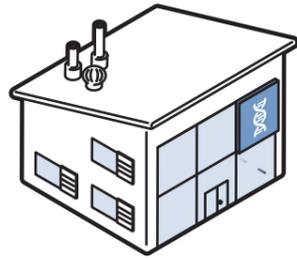
/ Controlling dosing processes precisely / The demand for artificially produced DNA in research is increasing. Oligonucleotide synthesis is a commonly used approach to generate artificial DNA strand material and involves dosing up to twelve different liquids in the microlitre (μl) range. Researchers use the artificial oligonucleotides or “oligos” in various applications, one example being primers for the polymerase chain reaction (PCR). An oligonucleotide’s maximum length and correct nucleotide sequence are decisive for its quality. Find out on the following pages how our fluidic solutions can enhance your dosing processes.

The dosing of liquids in the microlitre range for the production of oligonucleotides places extensive demands on the synthesisers. The most important criterion is the purity of the oligos. In addition, oligo manufacturers need a high level of throughput to operate economically.



How do you produce high-quality DNA strands in a controlled and reliable way? Bürkert valves and valve systems help you to master this task more effectively and efficiently.

/ Quality at top speed / Your customers require very pure oligos in the shortest possible time. To achieve this goal, the synthesiser must be able to dose up to twelve different liquids reliably and quickly. As a production and delivery time of sometimes less than 24 hours leaves no room for errors or mistakes.



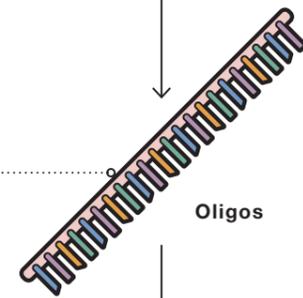
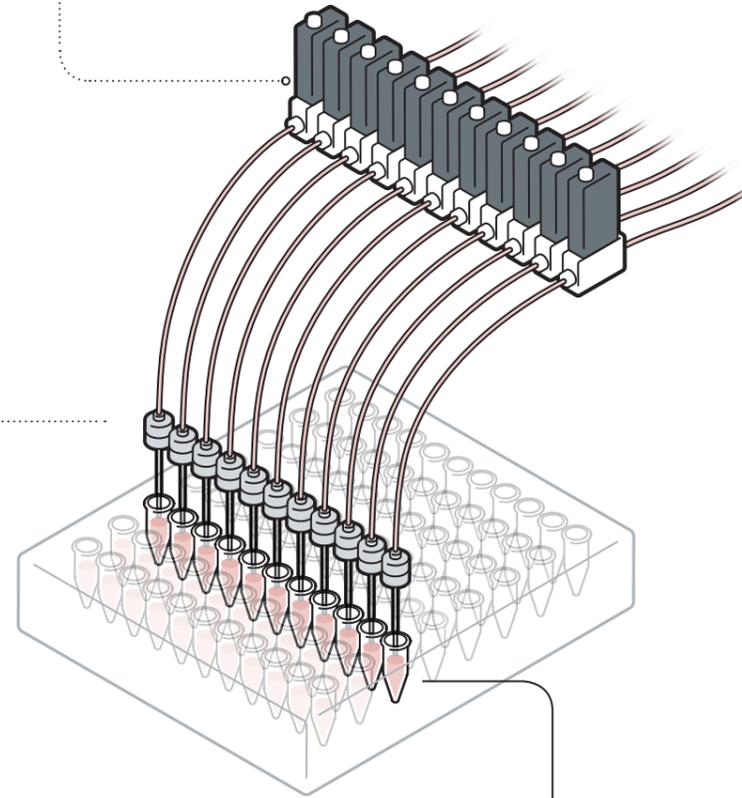
Synthesis device

Reliable, reproducible dosing processes

Due to the highly sensitive production process, it is important to detect errors very quickly and to eliminate them without having to spend hours searching for the cause. The faster you can initiate measures, the greater your process reliability.

High speed of the production process

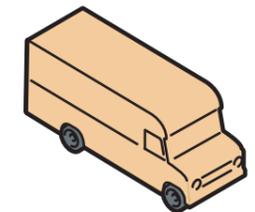
Extremely precise and reliable dosing technology is required to produce high-quality batches of oligos in a very short period of time. Further, expensive reagents need to be used as economically as possible.



Oligos

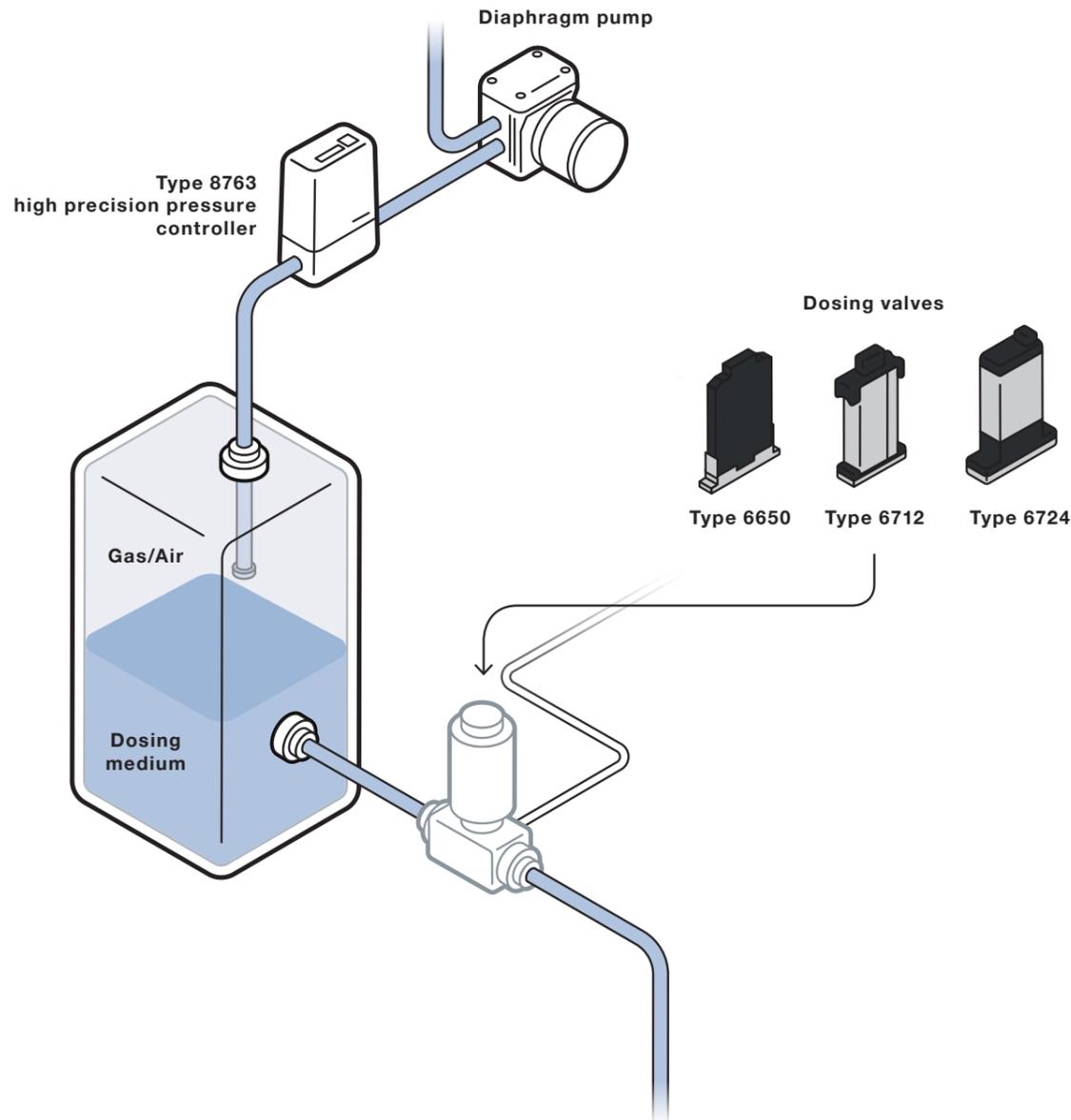
Ensuring the purity of oligos

In the field of oligonucleotide synthesis, precise dosing is crucial for the purity of oligos. When delivering perfect quality in record time, it is important to be able to dose liquids quickly, without compromising on precision.

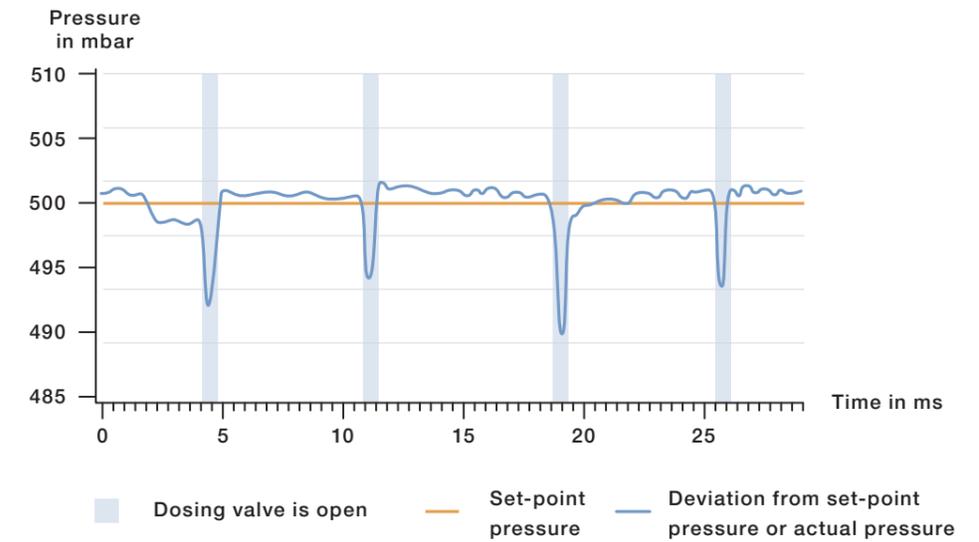


Delivery

/ Increasing productivity when dosing / Bürkert time-pressure dosing technology speeds up the dosing process and increases the efficiency of your synthesiser. The dosing quantity can be adjusted and changed quickly. The valves switch precisely and are leak-tight, thereby guaranteeing the purity of the oligos. Important to know: We adapt modular systems to your requirements or develop them together with you.



During the switching operation – illustrated by the bars in the diagram – the pressure inside the container drops. The curve shows how the controller readjusts the set-point pressure within milliseconds, by either applying pressure or venting pressure. This is a bidirectional control procedure.



Reproducible production of ultra-pure oligonucleotides



Repeatable and reliable production is essential for high-quality oligonucleotides. Thanks to tight manufacturing tolerances, Bürkert valves are characterised by their repeat accuracy and reliable switching behaviour. Our valves switch exactly the same at the first, the hundredth and the thousandth switching procedure.

Exact dosing results



In Bürkert system or block solutions, all the components are perfectly matched to guarantee a precise production process that can be reproduced whenever and wherever required. All the valves offer the same switching behaviour.

Accelerated production



Time-pressure dosing can accelerate your dosing process and make a synthesiser work more efficiently. At the same time, dosing is carried out in a reproducible manner with flexible dosing quantities. The small internal volume of the valve ensures that only the smallest amount of expensive reagents remains unused.

Process monitoring in real-time



Thanks to the digital communication interface, the switching point can be detected and reported in real time. A defect caused by wear and tear can thus be eliminated very quickly. This saves time and your plant is up and running again very quickly.

/ Real-time monitoring for systematic quality control / As an alternative to single valves, Bürkert block solutions offer many advantages, including fast integration and secure cabling. Further, we integrate all the required features into the compact system for you.

The digital communication interface allows you to monitor production of the oligos in real time. A valve with signs of wear and tear can be quickly identified and replaced.

Bürkert solution

Bürkert can supply you with individual valves or systems tailored to your needs.



Saving time and materials

The block solution can be replaced quickly and requires significantly fewer cables and plugs. For example, twelve valves can be supplied by just one electrical connection. The components are permanently installed, thus preventing individual strands from becoming loose.



Tracking production

The real-time analysis or the digital communication interface allows you to track production.



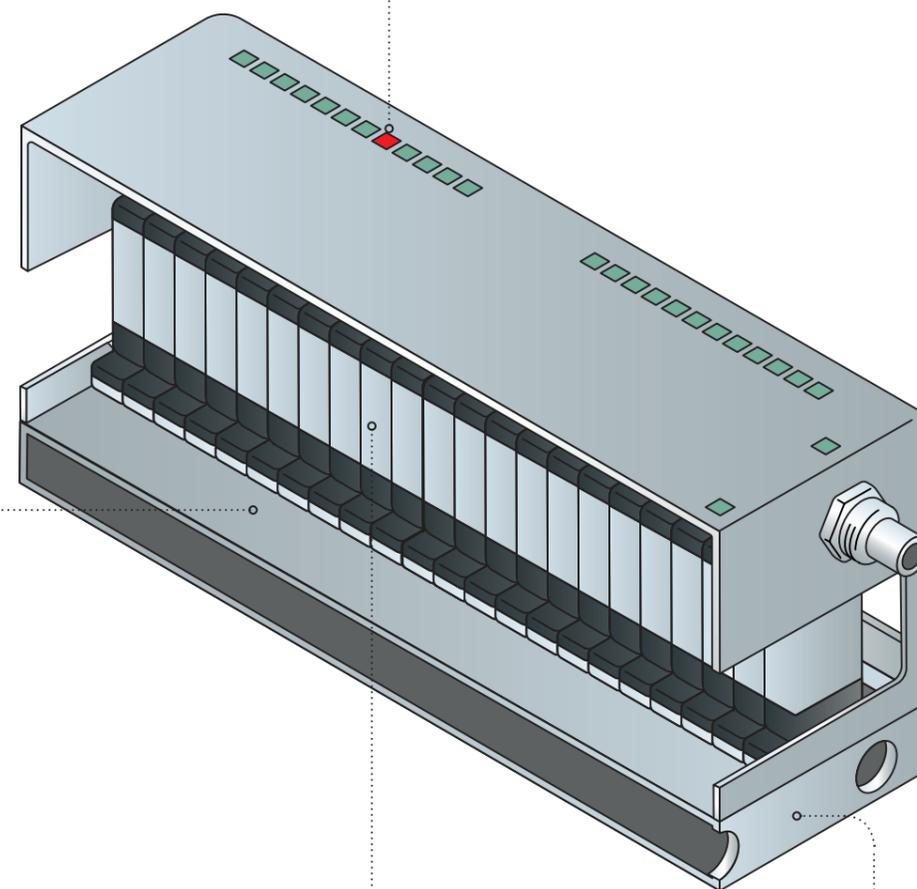
Preventing defective oligos

The software with switching point detection serves as a permanent quality control. It signals immediately if a valve has not switched. You can replace it directly and avoid the time and resource-consuming production of defective oligos.



Indicating errors

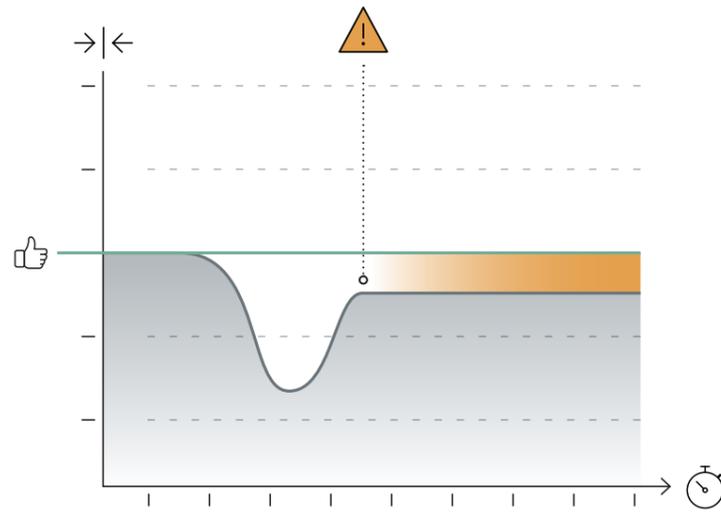
Thanks to the LEDs on the device, you can see directly where an error has occurred and correct it immediately.



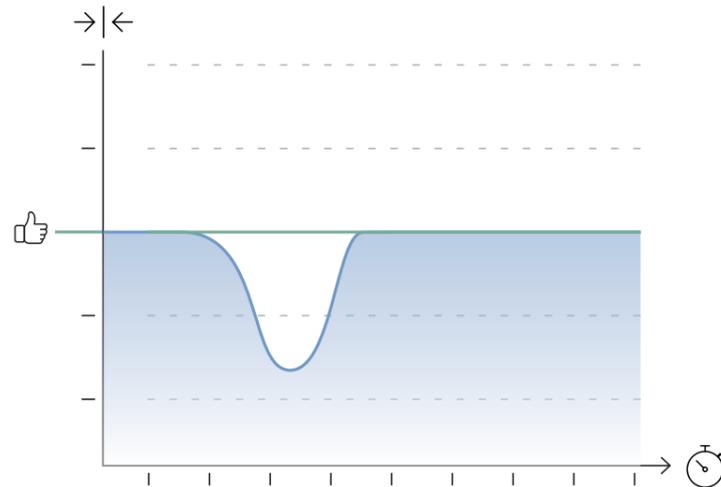
Guaranteeing reliable processes

Built-in pressure transmitters permanently monitor the pressure in the valves and provide additional reliability for your processes.

/ Is the pressure correct? / Thanks to constant pressure monitoring and electrical switching point detection, a pressure drop in Bürkert solutions can be detected directly at the corresponding valve. Therefore, only replace a valve when absolutely necessary: A failure is immediately reported via the digital communication interface, allowing you to correct it without delay.



Pressure curve for a process error: The pressure is not built up fully after switching. If this remains undetected, the oligonucleotides produced in the meantime will be defective.



Pressure curve without process error: The pressure immediately returns to the previous level after switching. A pressure drop is immediately indicated by the Bürkert valve solution.



Example calculation

Saving time: The comparison shows how failure detection simplifies your production process. Depending on your procedures, you can save a lot of time between a pressure drop occurring and its detection.

Conventional valve solution

Bürkert system solution



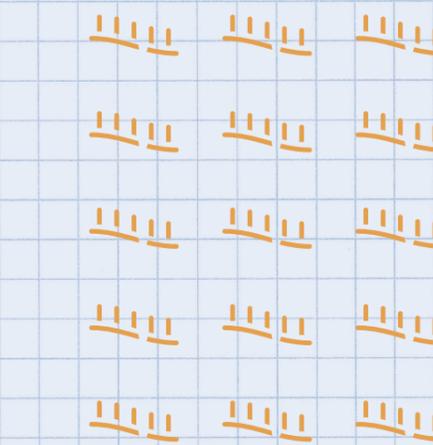
A valve has not switched (defective oligos are produced from this moment on)



0 min
1 min
20 mins



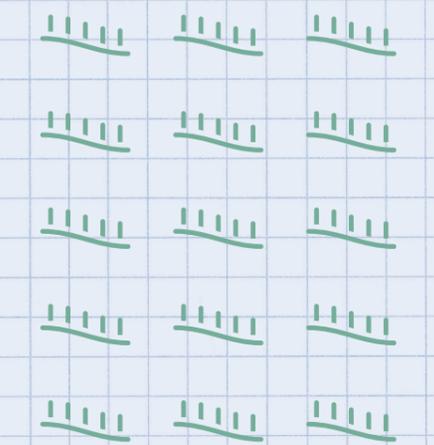
A valve has not switched – the operator recognises the error and eliminates it immediately. The defective valve can be replaced immediately



100 mins

150 mins

200 mins



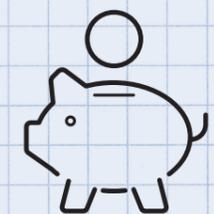
The batch is checked and the error found



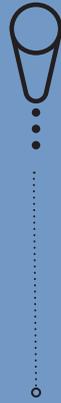
The production of half a day is waste – and there is a risk of no longer being able to meet the target schedule



The customer is supplied with ultra-pure oligos as scheduled



Maximum quality and minimum loss of time (20 mins. compared to 4 hours without a Bürkert solution)



Dosing

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