Making the COVID-19 Vaccine

AstraZeneca is committed to delivering billions of doses of its COVID-19 vaccine across the globe in a broad and equitable way, at no profit during the pandemic. We have established manufacturing capacity in 15 countries, across 25 different manufacturing sites and these facilities are working round the clock with the highest standards of quality to meet the unprecedented demand and incredible global need.

The vaccine is manufactured using a biological process and at every opportunity we continue to refine and optimise the efficiency whilst maintaining high standards of safety and quality.

Developing the process >

Growing & harvesting the vaccine

~60 days*

Producing the final drug product

~30-60 days*

Getting the vaccine to communities

~7-14 days*

01 | Process development

We created a comprehensive manufacturing process that could be reproduced in multiple manufacturing sites across the world

02 | Cell infection

Living cells are infected with the modified adenoviral vector so they can produce the vaccine

03 | Cell expansion

As the cells grow and multiply, they are moved to bioreactors of increasing size

04 | Purification

The vaccine is then separated from the host cells and purified

05 | Fill & finish

Materials, such as water, sugars and minerals are added to produce the final formulation which is filled into multidose vials

06 | Labelling & packaging

The vials are then labelled, packaged and stored at 2-8°C / 36-46°F

07 | Complete testing

Rigorous testing is completed to ensure each batch of vaccine meets safety, efficacy and quality standards

08 | Regulatory release

Documentation and batch records are submitted and reviewed by regulators and release is authorised

09 | Distribution & delivery

The vaccine is shipped to distribution centres where governments and multinational organisations take ownership and coordinate further distribution

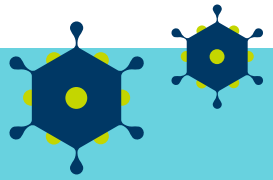
Testing & quality control

Over 60 tests are performed throughout the production process to ensure the quality of the vaccine product

*Timelines represent approximate averages, exact lead times may differ depending on manufacturing site, supply chain and regulatory requirements. There is a time range for producing the final drug formulation as it can take longer if each stage is carried out at multiple sites.

Each stage of development, from producing the vaccine to distribution, requires collaboration across our company, global supply network, funding partners and health authorities. Together, scientists, supply chain experts, engineers and quality professionals are working in parallel with clinical development to create and optimise an end-to-end process that is robust, efficient and safe.

Growing & harvesting the vaccine



~60 days*

Cell infection > Cell expansion > Purification

The vaccine is produced using adenoviral vectors inserted into living cells. The cells are grown and multiplied in bioreactors. A series of steps are taken to harvest and purify the vaccine.

To enable global supply, we further developed and optimised the process to ensure a repeatable, scalable process that delivers maximum yields and high-quality product across our supply chain.

To support quality testing we built an extensive analytical network and are rapidly transferring our analytical methods to these laboratories.

Producing the final drug product

~30-60 days*

Fill & finish > Labelling & packaging

The purified vaccine is combined with buffers to achieve a final formulation and then filled into multi-dose vials.

The multi-dose vials are labelled and packaged into cartons. There are defined storage and handling conditions to ensure product stability and shelf life.

Getting the vaccine to communities

~7-14 days*

Complete testing > Regulatory release > Distribution & delivery

Before the vaccine can be shipped, all required testing must be completed on the batch to ensure it meets robust efficacy, safety and quality requirements.

There are regulatory requirements that need to be met at a local country level and that we can only carry out after approval. These requirements differ around the world, so the time between approval and release can change from country to country. We are working very closely with all relevant authorities to ensure that the handover of the vaccine is carried out as smoothly and efficiently as possible.

Tests are run in parallel to production to avoid unnecessary pauses. However, some tests take weeks to complete and the results are needed before the vaccine is released - this way, we do not compromise the quality of the product. Once testing is complete and the quality confirmed, the vaccine can be distributed.

Veeva ID: Z4-30296
Date of preparation: February 2021