HyClone™ media and supplements

Cell Boost™ 7a and 7b supplements

HyClone Cell Boost 7a and Cell Boost 7b supplements are intended for use in combination with HyClone ActiPro™ and ActiSM™ media as part of the ActiPro cell culture system formulated to provide high yields of recombinant proteins in processes when using Chinese hamster ovary (CHO) cell lines (Fig 1). Cell Boost 7a and 7b are chemically defined, animal-derived component-free (ADCF), and optimized for high-yield protein production in fed-batch processes. Cell Boost 7a and 7b do not contain any growth factors (such as insulin), peptides, hydrolysates, phenol red, or 2-mercaptoethanol, ensuring batch-to-batch consistency and increased cell culture process efficiency.

ActiPro system of media and supplements is designed with adaptation and production in mind. The ActiPro system is suitable for general biomanufacturing with CHO cell lines such as CHO-GS, CHO-K1, CHO-DG44, and CHO-S.

Key features of Cell Boost 7a and 7b supplements:

- Demonstrated high yields of recombinant proteins (e.g., MAbs > 5 g/L) in fed-batch processes
- Chemically defined ADCF formulations
- Concentrated feeds that complement each other and are used together
- Accompanied with detailed protocols for use to maximize output

Specifications

Cell Boost supplements are used as an essential part of your cell culture feed strategy to enhance cell culture performance and increase product yield. Cell Boost 7 a and 7b are intended for use together in defined concentrations.

The supplements should be added to the cultivation vessel as individual solutions and should not be mixed in advance as this will cause precipitation. The recommended ratio of Cell Boost 7a to 7b is 10 to 1 (v/v). The total amount of feed added and the specific feeding regime will need to be adjusted according to the nutritional requirements of each specific clone.

Fig 1. ActiPro, ActiSM, and Cell Boost 7a & 7b are designed for high yields of recombinant proteins in fed-batch culture processes with CHO cells.

Cell Boost 7a

Cell Boost 7a has a pH close to neutral and contains amino acids, vitamins, salts, trace elements, and glucose.

Cell Boost 7b

Cell Boost 7b has an alkaline pH and is a concentrated solution of amino acids.

Safety declaration

Cell Boost 7b is a hazardous chemical:

- Causes skin irritation
- Causes severe eye irritation
- Can cause respiratory irritation

Please take appropriate safety precautions prior to using Cell Boost 7b.

1. Wear protective gloves
2. Wear eye or face protection
3. Avoid breathing dust

If inhaled, move the individual to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or physician if you feel unwell.

Store Cell Boost 7b in a locked location.

Dispose contents and container in accordance with all local, regional, national, and international regulations.

Shelf-life

Please refer to the label for the expiry date of your Cell Boost product.

Storage

Cell Boost 7a and 7b powder supplements should be stored in a dry environment, protected from light at 2°C to 8°C. Reconstituted Cell Boost 7a and 7b should be protected from light and stored at 2°C to 8°C.

Suggested preparation

To ensure proper reconstitution, please follow the protocol for your Cell Boost supplement.

Required equipment and materials include:

a. Mixing vessel

b. Stirrer

Note: a magnetic stirrer can be used for small-scale reconstitutions up to 5 L. An overhead or bottom-mounted impeller is recommended for larger volumes.

c. Calibrated pH meter

d. Calibrated osmometer

e. Highly purified water such as water for injection (WFI)

Reconstitution of Cell Boost 7a powder supplement

1. Fill a clean mixing vessel to 80% of the final volume with high-quality purified water, such as WFI, at ambient temperature (18°C to 25°C) and start stirring. For example, a preparation of 1 L Cell Boost 7a solution takes approximately 800 mL of water.

   Note: the stirring should be vigorous enough to quickly draw the powder below the liquid surface, but not too fast to cause formation of air bubbles and excessive foaming.

2. Add 181.04 g/L Cell Boost 7a powder slowly to the vessel, avoiding formation of clumps. Mix for 30 minutes. The solution will remain cloudy in this step, but should be clear of any clumps or dry powder residues. The color will be bright red.

3. Slowly add 18.6 mL/L of a 5 N NaOH solution or 9.3 mL/L of a 10 N NaOH solution and mix for 60 minutes. After this step, the solution will be clear.

4. Adjust the pH to between 6.60 and 6.80 by drop-wise addition of 5 or 10 N NaOH or HCl. After adjusting, continue stirring for an additional 60 min to ensure that all components are completely dissolved.

   Note: the pH will gradually increase with longer mixing times. Use caution when adjusting pH. Over adjusting can cause the osmolality to be out of specification.

5. Adjust to the final volume with high-quality purified water, such as WFI, and stir for an additional 10 min.

6. Measure and record the final pH and osmolality. Expected values:
   - pH 6.60 to 6.80
   - Osmolality 247 to 303 mOsmol/kg (diluted 1:5)

7. Sterilize immediately by membrane filtration. Use a low-binding filter membrane type, such as PVDF, PES, or cellulose acetate. The supplement is a clear bright red liquid.

8. Store the reconstituted supplement protected from light at 2°C to 8°C until use.

Reconstitution of Cell Boost 7b powder supplement

1. Fill a clean mixing vessel to 80% of the final volume with high-quality purified water, such as WFI, at ambient temperature (18°C to 25°C) and start stirring. For example, a preparation of 1 L Cell Boost 7b solution takes approximately 800 mL of water.

   Note: the stirring should be vigorous enough to quickly draw the powder below the liquid surface, but not too fast to cause formation of air bubbles and excessive foaming.

2. Add 94.6 g/L Cell Boost 7b powder slowly to the vessel, avoiding formation of clumps. Mix for 30 minutes. The solution will remain cloudy in this step, but should be clear of any clumps or dry powder residues.

3. Slowly add 160.5 mL/L of a 5 N NaOH solution or 80.25 mL/L of a 10 N NaOH solution and mix for 60 minutes. After this step, the solution will be clear.

4. Adjust the pH to between 11.0 and 11.4 by drop-wise addition of 5 or 10 N NaOH or HCl. After adjusting, continue stirring for an additional 60 min to ensure that all components are completely dissolved.

   Note: the pH will gradually decrease with longer mixing times. Use caution when adjusting pH. Over adjusting can cause the osmolality to be out of specification.

5. Adjust to the final volume with high-quality purified water, such as WFI, and stir for an additional 10 min.

6. Measure and record the final pH and osmolality. Expected values:
   - pH 11.0 to 11.4
   - Osmolality 218 to 266 mOsmol/kg (diluted 1:5)

7. Sterilize immediately by membrane filtration. Use a low-binding filter membrane type, such as PVDF, PES, or cellulose acetate. The supplement is a clear colorless or slightly yellow liquid. The color will turn darker yellow to brown over time.

8. Store the reconstituted supplement protected from light at 2°C to 8°C until use.

Preparation note

Cell Boost 7a and 7b powder supplements can be conveniently reconstituted using single-use mixers, such as the Xcellerex™ XDM mixers (Fig 2).

Fig 2. XDM Quad Mixing System, with a powerful motor and magnetically locked impeller, effectively mixes even highly viscous materials.

General culture recommendations

Cell Boost 7a and 7b are used as an essential part of your cell culture feed strategy and should be used together in defined concentrations to enhance cell culture performance and increase product yield.

- Cultures should be incubated at 37°C in a 7.5% CO_2 environment.
- Maintain adapted cells by establishing a mid-logarithmic growth phase subculturing schedule.
- Suggested seeding density of cultures 3.0 × 10^5 cells/mL; viability should be > 90%.

Process conditions

ActiPro medium and Cell Boost 7a and 7b supplements are recommended for use in a CO_2 atmosphere. Equilibration of ActiPro media in 7.5% CO_2 will result in a starting pH of 7.15 ± 0.05. During the cultivation, pH control can be managed by varying the CO_2 concentration or by addition of base such as $NaHCO_3$ or NaOH. The culture temperature should be adjusted according to the requirements of the specific clone or target product. ActiPro medium and Cell Boost 7a and 7b supplements have demonstrated excellent results both under constant temperature conditions and in biphasic processes comprising a shift to a lower temperature.

Custom production

Formulations and delivery systems can be customized to your specific process requirements or optimized to maximize process yields.

Rapid Response Production (RRP)

Our RRP program manufactures up to 200 L of your custom prototype formulation within seven working days of your request. Use our RRP service to expedite the development and testing of custom media for your biopharmaceutical manufacturing process.

Related products

Product specifications for Cell Boost 7a and 7b supplements and related products are listed in Table 1.

Table 1. Product specifications for ActiPro media and supplements

Specification	ActiSM	ActiPro	Cell Boost 7a	Cell Boost 7b
L-glutamine	-	-	-	-
Glucose	Y	Y	Y	-
Phenol red	-	-	-	-
Proteins	-	-	-	-
Hydrolysates	-	-	-	-
2-mercaptoethanol	-	-	-	-
Poloxamer 188	Y	Y	Y	-

ActiSM medium

ActiSM is a lean, chemically defined ADCF medium that does not contain glycine, hypoxanthine, or thymidine.

This medium was developed to be used as the first step in adapting cells to the ActiPro system of media and supplements. Once cells have undergone the adaptation process, we recommend using ActiPro medium for production.

ActiPro medium

ActiPro is a rich, chemically defined, and ADCF medium that does not contain hypoxanthine or thymidine and has been formulated for use in high-yield batch or fed-batch processes.

Technical support

Our cell culture medium specialists and technical support functions are happy to discuss your needs in getting the most out of your culture. In addition, we have an extensive service offering to help with, for example, process development, optimization, and scale-up. Please contact your local sales representative to learn more about the services we offer.

To find a certificate or a MSDS for a specific product, please visit gelifesciences.com/certificates.

Ordering information

Product	Quantity	Product code
HyClone Cell Boost 7a powder supplement	1 L†	SH31026.07
	5 L*	SH31026.01
	10 L†	SH31026.02
	25 L†	SH31026.03
HyClone Cell Boost 7b powder supplement	0.5 L*	SH31027.01
	1 L†	SH31027.07
	5 L†	SH31027.02
	10 L†	SH31027.04

Related products	Quantity	Product code
HyClone ActiPro powder medium	5 L*	SH31037.01
	10 L†	SH31037.02
	25 L†	SH31037.05
HyClone ActiPro liquid medium	500 mL*	SH31039.01
	1000 mL*	SH31039.02
	1 L†	SH31039.03
HyClone ActiSM powder medium	5 L*	SH31038.01
	10 L†	SH31038.02
	25 L†	SH31038.05
HyClone ActiSM liquid medium	500 mL*	SH31040.01
	1000 mL*	SH31040.02
	1 L†	SH31040.03
L-glutamine 200 mM	100 mL*	SH30034.01
	500 mL*	SH30034.02
	500 g†	SH30336.03

Note: powder product quantity is shown as the final volume of after powder reconstitution.

* Stock items.

† Item is made to order. Lead times and minimum order quantities apply.

GE Healthcare Bio-Sciences AB
Björkgatan 30
751 84 Uppsala
Sweden

gelifesciences.com/hyclone

29165413 AE 09/2016