

Doc. No.	Rev	Effective Date
PI3	2	08JUL2024

Balanced Salt Solutions (BSS)

A **balanced salt solution (BSS)** is a solution made to a physiological pH and isotonic salt concentration. Solutions most commonly include sodium, potassium, calcium, magnesium, and chloride. Balanced salt solutions are used for washing tissues and cells and are usually combined with other agents to treat the tissues and cells. They provide the cells with water and inorganic ions, while maintaining a physiological pH and osmotic pressure. Glucose may also be added as an energy source and phenol red is used as a pH indicator. In medicine, balanced salt solutions can be used as an irrigation solution such as during intraocular surgery and to replace intraocular fluids.

History

In 1883, the Dutch chemist, Hartog Hamburger, noted that red blood cells were less likely to lyse in a NaCl solution of 0.9 % than in more diluted solutions. Isotonic saline was born. However, the composition of 0.9 % saline differs significantly from that of blood. More physiologic solutions with a salt composition closely resembling that of blood than 0.9 % saline, ("balanced" salt crystalloids), were developed. Approximately 110 years ago, Sydney Ringer, an Australian physician, introduced a NaCl solution containing some K⁺ and Ca⁺⁺ to promote contraction of isolated heart. Eighty years ago, Alexis Hartmann (1898–1964), an American paediatrician, added the non-Cl⁻ anion lactate to prevent metabolic acidosis. The solution developed by A. Hartmann, currently termed either Hartmann's solution or lactated Ringer's solution, eventually replaced the original Ringer's solution.

Hank's BSS (HBSS) and Earle's BSS (EBSS)

Hanks' Balanced Salt Solution (HBSS) is a buffer used to maintain a physiological pH for cells maintained in non-CO2 atmospheric conditions. Hank's balanced salt solution (HBSS) and Earl's balanced salt solution (EBSS) are isotonic solutions used to maintain osmolality and pH in biological applications. Both HBSS and EBSS may also include glucose and sodium bicarbonate for short-term maintenance of cells outside of growth medium.

PBS and DPBS

Phosphate buffered saline (PBS) and Dulbecco's phosphate buffered saline (DPBS) are commonly used in biological applications. Both buffers offer a balanced salt solution used for a variety of cell culture applications, such as washing cells before dissociation, transporting cells or tissue samples, diluting cells for counting, and preparing reagents. Both include sodium chloride and phosphate and are formulated to prevent osmotic shock and maintain water balance in living cells.

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Life Science Production

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PBS is a commonly used buffer with a simple formulation, while DPBS also includes potassium chloride and is available in a larger variety of formulations, including with or without calcium and magnesium and with or without glucose and pyruvate.

Product Code	Product Description	Size
LSGHBSS-002L	Hanks Balanced Salt Solution with Calcium Chloride	1L
LSGHBSS-001L	Hank's Balanced Salt Solution	1L
55-022-PB	Corning® HBSS (Hank's Balanced Salt Solution), Powder without Sodium Bicarbonate, Calcium, Magnesium, and Phenol Red	10L
21-022-CM	Corning® HBSS (Hank's Balanced Salt Solution), 1x without Calcium, Magnesium and Phenol Red	6 x 1L
21-021-CV	Corning® HBSS (Hank's Balanced Salt Solution), 1x without Calcium and Magnesium	6 x 500mL
21-021-CM	Corning® HBSS (Hank's Balanced Salt Solution), 1x without Calcium and Magnesium	6 x 1L
21-023-CV	Corning® HBSS (Hank's Balanced Salt Solution), 1x with Calcium and Magnesium without Phenol Red	6 x 500mL
21-023-CM	Corning® HBSS (Hank's Balanced Salt Solution), 1x with Calcium and Magnesium without Phenol Red	6 x 1L
21-020-CV	Corning® HBSS (Hank's Balanced Salt Solution), 1x with Calcium and Magnesium	6 x 500mL
21-020-CM	Corning® HBSS (Hank's Balanced Salt Solution), 1x with Calcium and Magnesium	6 x 1L
20-021-CVR	Corning® HBSS (Hank's Balanced Salt Solution), 10x without Sodium Bicarbonate, Calcium and Magnesium	6 x 500mL
20-023-CV	Corning® HBSS (Hank's Balanced Salt Solution), 10x with Calcium and Magnesium without Phenol Red and Sodium Bicarbonate	6 x 500mL
21-022-CV	Corning® HBSS (1X without Calcium, Magnesium and Phenol Red)	6 x 500mL
21-031-CV	Corning® DPBS 1X (without Calcium and Magnesium)	6 x 500mL
21-031-CM	Corning® DPBS 1X (without Calcium and Magnesium)	6 x 1L
21-030-CV	Corning® DPBS 1X (with Calcium and Magnesium)	6 x 500mL
20-031-CV	Corning® DPBS 10X (without Calcium and Magnesium)	6 x 500mL
55-031-PC	Corning® DPBS (Dulbecco's Phosphate-Buffered Saline), Powder without Calcium and Magnesium	50L
55-031-PB	Corning® DPBS (Dulbecco's Phosphate-Buffered Saline), Powder without Calcium and Magnesium	10L
21-031-LX	Corning® DPBS (Dulbecco's Phosphate-Buffered Saline), 1x without Calcium and Magnesium	10L

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21-031-LB	Corning® DPBS (Dulbecco's Phosphate-Buffered Saline), 1x without Calcium and Magnesium	20L
21-030-CM	Corning® DPBS (Dulbecco's Phosphate-Buffered Saline), 1x with Calcium and Magnesium	6 x 1L
20-030-CV	Corning® DPBS (Dulbecco's Phosphate-Buffered Saline), 10x with Calcium and Magnesium	6 x 500mL
LSG-1207B	PBS 10% BSA Blocking Buffer	100ml
LSG-1207A	PBS 10% BSA Blocking Buffer	500ml
LSG-11111L	PBS 1% Tween	1L
LSG-1111B	PBS 1% Tween	100mL
LSG-1111A	PBS 1% Tween	500mL
LSG-111120L	PBS 1% Tween	20L
LSG-1108L	PBS1X without Calcium and Magnesium	1L
LSG-1108A	PBS1X without Calcium and Magnesium	500mL
21-040-CV	Corning® PBS 1X (without Calcium and Magnesium)	6 x 500mL
46-013-CM	Corning® PBS 10X (without Calcium and Magnesium, pH 7,4)	6 x 1L
21-040-CMX12	Corning® PBS (Phosphate-Buffered Saline), 1x without Calcium and Magnesium	12 x 1L
21-040-CM	Corning® PBS (Phosphate-Buffered Saline), 1x without Calcium and Magnesium	6 x 1L

Support

To learn more, contact us by phone at +44 1234 889180 or email sales@lifesciencegroup.co.uk

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