

Unique 4 x 1.5 L Capacity Rotor for High-Speed Centrifuges CR22N and CR30NX

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Executive Summary

Equipped with a broad collection of different fixed-angle and swing-bucket rotors, the high-speed Centrifuges CR22N and CR30NX are perfectly fitted for a wide range of applications, ranging from biomass harvesting to higher speed pelleting applications (up to 110,000 x *g* in Centrifuge CR30NX*).

One of the most common applications for these type of centrifuges is the harvesting of biomass, such as bacteria, yeast, or cell cultures. Processing batch volumes of several liters requires successive time-consuming steps to be repeated with every vessel to be centrifuged. It is now possible to reduce the number of bottles that are needed from six to four bottles with Rotor R9A2: The unique rotor design greatly improves the harvesting process efficiency

by reducing the number of vessels needed with a similar centrifugation capacity and consequently the process time (32% time saving). Processing up to four bottles of 1.5 L (6 liters) at up to 15,100 x *g*, this fixed-angle rotor is ideal for harvesting of bacteria, mammalian or insect cells, as well as algae or yeast. Moreover, the unique triangular wide-mouth bottles 1.5 L are specifically designed to improve process flexibility by allowing to process any initial batch volumes, since no filling volume restriction is imposed in contrast to commonly used large volume centrifugation vessels.



*With Rotor R25ST and Rotor R30AT

Introduction

Biomass harvesting is the initial downstream process step of every workflow related to bioprocess, such as DNA plasmid preparation or recombinant protein purification. As soon as several liters of cell culture need to be handled, floor standing centrifuges in combination with large capacity rotors are commonly used, requiring sometimes successive runs to process the complete batch volume. Although its principle is relatively simple, this preliminary harvesting

step consists of a succession of small, time-consuming steps to be repeated with every vessel to be centrifuged, starting from bottle filling, balancing, tight bottle closure and rotor loading to supernatant decanting, pellet recovery and finally bottle washing and autoclaving (as illustrated below). Consequently, every feature that allows to simplify this process will greatly improve workflow efficiency.



Figure 1: Handling steps in cell culture harvesting

Solutions & Benefits

Presenting a unique and compact design, the R9A2 fixed-angle rotor allows to process 4 bottles of 1.5 L per run, with a total capacity of 6 liters. Suitable for both high-speed Centrifuges CR22N and CR30NX, this rotor is perfectly suited for harvesting of bacteria, algae, yeast, mammalian, or insect cell cultures with a maximum speed of 15,100 x *g*. In contrast to commonly used large capacity fixed-angle rotors, this rotor reduces the number of vessels to be handled by researchers from six to four with a similar centrifugation capacity. Thanks to this unique feature, process efficiency can be greatly improved without impacting the pelleting efficacy. As illustrated in the table below, precise labor time assessment of every successive step through two parallel bacteria harvesting workflows showed, that this solution allows to save 19 minutes in comparison with a conventional 6x1L capacity rotor, corresponding to 32% of the complete processing time.



Figure 2: Unique triangular 1.5 L bottle

Made of PPCO (polypropylene copolymer), the 1.5 L bottles present excellent chemical and mechanical resistance. Together with their unique triangular shape, a wide-mouth opening and the tight closure system, they are specifically designed for harvesting applications. Very interestingly, their exclusive design is intended to improve process flexibility, by allowing to process any initial batch volumes, since no minimum filling volume is needed. In this respect, the triangular bottle 1.5 L as well as 1 L, 500 mL, and 250 mL flat-bottom bottles stand out strongly from conventional volume centrifugation vessels*. As long as they are balanced, those bottles can consequently be centrifuged with any filling volume from 0 to their respective maximum capacity volume.

*Competitor centrifuge bottles require a minimum filling volume of 80% due to limited mechanical resistance.

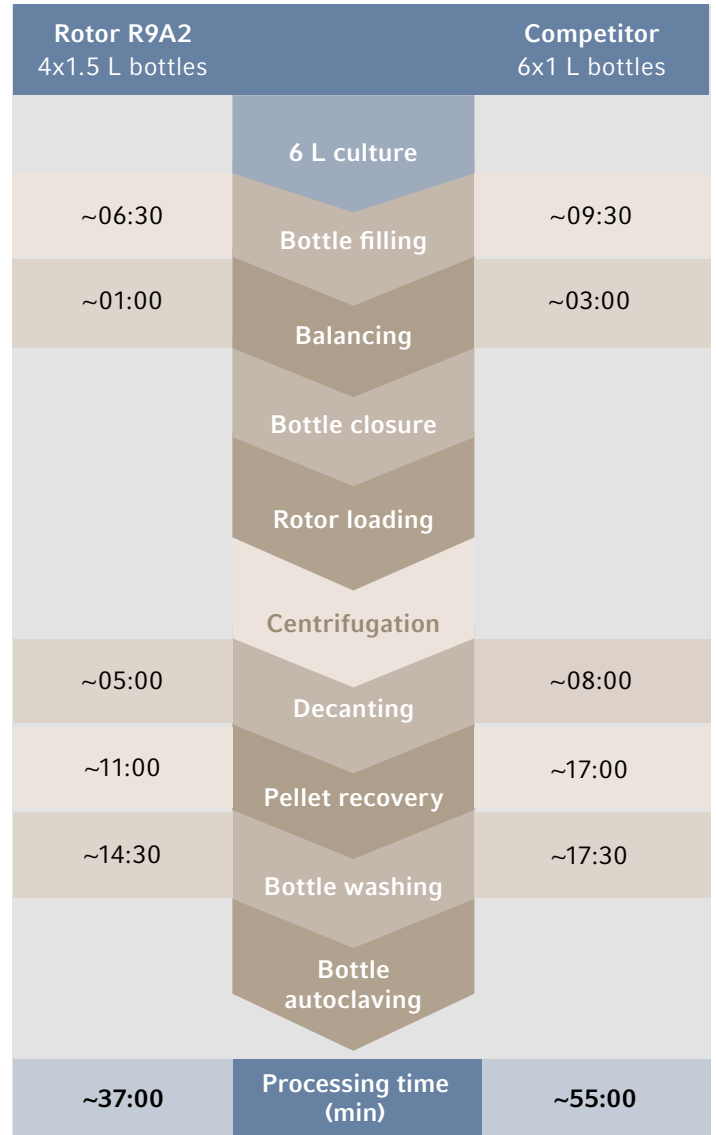


Figure 3: Handling time comparison four vs. six bottles

Article	Voltage Version	Bundle Components	Ordering Number
Harvesting Bundle CR30NX	China/APA - 220 V	Centrifuge CR30NX + Rotor R9A2 incl. triangular bottle 1500 mL (4 pcs.), incl. caps and tube vise	5721 351 511
Harvesting Bundle CR30NX	EU/India - 230 V	Centrifuge CR30NX + Rotor R9A2 incl. triangular bottle 1500 mL (4 pcs.), incl. caps and tube vise	5721 351 512
Harvesting Bundle CR30NX	EU/India (Three-phase four-wire)	Centrifuge CR30NX + Rotor R9A2 incl. triangular bottle 1500 mL (4 pcs.), incl. caps and tube vise	5721 351 514
Harvesting Bundle CR30NX	US – 208 V	Centrifuge CR30NX + Rotor R9A2 incl. triangular bottle 1500 mL (4 pcs.), incl. caps and tube vise	5721 351 513
Harvesting Bundle CR22N	China/APA - 220 V	Centrifuge CR22N + Rotor R9A2 incl. triangular bottle 1500 mL (4 pcs.), incl. caps and tube vise	5721 261 411
Harvesting Bundle CR22N	EU/India - 230 V	Centrifuge CR22N + Rotor R9A2 incl. triangular bottle 1500 mL (4 pcs.), incl. caps and tube vise	5721 261 412
Harvesting Bundle CR22N	US – 208 V	Centrifuge CR22N + Rotor R9A2 incl. triangular bottle 1500 mL (4 pcs.), incl. caps and tube vise	5721 261 413



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