When harvesting and separating smaller volume pilot-scale cultures, multiple manipulation and transfer steps in the open workflow may invite the risk of contamination. A novel closed workflow, using sterilized, single-use Thermo Scientific™ CentriPAK™ BioProcess Containers (BPC) and the Thermo Scientific™ Sorvall™ BIOS 16 Centrifuge, reduces these sources of contamination to protect sample integrity. As the CentriPAK BPC method also eliminates pre-setup and post-cleaning steps, it requires less overall processing time so that downstream steps may be taken more quickly.

The CentriPAK BPC chambers are gamma irradiated and offer weld-on or quick-connect fittings for enhanced convenience. The chambers may be joined through a BPC manifold so that all chambers are filled at once. BPC adaptors provide stability for the chambers during filing and also fit into 8 x 2000 mL or 6 x 2000 mL oval swinging bucket rotors used in the BIOS 16 Centrifuge. In this example, we compare a traditional open system to the closed, sterilized CentriPAK BPC method when harvesting a 3L mammalian cell culture.
## Open System Bottle Method
**Total time: 79 minutes**

**Fill**
- 21 minutes
  - Weld-on biocontainer to single-use bioreactor (SUB) or other culture vessel
  - Transfer contents from vessel to biocontainer
  - Seal biocontainer and transfer to biosafety cabinet (BSC)
  - Place receiving bottle inside BSC
  - Pressurize biocontainer and fill bottle to predetermined weight or volume
  - Repeat with second bottle
  - Close bottles

**Centrifuge**
- 20 minutes
  - Centrifuge bottles

**Separate**
- 37 minutes
  - Transfer centrifuged bottles to BSC
  - Transfer clarified supernatant to biocontainer
  - Add buffer to bottle
  - Resuspend cell pellet
  - Pour resuspended cell pellet into biocontainer
  - Clean and sterilize bottle
  - Proceed to next step (or store)

## Closed System CentriPAK BPC Method
**Total time: 45 minutes**

**Fill**
- 11 minutes
  - Connect sterilized CentriPAK BPC
  - Single chambers, joined via manifold, to SUB or other culture vessel
  - Open clamps to fill CentriPAK BPC chambers
  - Close clamps and disconnect CentriPAK BPC chambers from vessel

**Centrifuge**
- 20 minutes
  - Centrifuge CentriPAK BPC chambers

**Separate**
- 14 minutes
  - Connect BPC chambers to Labtainer
  - Open clamps and start pump to separate supernatant from pellet
  - Disconnect BPC chambers from Labtainer
  - Add buffer to resuspend cell pellet inside BPC chambers
  - Proceed to next step (or store)