

Modernizing single-use bioreactor design using agile methodology

Carrie Miller, Product Manager – Xcellerex Bioreactor

GE Healthcare, Boston Massachusetts

Single-use bioreactor design has mirrored stainless steel stirred bioreactor engineering principles. However, single-use bioreactor material limitations can hardly keep pace with the demand of increasingly high density cell lines. Agile methodology is deployed to develop a single-use bioreactor platform with incremental feature release strategy, focusing on performance, reliability and operator experience. Empirical studies and computational fluid dynamics (CFD) are correlated to confirm mass transfer capabilities of several bioreactor geometries with multiple sparge and impeller options. Performance of the first modern single-use bioreactor version was tested by an independent drug manufacturer using iterations of bag and hardware design. Continuous feedback from external sources provide our development teams valuable insights for implementing value-added bioreactor design features of the single-use bioreactor platform.