

## New England Biolabs Certificate of Analysis

*Product Name:* Remove-iT<sup>®</sup> Endo S  
*Catalog #:* P0741S/L  
*Concentration:* 200,000 units/ml  
*Unit Definition:* One unit is defined as the amount of enzyme required to remove > 95% of the carbohydrate from 5 µg of native mouse monoclonal IgG in 1 hour at 37°C in a total reaction volume of 10 µl.  
*Lot #:* 0021603  
*Assay Date:* 03/2016  
*Expiration Date:* 3/2017  
*Storage Temp:* 4°C  
*Storage Conditions:* 50 mM NaCl, 20 mM Tris-HCl, 5 mM EDTA, (pH 7.5 @ 25°C)  
*Specification Version:* PS-P0741S/L v1.0  
*Effective Date:* 12 Feb 2016

| Assay Name/Specification (minimum release criteria)   | Lot #0021603 |
|---|--------------|
| <b>Functional Test (Magnetic Beads, Enzyme Removal)</b> - Magnetic chitin beads ( 50 µl ) were equilibrated and incubated with 2,000 units of Remove-iT <sup>®</sup> Endo S in 300 µl of 50mM ammonium formate, pH 4.4 . The beads were pelleted using a magnetic separation rack. No Remove-iT <sup>®</sup> Endo S was detected in the supernatant as determined by activity assay and mass spectrometry analysis. | <b>Pass</b>  |
| <b>Glycosidase Activity (Endo F1, F2, H)</b> - A 10 µl reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled Endo F1, F2, H substrate (Dansylated invertase high mannose) and 2,000 units of Remove-iT <sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.   | <b>Pass</b>  |
| <b>Glycosidase Activity (β-Mannosidase)</b> - A 10 µl reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled β-Mannosidase substrate (Manβ1-4Manβ1-4Man-AMC) and 2,000 units of Remove-iT <sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.   | <b>Pass</b>  |
| <b>Glycosidase Activity (β-N-Acetylgalactosaminidase)</b> - A 10 µl reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled β-N-Acetylgalactosaminidase substrate (GalNAcβ1-4Galβ1-4Glc-AMC) and 2,000 units of Remove-iT <sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.  | <b>Pass</b>  |
| <b>Glycosidase Activity (β-Xylosidase)</b> - A 10 µl reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled β-Xylosidase substrate (Xylβ1-4Xylβ1-4Xylβ1-4Xyl-AMC) and 2,000 units of Remove-iT <sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.  | <b>Pass</b>  |

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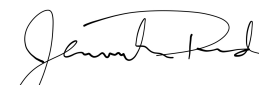
| Assay Name/Specification (minimum release criteria)   | Lot #0021603 |
|---|--------------|
| <p><b>Glycosidase Activity (<math>\beta</math>1-3 Galactosidase)</b> - A 10 <math>\mu</math>l reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled <math>\beta</math>-Galactosidase substrate (Gal<math>\beta</math>1-3GlcNAc<math>\beta</math>1-4Gal<math>\beta</math>1-4Glc-AMC) and 2,000 units of Remove-iT<sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.</p>                            | <b>Pass</b>  |
| <p><b>Glycosidase Activity (<math>\beta</math>1-4 Galactosidase)</b> - A 10 <math>\mu</math>l reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled <math>\beta</math>-Galactosidase substrate (Gal<math>\beta</math>1-4GlcNAc<math>\beta</math>1-3Gal<math>\beta</math>1-4Glc-AMC) and 2,000 units of Remove-iT<sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.</p>                            | <b>Pass</b>  |
| <p><b>Glycosidase Activity (<math>\alpha</math>-Glucosidase)</b> - A 10 <math>\mu</math>l reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled <math>\alpha</math>-Glucosidase substrate (Glc<math>\alpha</math>1-6Glc<math>\alpha</math>1-4Glc-AMC) and 2,000 units of Remove-iT<sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.</p>  | <b>Pass</b>  |
| <p><b>Glycosidase Activity (<math>\alpha</math>-N-Acetylgalactosaminidase)</b> - A 10 <math>\mu</math>l reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled <math>\alpha</math>-N-Acetylgalactosaminidase substrate (GalNAc<math>\alpha</math>1-3(Fuc<math>\alpha</math>1-2)Gal<math>\beta</math>1-4Glc-AMC) and 2,000 units of Remove-iT<sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.</p> | <b>Pass</b>  |
| <p><b>Glycosidase Activity (<math>\alpha</math>-Neuraminidase)</b> - A 10 <math>\mu</math>l reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled <math>\alpha</math>-Neuraminidase substrate (Neu5Ac<math>\alpha</math>2-3Gal<math>\beta</math>1-3GlcNAc<math>\beta</math>1-3Gal<math>\beta</math>1-4Glc-AMC) and 2,000 units of Remove-iT<sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.</p> | <b>Pass</b>  |
| <p><b>Glycosidase Activity (<math>\alpha</math>1-2 Fucosidase)</b> - A 10 <math>\mu</math>l reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled <math>\alpha</math>-Fucosidase substrate (Fuc<math>\alpha</math>1-2Gal<math>\beta</math>1-4Glc-AMC) and 2,000 units of Remove-iT<sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.</p>  | <b>Pass</b>  |
| <p><b>Glycosidase Activity (<math>\alpha</math>1-3 Fucosidase)</b> - A 10 <math>\mu</math>l reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled <math>\alpha</math>-Fucosidase substrate (Fuc<math>\alpha</math>1-3Gal<math>\beta</math>1-4GlcNAc<math>\beta</math>1-3Gal<math>\beta</math>1-4Glc-AMC) and 2,000 units of Remove-iT<sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.</p>       | <b>Pass</b>  |
| <p><b>Glycosidase Activity (<math>\alpha</math>1-3 Galactosidase)</b> - A 10 <math>\mu</math>l reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled <math>\alpha</math>-Galactosidase substrate (Gal<math>\alpha</math>1-3Gal<math>\beta</math>1-4GlcNAc-AMC) and 2,000 units of Remove-iT<sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.</p>   | <b>Pass</b>  |

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| Assay Name/Specification (minimum release criteria)  | Lot #0021603 |
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| <p><b>Glycosidase Activity (<math>\alpha</math>1-3 Mannosidase)</b> - A 10 <math>\mu</math>l reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled <math>\alpha</math>-Mannosidase substrate (Man<math>\alpha</math>1-3Man<math>\beta</math>1-4GlcNAc-AMC) and 2,000 units of Remove-iT<sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.</p>                            | <b>Pass</b>  |
| <p><b>Glycosidase Activity (<math>\alpha</math>1-6 Galactosidase)</b> - A 10 <math>\mu</math>l reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled <math>\alpha</math>-Galactosidase substrate (Gal<math>\alpha</math>1-6Gal<math>\alpha</math>1-6Glc<math>\alpha</math>1-2Fru-AMC) and 2,000 units of Remove-iT<sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.</p> | <b>Pass</b>  |
| <p><b>Glycosidase Activity (<math>\alpha</math>1-6 Mannosidase)</b> - A 10 <math>\mu</math>l reaction in Glyco Buffer 1 containing 1 nM of fluorescently-labeled <math>\alpha</math>-Mannosidase substrate (Man<math>\alpha</math>1-6Man<math>\alpha</math>1-6(Man<math>\alpha</math>1-3)Man-AMC) and 2,000 units of Remove-iT<sup>®</sup> Endo S incubated for 20 hours at 37°C results in no detectable activity as determined by thin layer chromatography.</p>   | <b>Pass</b>  |
| <p><b>Protease Activity (SDS-PAGE)</b> - A 20 <math>\mu</math>l reaction in 1X Glyco Buffer 1 containing 24 <math>\mu</math>g of a standard mixture of proteins and a minimum of 2,000 units of Remove-iT<sup>®</sup> Endo S incubated for 20 hours at 37°C, results in no detectable degradation of the protein mixture as determined by SDS-PAGE with Coomassie Blue detection.</p>  | <b>Pass</b>  |
| <p><b>Protein Purity Assay (SDS-PAGE)</b> - Remove-iT<sup>®</sup> Endo S is <math>\geq</math> 95% pure as determined by SDS-PAGE analysis using Coomassie Blue detection.</p>  | <b>Pass</b>  |



Authorized by  
Derek Robinson  
12 Feb 2016



Inspected by  
Jeremiah Read  
18 Mar 2016

