GenScript
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GenBuilder DNA Assembly Kits

Highest Efficiency Seamless Cloning Solution

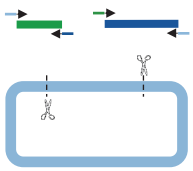
Robust Performance
Up to 12 DNA Fragments

Highest Cloning Efficiency
Tested among 8 DNA Assembly Kits

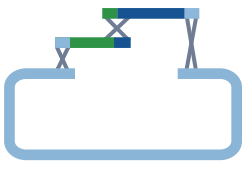
Short Assembly Time
Incubation within 15 minutes

Features	GenBuilder™ Cloning Kit	GenBuilder™ Plus Cloning Kit
Cat. No.	**L00701**	**L00744**
Highlights	Multi-gene cloning for up to 6 fragments	Multi gene cloning for up to 12 fragments
Number of fragments	6	12
Cloning efficiency %	>90%	>90%
Plasmid library construction	Suitable	Recommended
Incubation time	15 min	15 min
Cloning unpurified PCR product	Efficient	Highly efficient
Assembly with single stranded oligos	No	Yes
HT cloning	Yes	Yes
Seamless cloning	Yes	Yes
Cloning fragments >5 kb	Yes	Yes
Positive control	Linearized pUC57 with two fragments to reconstitute RFP for visual determination of cloning efficiency	Linearized pUC57 with two fragments to reconstitute RFP for visual determination of cloning efficiency
Size (No. of Reactions)	10, 50, customized	10, 50, customized

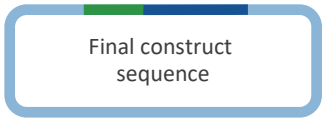
Assembly Workflow



1. Prepare the DNA fragments with overlaps and the linearized vector for assembly.



2. Add DNA fragments and linearized vectors in the GenBuilder™ master mix. Mix well and incubate at 50°C for 15-50 minutes.



3. Transform assembly product into competent cells and plate on selective medium. Obtain colonies containing the assembled DNA.

Highest cloning efficiency

GenBuilder and GenBuilder Plus have the highest cloning efficiency among competitors

A. DNA Assembly with five PCR fragments

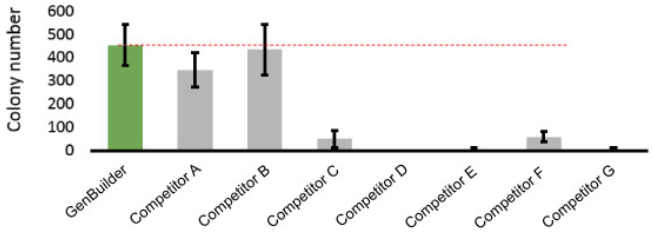
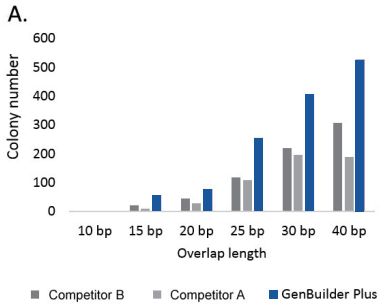
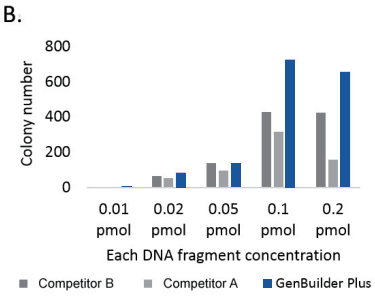


Figure 1. Cloning five or more PCR fragments with GenBuilder, GenBuilder Plus and other cloning kits

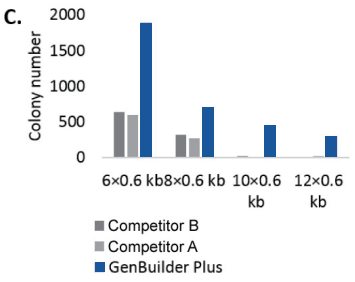
Performance Comparison of Assembly Kits



Graph A. Impact of the overlapping base pair length with cloning of 5 DNA inserts into one vector. Various PCR fragments with overlapping lengths of 10 bp, 15 bp, 25 bp, 30 bp, and 40 bp were assembled into pUC57 in a single-step assembly reaction. The number of colonies recovered from 1/10th of the cloning reaction were counted per reaction.



Graph B. Impact of DNA fragment concentration with cloning of 5 DNA inserts into one vector. Cloning of 5 DNA inserts of various concentrations into one vector using various DNA Assembly methods. Various concentrations of five PCR fragments (0.01 pmol, 0.02 pmol, 0.05 pmol, 0.1 pmol, and 0.2 pmol) were assembled into pUC57 in a single-step assembly reaction. The number of colonies recovered from 1/10th of the cloning reaction were counted per reaction.



Graph C. Performance of Assembly kits with the increase of the amount of DNA fragments. Multiple fragment cloning impact with various DNA Assembly methods. 6, 8, 10 and 12 PCR fragments were assembled into linearized pUC57 vector in a single-step assembly reaction. The number of colonies recovered from 1/10th of the cloning reaction were counted for each reaction. GenBuilder™ Plus DNA Assembly had the best assembly performance.

Figure 2. (graphs A, B and C). Comparison study of GenBuilder™ Plus DNA Assembly kit with Competitors A and B.

Reduced Reaction Incubation Time

Successful assembly in only 15 minutes

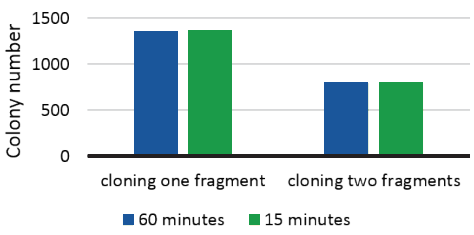


Figure 3. Cloning Efficiency Comparison: Incubation Time with GenBuilder™ Master-Mix

DNA assembly into the pUC57 vector was tested with a 1 kb PCR fragment and two 1.5 kb PCR fragments. GenBuilder™ reactions were incubated at 50°C for 15 or 60 minutes, then transformed into chemically competent DH10B cells. After recovery in 1 mL SOC medium, cells were spread on selective plates. Results showed no significant difference in colony numbers between 15-minute and 60-minute incubations. All colonies were >90% PCR positive.

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