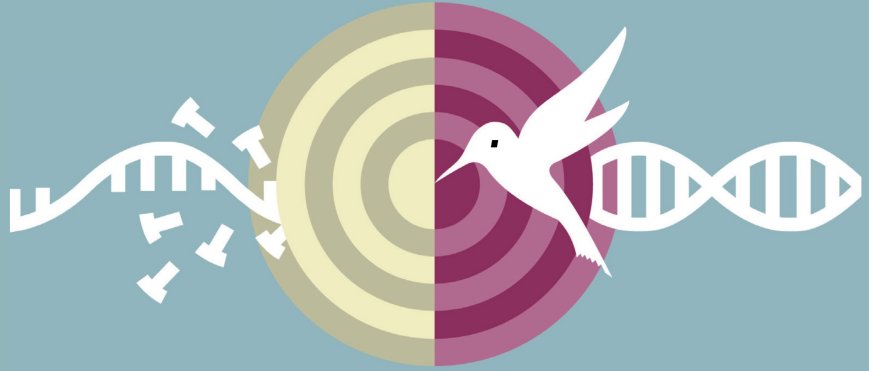


AS ONE SuperHiFi

HIGH FIDELITY DNA POLYMERASE



AS ONE SuperHiFi Polymerase is a proof-reading DNA polymerase with the ability to perform robust amplification of a vast range of difficult targets, including those up to 12.5 kb and with high to low GC content. The fidelity of the polymerase has been measured up to 50x Taq DNA Polymerase. The features of AS ONE SuperHiFi Polymerase have been attained by combining functional domains from two wildtype Archaeal high fidelity DNA polymerases, thereby creating a unique and chimeric DNA Polymerase displaying the most desired features from both wildtype DNA Polymerases. AS ONE SuperHiFi is well suited for PCR experiments whose outcome is strictly dependent on amplifications with very low error rates, such as cloning/sub-cloning, NGS applications and mutagenesis.

Features

- High Fidelity – measured up to 50x Taq fidelity
- High specificity
- Robust amplification
- Long range amplification capacity:
8.5 kb for gDNA and ≤ 12.5 kb for λ DNA

High Fidelity

SuperHiFi DNA Polymerase exhibits high fidelity providing the user with low error rate PCR results. Fidelity values of SuperHiFi DNA Polymerase and Taq DNA Polymerase was measured using a next-generation-sequencing (NGS) based method. A fidelity for SuperHiFi High Fidelity DNA polymerase of up to 50x the fidelity of Taq DNA Polymerase was measured. Furthermore, a profile displaying the error rate across the target for Taq DNA Polymerase was compared to that of SuperHiFi Polymerase. (Figure 1) The profile indicates that the error rate of Taq DNA Polymerase is higher than that of SuperHiFi Polymerase. Furthermore, the error rate of SuperHiFi DNA Polymerase is close to the background, indicating a low error rate.

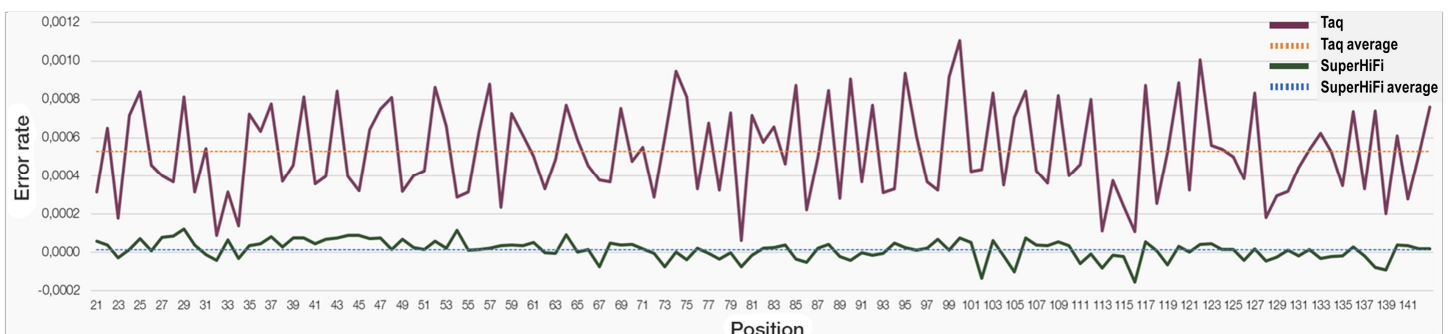


Figure 1. Error rate diagram. A PCR was run with Taq DNA Polymerase and SuperHiFi High Fidelity DNA Polymerase, followed by NGS sequencing of the PCR product. The error rate of each polymerase was then calculated in each PCR target position and plotted in this graph. The error rate calculation includes substitution errors, deletions and insertions, in each position. The dotted lines show the average error rate for each graph.



Long Range Amplification

SuperHiFi DNA Polymerase provides the user with the ability to amplify a broad range of DNA targets from short and up to <12.5 kb for simple DNA templates such as lambda DNA and for more complex templates, such as human genomic DNA up to 8.5 kb. (Figure 2)

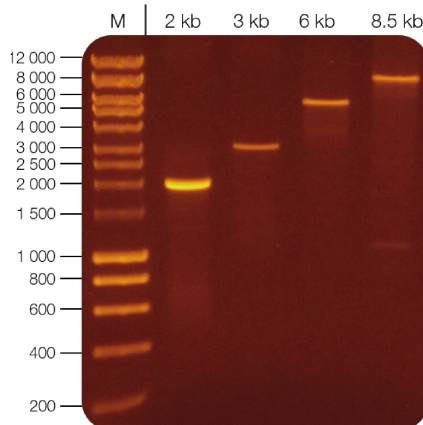


Figure 2: SuperHiFi enables amplification of large amplicons. Four different targets of human genomic DNA ranging from 2 kb and up to 8.5 kb was used for this study. Amplicon size are indicated at the top of the gel. Marker M is high range DNA Ladder from AS ONE (AO610141)

SUPERHIFI HIGH FIDELITY DNA POLYMERASE

Robust amplification on GC-rich DNA targets

SuperHiFi DNA High Fidelity DNA Polymerase provides the user with robust and specific amplification on a variety of DNA targets with GC content ranging from ~30 – 80%. The 10x SuperHiFi Buffer provided with the enzyme is recommended for highest fidelity and specificity. For DNA targets with a high GC content, more complex secondary structure or longer DNA targets, the addition of 1 - 2 M Betaine Enhancer Solution is recommended.

The PCR performance of SuperHiFi High Fidelity DNA Polymerase was compared to that of High Fidelity DNA Polymerases from three well recognized competitors. (Figure 3) PCR was performed on nine different human genomic targets, with GC content ranging from ~30 – 80%. Robust amplification was observed using SuperHiFi High Fidelity DNA Polymerase on the nine human genomic targets. In contrary, none of the three leading High Fidelity DNA polymerase were able to provide the same level of robust amplification on the DNA targets with the higher GC content, under the conditions tested here.

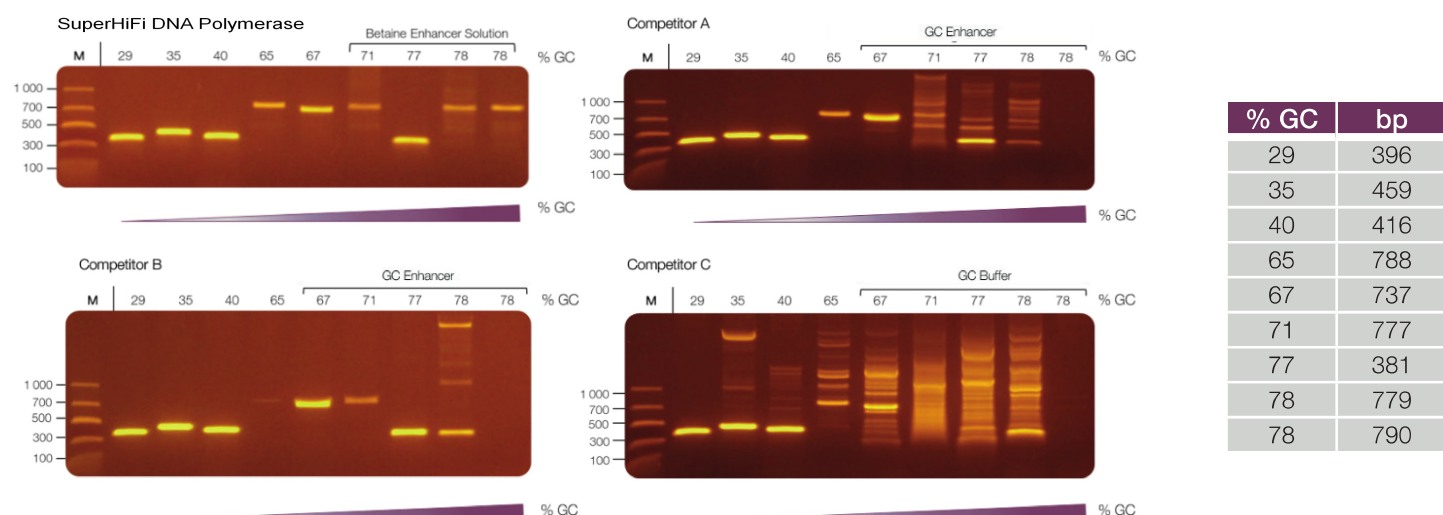


Figure 3. Robust amplification of SuperHiFi High Fidelity DNA Polymerase. Performance of SuperHiFi High Fidelity was compared to three leading High Fidelity DNA Polymerase (A, B and C). Nine different human genomic DNA targets, 400–800 bp in length and with GC content ranging from 29–78 %, were amplified. Amplification studies has been set up, as recommended by the manufactures. T_m calculators of the respective competitors were used to calculate optimal annealing temperature for primers. When amplifying GC-rich targets, 2 M Betaine Enhancer Solution (SuperHiFi DNA Polymerase), GC enhancer (Competitor A and B) or GC-rich specific PCR Buffer (competitor C) were included in the reaction mix.

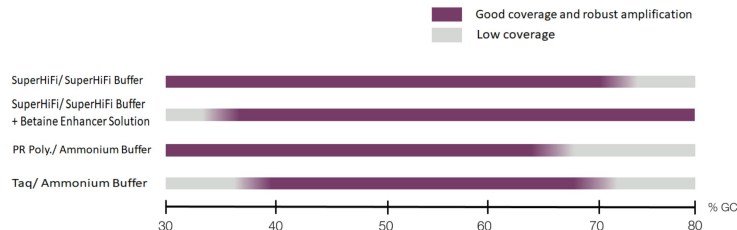


Figure 4. Illustration of the coverage of SuperHiFi.

10x SuperHiFi Buffer supports robust amplification of DNA targets with a GC content ranging from ~30 – 70%. The addition of 2M Betaine Enhancer solution supports amplification of DNA targets with higher GC content. The coverage of SuperHiFi High Fidelity DNA Polymerase is illustrated against the coverage of PR DNA polymerase from AS ONE INTERNATIONAL and Taq DNA Polymerase when using the 10x Ammonium Buffer.

Applications:

- Cloning/sub-cloning
- Mutagenesis
- Gene expression
- Construction of libraries
- NGS applications

Ordering information

Product	Size	Cat #
SuperHiFi High Fidelity DNA Polymerase	100 Units	AO610401
	500 Units	AO610403
	1000 Units	AO610404
	2500 Units	AO610406
SuperHiFi High Fidelity DNA Polymerase 2x Master Mix	100 Reactions	AO620701
	500 Reactions	AO620703
	2500 Reactions	AO620706
	5000 Reactions	AO620707
Betaine Enhancer Solution 5M	5 x 1 ml	AO351104

For more info please visit: www.asone-int.com

Reagents for in vitro laboratory use only.