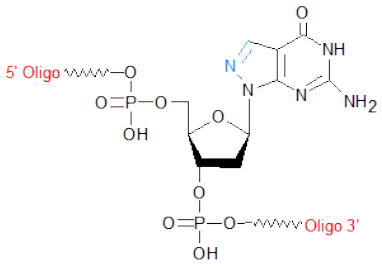
deaza G (PPG) 7 deaza 8 aza dG

Category	Minor Bases
Modification Code	deazaG-PPG
Reference Catalog Number	26-6654
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	329.2



deaza G (PPG): 7-Deaza-8-aza-dG [26-6654-XX]

7-deaza-8-aza-deoxyguanosine (deaza G (PPG)) is a deoxyribonucleoside in which the 7-nitrogen and 8-carbon are flipped. The resulting modified dG is unable to form a hydrogen bond at position 7, but can at position 8, of the base. The result is that the 7-deaza-8-aza-G : C base pair increases the stability of the duplex by about 1 degC in Tm compared with the unmodified G : C base pair (1, 2). Similar to 7-deaza-dG, 7-deaza-8-aza-dG can be used to reduce structural problems posed by G-rich and GC-rich regions. Because such regions can form both intra- and inter-strand non-Watson-Crick hydrogen bonds, they can form highly stable secondary structures (such as G-qudraplex) that effectively prevent generation of PCR products (or even readable DNA sequence) from them (3). Because it cannot form hydrogen bonds at position 7, substitution of 7-deaza-8-aza-dG at certain dG positions in G- or GC-rich oligos slated for use in PCR as either PCR primers or templates reduces the prevalence of these secondary structures, resulting in improved PCR product generation (4).

Furthermore, 7-deaza-8-aza-dG is specifically recommended over 7-deaza-dG whenever multiple insertions of a 7-deaza-dG-type modification into an oligo must be done. This is because 7-deaza-8-aza-dG is stable to the iodine-based oxidizer solution used in phosphoramidite-based DNA synthesis, while 7-deaza-dG is sensitive to it (for more information on the 7-deaza-dG modification, please refer to its technical sheet).

In addition to the above application, because the higher thermodynamic stability improves discrimination of G:A, G:G; and G:T mismatches in DNA duplexes, the 7-deaza-8-aza-dG modification makes the use of G-rich DNA probes a viable option for diagnostic assays (4). **References**

1. Seela, F.; Driller, H. 8-Aza-7-deaza-2'-deoxyguanosine: Phosphoramidite synthesis and properties of octanucleotides. *Helv. Chim. Acta.* (1988), **71**: 1191-1198.
2. Seela, F.; Driller, H. Alternating d(G-C)3 and d(C-G)3 hexanucleotides containing 7-deaza-2'-deoxyguanosine or 8-aza-7-deaza-2'-deoxyguanosine in place of dG. *Nucleic Acids Res.* (1989), **17**: 901-910.
3. Fernandez-Rachubinski, F.; Murray, W.W.; Blajchman, M.A.; Rachubinski, R.A. Incorporation of 7-deaza dGTP during the amplification step in the polymerase chain reaction procedure improves subsequent DNA sequencing.*DNA Seq.* (1990), **1**: 137-140.
4. Kutyavin, I.V.; Lokhov, S.

G.; Afonina, I.A.; Dempcy, R., et al. Reduced aggregation and improved specificity of G-rich oligodeoxyribonucleotides containing pyrazolo[3,4-d]pyrimidine guanine bases.*Nucleic Acids Res.* (2002), **30**: 4952-4959.