

DIN CALCULATION FOR GENOMIC DNA SAMPLES

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The DNA Integrity Number (DIN) is a numerical index generated by the TapeStation 4200 (TS4200) with the Genomic DNA ScreenTape kit, quantifying the degree of integrity of the genomic DNA (gDNA) in a sample. It is a value ranging from 1 to 10, where 10 represents highly intact (large) gDNA and 1 represents highly degraded (small fragments) gDNA.

The TS4200 calculates the DIN automatically through an algorithmic analysis of the electrophoretic profile generated during DNA separation. The process is based on several parameters:

- a) The size distribution profile: the presence of a main peak corresponding to high molecular weight DNA, and the proportion of short fragments to long fragments.
- b) Degradation pattern: the algorithm compares the profile of the analyzed sample with reference profiles representing different degrees of degradation. Based on this comparison, assign a numerical value.
- c) Ratio between the amount of high and low molecular weight fragments: The calculation incorporates the relative amount of fragments > 48 kb (integrity indicators) and fragments < 10 kb (degradation indicators).

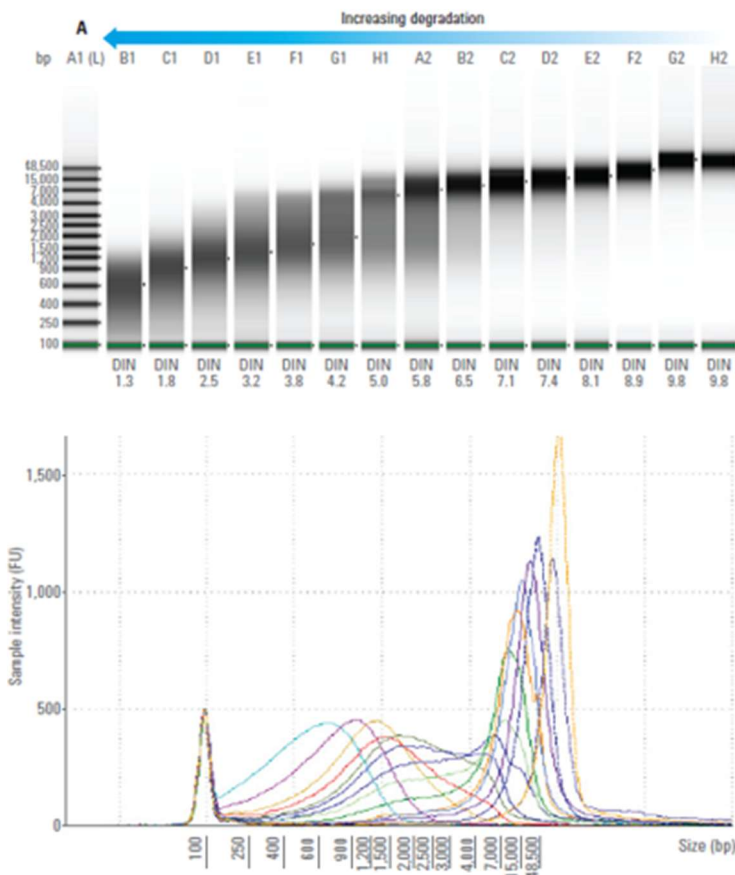


Image of the gel and electropherogram of 15 gDNA samples of different integrity levels analyzed with the gDNA ScreenTape assay and the TS

Based on the DIN value, there are some general recommendations regarding recommended applications:

DIN Value	Interpretation	Recommendations
8-10	Intact DNA	WGS, long read sequencing, large PCR
6-8	Good quality	WES, standard Sequencing , PCR
4-6	Medium quality	Degradation tolerant applications
1-4	Degraded DNA	ChIP-seq, ATAC-Seq, applications where degradation is not critical

DIN assessment is therefore a useful tool that allows us to standardize DNA quality between laboratories and experiments, help decide if a sample is suitable for a specific application, and facilitate the detection of problems in the extraction or preservation of biological material.