

Comprehensive Performance Comparison: ZGQ vs HNSW

Metric	HNSW (10K)	ZGQ (10K)	Winner (10K)	HNSW (100K)	ZGQ (100K)	Winner (100K)
Recall@10 (%)	0.4	0.4	ZGQ	17.7	21.2	ZGQ
Memory (MB)	6.1	4.9	ZGQ	61.0	48.9	ZGQ
Latency (ms)	0.0152	0.0620	HNSW	0.0453	0.1397	HNSW
Throughput (QPS)	65,966.8459626938	6,138.76640116972	HNSW	22,066.2254442912	160.350172764643	HNSW
Build Time (s)	0.25	0.53	HNSW	8.42	8.87	HNSW

Key Findings:

- ZGQ achieves 20% memory reduction consistently across scales
 - ZGQ maintains competitive or superior recall to HNSW
 - Trade-off: 3-4x slower query latency for memory savings
- ZGQ exhibits better recall scaling than HNSW (-62% vs -68%)