

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)	65,966.84596269386	138.76640116972	HNSW	22,066.22544429129	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%)