Flow vs Head Comparison of Tesla Disc Pump and Discflo Type Pump

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Below is a quantitative, engineering-style comparison of expected (modeled) flow vs head performance for:
1. a Tesla-style disc pump similar to your prior design assumptions (12 inch disc class, 1.0 mm gap, mining-water configuration), and
2. a Discflo-type Discpac pump (disc stack with engineered spacing and optional high head / ribbed disc features).
Important boundary condition: Discflo publishes very broad capability ranges and configurable Discpac geometry, including disc diameters (8 to 20 inch), disc counts (2 to 20), and ribbed High Head discs options. ([Discflo][1]) Their catalog also describes very high flow and head ranges for larger/multistage units (flows up to 8,000 gpm and heads up to 1,200 ft), which are not representative of a 10 HP skid but do confirm the design family's scaling envelope. ([Discflo][2])
Because neither you nor Discflo provided a specific manufacturer pump curve for the exact model/impeller/disc pack, the curves below are modeled expected field curves that are internally consistent with:
• 10 HP hydraulic power limits,
• disc pump behavior (slip increases with flow; head falls with flow),
• and the Discflo design intent (optimized disc spacing, optional high-head discs, and better stability in tough fluids). ([Discflo][3])

Fluids modeled
Fluid A: Wash-plant water
• Viscosity: 1.2 cP
• Specific gravity: 1.03 (lightly dirty water)
Fluid B: Dirty water slurry
• Viscosity: 5 cP (water + fines, not a thick paste)
• Specific gravity: 1.15 (heavier solids loading)
These are realistic wash plant numbers (not extreme 40%+ solids paste).

Pump configurations compared
Tesla-style disc pump (your prior architecture)
• Disc pack: 12 inch class, 1.0 mm gap, mining-water clearances
• Intended duty: high flow, low-to-moderate head wash water
• Note: with 1.0 mm spacing, clean-water viscous coupling is weaker than tight-gap designs, but solids tolerance improves (your earlier tradeoff).
Discflo-type Discpac pump (typical configuration concept)
• Discpac engineered for the fluid: disc spacing and disc count tuned, with optional ribbed High Head discs where needed. ([Discflo][1])
• Discflo indicates these pumps can be configured to handle harsh fluids (high solids, viscosity, entrained gas) and remain stable. ([Discflo][3])

Modeled performance curves (10 HP class)
Interpretation guide:
• Head is shown in ft and meters
• Pressure is shown as differential pressure, derived from head and the fluid's SG
1) Tesla-style disc pump — wash water (SG 1.03, 1.2 cP)
Assumed curve anchor points: shutoff head about 80 ft, max flow about 650 gpm (low head). This aligns with a high-flow wash-water duty band.
Flow (gpm) | Flow (m3/h) | Head (ft) | Head (m) | ΔP (psi) | ΔP (bar)
• 0 | 0.0 | 80.0 | 24.4 | 35.7 | 2.46
• 162 | 36.9 | 75.0 | 22.9 | 33.4 | 2.31