Carbon-Fiber braided packing — Technical Data Sheet / Datasheet / TDS

A1. Attributes / properties (typical)

- Composition: braided from continuous carbon-fiber yarns and heavily impregnated with PTFE (or PTFE dispersions) to provide a chemically inert, low-friction matrix.
- Temperature range: serviceable over wide ranges; typical continuous limits depend on impregnation and shaft/flush but many vendor datasheets indicate safe use in common process ranges (ambient → several 100 ° C). Check grade T-limit with supplier (PTFE filler limits chemical stability above ~260 ° C).
- Chemical resistance: excellent to most acids, bases, solvents and hydrocarbons because of PTFE impregnation; suitable for aggressive chemical environments.
- Mechanical / frictional behavior: low friction and low shaft wear (PTFE), good conformability and low leakage when properly installed; carbon fiber provides tensile strength and thermal stability.
- Limitations & cautions: carbon fibres can oxidize at high temperatures in air if not protected; PTFE reduces creep but cold flow under very high static loads remains a consideration — choose filled grades or mechanical support for pressurized joints. Confirm compatibility and recommended gland lubrication with supplier.

B — Carbon-fiber braided with graphite / carbon dispersion (graphite-enhanced carbon)

B1. Attributes / properties (typical)

- Composition: carbon-fiber braid impregnated or surface-treated with colloidal graphite or graphite/ carbon dispersions to enhance heat dissipation, lubricity and leak control. Such constructions aim to combine the structural strength of carbon fiber with graphite’s sealing/lubricating benefits.
- Temperature & leakage: improved heat dissipation helps in hotter seals; impregnated graphite reduces permeability and helps vacuum/steam service. Check oxidation limits — graphite can oxidize at high T in air without inhibition.
- Mechanical: good compressibility and thermal conductivity; better low-leak performance compared with bare carbon/PTFE packings in steam & thermal cycling.

C — Graphite packing with carbon-fiber corners (carbon-reinforced graphite)

C1. Attributes / properties (typical)

- Construction: flexible/expanded graphite braided packing or graphite filler braid with carbon-fiber corner yarns (lattice braid) that bind and reinforce the braid corners to minimize extrusion and improve tensile/tear strength.

- Performance: retains graphite's excellent chemical & thermal performance while carbon corners add mechanical robustness (less extrusion, better life under vibration/pressure). Good general choice for high-T petrochemical & refinery services.
- Cautions: graphite base still requires oxidation protection at very high temperatures in air; selection of carbon corner geometry influences shaft wear — use sleeve or hardened shaft if required.

D — Metal / wire-mesh or Inconel-jacketed carbon braid (jacketed carbon packings)

D1. Attributes / properties (typical)

- Construction: carbon fiber braid enclosed/overwrapped by a metal mesh (stainless steel or Inconel) or metal filaments incorporated into the braid — purpose is to prevent extrusion, increase mechanical strength and protect against abrasive media.
- Advantages: extreme abrasion resistance, high pressure capability, good for slurry/mining pumps and severe-duty services where plain braid erodes quickly. Metal jackets also improve gland life and protect braided core.
- Limitations: metal jacket can reduce flexibility and may react with some fluids at high temperatures — metallurgy selection must match chemistry (use Inconel for high-T / halide environments). Shaft wear considerations remain (jacket may be abrasive to soft shafts).

E — Hybrid carbon + synthetic core braids (carbon + aramid/graphite/PTFE combinations)

E1. Attributes / properties (typical)

- Construction: carbon core or carbon face yarns combined with aramid, PTFE, graphite or glass reinforcement in corners/cross-section to tune abrasion, friction and chemical resistance. These hybrids are engineered to balance abrasion resistance, low friction and chemical stability.
- Benefits: customizable tradeoffs: e.g., carbon core + PTFE faces → good chemical resistance + low thrust; carbon core + aramid corners → abrasion resistance + mechanical strength.