

# Graphite Sheet — Technical Data Sheet / Datasheet / TDS

1) Flexible / [Expanded Graphite Sheet](#) (aka “flexible graphite foil” / GRAFOIL / SIGRAFLEX)

## A — Properties (typical)

Property	Typical / notes
Composition	Expanded (exfoliated) natural graphite (no binders).
Appearance	Thin, flexible foil / sheet — gray/black; can be supplied as plain foil or impregnated/treated.
Density (bulk)	~0.7 - 1.4 g/cm <sup>3</sup> (product dependent).
Typical thickness range	0.08 mm - 1.65 mm (0.003” - 0.065”) for roll products; sheet products commonly 0.3 mm - 3.0 mm depending on brand/grade.
Temperature range	Graphite material stable ~ -200° C to +450° C in inert/non-oxidizing atmospheres; in air oxidation becomes critical above ~350 - 450° C unless oxidation inhibitors/impregnation are used. Design accordingly.
Chemical resistance	Excellent to most chemicals and process fluids (strong acids, bases, hydrocarbons) — widely used in chemical & refining industries.
Compressibility / recovery	Good compressibility; typical compressibility and recovery depend on grade — manufacturers publish ASTM F36/F36M values. Example laminates show ~30 - 40% compressibility with low recovery under certain laminates.
Oxidation / protection	Uncoated graphite oxidizes in oxygen at elevated T — many grades are impregnated or supplied with oxidation inhibitors; metal-laminates or coatings are used for high-T oxidizing environments.
Electrical / thermal	Electrically and thermally conductive — useful where heat spreading or grounding is relevant.
Typical strengths / limits	Tensile strength of foil is limited compared with metal; sealing performance relies on conformability and compressibility rather than tensile load-bearing.

2) Impregnated / [Laminated Graphite Sheet](#) (impregnated flexible graphite — enhanced sealing)

## A — Properties (typical)

Property	Typical / notes
Composition	Flexible graphite foil impregnated with resins, silica, oil or other agents to reduce porosity and improve handling/leak tightness.
Advantages	Lower gas permeability, improved handling (less dust), sometimes higher oxidation resistance depending on impregnant.
Typical thicknesses	Similar to flexible foil/sheet — often 0.3 - 3.0 mm for sheet stock.
Typical uses	Steam, gas, vacuum, high-temperature process gaskets where lower leakage is required.

### 3) [Reinforced Graphite Sheets](#) (metal insert / wire mesh / tanged or foil reinforcement)

## A — Properties (typical)

Property	Typical / notes
Construction types	(a) Stainless steel foil-reinforced (thin SS foil bonded between graphite faces); (b) tanged metal insert (perforated tanged SS plate mechanically bonded); (c) wire-mesh or wire-screen reinforcement.
Purpose	Improve mechanical strength, blow-out resistance, control creep and improve handling for larger / high-pressure gaskets.
Typical laminate thickness	Overall laminate thickness often 1.0 - 3.0 mm; metal insert thickness $\sim$ 0.1 - 0.2 mm typical for foil/tanged insert types.
Mechanical behavior	Lower compressibility (than plain graphite) but higher stability under bolt load and cyclic thermal/pressure cycles.

#### 4) Metal-clad / Metal-lined Graphite Composites (graphite laminated onto thin metal foil / PTFE-graphite hybrids)

##### A — Properties (typical)

Property	Typical / notes
Construction	Graphite layer adhesively or mechanically laminated to a thin metal facing (e.g., SS 304/316) or to PTFE/polymer layers to combine properties.
Advantages	Metal facing improves bolt-face contact, adds corrosion barrier and mechanical strength; PTFE facing adds chemical inertness/anti-stick.
Typical thickness	Combined laminate 1 - 5 mm depending on metal gauge and graphite layers.

#### 5) High-purity / Specialized Graphite Sheet (nuclear, aerospace, specialty gasketing)

##### A — Properties (typical)

Property	Typical / notes
Purity	Ultra-high carbon content / low ash & halogen levels for nuclear or semiconductor uses (purity $\geq$ 98 - 99.9%).
Special tests	Low-halogen, low-sulfur, controlled chloride content; special oxidation/inhibitor treatments.
Typical uses	Nuclear plant gaskets, aerospace seals, semiconductor high-purity processing equipment.