



World Leader in Boron Nitride Coatings

120 Valley Court • Oak Ridge, TN 37830 • PH: 865-482-5717 • FAX: 865-482-1281 • info@zypcoatings.com • www.zypcoatings.com

**Reportedly Stable at High Temperatures
(Minimum Interaction)***

**Reacts at High Temperatures
(Unstable)***

MATERIAL

ELECTRICAL INSULATORS
TO CONDUCTOR AT
HIGH TEMPERATURES

Y₂O₃ Er₂O₃ Gd₂O₃	U, Ti (reacts slightly), Be, V, Cr, Zr, Hf, Ni Specialty Steels, Copper Alloys, Most Mol- ten Metals, Glasses, Slags, and Salts	Acidic materials CuO, C (>1500 C, vac.)
BN	Al, Mg, Zn, Na, B, Fe, Ni (below melting), Si, Cryolite, KBF ₄ , Li ₂ B ₄ O ₇ , Molten Halide Salts, Steels, Ge, Sb, In, Cu, Sn, Cd, Stainless Steels, Non-Lead Glasses, MoSi ₂ , W; C, ZrO ₂ & Y ₂ O ₃ (up to BN dissociation)	Li, Ni (molten), Pt, U, Ce, Be, Mo, Cl ₂ , High-lead Glasses, MoO ₃ , PbO _x , Sb ₂ O ₃ , AsO ₃ , CuO, Cr ₂ O ₇ , Bi ₂ O ₃ , Molten K ₂ CO ₃ /KOH
Si₃N₄	Al, Sn, Zn, Ti (to 1200 C), Pb, Brass (at 950 C); NaCl/KCl, NaF/ZrF ₄ ; Many Glasses	KOH, Na ₂ O, PbCrO ₄ , PbO ₂ , PbO, Cu; weak reaction with Mg, Fe, Cryolite, some Molten Salts
Al₂O₃	Mo, Ni, Nb, Ta, Cu, Sn, Bi, Pr, Rh, W, Pt, Au, Al, Pb, Zn, Ag, V, Co, Fe, Cr, Mn, Steels, Acidic & Basic Slags, S, Se, Silicides, Phosphates, Be or Mg or Ca (reacts slightly), Te, Sb, As, P, Ga, Na ₂ CO ₃	Ti, U, Zr, Hf, Na, Li, B, Si, BeO, MgO, C (>1500 C, vac.), CuO, PbO, ZrO ₂ , Y ₂ O ₃
ZrO₂	Al, Pt, Rh, Zr, Nb, Ta, Mo, W, U, Cu, Fe, Pb, Cr, Mn, Zn, Bi, Be, Ni, Co, Si, PbO, Pd, Ru, Ti or MoSi ₂ (reacts slightly), Acidic Slags, Steels, Titanates (below melting)	Basic Steel Slags, CuO, C (>1400 C), Na, Ca, Sr, Ba, Li, K, Na ₂ CO ₃
SnO₂	Many Molten Glasses (Lead-silicate; phosphate; borate; soda-lime; "E", Amber; Fiberglass), Acidic & Basic Slag-Salt Melts; Molten Fluorides; Ag, Ni; oxidizing conditions <1500 C	Reducing conditions (C, H ₂ , Cl ₂), Fused Alkalis & Alkali Hydroxides, Carbonates; Molten Al, Fe, Pb, Zn
TiC	Na, Bi, Zn, Cd, Sn, Pb, C, Al (reacts slightly), Slags, Basic Slags, Cryolite (reacts slightly), ZrO ₂ , Y ₂ O ₃	Si, Co, Ni, Cr, Carbon Steel, Cast Iron, Molten NaOH
MoSi₂	Na, Fe, Hg, Ag, Zn, Sn (reacts slightly at very high temperatures), Pb, Pb-Bi, Bi, Cu (below 1130 C), C (forms stable ternary phase), Y ₂ O ₃ , ZrO ₂	Ta, Cr, Pt, Al, Si, Ni, B, F ₂ , CuO, PbO, ZnO, MnO, Fe ₂ O ₃ , Cr ₂ O ₃ , KNO ₃ & K ₂ CO ₃ , Molten NaOH & Fused Alkalis
ZrB₂	Zn, Cu, Sn, Pb, Bi, or Cr (reacts slightly), Al, C, Cryolite (reacts slightly), Brass, Carbon Steel, Cast Iron, Nonferrous and Rare Metals and their Alloys, Y ₂ O ₃ , ZrO ₂ , Al ₂ O ₃ , W (below 2100 C), Basic and Acidic Slags	Co, Ni, P, Na ₂ O, PbO ₂ , Molten NaOH, Alkali Carbonates/Bisulfates
TiN	Sn, Bi, Fe, Carbon Steel, Basic Slag, Acid Slag; W, Mo, Nb, Ta to 1800 C; Al (wets), U, Ce, Sm-Co and Rare Earth Metals	NaOH; Be; weak reaction with Pb, Cd, Cryolite; MgO, ZrO ₂ above 1300 C; Na, K

*Data are for the pure materials. Performance of the coatings may differ. Given for general information only; some interaction may occur at certain temperature and environmental conditions; it is advised that investigations evaluate their specific systems based on a thorough search of the literature. Many materials may be compatible/stable but were not known to us--this list should not be considered exhaustive.