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Comparison of High Temperature Coatings

VERY HIGH USE TEMPERATURE R&D COATINGS – Comparison of Properties

(Roughly in order of preference of testing with very reactive materials)

YTTRIUM OXIDE

Type Y	Water-based, pH 7	Washcoating for all substrates	Most non-reactive coating	Not for Air Inert: 2000 C Vac: 2000 C Vac with C: 1500 C
Y Aerosol	Solvent-based	Low Adherence for all substrates	Easy to apply/dry	OK in Air: 1900 C Inert: 1900 C Vac: 1900 C Vac with C: 1500 C

HAFNIUM-TITANIUM OXIDE, 66.7HfO₂*33.3TiO₂

Zypcoat HTO	Water-based, pH 2-3	Good Adherence mainly for ceramics	High stability, near-zero CDE	>2000 C all atmospheres
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ZIRCONIUM DIOXIDE

Type YSZ	Water-based, pH 2-3	Good Adherence for Ceramics/Metals	Yttria stabilized	Air: 2000 C Inert: 2000 C Vac: 2000 C Vac with C: 1400 C
Type ZO	Water-based, pH 2-3	Good Adherence for all substrates	Calcia stabilized	Air: 1800 C Inert: 1800 C Vac: 1800 C Vac with C: 1400 C
Z Aerosol	Solvent-based	Low Adherence for all substrates	Easy to apply/dry Calcia stabilized	Air: 1900 C Inert: 1900 C Vac: 1900 C Vac with C: 1500 C

YAG, 3Y₂O₃*5Al₂O₃

Zypcoat YAG	Water-based, pH 3-4	Good Adherence for all substrates	High stability coating	Air: 1700 C Inert: 1700 C Vac: 1700 C Vac with C: 1400 C
YAG Bondcoat	Water-based, pH 2-3	High Adherence for all substrates	50% Phosphate bond Less stability, more erosion resistance	Air: 1400 C Inert: 1400 C Vac: 1400 C Vac with C: Not recommended

ALUMINUM OXIDE

Type A1	Water-based, pH 2-3	Good Adherence for all substrates	100% Al ₂ O ₃ coating	Air: 1800 C Inert: 1800 C Vac: 1800 C Vac with C: 1500 C
A Aerosol	Solvent-based	Low Adherence for all substrates	Easy to apply/dry	Air: 1800 C Inert: 1800 C Vac: 1800 C Vac with C: 1500 C