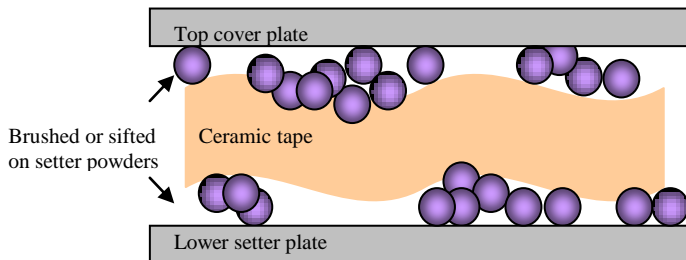
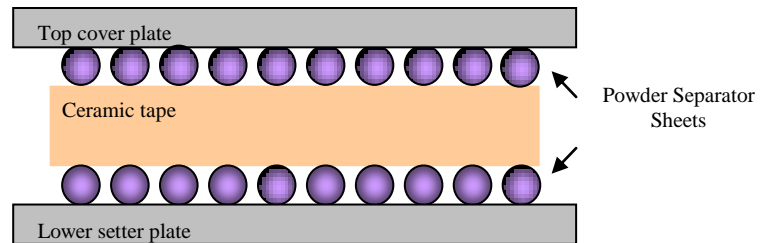


Separator Sheets™

UNIFORM SETTER POWDER DISTRIBUTION IMPROVES PIEZO-CERAMIC FIRING PROCESS



Cracks can form when powders are not evenly distributed.



Powders are deposited uniformly with Powder Separator Sheets™ yielding ceramic parts that are crack-free and flat.

Separator Sheets:

- Eliminate sticking and reduce stress on fragile and difficult to fire parts and substrates. Also used for "flat firing" of ceramic plates.
- Allow the use of weighted cover plates to prevent warping – Enables even and cost efficient stacking of parts or substrates.
- Reduce labor costs associated with applying sands and powders.
- Reduce contamination and prolongs the life of setter plates.
- Can improve yields by allowing the bottom surfaces to "breathe".
- Are uniform particles of Carbon, ZrO₂, Al₂O₃, or MgO contained in a paper-thin sheet with minimal organic binder.
- Are convenient to use, burn away cleanly during firing, reduce labor costs and improve yields.
- Can be processed using your proprietary powders or with custom formulations and particle sizes depending on your application.
- Are available in rolls (to 20" wide) or in packages of ten (10) individual pre-cut 4" x 6" sheets.

Ideal for Piezoceramics, metal injection molding, LTCC, glass ceramics, and other components with vitreous or volatile phases

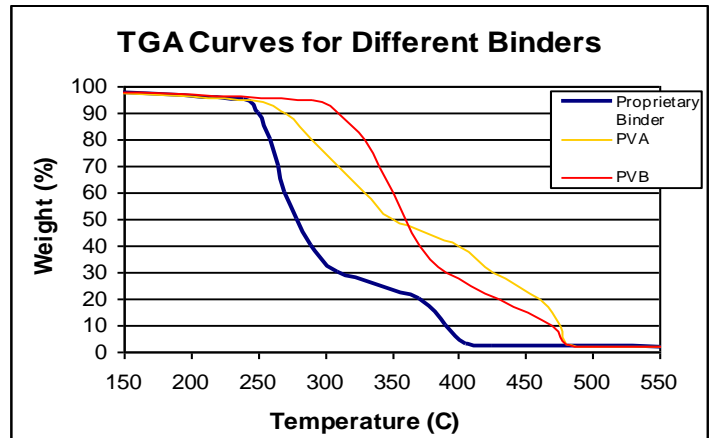
Product Specifications

Separator Sheets™ (Type SPS)

Properties	Separator Sheet™ (SPS-XX-2)*
Average particle size	100-250µm
Thickness	0.002-0.02 inch varies by material
Setter powders available	Carbon, ZrO ₂ , Al ₂ O ₃ , MgO, Custom
Characteristics	Flexible sheet with high density uniform powder dispersion
Applications	Bulk parts, e.g. pressed or hot pressed parts; substrates, "flat-firing"

*X denotes powder type, e.g. ZrO₂, Al₂O₃, MgO

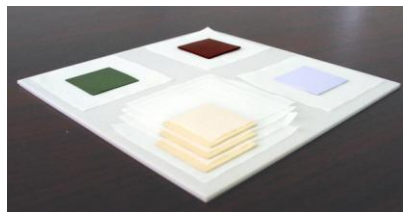
- Binder used in *Separator Sheets* is designed to burn out at a lower temperature than the binders typically used in green tapes.
- Maintains a uniform distribution of setter powder as binders burn out of fired part, thus preventing formation of cracks.



TGA curves for two binders commonly used to process electroceramic green tapes, PVA and PVB, and proprietary binder used for Separator Sheets™ and Ceramic Powder Liners™.



Separator Sheets are available in pre-cut sheets or rolls up to 20" wide.



Separator Sheets are ideal for LTCC, glass ceramics, SOFC, and multilayer piezoceramic stacks.



Separator Sheets are available in various sizes, shapes and compositions.