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Fire hazard of titanium powder layers mixed with inert nano TiO_2 powder

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Highlights

- Forced airflow yielded lower FSV than that in convective conditions for μm-Ti powder
- Forced airflow yielded higher FSV than that in convective conditions for nm-Ti powder
- Fly fire emerged resulting in greater fire hazard for nano Ti powder
- FSV in aided airflow was larger than that in opposed airflow for Ti powder layer
- Nano TiO_2 at 80% and 90% are needed to fully suppress micro and nano Ti layer fires

Abstract:

Metallic dust layers are highly sensitive to ignition from common ignition sources, even when mixed with high percentages of inert solids. In turn, dust layer fires are a potential ignition