



*TECAPOWDER PI Solution Grades
for Coatings*

TECAPOWDER PI solution grade granulate has important uses in the industry due to the unique combination of high temperature stability and chemical resistance.

Many advantages for coatings

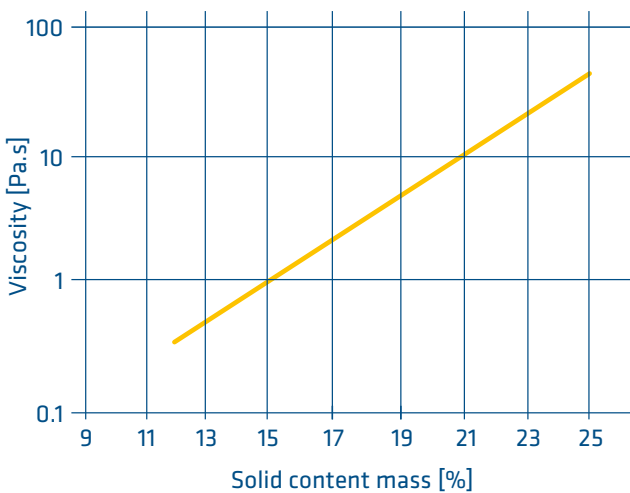
Specialty coatings made of TECAPOWDER PI granulate allow customers to formulate different weight percent solids content and allow for various additives to improve end use characteristics. The fully imidised solutions can be used as structural adhesives and bond very well to most metals.

- Fully imidized
- Excellent chemical resistance to acids reaching to the neutral side of the pH scale
- Excellent resistance to organic solvents, oils and fuels e.g.: nitric acid, hydrochloric acid, acetic acid, formic acid, oxalic acid, ethylene glycol, acetone, benzene, diglycolic methyl ether, methylene glycol, perchloro ethylene, tetra chloro ethane, toluene and trichloroethylene
- Contact with alkaline media should be avoided
- Solubility in high polar solvents such as dimethylformamide (DMF), N-Methyl-2-pyrrolidon (NMP)

Outstanding chemical properties

Solid TECAPOWDER PI polyimide for dissolving in NMP, DMSO, Dmac. Solutions in NMP are achievable from 5-35 % solid content in NMP.

Viscosity cersus solid content in NMP

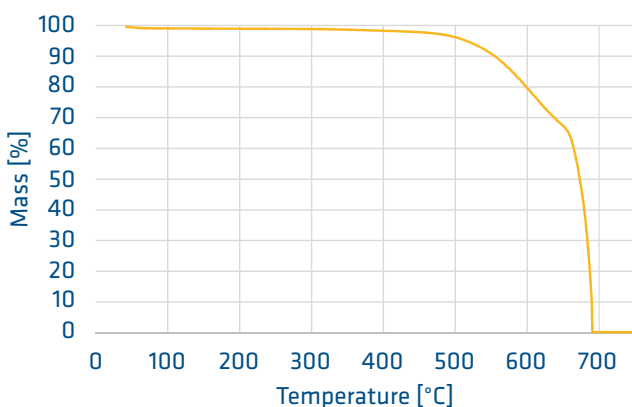


Thermal properties of TECAPOWDER PI*

Glass transition temperature (Tg)	315 °C (599 °F)
Decomposition temperature (onset)	> 550 °C (> 1,000 °F)
10 % loss of weight	in air: 525 °C (977 °F)
No melting point	in nitrogen: 570 °C (1,000 °F)
Limiting oxygen index (LOI)	38 % O ₂

*TECAPOWDER PI is an organic polymer with exceptional heat resistance.

Thermogravimetric analysis

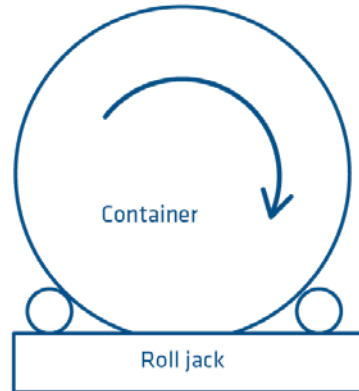


Processing Guidelines

Dissolving procedure

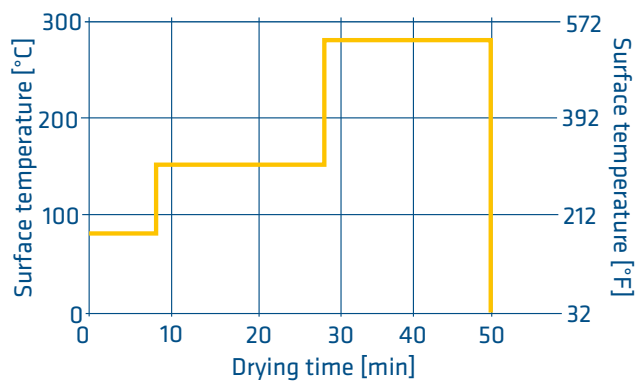
Put desired quantity of granulate into clean and dry flask or container. Add accurate volume of NMP. Close the container tightly and shake immediately and continuously to avoid agglomeration. Put immediately on a roll jack and dissolve at low speed for 72 hours at room temperature.

- Recommended solvent: N-Methyl-2-pyrrolidon (NMP)
- Limit of possible solid content: approximately 30 %
- Important note: Do not use high speed mixers for acceleration of dissolving process. Also do not heat solution.

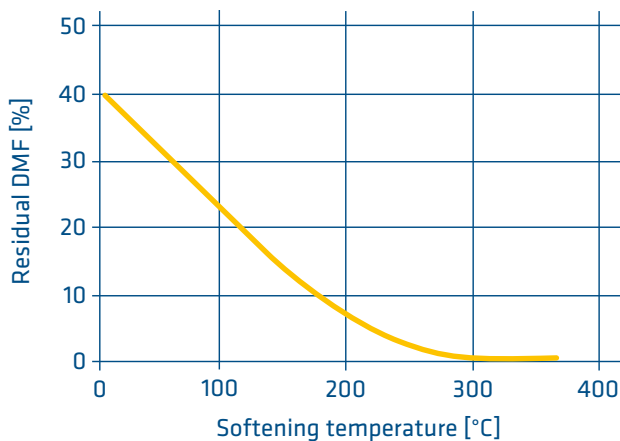


Processing

- Application by casting, dipping, spin-coating, spraying (only low viscosity) or roller coating
- Non-compatibility with non-solvents (precipitation of polymer). Since the solvents used are hygroscopic, coagulation can also be triggered off by moisture.
- Solubility in high polar solvents such as dimethylformamide (DMF), N-Methyl-2-pyrrolidon (NMP), etc.
- Do not use mixers with high shear rate to incorporate additives like fillers
- Thermal drying without chemical reaction
- Contact with alkaline media should be avoided



Softening temperature (depending on residual solvent)



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The Ensinger Group is engaged in the development, manufacture and sale of compounds, semi-finished materials, composites, technical parts and profiles made of engineering and high-performance plastics. To process the thermoplastic polymers, Ensinger uses a wide range of production techniques, such as extrusion, machining, injection moulding, casting, sintering and pressing. With a total of almost 3,000 employees at over 30 locations, the family-owned enterprise is represented worldwide in all major industrial regions with manufacturing facilities or sales offices.

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