

# P84<sup>®</sup> Polyimide Solution

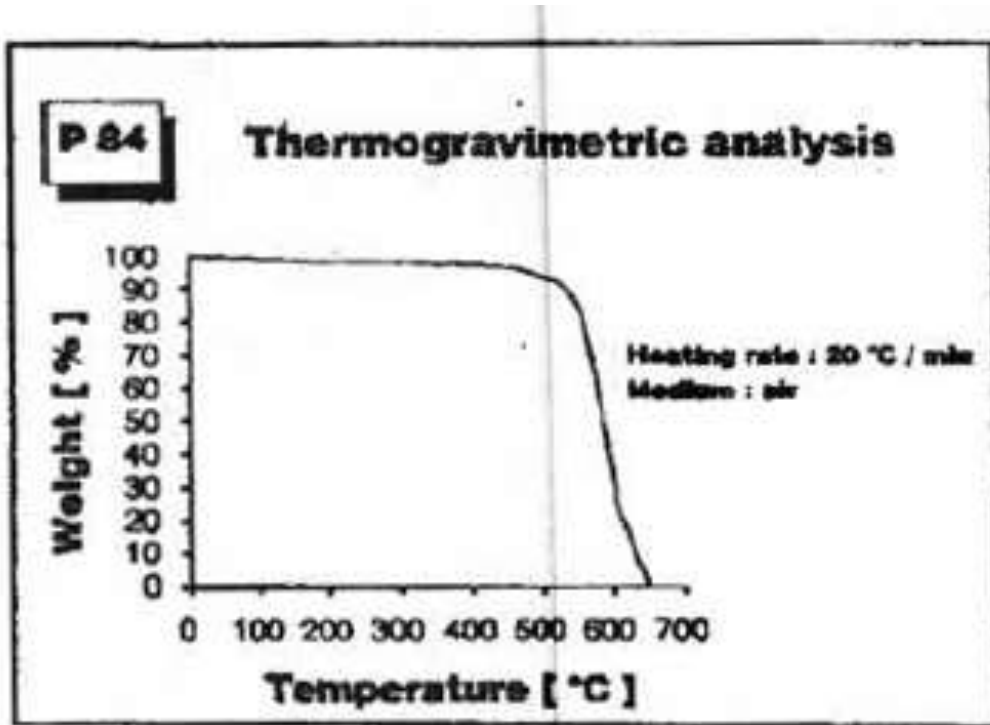
## Technical Information



HP Polymer GmbH  
A-4860 Lenzing

We reserve the right to technical alterations!  
All information on this leaflet is correct to the best of our knowledge; however, no guarantees whatsoever are implied.

## THERMAL PROPERTIES



### P84 POLYIMIDE COATING

Glass transition point:  
(TG) 315 °C

Decomposition temp.:  
(Onset) > 550 °C

10 % loss of weight: in air: 525 °C  
in nitrogen: 570 °C

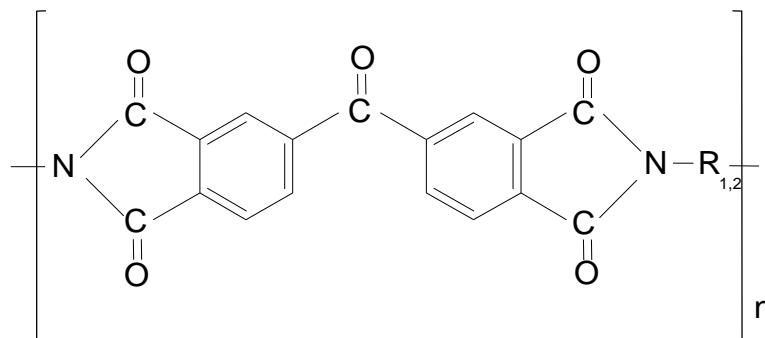
No melting point

Limiting Oxygen Index (LOI): 38 % O<sub>2</sub>  
(ASTM D2863)  
(25μ film without substrate)

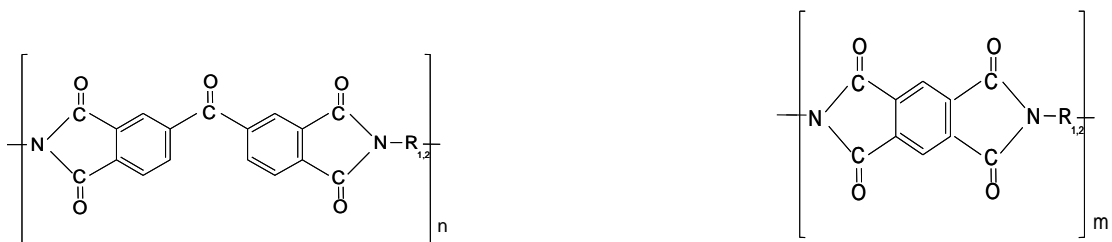
# CHEMICAL PROPERTIES

- Fully imidized
- Excellent chemical resistance to acids reaching to the natural side of the pH scale
- Excellent resistance to all normal 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, Perchloroethylene, Tetrachloroethane, Toluene, Trichloroethylene
- Contact with caustic or base media should be avoided
- Solubility in high polar solvents such as dimethylformamide (DMF), N-Methylpyrrolidone (NMP)

## P84 Polyimide



## P84 HT Polyimide



# TYPICAL VISCOSITY

- **Solutions in DMF**

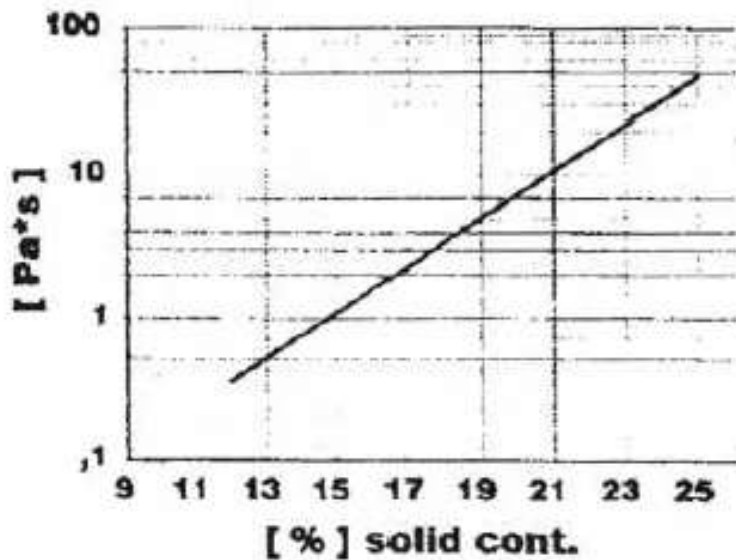
Type 70: 25 % (+ 2 %) solid content in DMF  
Delivery viscosity: 60 – 80 Pa. s

Type 50: 25 % (+ 2 %) solid content in DMF  
Delivery viscosity: 10 – 20 Pa. s

- **Solution – Grade – Granulate**

Solid P84 polyimide for dissolving in NMP, DMSO, Dmac

## Viscosity versus solid content in NMP (Typical Solution-Grade-Granulate)



- **Solution in NMP**

Available 5 – 35 % solid content in NMP

# TYPICAL ELECTRICAL PROPERTIES



## 50 $\mu$ P84 – POLYIMIDE COATING

**Dielectric strength:**

DC 415 V/ $\mu$   
AC (50 Hz) 280 V/ $\mu$

**Dielectric constant:**

(50 Hz, absolutely dry)

3.5

**Dissipation factor:**

(1 kHz)

0,001

**Volume resistivity:**

$10^{17}\Omega\cdot\text{cm}$

**Refractive index:**

(650 – 770 nm)

1.68

Test as per DIN 53481, DIN 53483

# DISSOLVING PROCEDURE SOLUTION GRADE GRANULATE



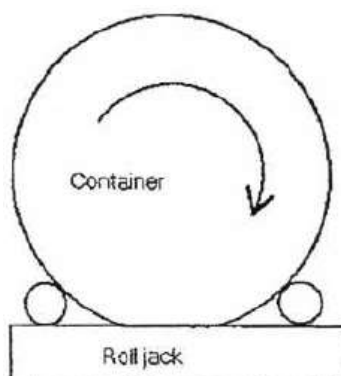
## Dissolving procedure:

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-Methylpyrrolidone (NMP)
- **Limit of possible solid content:** appr. 30 %
- **Important note:**

Do not use high speed mixers for acceleration of dissolving process. Also don't heat solution.

- **Drawing of roll jack:**

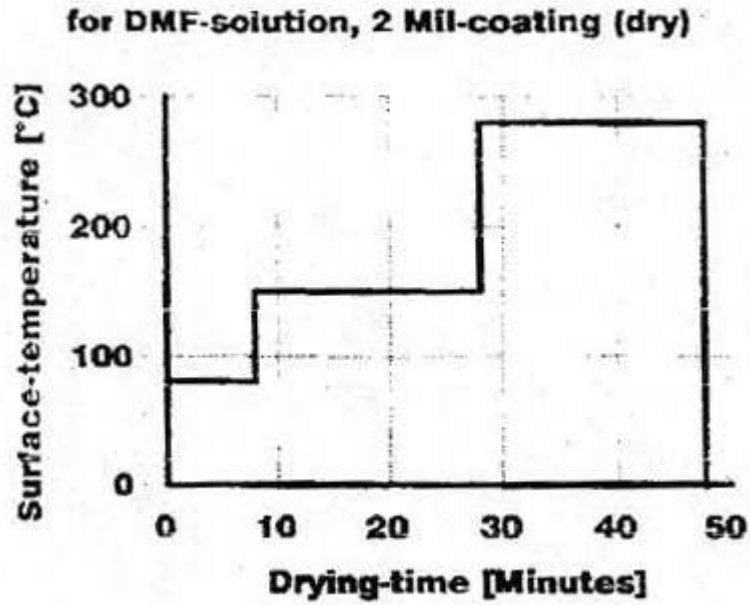


# PROCESSING

- 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
- Do not use mixers with high shear rate to incorporate additives like fillers
- Thermal drying without chemical reaction. Temperatures around TG will induce some crosslinking

## REC. DRYING CYCLE

In DMF-solution, 2 Mil-coating (dry)



## SOFTENING-TEMPERATURE

Depending on residual solvent

