Stanyl® PA46
The preferred material in high-performance connector applications

Stanyl's advantages over PA9T explained

a DSM Product

Astonishing Stanyl®

Stanyl outperforms PA9T on productivity

- Lower system costs
  - Shorter processing cycle times due to faster crystallization (up to 40% shorter)
  - Lower investment & maintenance costs as water heated molds can be used & mold deposits are negligible compared to PA9T (50% longer tool running times)
  - Significant regrind of Stanyl possible as compared to PA9T as reprocessed Stanyl retains maximum mechanical properties

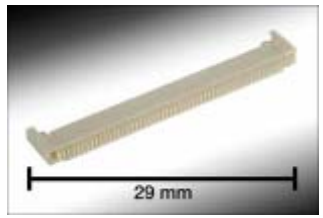
Stanyl outperforms PA9T on productivity II

- Higher product reliability
  - No micro-cracking during pin insertion due to superior ductility and toughness
  - Higher pin retention due to better creep resistance & mechanical strength
  - Higher weld line strength – less rejects and defects (50% higher)

Stanyl outperforms PA9T on reliability

- Risk-free compared to industrial endurance requirements
  - Peace of mind: automated or manual assembly: Stanyl has the highest mechanical strength to meet your endurance test requirements
- Compliance with safety standards and end-user needs
  - Guaranteed real-life compliance with flammability requirements: Stanyl is always UL94 V-0, even at low wall thicknesses

Stanyl's wide grade portfolio: your best choice



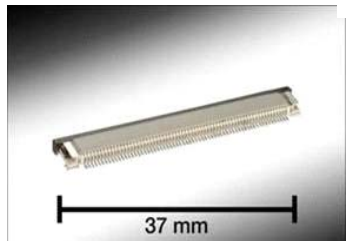
Stanyl TS250F8

Improved blistering resistance, higher strength

Consult your local DSM EP representative for more options!

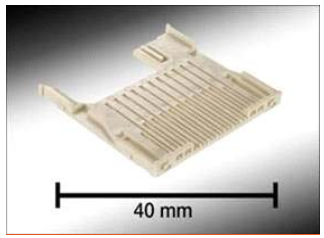
Stanyl 46HF5040

High flow, higher mechanicals



Stanyl TS250F6D

Improved blistering resistance and high mechanicals



Stanyl 46HF5041LW

High flow, low warpage

Stanyl 46SF5030 (Q3/2005)

Highest flow, high mechanicals

Higher strength, pin retention

Higher pin count, lower pitch or form factor, higher cavitation

Increased productivity with Stanyl

Best flow to fill multi-cavity, complex thin-walled tools
at the lowest pressures

Wall thickness 0.2 mm

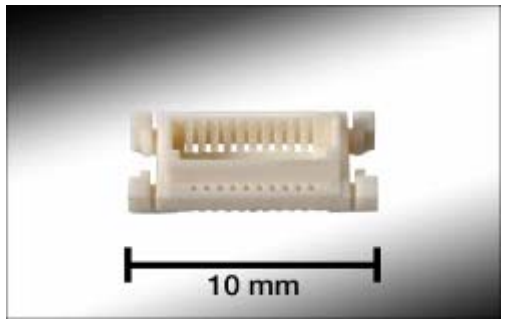
Stanyl TS250F6D
Stanyl 46HF5040
Stanyl 46HF5050
PA9T 33%GF
PA9T high-flow 50%GF
PA9T high-flow GMF

Stanyl's **outperforms** PA9T:

-shorter cycle times (up to 40% shorter) give higher productivity

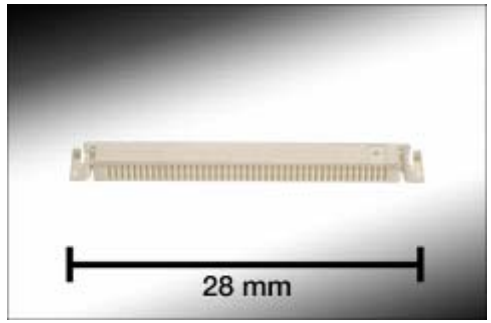
- higher flow, better processability (easier to fill multi-cavity tools – lower maintenance costs)

Actual examples: Stanyl outperforming PA9T in processing times



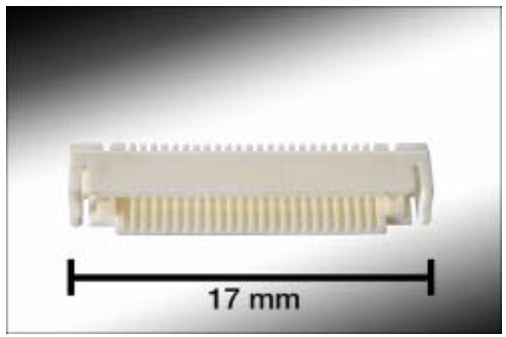
BtB, 0.5 mm pitch, 20 pins, 4 cavities

Stanyl cycle = 7 s, PA9T cycle = 12 s



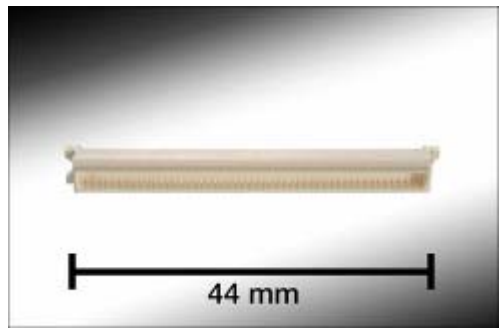
FPC, 0.5 mm pitch, 50 pins, 8 cavities

Stanyl cycle = 8 s, PA9T cycle = 13 s



FPC, 0.5 mm pitch, 20 pins, 8 cavities

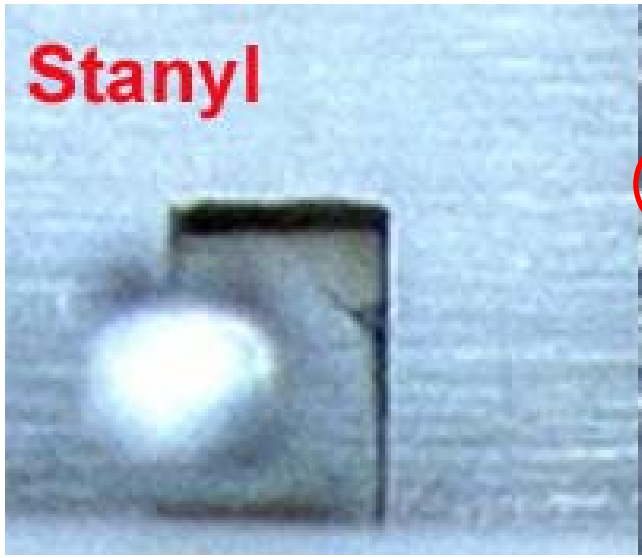
Stanyl cycle = 7 s, PA9T cycle = 14 s



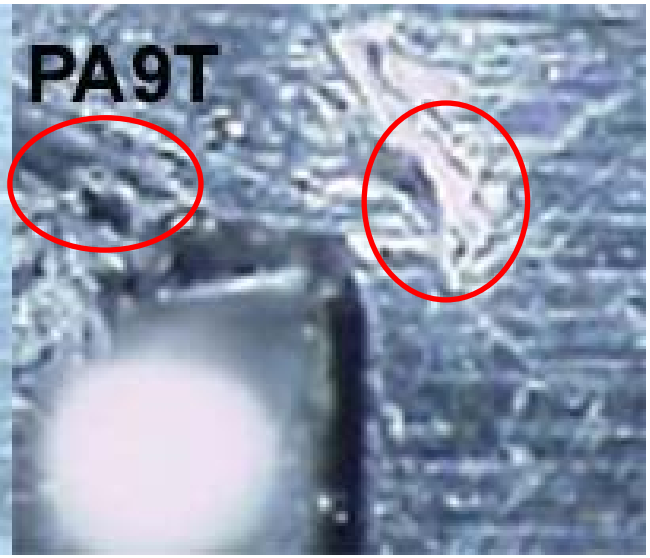
BtB, 0.8 mm pitch, 90 pins, 4 cavities

Stanyl cycle = 8 s, PA9T cycle = 11 s

Mechanical reliability only comes with Stanyl



Connector in Stanyl after pin insertion: no micro-cracks and high pin retention



Connector in PA9T, also after pin insertion: micro-cracking clearly visible (red) and low pin retention

Either with high-speed automated or lower-speed manual pin insertion, Stanyl's toughness ensures reliable, high pin retention

Maintain highest mechanical properties even when using regrind

Property Retention (%)	Stanyl TS250F6D	PA9T 30GF FR	Stanyl 46HF5040	PA9T 50GF, FR	Stanyl 46HF5041LW	PA9T GMF, FR
Tensile strength (MPa)	180	170	190	175	160	160
% Tensile strength retention with 25% regrind	>95	>90	>95	>80	>95	>85
% Elongation at Break with 25% regrind	>75	>50	>95	>60	>85	>60
Notched Izod Impact	>95	>80	>95	>80	>50	>60

Tensile testing: ISO 527-1, Impact testing: ISO 180-1A, all samples dry as molded.

Stanyl UL Yellow cards which allow 50 and 100% regrind, are available

Best practice found in the market – Stanyl excels

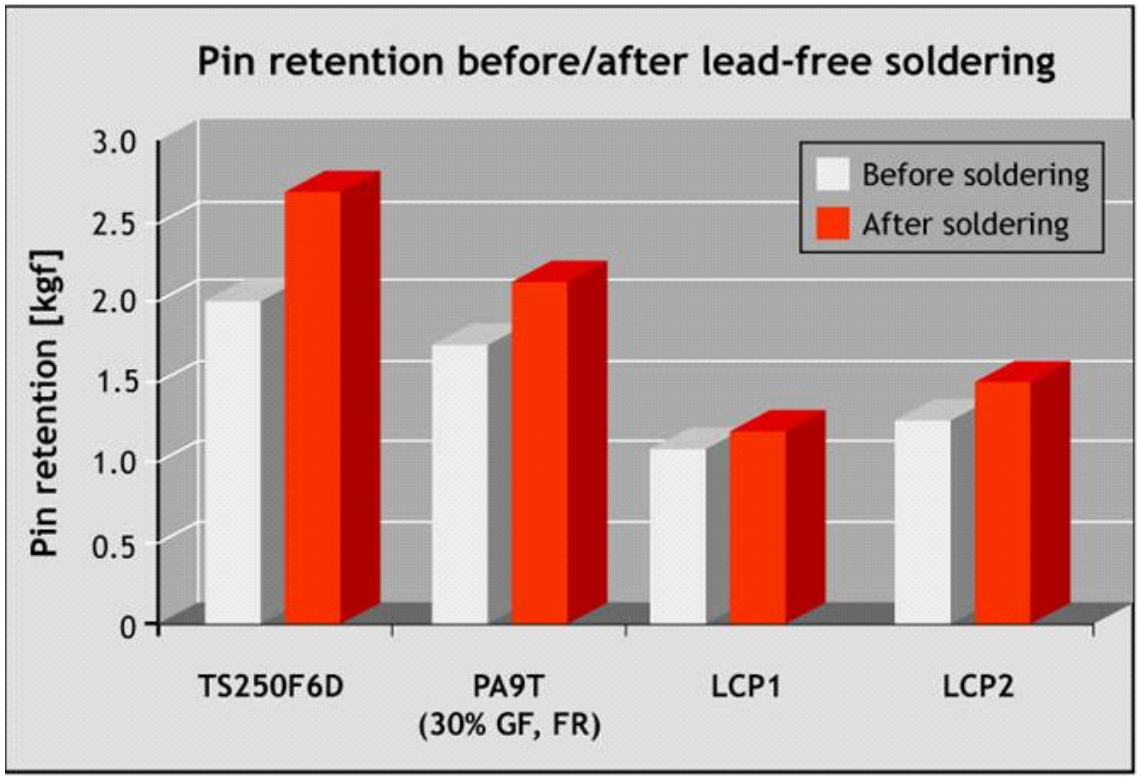
Stanyl's robustness and superior retention of mechanical properties (FPC, BtB, WtB etc) is used by customers to maximize regrind levels for a lower total cost

Max allowable regrind levels at different wall thicknesses - in practice

Pitch [mm]	<0.4 mm	0.5 mm	0.8 mm	>1.0 mm
Stanyl	**Up to ≥25% regrind**	**Up to ≥25% regrind**	**Up to ≥50% regrind**	**Up to 100% regrind**
PA9T	**100% virgin**	**Max. 10-15% regrind**	**Max. 15-20% regrind**	**Max. 25% regrind**

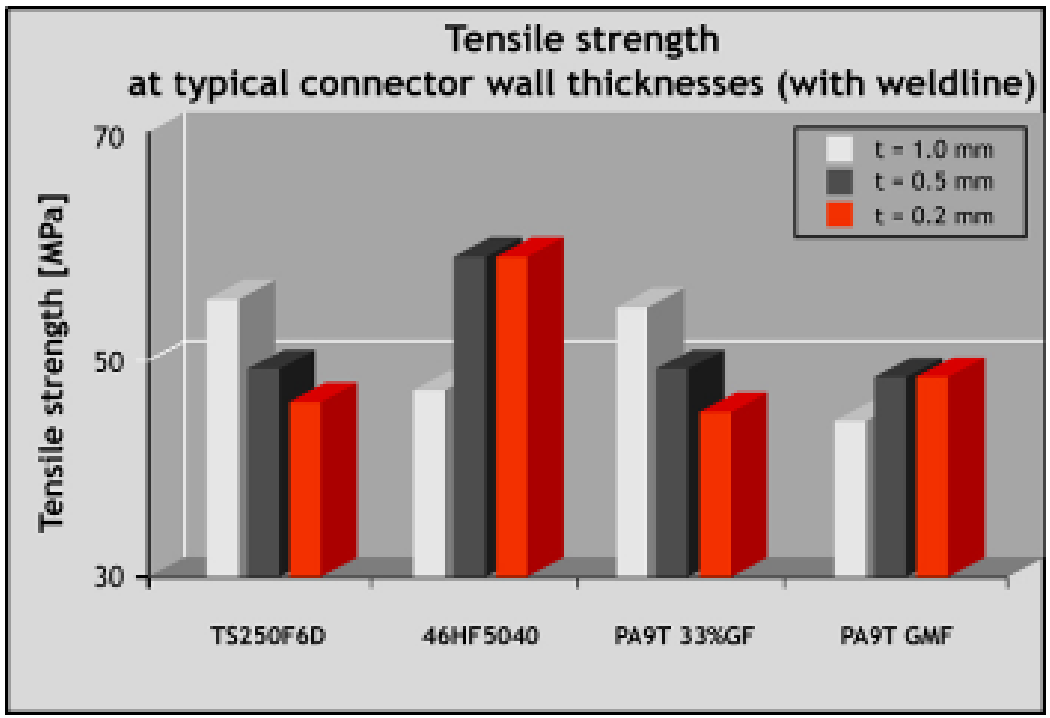
Stanyl for Astonishing connector reliability

Stanyl gives 20-50% more pin retention compared to PA9T, both before and after lead-free soldering



Stanyl -Highest mechanical strength at the lowest wall thicknesses

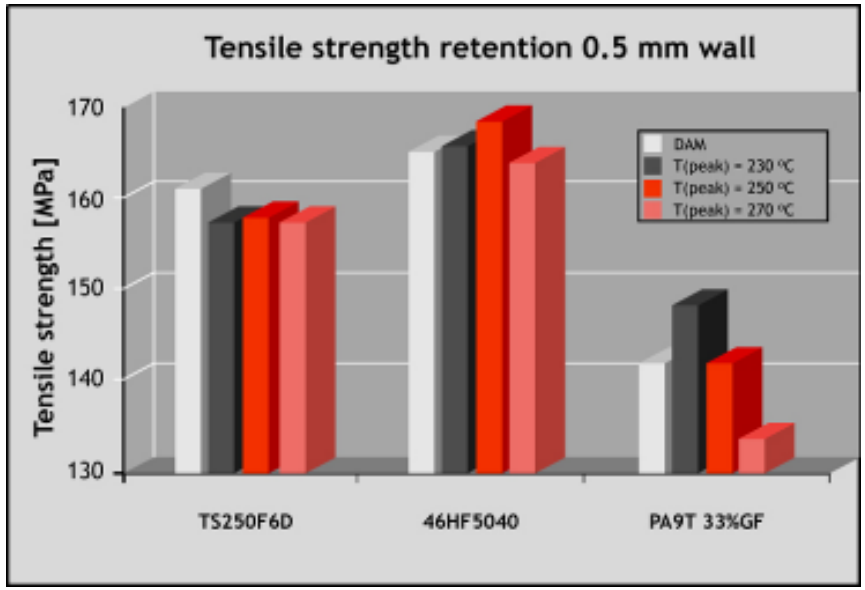
With weld lines



ISO 527-1, 5 mm/min

Highest strength – even after reflow soldering

Stanyl high flow grades give the highest mechanical strength, outperforming PA9T grades especially at lower wall thicknesses



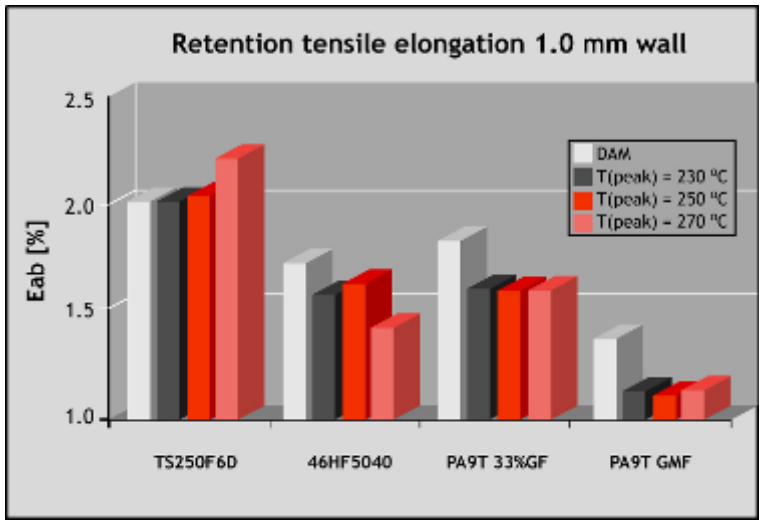
ISO 527-1 tensile testing data (5 mm/min), Sony reflow profile (SS-254)

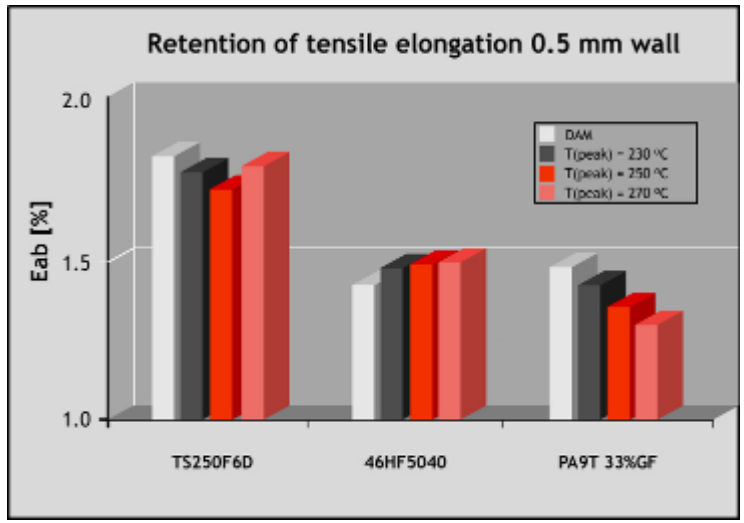
TS250F6 and PA9T 33%GF are standard grades

46HF5040 and PA9T GMF are high flow grades

Highest toughness even after reflow

At all wall thicknesses, Stanyl displays the highest elongation (toughness) before and after reflow soldering for any grade type





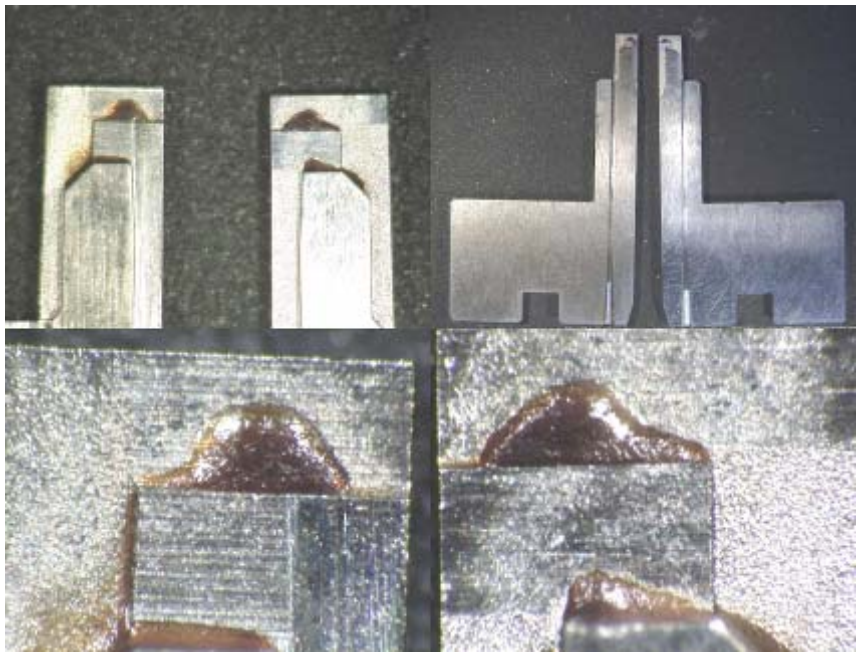
ISO 527-1 tensile testing data (5 mm/min), Sony reflow profile (SS-254)

TS250F6 and PA9T 33%GF are standard grades

46HF5040 and PA9T GMF are high flow grades

At low wall thickness, Stanyl high flow series outperforms regular PA9T grades

Stanyl eliminates mold deposit issues



FPC tool inserts showing typical mold deposit found with PA9T

Lower maintenance downtime and costs with Stanyl!

Stanyl gives you up to 50% longer tool running before cleaning is required!

Stanyl gives FR reliability and peace of mind

Stanyl ensures your UL94 V-0 ratings, even with high regrind % and in all colors

- **Extensive number of UL yellow cards - meeting stringent requirements**
  - down to 0.35 mm wall thickness –highest RTI's
  - many color listings
- **Regrind (50 – 100%) listings**
- **Highest reliability – 100% UL in-house testing before shipping**
  - always UL94 V-0, unlike the competition

Virgin material 0.75 mm thickness	Yellow Card Listing	Actual Test result (UL 94)
PA46 (all grades)	V-0	V-0 (no burning dripping)
PA9T (33% GF, FR)	V-0	V-2 (40% burning dripping with cotton ignition)
PA9T (hybrid, high flow)	V-0	V-2 (60% burning dripping with cotton ignition)

DSM internal results.

See the UL test result !