Surround™

EMI/RFI SHIELDING FORMULATIONS

PROCESSING GUIDE

AVIENT™

SURROUND™

EMI/RFI Shielding Formulations

Surround EMI/RFI Shielding Formulations are developed to protect critical electronics applications by minimizing electromagnetic and radio frequency interference (EMI/RFI). These materials utilize long fiber technology and exhibit enhanced shielding effectiveness versus standard short fiber conductive polymers. Furthermore, Surround formulations offer improved performance in the areas of creep and fatigue resistance, dimensional stability, and surface finish when compared to traditional highly-filled, short fiber formulations.

TEMPERATURE

Material	Rear °F (°C)	Center °F (°C)	Front °F (°C)	Nozzle °F (°C)	Melt °F (°C)	Mold °F (°C)
Nylon 6,6 14% NiCF	540–570 (280–300)	530–560 (275–290)	530–560 (275–290)	540–570 (280–300)	540–570 (280–300)	200–300 (90–150)
Nylon 6,6 30% SS	540–570 (280–300)	530–560 (275–290)	530–560 (275–290)	540–570 (280–300)	540–570 (280–300)	200–300 (90–150)
PBT 14% NiCF	510–410 (265–280)	490–540 (255–280)	480–530 (250–275)	480–530 (250–275)	480–530 (250–275)	150–250 (65–120)
PC 14% NiCF	540–570 (280–300)	540–570 (280–300)	530–560 (275–290)	530–560 (275–290)	530–560 (275–290)	150–250 (65–120)
ABS 14% NiCF	470–520 (240–270)	460–520 (240–270)	460–520 (240–270)	460–530 (240–275)	460–530 (240–275)	100–200 (40–90)
PP 14% NiCF	440–480 (225–250)	440–480 (225–250)	430–470 (220–245)	420–460 (215–240)	420–460 (215–240)	125–175 (50–80)

DRYING

Material	Temperature °F (°C)	Time	Minimum Moisture	Maximum Moisture
Nylon 6,6 14% NiCF	180 (80)	4–5 hours	0.05%	0.20%
Nylon 6,6 30% SS	180 (80)	4–5 hours	0.05%	0.20%
PBT 14% NiCF	250 (120)	6-8 hours	0.02%	0.03%
PC 14% NiCF	250 (120)	3–4 hours	0.02%	0.02%
ABS 14% NiCF	200 (90)	2–4 hours	0.05%	0.10%
PP 14% NiCF	180 (80)	2–4 hours	0.20%	0.30%

PROCESSING	
Screw Speed	Slower screw speeds are recommended to protect fiber length
Back Pressure	Lower back pressure is recommended to protect fiber length
Pack Pressure	60–80% of max injection pressure
Hold Pressure	40–60% of max injection pressure
Cool Time	10–30 seconds (depends on part geometry and dimensional stability)

Equipment

- Feed throats smaller than 2.5" may cause bridging due to pellet size
  - Larger feed throats will be more advantageous with long fiber EMI shielding resins
- General purpose metering screw is recommended
  - Mixing/barrier screws are not recommended
- L/D ratio
  - 18:1–20:1 (40% feed, 40% transition, 20% metering)
- Low compression ratio
  - 2:1–3:1
- Deep flights recommended
  - Metering zone 3.5 mm
  - Feed zone 7.5 mm
- Check ring
  - Three-piece, free-flowing check ring
- General purpose nozzle (large nozzle tips are recommended)
  - Minimum orifice diameter of 7/32"
  - Tapered nozzles are not recommended for long fiber EMI shielding resins
- Clamp tonnage:
  - 2.5–5 tons/in^2

Gates

- Large, free-flow gating recommended
  - 0.25" x 0.125" land length
  - 0.5" gate depth

Runners

- Full round gate design
- No sharp corners
- Minimum of 0.25" diameter
- Hot runners can be used

PROCESS CONSIDERATIONS

Recommended – retain fiber length (maximize conductivity)

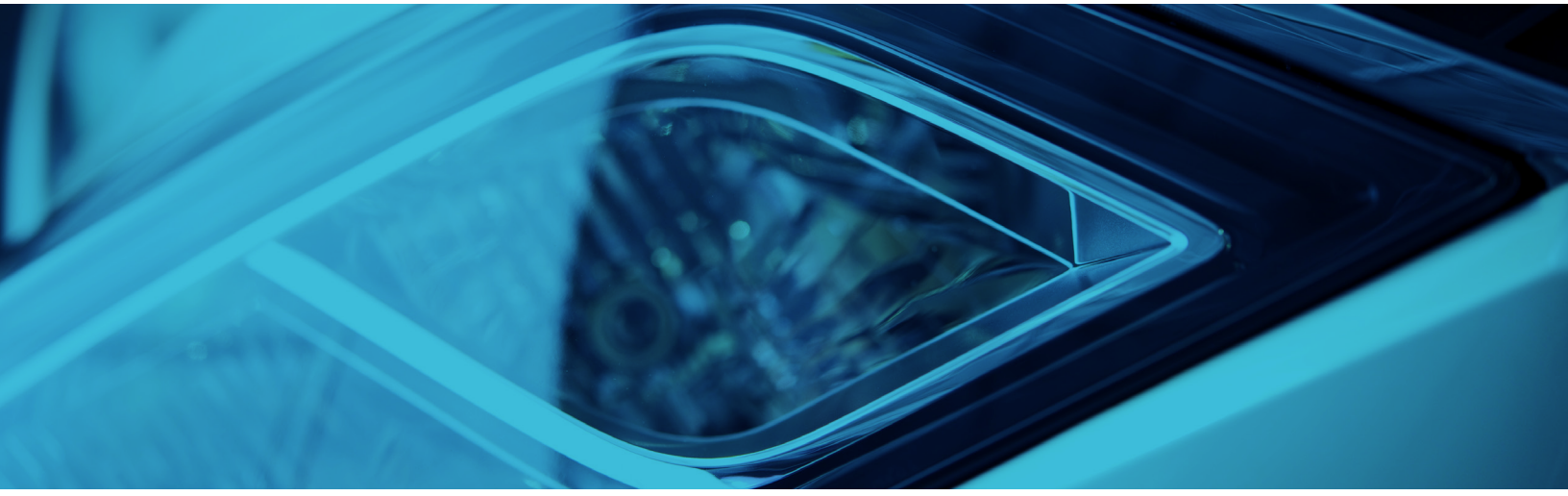
- Low shear process
- Low screw speed and screw RPM
- Slow Injection speed
- Fill to 99–100% on first stage of injection
  - Reduces potential nesting of fibers at gate location
  - Improves mechanical performance near gate location
  - Promotes ideal fiber orientation

Resin Rich Surface

- Achieved when using a hot mold temperature and longer cure times
  ≥ Max mold temperature recommendation
- Improved surface aesthetic
- Reduced surface conductivity
- Could reduce attenuation performance in an assembly

Fiber Rich Surface

- Achieved when using a cold mold temperature and shorter cure times
  ≤ Minimum mold temperature recommendation
- Improved surface aesthetic
- Reduced surface conductivity
- Could improve attenuation performance in an assembly



www.avient.com