Fiber Technologies, LLC

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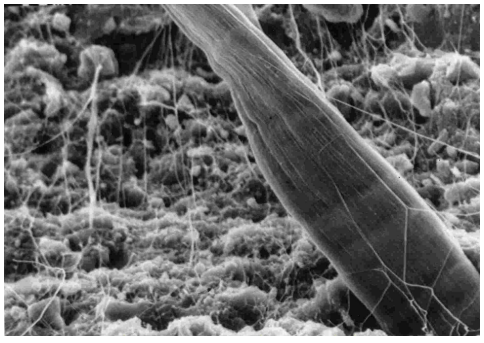
Fiber Forming Network

AP 101 additive is soft granules of PTFE coated with MOS2. When compounded with sufficient shear, the small putty like granules are fibrillated or drawn into fibrils and dispersed as a reinforcing fiber network in the rubber matrix. This three dimensional reinforcing network is made up of fibrils that average 0.4 to 0.6 microns in diameter with length to diameter of greater than 50/1.

The AP 101 additive fibril network increases green strength, tear strength and modulus at room temperature and service temperatures (up to 350-500F). With insitu fibril reinforcement of AP 101, elongation is reduced slightly yet flexibility maintained. When added to silicone compounds at low levels (0.75-1.5 pph), it acts as a processing agent improving both milling and calendaring properties.



AP 101 during dispersion

Mill Mixing of AP 101/AP 202 rubber additives

Use dissimilar speed rolls.
Set nip as tight as possible

1. Band elastomer on mill
2. Add AP 101 additive, sprinkling across mill nip gradually and uniformly. (This insures both maximum shear for fibrillations and uniform dispersion). Care should be taken to add the additive slowly and in small amounts
3. Add carbon black or other fillers, minor ingredients, and oil as required in the normal manner. (Oil cannot be added during AP 101 addition and dispersion).
4. Remove from mill, cool and rest. In most compounds the fibrillation process is optimized by resting the compound for 12 to 24 hours then re-milling.
5. After cooling and resting, band on mill
6. Add cure systems, keeping temperature as low as possible.
7. AP 202 additives may be added anytime after step 2 before or after addition of fillers

Banbury mixing of AP 101/AP 202 additives

Use normal rotor speeds

1. Add rubber and masticate
2. Add AP 101 in to the elastomer for fibrillation. (a) An increase in temperature and or energy requirements will indicate that fibrillation is occurring. When the rate of temperature increase declines, or energy demand stabilizes, fibrillation is complete. If no temperature or energy demand change is noted, there may be insufficient mix volume or the viscosity of the elastomer may be too low to generate shear for fibrillation. If so, add filler (i.e. carbon black) sufficient to increase the volume of viscosity. Under some conditions fumed silica may interfere with fibrillation.
3. Add minor ingredients and fillers
4. Add oils
5. Drop, cool and rest for at least 12-24 hrs. After resting remix in banbury. (B,C)
6. Finalize on mill and/or banbury adding cure. Keep temperature as low as possible for cure stability and maximum shear

Footnotes

(A) It may be necessary with low viscosity elastomers to add fillers and AP 101 simultaneously

(B) If, at the end of the mixing cycle massing is incomplete, drop, rest cool and remix the following day.

(C) For single pass mixing, add cure at this time. It will usually be noted that the batch temperature, due to fibrillation, will be higher. If this is the case it may be necessary to adjust the formula or mix cycle