

REXtac[®], LLC is introducing several new amorphous poly alpha olefin polymers: a family of amorphous propylene and hexene copolymers and two families of amorphous propylene and hexene terpolymers that including either ethylene or butene.

The hexene copolymers and terpolymers vary between 200 cPs and 50,000 cPs in viscosity, between 180- and 280-degrees Fahrenheit in ring and ball softening point, 5 seconds to permanent open times, and less than 5 to more than 100 dmm needle penetration values. These new REXtac[®] APAO families also include copolymers and terpolymers reaction-modified with external donors for increased cohesive strength.

These new REXtac[®] propylene-hexene, propylene-butene-hexene and propylene-ethylene-hexene APAOs can be used neat as hot melt adhesives or melt blended with other APAOs and/or a wide variety of co-adjuvants or additives. Useful additives may include:

- *Polyethylenes and polypropylenes*
- *Fully or partially hydrogenated C₅ and C₉ tackifiers*
- *Maleic anhydride grafted polyolefins and polyolefin waxes*
- *Fischer-Tropsch waxes*
- *Paraffinic waxes*
- *Metallocene catalyst synthesized waxes*
- *Mineral, paraffinic or naphthenic oils.*
- *Hydrogenated styrene block copolymers such as styrene-ethylene-butadiene-styrene (SEBS) and styrene-ethylene-propylene-styrene (SEPS)*
- *Metallocene catalyst synthesized polyethylene homo- and copolymers of butene, hexene or octene.*
- *Metallocene catalyzed polypropylene homo- and copolymers*
- *Primary and secondary anti-oxidants*
- *UV stabilizers*

These APAO copolymers and terpolymers are designed and tested to use both neat and as components in adhesive systems such as:

- *Pressure sensitive adhesives of all types*
- *Hot melt adhesives used in the production and assembly of various absorbent products including infant and childcare diapers, articles for feminine hygiene, adult incontinence products, surgical drapes and gowns, pet pads and absorbent pads for packaging.*
- *Pressure sensitive adhesive used as a positioning adhesive for attaching hygiene products to various garments*
- *Hot melt adhesives used in manufacturing assembly, construction, or lamination of both durable and non-durable goods such as furniture, transportation systems, packaging, clothing and footwear, electronics, batteries plus housing, building, and civil construction materials.*
- *Production of various articles including footwear and other applications that require such properties as permanent tackiness, controllable open time, low temperature flexibility, and other such desirable properties.*
- *Production of permanent and removable labels used for identification of durable and non-durable goods.*
- *Production of tapes for various industrial and DIY applications.*
- *Production of “peel and stick” or self-adhering roofing products.*
- *As a replacement for tackifier in olefin adhesive systems*

The following are some example formulations:

Example 1. – Copolymer

A hot melt adhesive formulation has 60 wt.% of an amorphous propylene-co-hexene polymer component. This amorphous propylene-co-hexene polymer component has 50 wt.% of propylene co-monomer and 50 wt.% of a hexene co-monomer. Forty wt.% of an additive such as a partially or a fully hydrogenated C₅ and C₅-C₉, or a fully hydrogenated dicyclopentadiene (DCPD) tackifier is added to the amorphous propylene-co-hexene polymer component. This HMA formulation has a melt viscosity, MV, of 3200 cps measured @ 375°F, a needle penetration, NP, of 45 dmm, a Ring & Ball Softening Point, R&B SP, of 230°F and a Shear Adhesion Failure Temperature, SAFT, of 198°F.

Example 2.- Copolymer

A hot melt adhesive formulation has 90 wt. % of an amorphous propylene-co-hexene polymer component. The amorphous propylene-co-hexene polymer component has 60 wt.% of propylene co-monomer and 40 wt.% of a hexene co-monomer. Ten wt.% of a plasticizer, like mineral oil or naphthenic oil is added to this copolymer. This HMA formulation has a MV of 6200 cps, a NP of 27 dmm, a R&B SP of 242°F and a SAFT of 202°F.

Example 3.- Copolymer

A hot melt adhesive formulation has 88 wt.% of an amorphous propylene-co-hexene polymer component. The amorphous propylene-co-hexene polymer component consists of 40 wt.% of propylene co-monomer and 60 wt.% of a hexene co-monomer. 12 wt. % of a styrene block copolymer such as Kraton MD-1648 is added to this copolymer. This HMA formulation has a MV of 4560 cps, a NP of 24 dmm, a R&B SP of 263°F and a Shear Adhesion Failure Temperature, SAFT, of 225°F.

Example 4.- Terpolymer

A hot melt adhesive terpolymer formulation consists of 75 wt.% of an amorphous propylene-co-butene-co-hexene polymer component. The amorphous propylene-co-butene-co-hexene terpolymer component has (i) 20 wt.% of propylene co-monomer, 40 wt.% of a butene co-monomer and 40 wt.% of a hexene co-monomer. 25 wt. % of a maleated polypropylene wax such as Epolene 43 is added to this terpolymer. This HMA formulation has a MV of 3860 cps, a NP of 13 dmm, a R&B SP of 252°F and a Shear Adhesion Failure Temperature, SAFT, of 220°F.