

Dynamic Modifiers

PAL...VersaCHAR™ Olefin Compounds

Light-Weight, Environmentally Friendly, Non-Halogenated
Flame Retardant Advanced Polyolefin Compounds

Product

PAL...VersaCHAR compounds are the latest non-halogenated, non-heavy metal solution to impart the highest degrees of flame retardancy achievable with polyolefins (Olefins). This line of flame retardant compounds incorporate a char forming additive formulation. **VersaCHAR** compounds have been found to be extremely effective yielding test performance results meeting and exceeding UL-94 V-0 and FAR 25-853 Appendix F.

VersaCHAR compounds can be custom tailored in any number of polyolefin carrier resins possessing various melt flows rates or indices. During such custom formulation, ultra-violet light stabilizers, processing aids, anti-microbial/fungicides, nucleators, coloration & pigments, et cetera, can often easily be incorporated into the overall formulated compound or concentrate.

VersaCHAR compounds form high levels of non-combustible char bodies and entrained ash when exposed to intense heat sources such as focused or diffuse open flames. Formation of these char bodies and entrained ash block transmission of heat in the surrounding polymer thereby eliminating the spread of flame and deformation of the polymer. **VersaCHAR** compounds will simply not support combustion. The formation of the protective char layer and the heat blocking protection it imparts allows the overall polymeric structure to maintain much of its mechanical integrity when used in thicker gauge polypropylene homopolymer carriers even after prolonged exposure to diffuse or focused flames. Additionally, almost no smoke or other toxic gases are emitted during or after exposure to flame or heat for any length of time.

Listed below are a few of the more common specifications **VersaCHAR** compounds are designed to pass:

<u>Specification</u>	<u>Comment</u>
NFPA 701	All years and revisions
CPAI-84	All Sections and Revisions
UL-94	V-0, V-1, V-2
ASTM D-2863	
MVSS 302	
ASTM E84	Class A and Class B
FAR 25-853 Appendix F	All Flammability and Smoke Density Specs

Recommended Use

As an example, the **VersaCHAR** compounds are known to have zero second after-flame with no burning drips when exposed to 1,950 degree (C) methane torch from a distance of 1.5 inches for 30 seconds or more.

It is recommended that VersaCHAR compounds be used as a fully formulated compound. As mentioned before, other additives or colorants can be custom tailored to the final compound formulation providing the desired appearance, UV Stability, anti-microbial functionality, etc.

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Physical Properties of Compound & Concentrate

The exact effect on the mechanical properties compared to unmodified resin(s) should be determined on a case by case basis depending on any custom-tailored olefin carrier resin specified. In general, the following properties of a typical **VersaCHAR** compound are observed:

1. Significantly Improved Heat Distortion Temperature
2. Non-Blooming (Non migration of the flame retardant chemicals to the surface of the polymer)
3. Low Density relative to other higher density filled FR compounds.
4. Low water absorption.

VersaCHAR compounds are translucent to opaque depending on thickness of the substrate and neutral in color and appearance and therefore highly colorable. Please see your Dynamic Modifiers representative to obtain exhibits demonstrating the rich and deep shades achievable when using **VersaCHAR** compounds.

Physical Properties of Compound & Concentrate (continued)

Appearance: Cylindrical Pellets

Color: White to Off White or any Custom Color Desired

Specific Gravity: <1.0

Thermogravimetric Analysis Data of Active Components (10 mg @ 10 Degrees Celsius under N₂)

Temperature, Celsius	<u>295</u>	<u>328</u>	<u>400</u>
Weight Loss, (%)	5%	10%	25%

Processing Conditions

In general, it is recommended that **VersaCHAR** compounds should be processed at temperatures not to exceed 220 degrees Celsius. However, optimal processing conditions should be determined experimentally.

Other/Special

Determination of degree of flame retardancy imparted to the final polyolefin part or construction must be determined on a case by case basis.

We highly recommend that you consult with your technical service representative in your evaluations of this product and its specific end use applications.

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