



## Intelligent Rubber Processing Additive Solutions

**Opening** *A World Of New Opportunities*



## Intelligent Additive Solutions for the Polymer Industry

When it comes to polymer additives, Struktol's vast chemical experience is translated into the most intelligent solutions available anywhere. Our sales and technical staff are the industry's most knowledgeable polymer additive experts and are dedicated to improving your processing performance.

Struktol *Intelligent Additive Solutions* make polymers easier to process ensuring maximum product quality and performance consistency. Our extensive R&D capabilities allow us to formulate solutions that enable you to stay ahead of your competition. And our ISO 9001 certification means our quality management system is focused on delivering product quality each and every order.

Let our extensive line of products improve the functionality, quality and performance values in your business.

### Depend on Struktol Additives for:

- Superior viscosity control
- Improved mold release
- Improved mixing and uniform filler dispersion
- Decreased mixing times and energy
- Improved compression set
- Improved ease of manufacturing

### Depend on Struktol Company for:

- Outstanding customer and technical services
- State-of-the-art laboratory testing capabilities
- Custom product development
- Just-in-time shipping



***At Struktol, we've built a reputation for unique, dynamic and cost-effective solutions. Let us help your business open a world of new opportunities. Call us today at **330-928-5188** or visit us on the web at **[www.struktol.com](http://www.struktol.com)**.***

# STRUKTOL® Rubber Processing Additives



Processing and Dispersing Agents

Product	Description
<b>A 50</b>	A rubber soluble zinc soap of high molecular weight that leads to a faster physical peptizing of natural rubber. It starts to be effective in the lower temperature range of compounding and can be used for mastication in a separate stage as well as for single stage mixing.
<b>A 60</b>	A rubber soluble zinc soap leading to a faster physical peptization of natural rubber. It starts to be effective in the lower temperature range of compounding and can be used for mastication in a separate stage as well as for single stage mixing. A 60DH has a lower melting profile than A 60.
<b>EF 44 A</b>	A blend of fatty acid derivatives (predominantly zinc soaps) that is useful as a processing additive for applications in natural and synthetic rubber and provides excellent improvement of processing behavior for a wide range of elastomers such as NR, SBR, and EPDM (except for halogenated elastomers).
<b>EP 52</b>	A processing additive designed for use in EPDM, butyl, and halobutyl rubber compounds. It is a blend of rubber compatible non-hardening synthetic resins and fatty acid soaps, and is effective at improving extrusion uniformity and preventing surging while smoothing out the extrudate.
<b>HPS 11</b>	A product designed and selected to give maximum polymer to additive interactions. It is effective in increasing flow, promoting release, and effectively acts to improve overall processing. It contains no metal ions.
<b>HT 290</b>	A processing additive for fluorinated rubbers. It is a blend of fatty acid derivatives and waxes and is a silicone free processing additive especially designed for fluoroelastomers and provides improved flow and easier demolding. Its good lubricating properties provide an increased extrusion rate and lead to an improved appearance rating.
<b>JV 46F</b>	This is the newest addition to our family of processing additives. It was designed for high performance silica loaded compounds. It is excellent for use in performance tires containing a wide range of elastomers NR, BR, SBR and S-SBR. It dramatically improves processing and extrusion (especially silica filled compounds) and stabilizes viscosity during extended storage times while giving your compound enhanced dynamic properties.
<b>TR 251</b>	A complex oleochemical mixture containing mono and di amides and metal soap. It is a unique blend of anionic and ionic surfactants with lubricants, and is an effective dispersant, wetting agent and process agent in a variety of polymer systems.
<b>W 34</b>	For the production of compounds on open mills or in internal mixers, the addition of this product causes a better plasticity of elastomers which leads to a rapid incorporation of the fillers and other powdery ingredients. In highly filled compounds, it counteracts the formation of filler agglomerates. The dispersing effect supports the fine dispersion of all mixing ingredients so that lots with uniform properties will result.
<b>WA 48</b>	A highly effective processing aid that is mainly used for special polymers. It contains a combination of zinc soaps and fatty acid ester tailor-made for use in epichlorohydrin rubber (ECO) to improve flow properties and release.
<b>WB 16</b>	This mixture of fatty acid soaps, predominantly calcium, is used in rubber compounds to improve the flow properties attributable to a considerable reduction of the viscosity (internal friction) of the green compound. It improves mold release, especially when complicated mold designs are involved. It has a slight activating effect on the cure rate of sulfur-containing compounds.
<b>WB 212</b> <b>WB 222</b>	A blend of high-molecular weight, aliphatic, fatty acid esters and condensation products, bound to chemically inert fillers. A processing additive for polymers and is normally used to improve the general compound processing without significant influence on the physical properties. It acts as a dispersing agent for powdered materials and can shorten the mixing time by faster filler incorporation. The effect of the vulcanization behavior is neutral. It can reduce the risk of scorching particularly in highly loaded compounds. Due to the good plasticizing properties, molds can be filled faster with lower pressures during injection and transfer molding. The water content in WB 212 may cause a slight activation in compounds based on chlorosulfonated polyethylenes or equivalent polymers.
<b>WS 180</b>	A condensation product of fatty acid derivatives and silicones. This product leads to best results in the processing of both special (e.g. ACM, ECO) and standard elastomers showing most advantageous effects, lowering viscosity, improving mill release and helping to solve mold release problems. It has an extremely low peroxide demand and has practically no effect on physical properties.
<b>WS 280</b>	A processing additive based on organosilicones. These new organosilicones are highly compatible with rubber compounds. It has an extremely low volatility at high temperatures and is particularly suitable for FKM compounds and silicone compounds. It offers better extrusion properties and is excellent for injection molding.
<b>ZB 47</b>	A proprietary zinc compound which helps in the processing of filled rubber systems. It offers heat stability (reversion resistance) and improves dynamic properties in natural rubber compounds containing mineral fillers and silane coupling agents. It can improve tack of high natural rubber compounds.

# STRUKTOL® Rubber Processing Additives

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Activators	<b>Activator 73 A</b> <b>Activator 73 LM</b>	Multifunctional cure activators for the sulfur vulcanization of diene rubber, especially natural rubber. They can partly or totally replace conventional activators based on fatty acids (stearic acid, zinc stearate, and zinc 2-ethylhexanoate) and impart excellent reversion resistance. They can also be used as an effective physical peptizer for the mastication of natural rubber to improve processability in mixing, extrusion and molding. "LM" is designed for low shear and low temperature mixes.
	<b>ZEH</b> <b>ZEH-DL</b>	As a rubber soluble zinc soap, it is used instead of stearic acid and reduces stress relaxation and primary creep of NR-vulcanizates, especially in combination with soluble EV-systems. ZEH-DL is a free flowing powder; it offers processing advantages compared to the high viscous liquid of ZEH.
	<b>Zimag 29/43A</b>	A cross-linking agent consisting of a 2:3 ratio of zinc oxide to magnesium oxide for chloroprene compounds to reduce scorch.
	<b>Zinc Laurate</b>	Used as an activator for thiazoles, thiurams and dithiocarbamates by supplying fatty acid and soluble zinc.
Amides	<b>TR 121</b> <b>TR 131</b> <b>TR 141*</b>	These unsaturated fatty primary amides function by migrating to the surface in a microscopic coating which reduces the coefficient of friction. TR 121 (oleamide) migrates more rapidly than TR 131 (erucamide) but has reduced heat stability. They function as both a lubricant and mold release agent and their low odor make it extremely suitable for food contact applications. *For peroxide cure systems, use TR 141.
Coated Sulfur	<b>SU 95A</b> <b>SU 109A</b> <b>SU 120A</b> <b>SU 135A</b>	These coated sulfurs contain dispersing and wetting agents that can be added to any natural rubber and synthetic rubber compound which is sulfur cured. They are active dispersions of oil treated sulfur at the following activity: SU 95A – 95% (soluble), SU 109A – 75% (insoluble), SU 120A – 83% (soluble), and SU 135A – 36% (insoluble).
Coupling Agents	<b>Silane Coupling Agents</b>	They provide coupling of most non-black pigments to the polymer backbone allowing for: improved abrasion resistance, higher compound modulus, lower hysteresis, improved compression set, and improved rolling resistance in tire tread compounds and shoe sole compounds.
Fillers (non-black)	<b>Hoffmann Mineral</b>	The numerous applications of Neuburg Siliceous Earth in elastomers include rubber articles for the automotive and construction, machinery and equipment industries, pharmaceutical rubber goods and compounds for the cable and general electrical industry. Aside from the Neuburg Siliceous Earth grades Sillitin and Sillikolloid, which mainly differ with respect to their particle size distribution, use also is often made of the surface treated Aktisil grades. Compared with untreated Neuburg Siliceous Earth grades, the Aktisil grades, in many applications, impart further improved processing characteristics as well as improves physical properties.
Homogenizing Agents	<b>40 MS</b> <b>60 NS*</b>	These homogenizing agents are particularly effective with those elastomer blends that tend to crumble at the beginning of the mixing cycle. They are used to improve the homogeneity of elastomers of different polarity and viscosity. They also reduce bagging tendencies; extrusion rates are increased without increasing the die swell, and calendaring properties are improved. Struktol homogenizing agents increase the green tack of many compounds although strictly they are not tackifiers. *For light colored compounds use STRUKTOL® 60 NS.
	<b>HP 55</b>	This is a high performance process additive developed for the rubber industry. Benefits have been shown in the tire industry, particularly where solution SBR and NR are being used. Processing benefits are seen without adverse effects on dynamic properties. This leads to potential application in other tire and non-tire applications (conveyor belts, motor mounts, hose, etc.).
	<b>TH 10A</b>	This processing additive gives good tack and homogeneity in raw compounds. Due to the balanced combination of the tackifying resins and homogenizing agent, an optimum dispersion of the ingredients in the raw compound is achieved which maintains its green tack for several weeks under normal storage conditions.



# STRUKTOL® Rubber Processing Additives



	Product	Description
Mold Cleaner	<b>MCAR</b>	A curable rubber compound for in situ cleaning of molds.
Peptizers	<b>A 80 A 82 A 86 A 95</b>	These are used as a combination peptizing and processing additive which is effective in natural and synthetic rubber. A 80 and A 82 are easily dispersed in rubber due to their high content of dispersing agent. A 86 and A 95 contain more active substance and can therefore be used at lower levels.
	<b>A 91F</b>	A mixture of zinc soaps of high molecular weight fatty acids used to reduce viscosity in NR and SBR.
Plasticizers	<b>AW 1</b>	An antistatic plasticizer for mineral filled NBR, SBR and NR compounds. A surface resistance as low as $1 \times 10^6$ Ohms can be achieved for NBR based vulcanizates.
	<b>KW 400</b>	An easily soluble plasticizer in aliphatic and aromatic hydrocarbons to improve the low temperature flexibility with all commonly used rubbers. NBR vulcanizates can be compounded with flexibility at temperatures as low as -55°C.
	<b>WB 300</b>	Used in NBR, EXO, and ACM to improve oil and fuel resistance. Due to its incompatibility with aliphatic hydrocarbons, mineral oils and greases, it will not leach from vulcanizates, which minimizes hardening and shrinkage.
Polyethylene Waxes	<b>HM 97</b>	A blend of low molecular weight polyethylene waxes that offers improved performance and/or processing of hot melt adhesives. It can improve bond strength, anti-blocking, softening point, viscosity modification and solvent and oil gelation.
	<b>PEH-100</b>	A versatile polyethylene wax (homopolymer) used in natural and synthetic elastomers. It is used to improve flow and processability.
Rubber Antitack	<b>Antiadherente P</b>	A mixture of insoluble and soluble soaps with dispersing agents. It is a batch-off slab lubricant designed for use in the rubber industry. The formulation is made without inorganic fillers.
Specialty Polymers	<b>Liquid Polybutadienes (Synthomer)</b>	Lithenes are liquid hydrocarbon polymers of butadiene and are useful in a diverse range of applications such as rubber coagent for peroxide cured EPDM/EPR, automotive sealants, electrical potting and encapsulation, electro-deposition paints, co-curable plasticisers/process aids, adhesion promoter additives, modifiers for other resin systems, chlorinated rubber feedstock, and sealants; e.g. ambient temperature cures.
	<b>Vestenamer 8012 (Degussa)</b>	As a polymeric processing aid, it acts as a non-extractable plasticizer for rubber compounds. It is used as a processing aid in tires, profiles, tubes, a variety of molded rubber articles, roller coatings and calendered articles. This unique product becomes a liquid at low temperatures but returns to a solid at room temperature.
Tackifying Resins	<b>Koresin (BASF)</b>	This product can be used as a high performance tackifier for natural and synthetic elastomers for improving long term building tack in compounds and cements.
	<b>TS 30 TS 30DL TS 35 TS 35DL TS 50</b>	These products are resinous plasticizers which significantly increase the low green tack of synthetic rubber compounds. The "DL" forms are free-flowing powders that offer improved handling over high viscosity products. The TS 50 is especially suitable for EPDM compounds to improve the tack of "dry" highly loaded compounds.
	<b>Strukrez 110</b>	A hydrocarbon resin that improves the homogeneity of elastomers of different polarity and viscosity. They are rapidly absorbed by the polymers during the mixing cycle. A relatively low viscosity mass is quickly achieved into which other compounding ingredients can easily be incorporated.



# STRUKTOL® General Recommendations

	General Purpose	Mill Mixing	Milling & Calendering	Compression & Transfer	Injection Molding
<b>AEM</b>	HPS 11 W 34	NS	NS	NS	NS
<b>Butyl</b>	40 MS ✦ A 50 ▲ WB 16 ▲	A 50 ▲ WB 16 ▲	HPS 11 WB 16	HPS 11 WB 16	HPS 11 WB 16
<b>CPE</b>	WB 222 HPS 11	WB 222 HPS 11	WB 222 ▲ HPS 11	HPS 11 WB 222	HPS 11 WB 222
<b>CSM</b>	WB 222 HPS 11	WB 222 HPS 11	WB 222 HPS 11	WB 222 HPS 11	WB 222 HPS 11
<b>E-SBR and Blends</b>	JV 46F ✦ EF 44A A 50	JV 46F ●▲ EF 44A WB 212 ■	JV 46F ●▲ HPS 11 WB 212 ■	JV 46F ● HPS 11 WB 212 ■	JV 46F ● HPS 11 WB 212 ■
<b>ECO</b>	WA 48 ▲ HPS 11	A 50 ▲ WA 48	WA 48 HPS 11	WB 222 ▲ WA 48	WB 222 ▲ WA 48
<b>EPDM (Sulfur)</b>	JV 46F A 50 WB 42 WB 16	JV 46F A 50 WB 16 WB 42	A 50 WB 16 HPS 11 JV 46F	WB 16 ● JV 46F WB 42 HPS 11 A 50	WB 16 ● JV 46F WB 42 HPS 11 A 50
<b>EPM/EPDM (Peroxide)</b>	HPS 11 WB 42 ✨ WB 16	HPS 11 WB 42 WB 16	HPS 11 WB 16 HPS 11 WB 42	HPS 11 WB 42 WB 16	HPS 11 WB 42 WB 16
<b>EVA</b>	TR 251 WB 16 60 NS	TR 251	TR 251	TR 251	TR 251
<b>FKM</b>	WS 280 HT 290 WB 222	NS	NS	NS	NS
<b>FVMQ</b>	WS 280 HT 290	NS	NS	NS	NS
<b>Halobutyl</b>	40 MS ✦ HPS 11 ●	HPS 11 ●▲ WB 16	HPS 11 ● WB 16	HPS 11 ● WB 16	HPS 11 ● WB 16
<b>NBR</b>	HPS 11 ● WA 48 WB 222 ▲ WB 212	HPS 11 ● WB 222 WB 42 WA 48 ▲	HPS 11 ● WB 222 WB 212 WA 48	HPS 11 ● WA 48 WB 212	HPS 11 ● WA 48 WB 212

- Improved Flow
- ▲ Mold Release / Mill Sticking
- ★ Reversion Resistance
- Economy
- ✨ Reduce Mold Fouling
- ✦ Blending Polymers or Different Viscosities
- NS Not Studied



# STRUKTOL®

## General Recommendations

	General Purpose	Mill Mixing	Milling & Calendering	Compression & Transfer	Injection Molding
<b>Neoprene</b>	<b>HPS 11</b> ▲ WB 42	<b>WB 222</b> ▲ HPS 11 ▲ WB 42	<b>HPS 11</b> ▲ WB 222	<b>HPS 11</b> ● WB 222	<b>HPS 11</b> ● WB 222
<b>NR</b>	<b>JV 46F</b> ◆▲ <b>EF 44A</b> <b>ZB 47</b> A 50 Activator 73 A ★	<b>JV 46F</b> ◆▲ <b>A 50</b> ZB 47 EF 44A ▲	<b>JV 46F</b> ◆▲ <b>A 50</b> ZB 47 EF 44A	<b>JV 46F</b> ◆● <b>A 50</b> ZB 47 EF 44A	<b>JV 46F</b> ◆● <b>A 50</b> ZB 47 EF 44A
<b>NR (Blends with SBR or BR)</b>	<b>JV 46F</b> ◆▲ <b>A 50</b> HPS 11 EF 44A	<b>JV 46F</b> ◆▲ <b>EF 44A</b> A 50 Activator 73 LM	<b>JV 46F</b> ◆▲ <b>EF 44A</b> <b>HP 55</b> ◆ A 50 40 MS ◆	<b>JV 46F</b> ◆● <b>EF 44A</b> ▲ A 50 Activator 73 A ★	<b>JV 46F</b> ◆● <b>EF 44A</b> ▲ A 50 Activator 73 A ★
<b>Polyacrylate</b>	<b>HPS 11</b> WS 280	<b>WS 280</b> ▲ HPS 11 ▲	<b>HPS 11</b> WS 280	<b>HPS 11</b> WS 280	<b>HPS 11</b> WB 222
<b>SBR (Mineral)</b>	<b>JV 46F</b> ◆ <b>EF 44A</b> A 50 W 34 ■	<b>JV 46F</b> ◆●▲ EF 44A A 50	<b>JV 46F</b> ◆●▲ EF 44A A 50	<b>JV 46F</b> ◆ EF 44A A 50	<b>JV 46F</b> ◆ EF 44A A 50
<b>S-SBR and Blends</b>	<b>JV 46F</b> ◆ EF 44A A 50	<b>JV 46F</b> ◆●▲ <b>EF 44A</b> Activator 73 A ★ WB 16	<b>V 46F</b> ◆●▲ <b>EF 44A</b> <b>HP 55</b> <b>HPS 11</b> WB 16 40 MS	<b>JV 46F</b> ◆ <b>EF 44A</b> <b>HP 55</b> <b>HPS 11</b> WB 16 40 MS	<b>JV 46F</b> ◆ <b>EF 44A</b> <b>HP 55</b> <b>HPS 11</b> WB 16 40 MS
<b>Urethane (Millable)</b>	<b>WB 222</b> ▲	NS	NS	NS	NS
<b>XNBR, HNBR</b>	<b>WB 222</b> WB 212 WS 280	<b>WB 222</b> WB 212 WS 280	<b>WB 222</b> WB 212 WS 280	<b>WB 222</b>	<b>WB 222</b> WS 280

Items listed in **BOLD** are primary recommendations; others are alternatives.

### Peroxide Curing Systems

We generally recommend HPS 11, TR 141, WB 16, WB 42, WB 212, WB 222 and WS 280.

### Dosage

We recommend 2% of total batch weight as a starting point.

### Additional Recommendations

**Building Tack:** For Butyl and Halobutyl we recommend 40 MS or Strukrez 110.

**Friction Reduction/Slip:** TR 121 is recommended for most polymers; TR 131 is suggested as an alternative. TR 141 is for any peroxide cured polymer.



## Struktol Company of America

Struktol Company of America is a member of the Schill & Seilacher family of companies, with representation in over 100 countries around the world. A global organization with over a century of specialty chemical expertise, Schill & Seilacher markets most of their polymer processing products under the brand name STRUKTOL® – a name that has become synonymous with both quality and performance. Struktol chemicals are found in plastics and rubber as well as man-made fibers, textiles and leather, and paper products.

The Struktol approach to the rubber and plastic additives business is by no means typical or ordinary. Chemistry is at the heart of everything we do. Providing Intelligent Additive Solutions, Struktol products are designed to meet the challenges and exacting demands of our customers. Our technical specialists, R&D chemists and compound laboratory are dedicated to creating innovative solutions for the ever-changing polymer industry – solutions that keep you ahead of your competition with increased productivity, better quality parts and lower overall cost. In addition to premium product performance, Struktol Customer Service initiatives have become the industry benchmark.



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