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RUBBER CHEMICALS
-ACCELERATORS-
DITHIOCARBAMATES

ROBAC SAA-30 PM 50 PELLETS

[2,2'-Dithiodi (ethylammonium) -bis (dibenzyl dithiocarbamate)]

PRODUCT DESCRIPTION:

Robac SAA-30 PM 50 is a newly developed, ultra-fast type of dithiocarbamate that is nitrosamine safe. The active chemical in this rubber-dispersed form has a number of unique properties (see applications below) of which compounders can take advantage. For reference sake, picture ZBED but instead of a Zn salt, the dithiocarbamate is strongly activated by a thioamine (see thioamine structure on page 2).

TYPICAL PROPERTIES:

Appearance	Off-white to tan pellets
Melting Point	96°C - 97°C (SAA-30)
Specific Gravity	1.30
Activity	50% SAA-30 in polymeric binder

APPLICATIONS:

- ❖ **Safe Nitrosoamine:** The nitrosamine generated is safe. While this is not unusual since many rubber accelerators have been developed that generate safe nitrosoamines, what is exceptional about SAA-30 PM 50 is its second attribute, the fast rate of cure.
- ❖ **Very Fast Accelerator:** SAA-30 PM 50 is an extremely active accelerator. The majority of safe nitrosamine accelerators produce very sluggish cures. They tend to be bulky molecules that are slow accelerating. Thus, large amounts of these expensive accelerators must normally be used, especially in EPDM. This causes a number of problems, the least of which is a much higher cost cure system. SAA-30 PM 50 gives a powerful acceleration at low levels. EPDM bloom is not a problem as it is with many accelerators. SAA-30 PM 50 uses sulfur efficiently to create good cures in formulas with lower levels of sulfur. This fast cure can be modified with sulfenamides to allow adequate processing scorch time.
- ❖ **Reduced or Eliminated Iridescence:** SAA-30 PM 50 has an unusual ability to **scavenge sulfur** in a compound. Iridescence, or oil-on-water sheen that appears primarily on EPDM, is thought to be at least partially the result of excess available sulfur in carbon black and process oils. Use of SAA-30 PM 50 has been shown to reduce or eliminate iridescence in production parts.

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- ❖ **Reversion Resistant Additive:** The thioamine portion of the SAA-30 PM 50 acts as sulfur scavenger, then splits and bonds with a **monosulfidic** cross-link similar to that produced by EV or semi-EV cures. However, while the crosslink is stronger than polysulfidic (less susceptible to breaking by heat), it is also a longer length than a typical single-sulfur chain. This provides flexibility to the network and much improved flex fatigue compared to typical EV cures that are normally used to prevent reversion.

Sulfur Usage



The stable, high states-of-cure developed with SAA-30 result in low heat build-up (low hysteresis) and excellent compression set in natural rubber – particularly in thicker cross-sections that may get over cured.

- ❖ **Low Temperature Cures:** Fast cures can be produced at 120°C by using SAA-30 PM 50 as the sole accelerator. Not only is it a fast cure but also it is a stable cure. Other dithiocarbamates that can cure at these temperatures will often revert natural rubber if they are the sole accelerator. These low temperature cures can be modified with MBT or DPTT to slow the scorch or modified with Accelerator ZDBCX to cure at even lower temperatures. Room temperature cures are possible but ZDBCX/ZIX is the most effective RT acceleration method. Critical dynamic parts can be cured at lower temps to maximize performance.
- ❖ Below are a few recommended starting points for safe nitrosoamines, continuously-vulcanized, extruded sealing system EPDM cures (all values in phr):

<u>Flat, fast cure</u>		<u>Higher torque cure</u>	
SAA-30 PM 50	1.60	SAA-30 PM 50	1.60
ZBED	1.50	MBT	1.00
CBTS	1.50	CBTS	1.50
Sulfur	2.00	Sulfur	2.00
 <u>Fast, semi-EV</u>		 <u>Sponge</u>	
SAA-30 PM 50	1.60	SAA-30 PM 50	1.40
ZBED	1.50	MBT	1.00
BBTS	1.50	MBTS	0.40
MBT	1.00	CBTS	1.50
Sulfur	1.20	Sulfur	1.00
		+ foaming agent	

These represent only a guide. Total formula loading, EPDM diene level, and production requirements may require altering of the formulas. If material is too scorchy at any point, use less MBT and more CBTS (or BBTS if more scorch safety is desired with a higher state-of-cure).

- ❖ **Rubber-bound form:** SAA-30 PM 50 is available from Akrochem only in a rubber-bound pellet form (50% active SAA-30). SAA-30 reacts so rapidly with sulfur that it is necessary to use the rubber-bound form to prevent premature reactions with sulfur or sulfur-bearing chemicals.

- ❖ **Storage:** Storage conditions are important to retain the unique SAA-30 PM 50 properties. Due to the high reactivity of SAA-30 PM 50, proper storage practices are recommended, such first-in, first-out inventory control, cool(below 30°C), dry and out of direct sunlight location, etc. A twelve month shelf life is currently certified when stored in proper conditions.