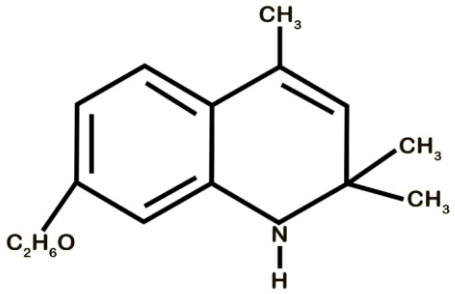
Kawaguchi Chemical Industry Co., Ltd.

MADE IN JAPAN

Molecular Structure



ANTAGE AW-P

STRONG ANTIOZONANT

Antage AW-P is an Antiozonant which protects the Rubber Articles from Ozone attack and in addition to that it enhances Heat Resistance and Protection from Oxidation.

General Properties:

Chemical Composition	: 6-Ethoxy-2, 2,4-Trimethyl-1, 2-Dihydroquinoline
Appearance	: Dark Brown Powder
Specific Gravity	: 1.02 to 1.06
Volatile matter	: 0.5%
Ash content	: 0.3 %
Solubility	: Benzene, Ethanol, Acetone, Ether, Gasoline, Carbon disulphide & Carbon tetrachloride. It is insoluble in water.

Antiozonants are chemicals that delay the Ozone degradation by inhibiting the formation of "free-radicals" and prevent the propagation of "free-radicals" which cause the degradation of the Rubber Articles at normal (Room Temperature) and Elevated Temperatures (Heat Ageing).

In simple terms **Antiozonants** protect the Rubber Goods from the attack of Ozone-"O_3" and **Antioxidants** protect the Rubber Goods from the attack of Oxygen-"O_2".

The common chemical entity which causes the degradation of rubber goods in both the cases is the "free-radicals".

Functions:

Antage AW-P (ETDQ) has very low level of Aminic Impurities and higher level of Dimer and Trimer % hence the Free radical scavenging and propagation is highly efficient. In addition to that, "Antage AW-P" has an Ethyl Pendant Group which protects the Rubber from further attack by the free radical lent by Ozone. The normally used "TDQ's contain Aminic" impurities which activate Sulphur and reduces scorch safety of the compound. They also have lower % of Dimer and Trimer which are the active entities for the prevention of Free radical attack and propagation of free radical.

This is unique of Antage AW-P which does not have a parallel product in the industry.

Given below is the table of Comparison which clearly shows the high purity level and higher content of effective entities in Antage AW-P which makes it a unique Antiozonant.

S.No	Chemical Component	Attributes	Commercial TDQ	Antage AW-P "ETDQ"	Effect
1.	**Aminic Impurities:** a. Bis Aniline-A b. Monomer Aniline c. 3-(4'amino-phenyl) terminated TDQ d. 6-(4-amino-phenyl) terminated TDQ	• Reduces Peptization • Increases mooney • Activates Sulphur • Scorching initiated by primary Aminic group • (-NH2) produced by the aminic impurities	Above 0.5%	Below 0.1%	Scorch Safety
2.	Polymer Composition	• Higher the Dimer Content means higher the secondary aminic groups (=N-H) • which scavenges the free radicals and Stops Propagation of Free radical reaction	Dimer <50% Trimer >30% Tetramer >20%	Dimer >65% Trimer <20% Tetramer <5%	Exhibits Higher Oxidation High Heat Resistance
3.	Additional Group Pendant Ethoxy group	• Prevents the attack of unsaturated • Double bonds by free radicals from Ozone	No Pendant Groups	Ethoxy group	Ozone Resistance is provided

Characteristics: " Antage AW-P" protects Rubber Goods based on unsaturated Polymers like NR and Synthetic Rubbers like SBR, NBR, BR & IR by exhibiting following properties:

1. It retards the crack formation on the Rubber Goods due to Fatigue and Light (UV).
2. It protects the rubber goods which are subject to Dynamic or Static stress from ozone attack.
3. It improves the Heat and Oxidation resistance of Ruber Goods.
4. It prevents the degradation of the Rubber Goods from the attack of metallic Poisons like Manganese, Copper, Lead etc.
5. It Synergically works with "Antage 3C" which is an Antiozonant (IPPD) to give the best combination of Heat and Ozone Resistance.
6. It easily disperses in Rubber compounds thereby improving the processability.
7. It does not interfere with the rate of Cure, hence it is scorch safe.
8. It is used for dark coloured articles.

Application: It is used in NR, SBR, NBR, IR, BR based Rubber compounds used in the manufacture of Tryes, Belts, Hoses, Cable covering and Molded items.

Dosages: Dosages of Antage AW-P is lower than and more effective compared to other Antiozonants available in market.

OTHER SPECIALTY RUBBER CHEMICALS" MADE IN JAPAN"

Accel EM 33: Single Substitute of 3-4 Accelerators for Sulphur cure EPDM Rubber Compound and gives a Rapid, Optimum Cure and Non Blooming Products.

Antage 3C (4010): Excellent Antioxidant providing resistance against Ozone, Heat, Flex-cracking & Weathering.