



Shanghai Powerflex New Material Co., Ltd (under Sane Zen Group) The anti-fatigue agent **AF28** developed by Powerflex effectively improves the dispersion of carbon black, and the highly active groups on its surface can react with the corresponding groups at the end of the natural rubber molecular chain, thereby significantly reducing the dynamic heat generation of the natural rubber carbon black system. Performance, it can improve the dynamic mechanical properties of the rubber and reduce rolling resistance. It can improve the heat aging resistance of the tire, reduce compression heat generation, and extend the service life. Adding an appropriate amount of anti-fatigue agent **AF28** can improve the hardness, elasticity, and elongation of the rubber. stress without significantly changing the tensile strength.

At the same time, it can prevent the vulcanized rubber from returning to its original state after high temperature or long-term use, that is, the cross-linked network of the vulcanized rubber is degraded, resulting in a decrease in physical properties. The anti-fatigue agent **AF28** can reduce the thermal degradation of some polysulfide bonds. Degradation occurs, thereby improving the thermal stability of the vulcanized rubber.

The use of anti-fatigue agent **AF28** is crucial to improving the quality, safety and life of tires.



Main function:

- 1. Reduce heat generation: the end of the molecular chain is modified, the hysteresis loss of vulcanized rubber is improved significantly, and the dynamic heat generation is reduced.
- 2. Improve elasticity: significantly improve rubber elasticity.
- 3. Reduce rolling resistance: It can improve the dynamic mechanical properties of the compound and reduce rolling resistance.
- 4. Prevent vulcanization reduction reaction: Prevent reversion of vulcanized rubber after prolonged use or exposure to high temperatures.
- 5. Speed up vulcanization: Improve production efficiency.

Suggestions for use:

1. Suggestions for use: Only applicable for natural rubber or primarily natural rubber-based compounds, with a recommended dosage of 1 to 1.6 phr.
2. The anti-fatigue agent AF28 must be added during the first mixing stage using Natural Rubber (NR) as the raw material to effectively achieve maximum performance.



No.	Raw material	Formula 1 (None)	Formula 2 (With anti-fatigue agent)
1	SCR 10	100	100
2	N234	47	47
3	ZnO	3	3
4	SA	3	3
5	Wax	1	1
6	4020	1.2	1.2
7	RD	1	1
8	S	1.5	1.5
9	NS	1.1	1.1
10	AF28		1
Total:		158.8	159.8

Test	Formula 1	Formula 2
ML(dN.m)	1.92	2.56
MH(dN.m)	18.1	17.01
T10 (min)	3.66	3.26
T50 (min)	4.91	3.88
T90 (min)	10.21	7.21
TS2 (min)	3.92	3.35

Vulcanization condition of rubber:
151°C × 60min

Test standard: GB/T 16584-1996



Project	Test		Formula 1	Formula 2 (+AF28)	Test condition	Standard
Physical property	Mooney	ML(1+4)100°C	62	75	100°C	ASTM D1646
	Hardness	Shore A	65	66	151°C*30min	ASTM D2240
	M100%	Mpa	2.9	3		ASTM D412
	M300%	Mpa	14.8	15.5		
	Tensile Strength	Mpa	33.3	32.9		
	Elongation	%	551	529		ASTM D624
	Tear Strength	m/kN	95	94		
	Rebound %		43	49	151°C×30min	GB/T 1681-2009
Aging performance	Hardness	Shore A	70	69	100°C*48hrs	ASTM D2240
	M100%	Mpa	3.5	3.2		ASTM D412
	M300%	Mpa	16.6	15.8		
	Tensile Strength	Mpa	25.4	26.9		
	Elongation	%	438	456		ASTM D624
	Tear Strength	m/kN	52	55		
	Rebound %		48	51		GB/T 1681-2009
Function	the volume of abrasion /cm ³		0.141	0.144	151°C×30min	ISO-23337
	E'/MPa	0°C	22.01	17.67	DMA 151°C×30min	ISO-23337
		60°C	12.45	10.57		
	tanσ	0°C	0.129	0.126		
		60°C	0.098	0.08		
		Improvement rate %	100	81.6		

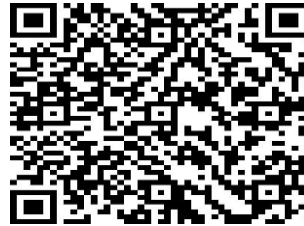


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