

3. COMPOUNDING AND VULCANIZATION

AFLAS can be compounded easily by conventional means, such as Banbury and open mill mixers. It can also be fabricated into a variety of articles by means of press mold, injection mold, extruder, and calender.

The standard compounding formulation and vulcanization conditions of AFLAS are listed.

AFLAS 100, 150 and AFLAS S grades are vulcanized by organic peroxides with the aid of an appropriate co-agent, such as triallyl isocyanurate (TAIC), under normal conditions, preferably followed by post cure.

AFLAS M grades can be vulcanized by bisphenol-AF.

● Formulation and Physical Properties

	AFLAS SP cure-incorporated	AFLAS MZ201 cure-incorporated	AFLAS 150P	AFLAS 100S
[Formulation]				
Polymer	100	100	100	100
MT Carbon	30	30	30	30
Ca(OH) ₂	6	3		
MgO	3	3		
TAIC*	3		5	5
Peroxide**	1		1	1
Sodium stearate			1	1
[Cure Conditions]				
Press cure	← 170C°/20min →			
Post cure (°C/hr)	200/4	230/24	200/4	200/4
[Physical Properties]				
Hardness, JIS-A	76	74	70	72
100% Modulus, MPa	7.9	6.1	6.2	7.2
Tensile, MPa	18.2	13.7	20.9	23.7
Elongation, %	220	210	260	240

* Triallyl Isocyanurate

** 1,3-bis(t-butylperoxy)-diisopropylbenzene

● MT-Carbon loadings vs physical properties

[Formulation]		100 (phr)	100	100	100	100	100	100
AFLAS SP*		100 (phr)	100	100	100	100	100	100
MgO		3	3	3	3	3	3	3
Ca(OH) ₂		6	6	6	6	6	6	6
MT-Carbon		0	5	10	20	30	40	50
TAIC**		3	3	3	3	3	3	3
Peroxide***		1	1	1	1	1	1	1
Mooney Viscosity (121 °C)								
ML1+4		47	49	49	51	53	57	61
ML1+10		64	61	63	59	61	61	63
ODR:177 °Cx24 min, 3 deg. of arc								
MH	lb · inch	55	54	79	74	89	9.0	54
ML	lb · inch	10	9	10	9	9	9	9
t10	min	1.5	1.5	1.4	1.4	1.5	1.5	1.5
t90	min	6.6	6.6	8.8	8.0	9.6	9.9	6.6
[Physical properties]****								
Tensile Strength	MPa	18	19	19	20	20	20	20
Elongation	%	280	280	260	260	220	200	180
100% Modulus	MPa	3.0	3.8	4.8	6.6	8.7	10.0	11.7
Hardness	JIS-A	62	63	65	70	76	78	83
Specific Gravity		1.56	1.57	1.58	1.60	1.61	1.62	1.64
Compression set	%,(200 °Cx 70hr)	34	34	34	36	36	38	41
	%,(175 °Cx 70hr)	17	18	18	19	20	19	20

* Cure promoters are incorporated into the polymer

** Triallyl isocyanurate (100% active)

*** 1,3-bis (t-butylperoxy)-diisopropylbenzene (100% active)

**** Cure Conditions: Press cure 170 °C X 20 min + Post cure 200 °C X 4 hr