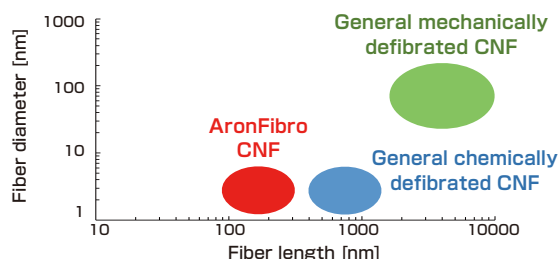


AronFibro® MB

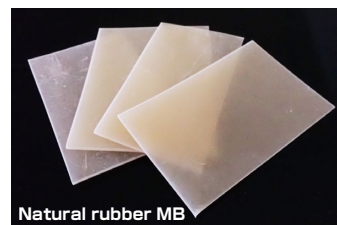
CNF Masterbatch for Rubber Compound

1. Characteristics of AronFibro CNF



- Biomass materials made from inedible pulp.
- The fiber diameter is controlled to 2-5 nm using a unique chemical treatment.
- Due to its short fiber length, it has a very low viscosity and is well dispersed in rubber.

2. AronFibro® MB



Natural rubber MB

shape	plate-shaped
amount	20 phr
SG	0.97
Rubber type	NR, NBR etc.

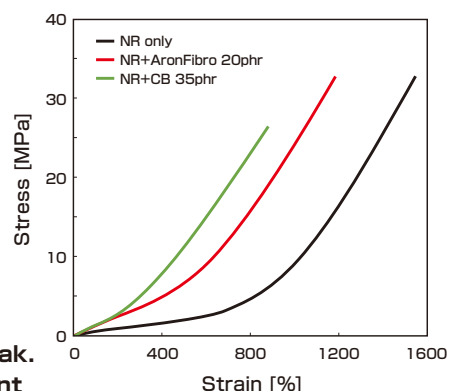
3. Compounding examples 1

Composition ^a [phr]			SG	HDA	Tensile properties ^b			
NR	CB	CNF			M ₁₀₀ [MPa]	M ₃₀₀ [MPa]	strength [MPa]	extension [%]
100	—	—	0.96	42	0.68	1.35	32.8	1542
100	35	—	1.08	57	1.44	5.25	26.4	873
100	—	20	1.02	51	1.44	3.74	32.8	1180

Vulcanization conditions: 165°C×5min

a) Includes ZnO: 5phr, Stearic acid: 5phr, CBS: 0.7phr, Sulfur: 2.25phr b) Tensile speed: 500 mm/min

- It can increase the initial modulus while maintaining the extension at break.
- Lighter weight can be expected because the SG is smaller and the amount of additives can be reduced.

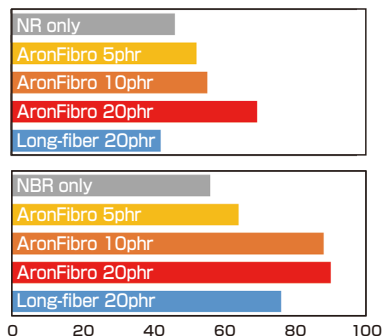


4. Compounding examples 2

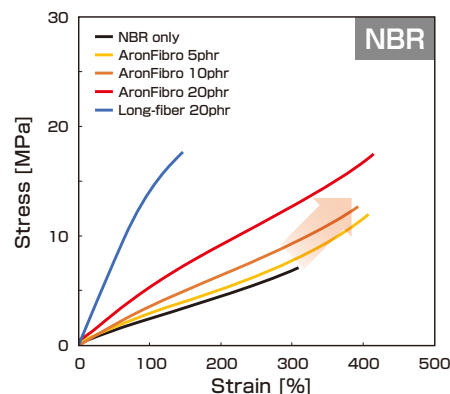
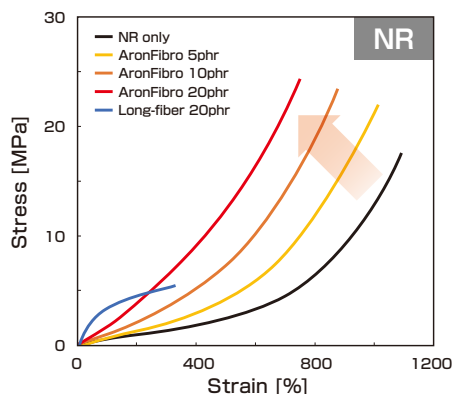
◆ Composition^a

Rubber	CNF	DCP
100	0~20	2

◆ Abrasion resistance index^b



◆ Tensile test^c: Stress-Strain curve



- Composite construction can be expected to improve abrasion resistance.
- Reinforcing effect has been confirmed with various rubber types.

a) Vulcanization conditions: 165°C×20 min, b) DIN abrasion test, A method, abrasion distance: 40m equivalent, Load force: 10 N, reference test piece: D1, c) Tensile speed: 500 mm/min,