KEP5770 EPDM Rubber

May, 2014

beyond the best KUMHO POLYCHEM

1. Polymer Index

Item	KEP570F	KEP5770
Polymer MV (ML1+4,125℃)	59.5	73.0
MLRA	220	450
Ethylene Contents(wt.%)	69.7	75.6
ENB Contents(wt.%)	4.5	5.2
Molecular Weight Distribution	Narrow	Narrow
Polymer Green Strength(kgf/cm^2)	30	67

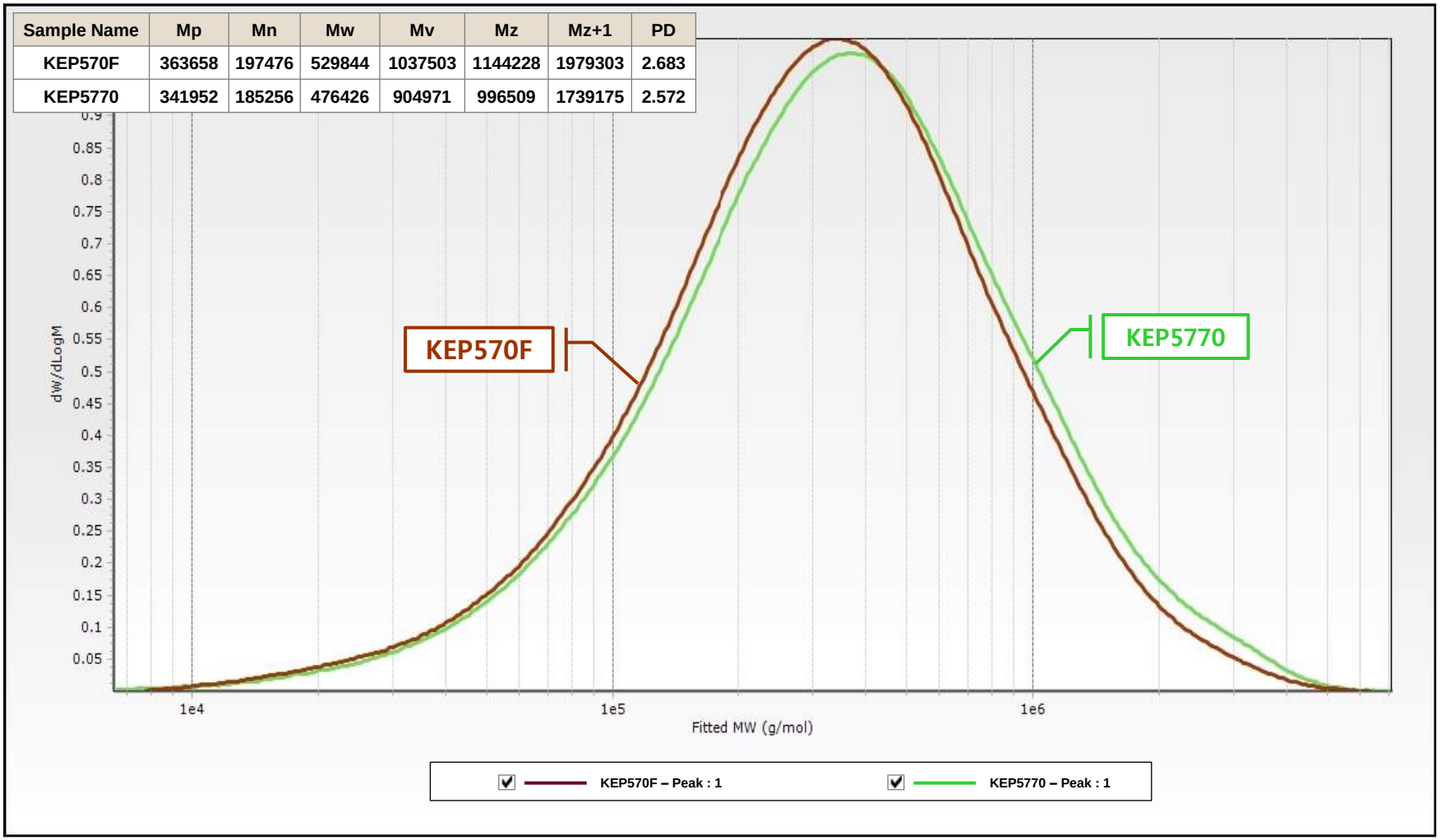
- KEP5770 Compared to KEP570F

  -. Mooney viscosity and Ethylene Contents are higher

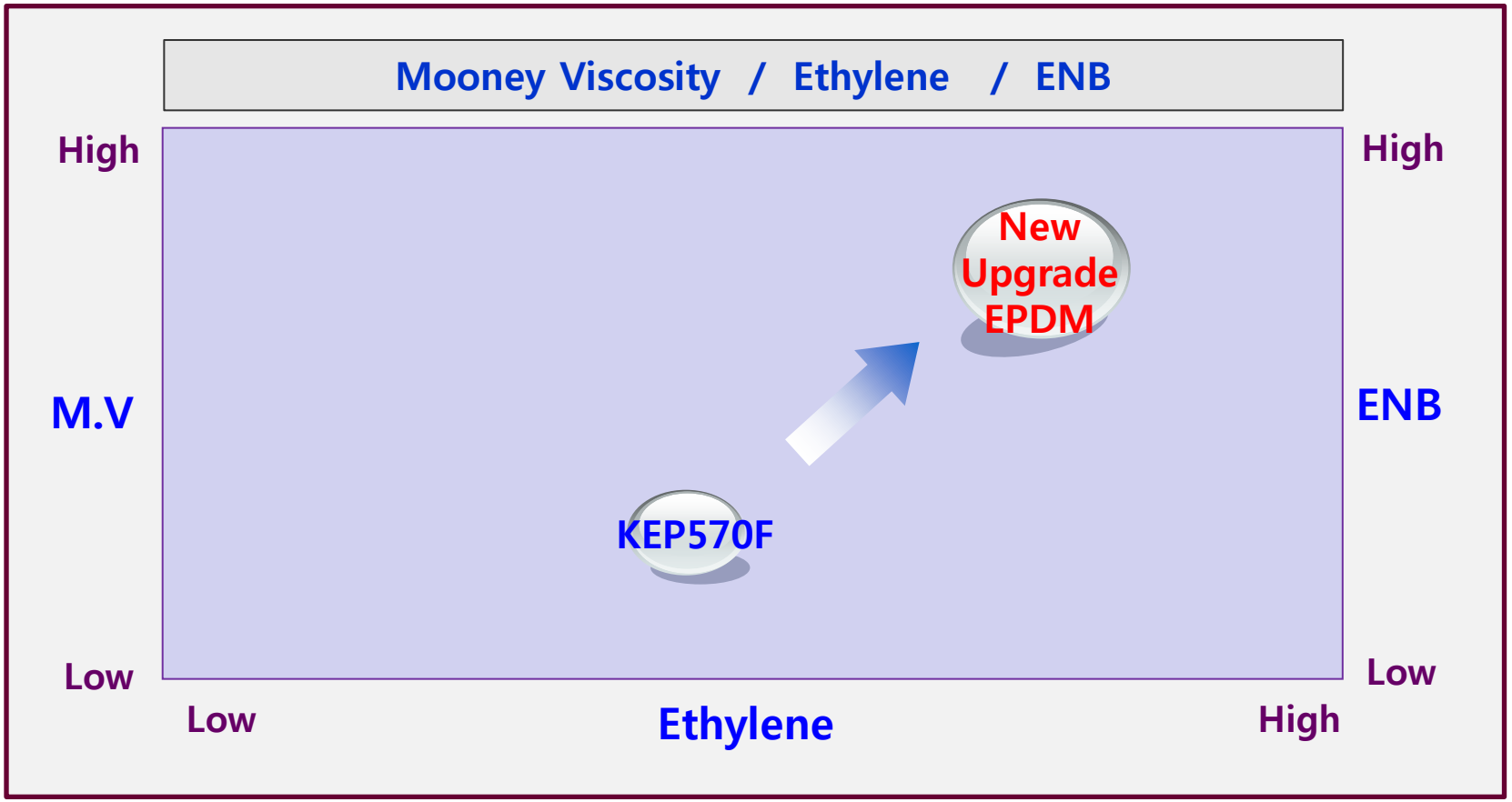
  -. Polymer Green Strength is higher

2. GPC Analysis

Sample Name	Mp	Mn	Mw	Mv	Mz	Mz+1	PD
KEP570F	363658	197476	529844	1037503	1144228	1979303	2.683
KEP5770	341952	185256	476426	904971	996509	1739175	2.572



3. KEP5770 Position

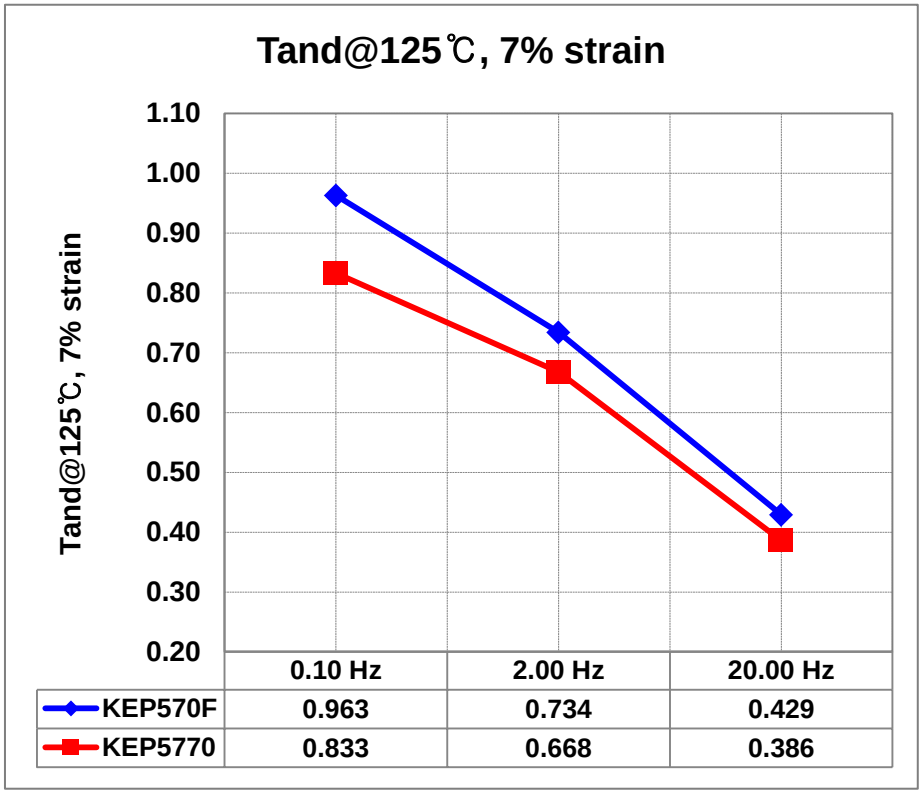


4. KEP5770 Characteristics

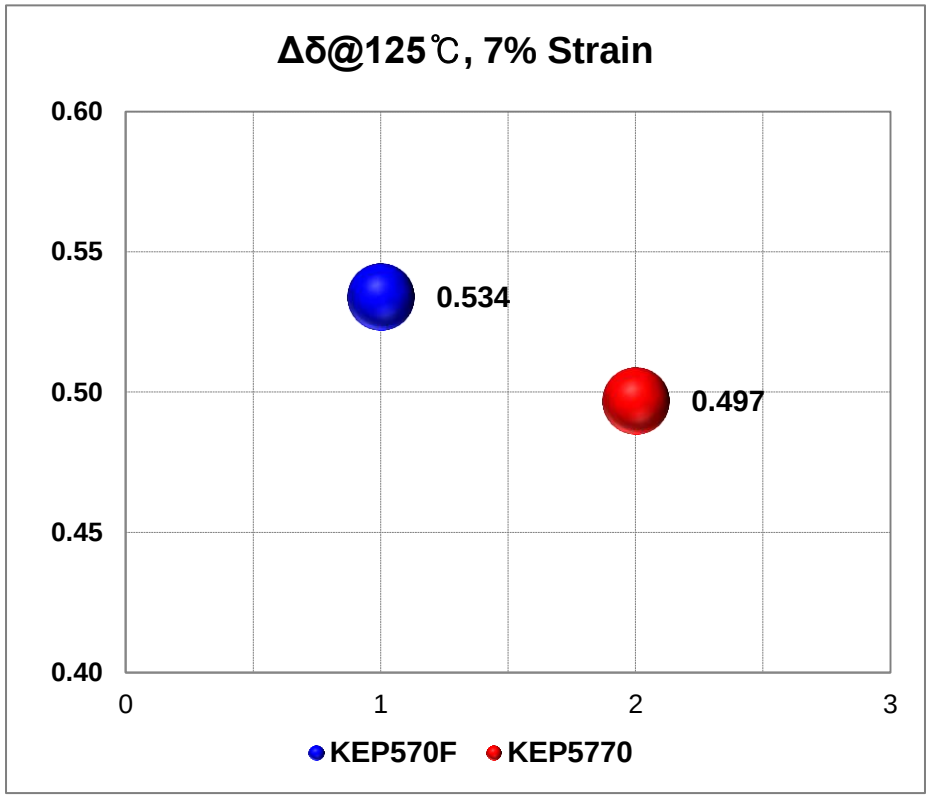
Features	Benefits
High Molecular Weight	High Physical Properties Excellent Collapse Resistance
Narrow Molecular Weight Distribution	Excellent Physical Properties Extrusion Stability
High Ethylene Content	High Fast Extrusion Excellent Physical Properties High Filler Loading
High ENB Content	Fast Cure

5. RPA Analysis - ASTM D6204 Part A

A. Frequency Sweep



	0.10 Hz	2.00 Hz	20.00 Hz
KEP570F	0.963	0.734	0.429
KEP5770	0.833	0.668	0.386



【RPA Test Condition】

- Frequency Sweep： ASTM D6204 Part A (3 Point Freq's Sweep) - 125℃, 7% Strain, 0.1Hz - 2.0Hz – 20.0Hz

6. ASTM Compound

Properties	KEP570F	KEP5770
Compound Mooney Viscosity		
ML1+4, 100℃	70.7	72.3
Mooney Scorch(ML1-125℃)		
Vm	48.4	50.9
t5 (m.s)	11.48	11.15
t35 (m.s)	18.32	17.18
MDR (180℃×10min-1arc)		
ML (dNm)	2	4
MH (dNm)	39	40
ts2 (m.m)	1.69	1.51
T10 (m.m)	1.89	1.72
T90 (m.m)	10.16	10.44
Physical Properties MDR (180℃×10min – Press cure)		
100% Modulus (kgf/cm^2)	36	39
300% Modulus (kgf/cm^2)	110	124
Tensile Strength (kgf/cm^2)	203	226
Elongation (%)	499	491
Hardness (Shore-A)	74	74

【Recipe】Polymer 100, Zinc Oxide 5, Stearic Acid 1, IRB-7 80, Paraffinic Oil 50, Sulfur 1.5, MBT 0.5, TMTD 1.0

7. Application Compound (400phr)

Properties	KEP570F	KEP5770
Compound Mooney Viscosity		
ML1+4, 100℃	44	47
Mooney Scorch (ML1-125℃)		
Vm	32	35
t5 (m.s)	4.50	4.16
t35 (m.s)	7.17	6.22
MDR (180℃×10min-1arc)		
ML (dNm)	1.2	2.0
MH (dNm)	23	28
ts2 (m.m)	0.52	0.43
T10 (m.m)	0.52	0.44
T90 (m.m)	3.40	3.32
Physical Properties MDR (180℃×10min – Press cure)		
100% Modulus (kgf/cm^2)	31	33
Tensile Strength (kgf/cm^2)	116	127
Elongation (%)	361	383
Hardness (Shore-A)	68	70

【Recipe】 Polymer 100, Zinc Oxide 5, Stearic Acid 1, PEG4000 1, FEF 128, Paraffinic Oil 95, $CaCO_3$ 75

Properties	KEP570F	KEP5770
Heat Resistance (130℃ × 72hr)		
ΔTb (%)	-5	7
ΔEb (%)	-43	-37
ΔHs (point)	10	8
Compression Set (180℃×10min-press cure)		
130℃×72hr, 25% defl.	61	60
Extrusion Properties		
Extrusion rate (g/min)	138	136
Extrusion Speed (m/min)	2.5	2.3
Die swelling (%)	21	16
Dispersion (Strip No.)	15	14

【Extrusion Condition】

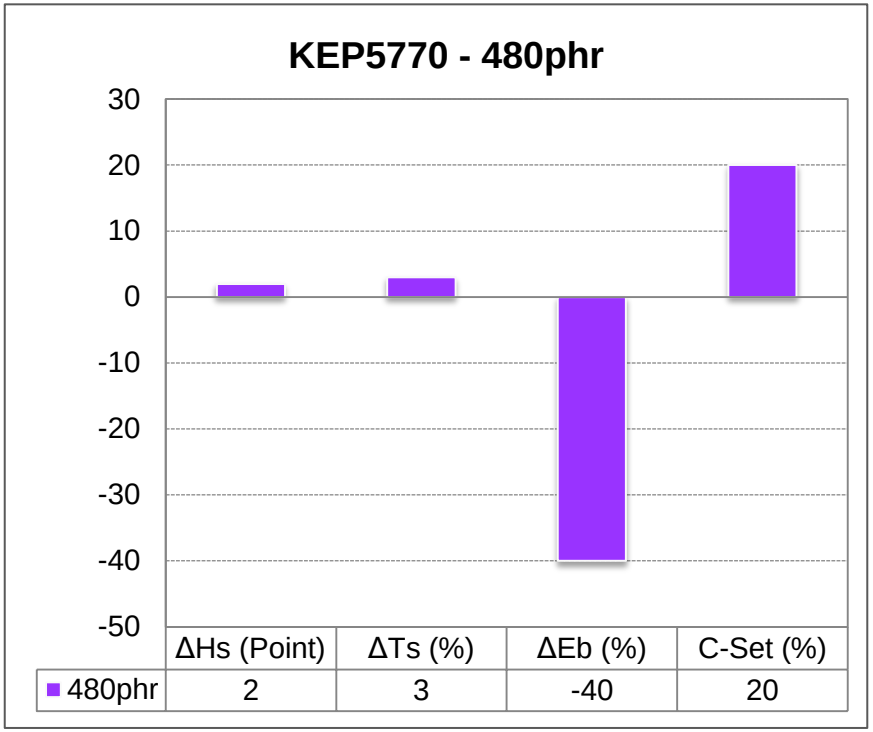
-. Head 80℃ / Cylinder 1 60℃ / Cylinder 2 70℃ / Screw 50℃

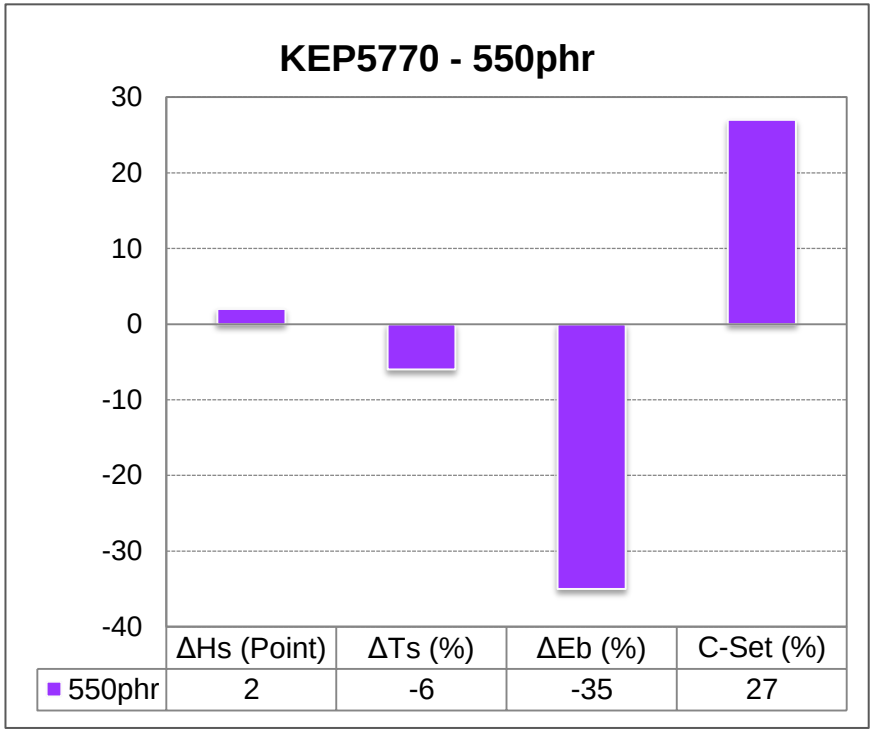
-. Extruder RPM : 55

8. KEP5770 Application Compound

Properties	KEP5770	
	480phr	550phr
Compound Mooney Viscosity		
ML1+4, 100℃	43.6	65.0
Mooney Scorch (ML1-125℃)		
Vm	38.2	51.8
t5 (m.s)	4.34	4.45
t35 (m.s)	6.42	6.40
MDR (180℃×10min-1arc)		
ML (dNm)	1.8	3.0
MH (dNm)	20.7	19.0
ts2 (m.m)	0.41	0.44
T10 (m.m)	0.39	0.41
T90 (m.m)	1.97	2.06
Physical Properties MDR (180℃×10min – Press cure)		
100% Modulus (kgf/cm^2)	35	57
Tensile Strength (kgf/cm^2)	110	93
Elongation (%)	329	197
Hardness (Shore-A)	76	77

[Heat Resistance Test]





※ **Test Condition : 100℃ × 72hrs**

【Recipe-480phr】 Polymer 100, Zinc Oxide 8, Stearic Acid 2, PEG4000 2, FEF 168, Paraffinic Oil 106, $CaCO_3$ 92

【Recipe-550phr】 Polymer 100, Zinc Oxide 8, Stearic Acid 2, PEG4000 2, FEF 240, Paraffinic Oil 142, $CaCO_3$ 60