

APPENDIX

**A. THEORETICAL MASS DENSITY (TMD) RESULTS FOR
ASPHALT RUBBER BINDER**

ASPHALT RUBBER BINDER										Average
Picn.	MP	MP+MM	MM	MP+MM+H2O	°T TEST	dW / 0,9970	MP+H2O	H	TMD o MVA	2,355
	[g]	[g]	[g]	[g]	[°C]		[g]	[g]	[g/cm3]	
5	889	1484,4	595	2563,5	26,9	0,999494914	2222,851293	0	2,337	
Picn.	MP	MP+MM	MM	MP+MM+H2O	°T TEST	dW / 0,9970	MP+H2O	H	TMD o MVA	
	[g]	[g]	[g]	[g]	[°C]		[g]	[g]	[g/cm3]	
8	974	1565,2	592	2632	27,1	0,999439793	2292,505775	0	2,345	
Picn.	MP	MP+MM	MM	MP+MM+H2O	°T TEST	dW / 0,9970	MP+H2O	H	TMD o MVA	
	[g]	[g]	[g]	[g]	[°C]		[g]	[g]	[g/cm3]	
5	889	1523,2	634	2587,8	26,4	0,99963113	2223,024848	0	2,354	
Picn.	MP	MP+MM	MM	MP+MM+H2O	°T TEST	dW / 0,9970	MP+H2O	H	TMD o MVA	
	[g]	[g]	[g]	[g]	[°C]		[g]	[g]	[g/cm3]	
8	974	1577,6	604	2643,7	26	0,999738453	2292,918	0	2,385	

**B. GEOMETRICAL VOID PERCENTAGE VALUES FOR
ASPHALT SLABS**

Slab 1		
<i>Height at:</i>	Side 1 (mm)	Side 3 (mm)
5 cm	49,65	49,33
15 cm	50,78	50,68
25 cm	52,45	51,13
35 cm	53,01	51,80
45 cm	52,18	51,32
<i>Height at:</i>	Side 2 (mm)	Side 4 (mm)
3 cm	49,63	51,64
9 cm	49,58	51,23
15 cm	48,73	50,79
Average (mm)	50,87	
Weight 1 (g)	9936,4	9936,4
Weight 2 (g)	9936,4	
	mm³	cm³
Volume	4578356,25	4578,35625
TMD	2,355	
Density (g/cm³)	2,170	
% real voids	7,84	
Initial mass (g)	10050,000	
Mass loss (g)	113,600	

Slab 2		
<i>Height at:</i>	Side 1 (mm)	Side 3 (mm)
5 cm	51,87	50,80
15 cm	51,06	50,37
25 cm	50,97	49,51
35 cm	51,23	51,29
45 cm	50,95	50,77
<i>Height at:</i>	Side 2 (mm)	Side 4 (mm)
3 cm	50,69	49,30
9 cm	49,78	50,62
15 cm	49,09	49,70
Average (mm)	50,50	
Weight 1 (g)	9780	9780
Weight 2 (g)	9780	
	mm³	cm³
Volume	4545000	4545
TMD	2,355	
Density (g/cm³)	2,152	
% real voids	8,63	
Initial mass (g)	10050,000	
Mass loss (g)	270,000	

Slab 3		
Height at:	Side 1 (mm)	Side 3 (mm)
5 cm	50,62	49,22
15 cm	50,97	48,90
25 cm	51,08	48,99
35 cm	52,07	50,26
45 cm	52,17	51,36
Height at:	Side 2 (mm)	Side 4 (mm)
3 cm	51,45	50,30
9 cm	51,65	49,15
15 cm	51,59	51,16
Average (mm)	50,68	
Weight 1 (g)	9860,9	9860,9
Weight 2 (g)	9860,9	
	mm³	cm³
Volume	4561537,5	4561,5375
TMD	2,355	
Density (g/cm³)	2,162	
% real voids	8,21	
Initial mass (g)	10050,000	
Mass loss (g)	189,100	

Slab 4		
Height at:	Side 1 (mm)	Side 3 (mm)
5 cm	49,22	50,46
15 cm	50,94	52,20
25 cm	49,50	52,18
35 cm	51,21	52,15
45 cm	51,78	51,34
Height at:	Side 2 (mm)	Side 4 (mm)
3 cm	51,70	49,76
9 cm	51,31	49,58
15 cm	50,48	48,86
Average (mm)	50,79	
Weight 1 (g)	9847,8	9847,8
Weight 2 (g)	9847,8	
	mm³	cm³
Volume	4571268,75	4571,26875
TMD	2,355	
Density (g/cm³)	2,154	
% vuoti real.	8,52	
Initial mass (g)	10050,000	
Mass loss (g)	202,200	

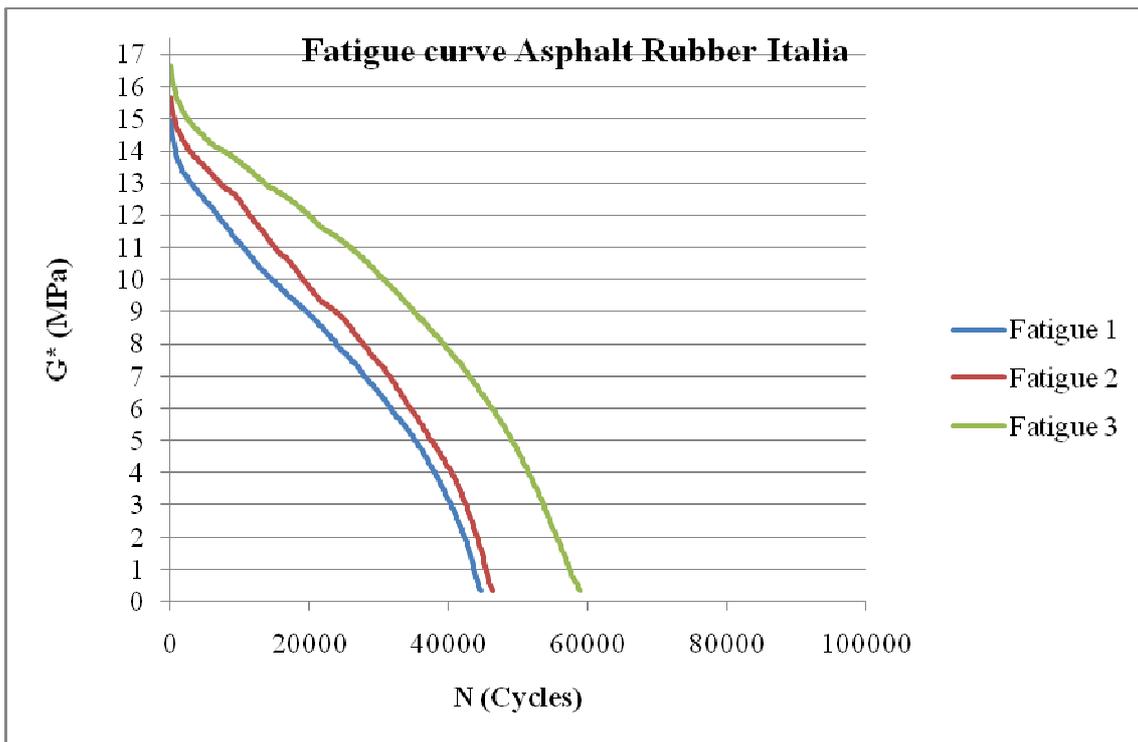
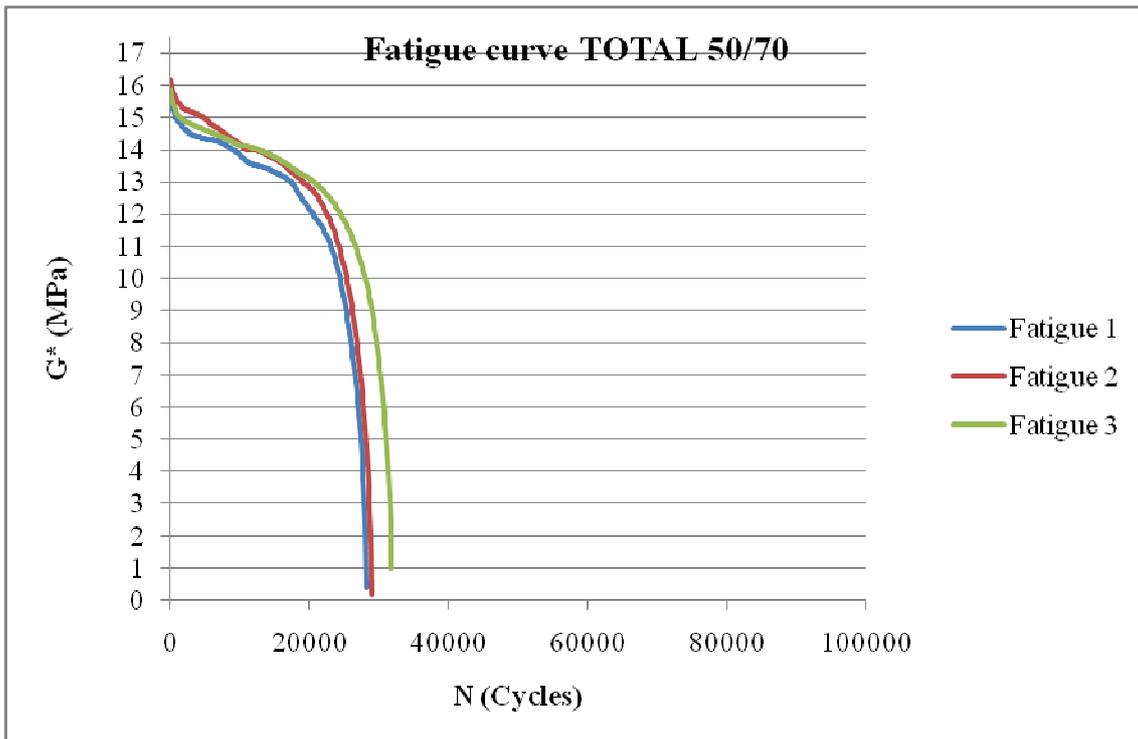
C. DSR FATIGUE TESTING RESULTS

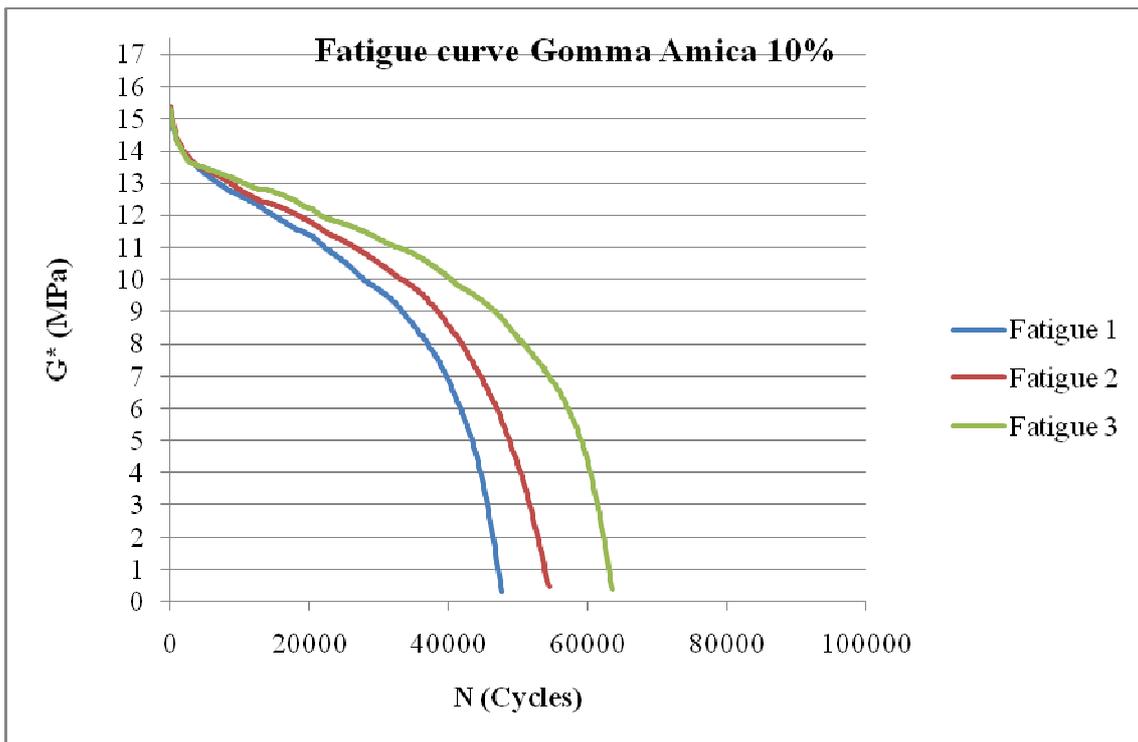
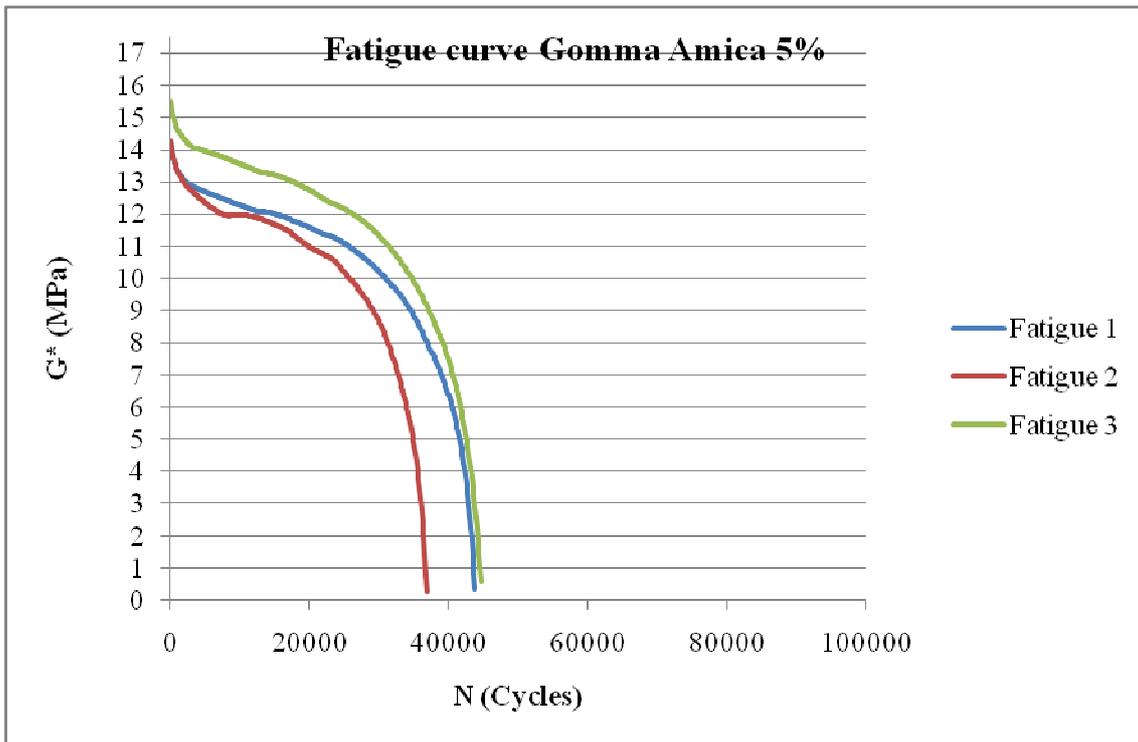
		Rubber	Temperature	G*	Strain	Np	Np20	Nt	N der max	N50%	RCPA	RCPA
		%	°C	Mpa	%	Der max					(Np)	(Np20)
Asphalt Rubber	AR 1		10,5	14,92	1,9554	19.079,63	15.900	26.850	33.000	26.250	0,422	0,518
	AR 2		10,5	15,66	1,8623	19.686,95	17.250	30.300	31.800	28.350	0,381	0,458
	AR 3		10,5	16,66	1,7773	25.615,29	26.400	36.600	41.550	37.950	0,384	0,365
TOTAL 50/70	50/70 1		15,5	15,65	1,8895	18.489,30	23.100	22.500	22.950	26.100	0,194	-0,007
	50/70 2		15,5	16,17	1,8278	19.033,03	23.700	23.100	23.400	26.850	0,187	-0,013
	50/70 3		15,5	15,84	1,8659	21.059,28	26.250	25.500	25.950	29.700	0,188	-0,012
Gomma Amica 5	GA5 1	5	16	14,23	2,0796	26.276,75	32.550	33.450	33.900	38.850	0,225	0,040
	GA5 2	5	16	14,27	2,0741	22.354,24	27.750	28.200	29.400	32.700	0,240	0,056
	GA5 3	5	16	15,49	1,9094	26.571,85	33.000	33.300	34.350	39.600	0,226	0,039
Gomma Amica 10	GA 10 1	10	14,5	15,22	1,9454	25.101,63	27.300	33.600	36.600	38.250	0,314	0,254
	GA 10 2	10	14,5	15,39	1,9239	28.286,57	32.550	36.900	39.150	42.750	0,277	0,169
	GA 10 3	10	14,5	15,3	1,9347	34.123,06	39.450	46.200	47.100	52.350	0,276	0,162
Gomma Amica 15	GA 15 1	15	13,5	14,3	2,0427	11.242,91	9.300	16.650	18.450	16.200	0,391	0,496
	GA 15 2	15	13,5	14,4	2,0287	9.039,84	8.250	13.650	15.150	13.650	0,403	0,455
	GA 15 3	15	13,5	16,35	1,7845	27.744,56	26.100	40.950	42.000	42.900	0,339	0,379

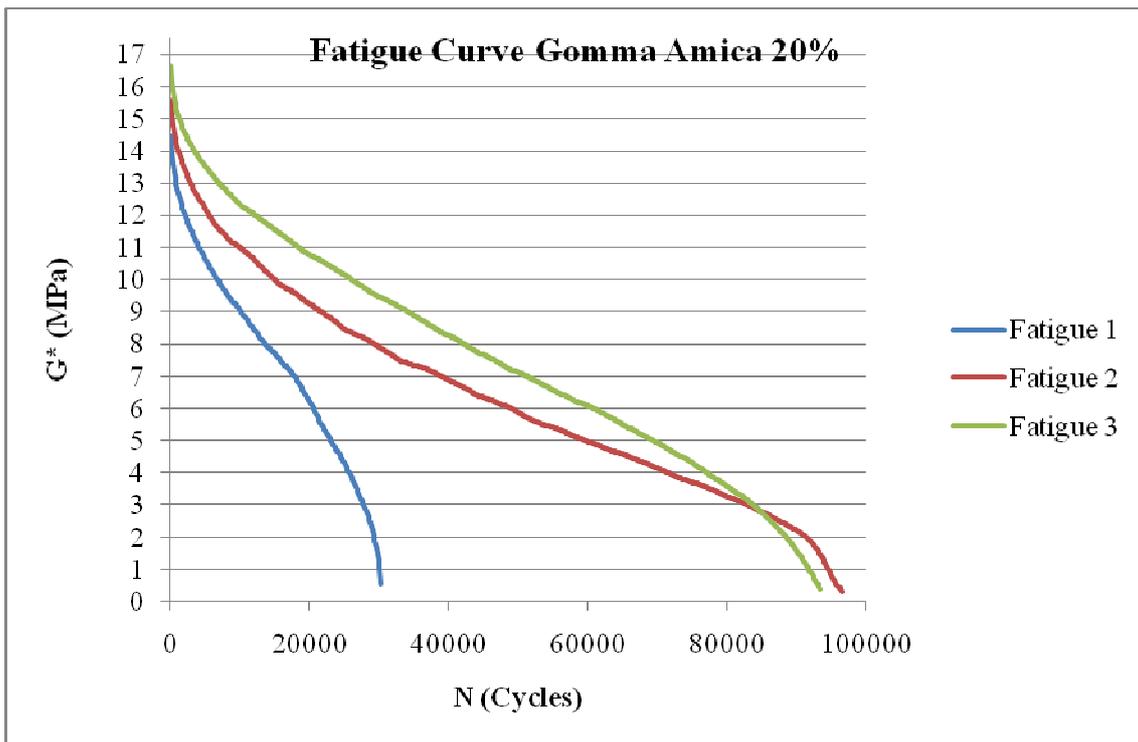
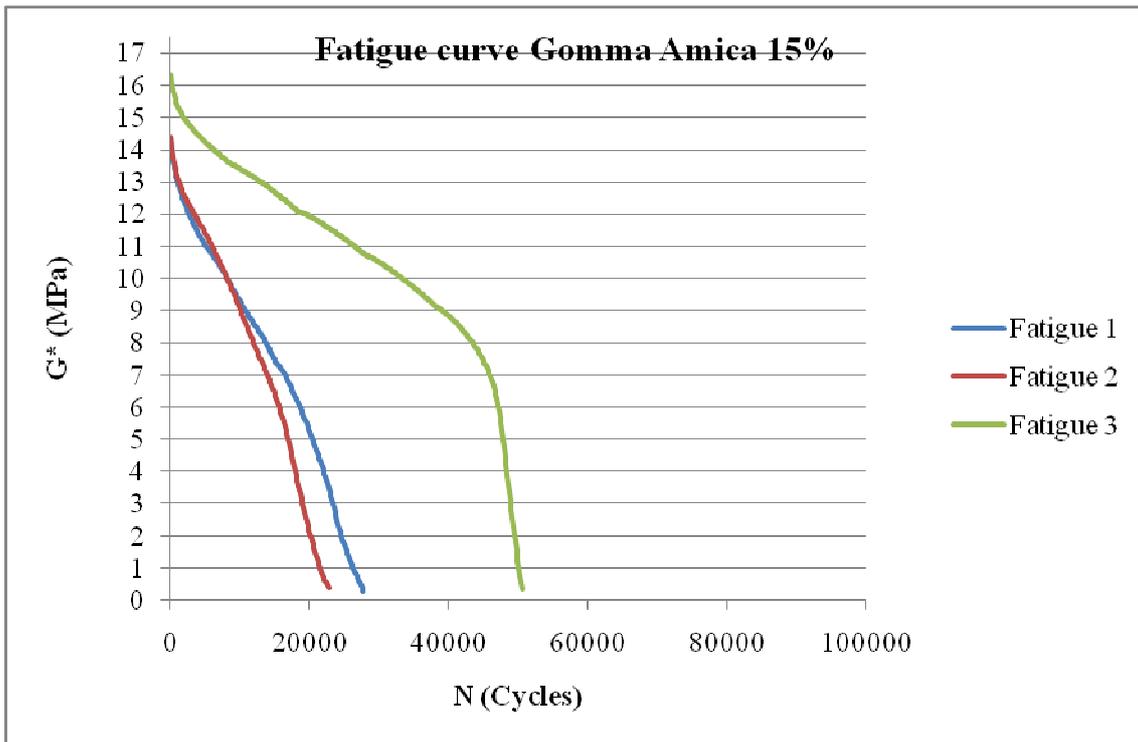
		Rubber	Temperature	G*	Strain	Np	Np20	Nt	N der max	N50%	RCPA	RCPA
		%	°C	Mpa	%	Der max					(Np)	(Np20)
Gomma Amica 20	GA 20 1	20	12	14,46	2,0239	12.880,98	8.700	18.600	20.400	16.950	0,369	0,574
	GA 20 2	20	12	15,59	1,8746	38.821,01	15.750	60.450	76.050	30.900	0,490	0,793
	GA 20 3	20	12	16,64	1,7554	37.628,21	22.800	60.600	70.050	39.450	0,463	0,675
Graneco 5	GR5 1	5	16	15,28	1,9366	25.150,25	31.350	31.500	31.800	37.050	0,209	0,014
	GR5 2	5	16	14,25	2,0763	23.679,43	29.400	29.400	29.400	34.650	0,195	0,000
	GR5 3	5	16	14,67	2,0176	24.686,79	30.300	31.650	32.550	35.850	0,242	0,069
Graneco 10	GR10 1	10	15	15,55	1,9035	23.399,79	26.700	31.200	33.300	35.550	0,297	0,198
	GR10 2	10	15	16,9	1,7514	40.549,59	46.050	55.800	61.200	63.000	0,337	0,248
	GR10 3	10	15	15,49	1,9111	26.598,48	31.800	35.100	36.150	40.950	0,264	0,120
Graneco 15	GR 15 1	15	15,5	15,22	1,9176	21.378,21	16.650	31.800	39.600	28.350	0,460	0,580
	GR 15 2	15	15,5	15,78	1,8497	16.719,58	13.200	25.950	30.450	22.350	0,451	0,567
	GR 15 3	15	15,5	11,84	2,4733	9.711,28	6.450	14.700	18.750	11.400	0,482	0,656
	GR 15 4	15	15,5	12,98	2,2539	12.068,82	8.400	19.350	21.450	14.400	0,437	0,608
Graneco 20	GR 20 1	20	13	14,12	2,193	17.478,77	7.950	26.700	33.000	16.500	0,470	0,759
	GR 20 2	20	13	14,55	2,0111	13.186,23	7.200	20.550	22.800	15.150	0,422	0,684
	GR 20 3	20	13	14,83	1,9716	13.958,13	8.850	21.450	25.950	16.950	0,462	0,659

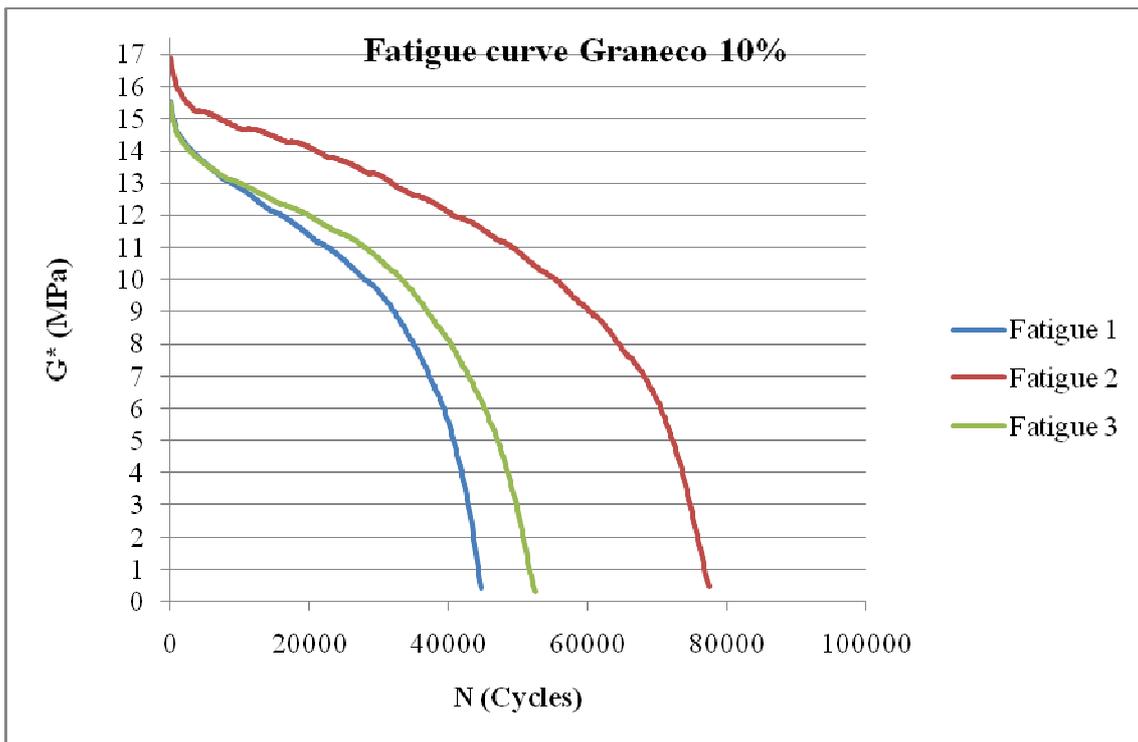
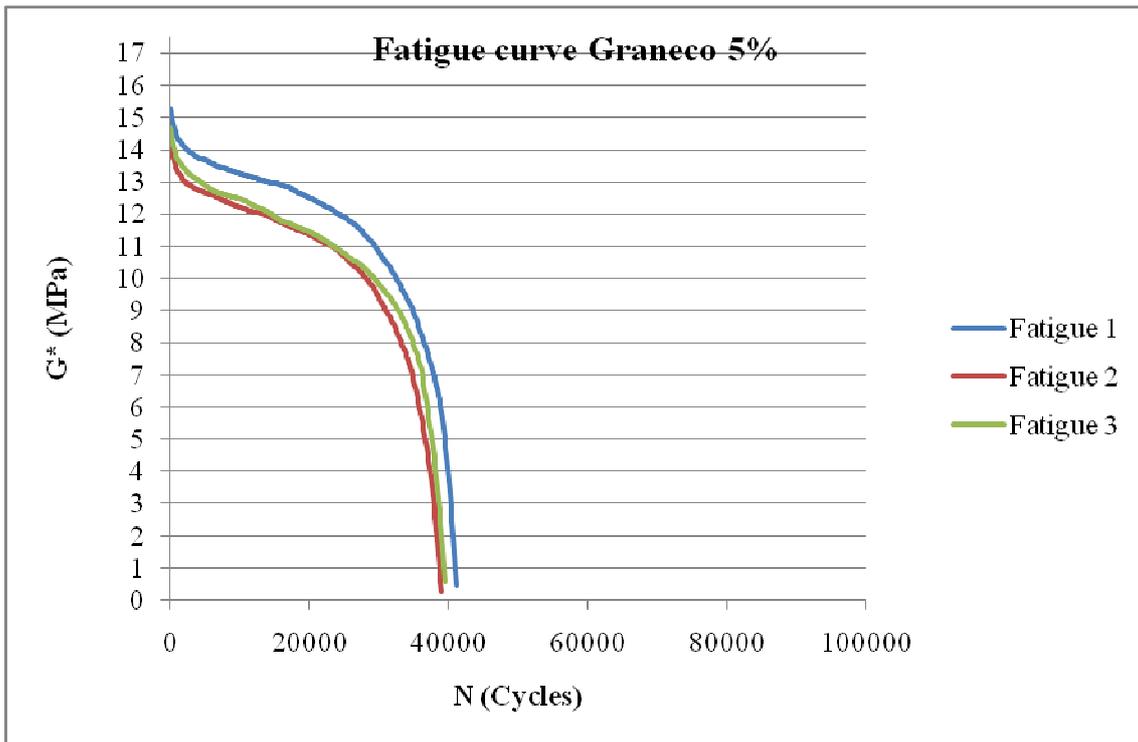
		Rubber	Temperature	G*	Strain	Np	Np20	Nt	N der max	N50%	RCPA	RCPA
		%	°C	Mpa	%	Der max					(Np)	(Np20)
Tritogom 5	TR5 1	5	16	15,37	1,9252	31.291,57	38.550	40.200	40.650	46.050	0,230	0,052
	TR5 2	5	16	15,97	1,8528	42.803,12	53.400	53.250	53.250	62.400	0,196	-0,003
	TR5 3	5	16	15,66	1,8894	30.351,68	37.500	39.000	39.900	45.150	0,239	0,060
Tritogom 10	TR10 1	10	14,5	15,36	2,0008	33.184,75	37.500	46.050	47.700	50.400	0,304	0,214
	TR10 2	10	14,5	14,71	1,9821	23.041,94	27.750	30.450	31.950	34.950	0,279	0,131
	TR10 3	10	14,5	16,54	1,7896	33.999,40	39.450	46.200	47.550	52.200	0,285	0,170
Tritogom 15	TR 15 1	15	15,5	15,16	1,9259	19.831,45	14.250	31.650	37.800	24.900	0,475	0,623
	TR 15 2	15	15,5	15,77	1,8502	21.464,71	15.450	34.650	39.600	26.700	0,458	0,610
	TR 15 3	15	15,5	14,59	2,0021	17.548,68	13.500	27.450	30.600	22.650	0,427	0,559
Tritogom 20	TR20 1	20	13	14,09	2,0762	20.749,45	9.000	34.050	41.250	17.100	0,497	0,782
	TR20 2	20	13	14,67	1,9932	23.396,78	9.600	37.050	46.350	18.300	0,495	0,793
	TR20 3	20	13	15,1	1,9362	37.196,67	13.950	60.750	73.950	25.500	0,497	0,811

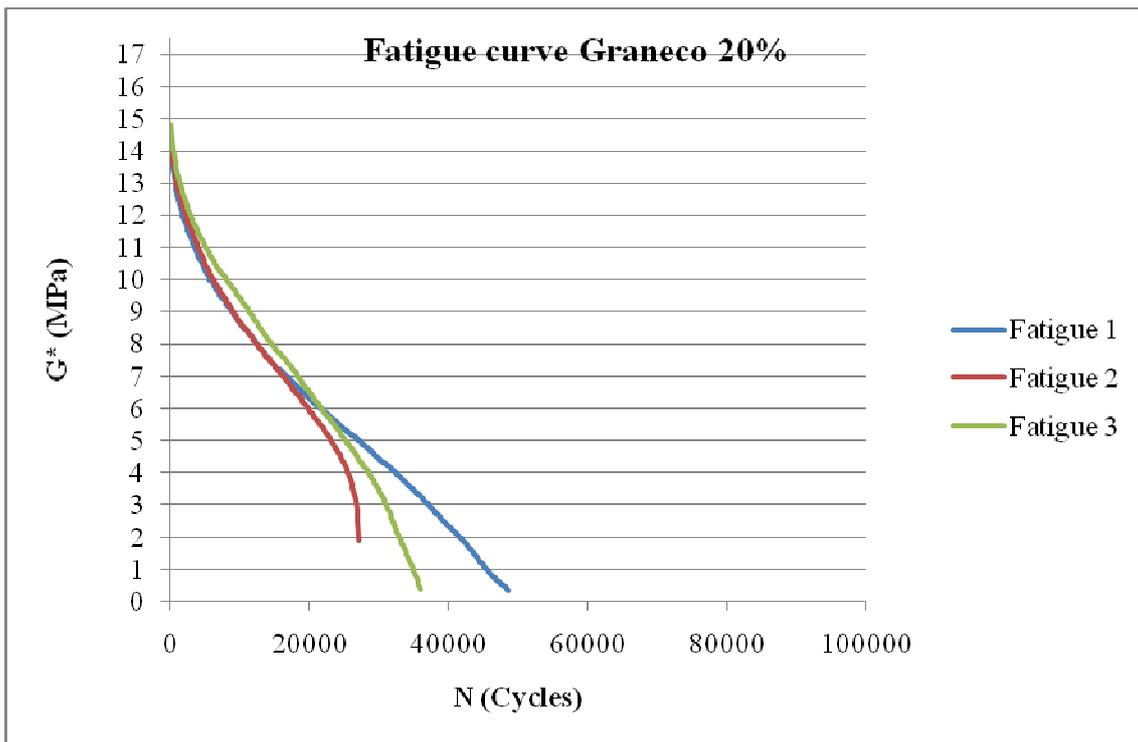
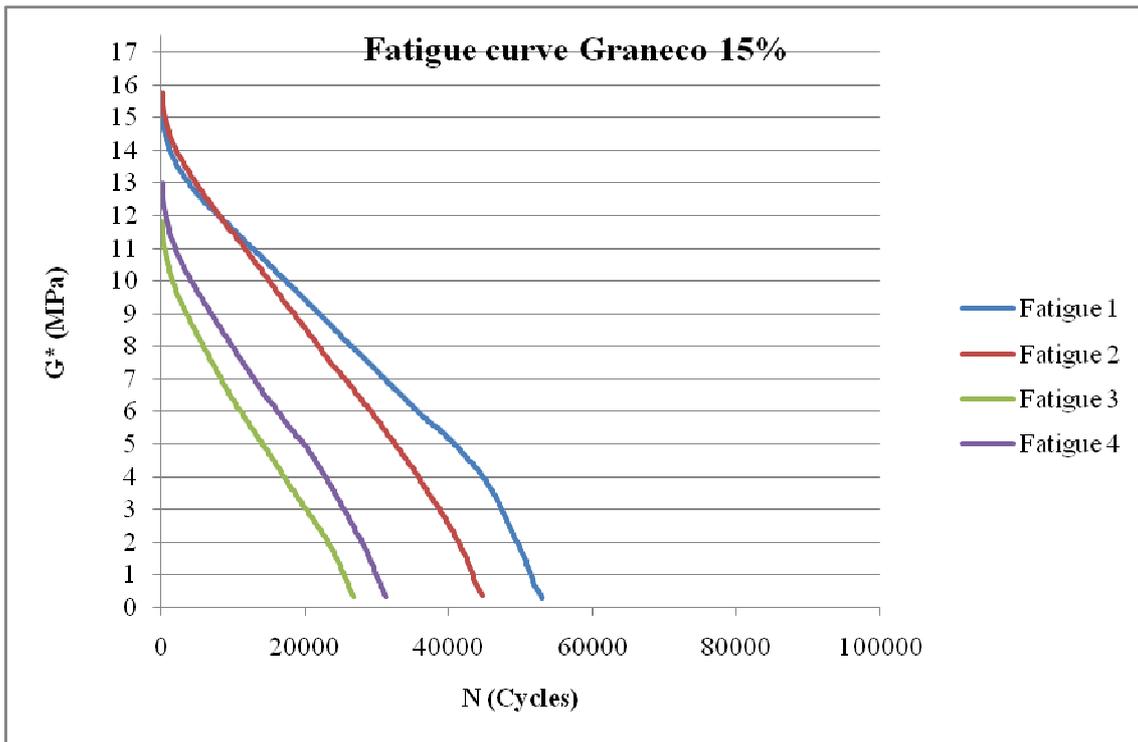
D. FATIGUE CURVES FROM THE DSR TESTING

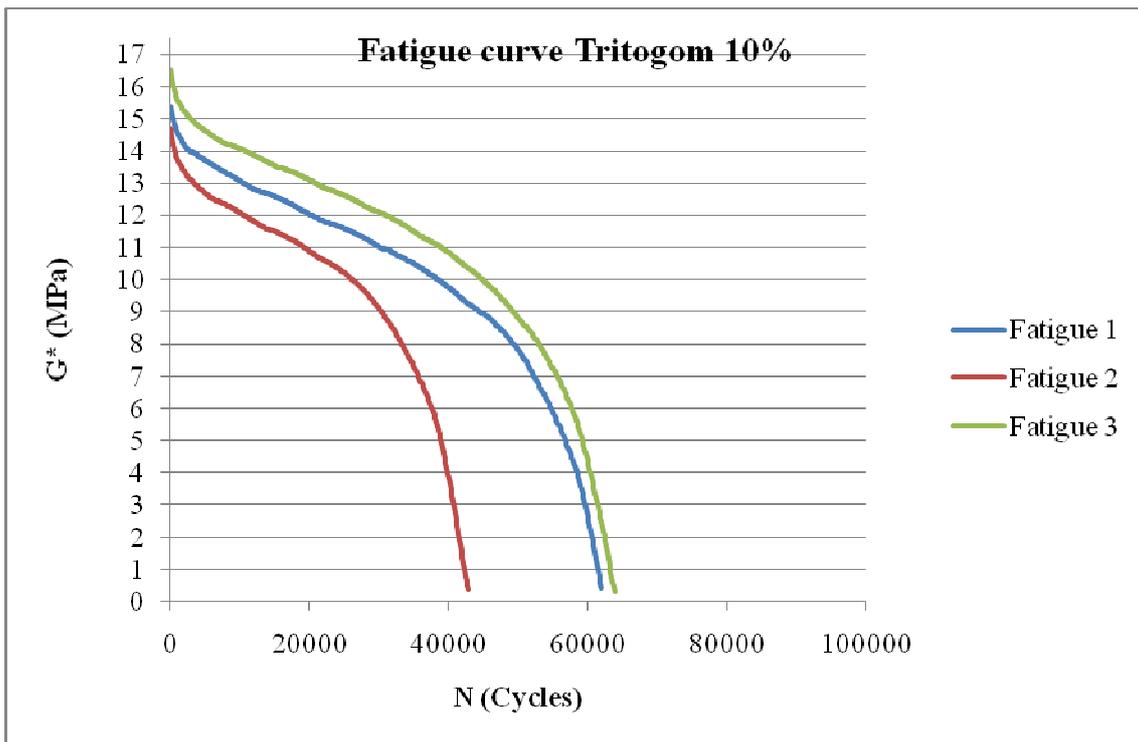
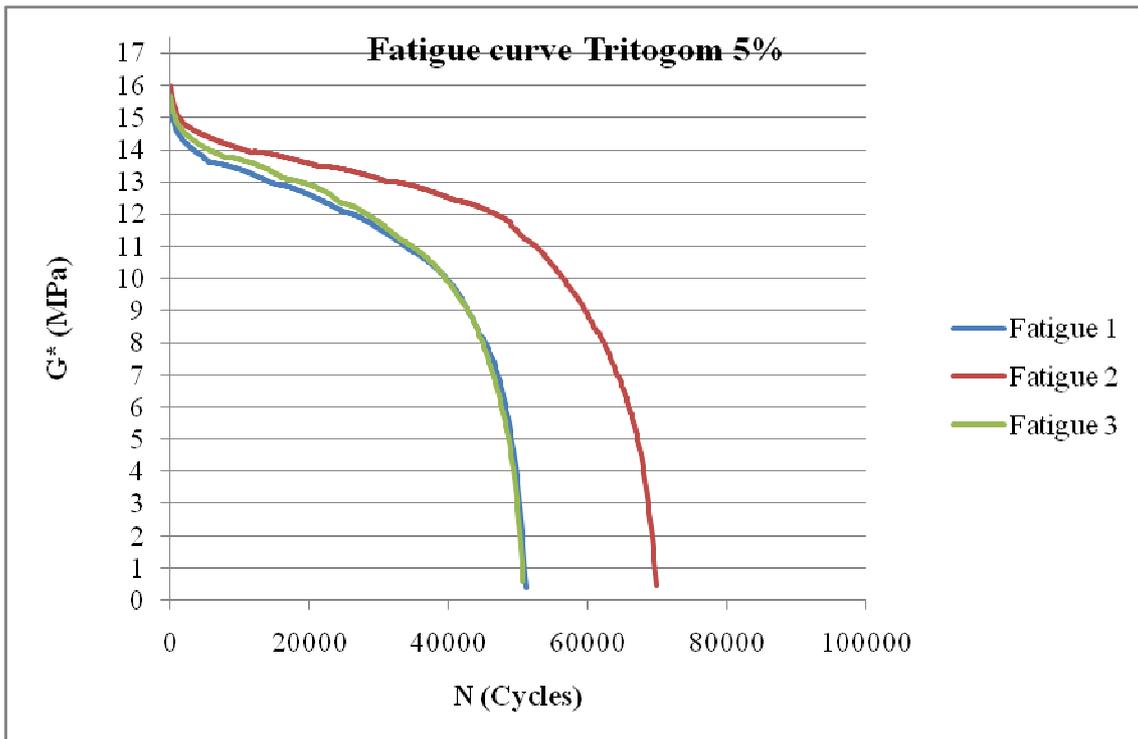


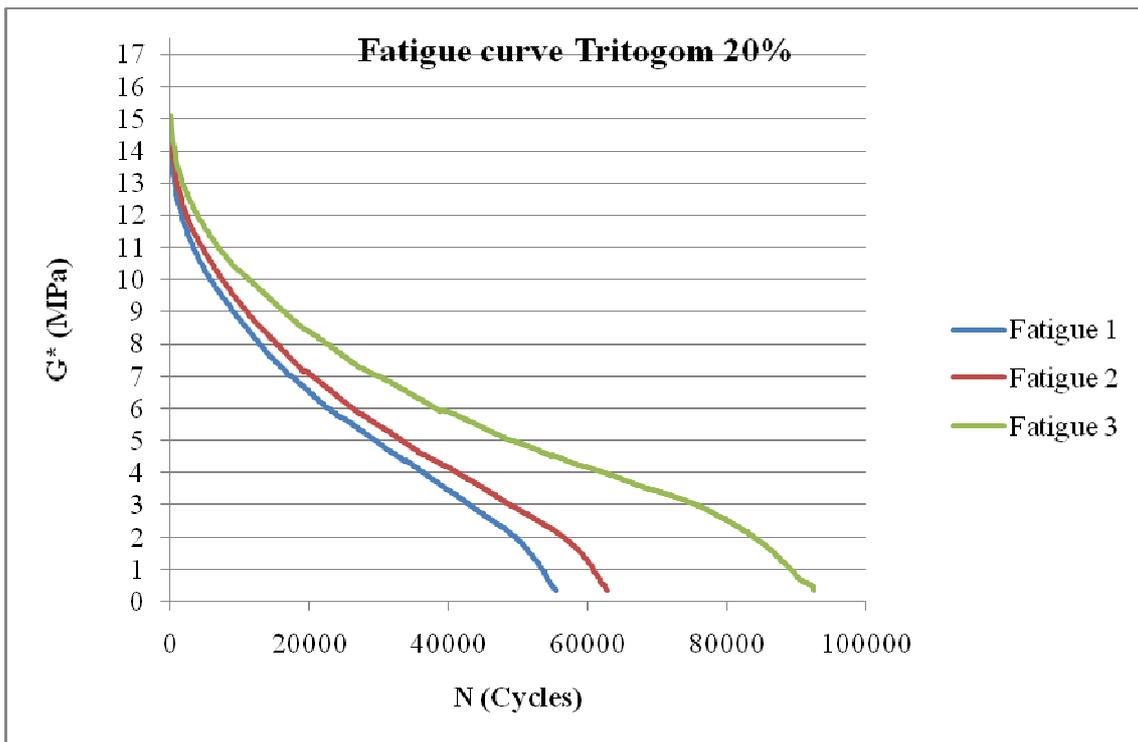
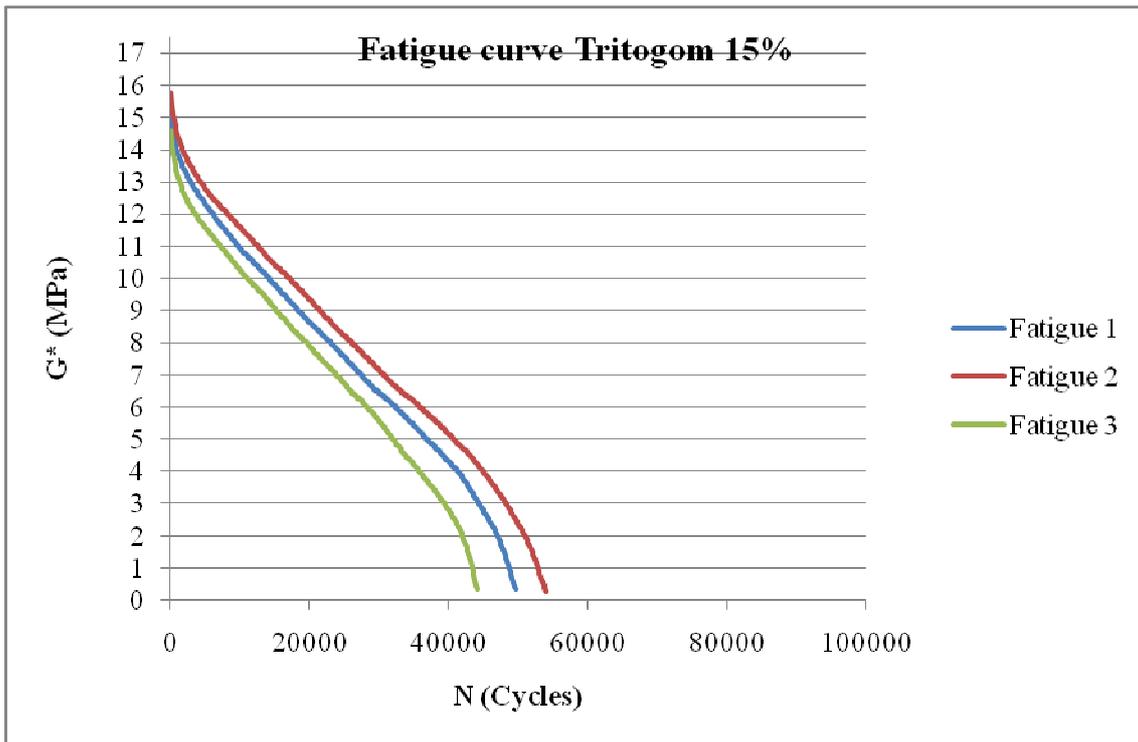




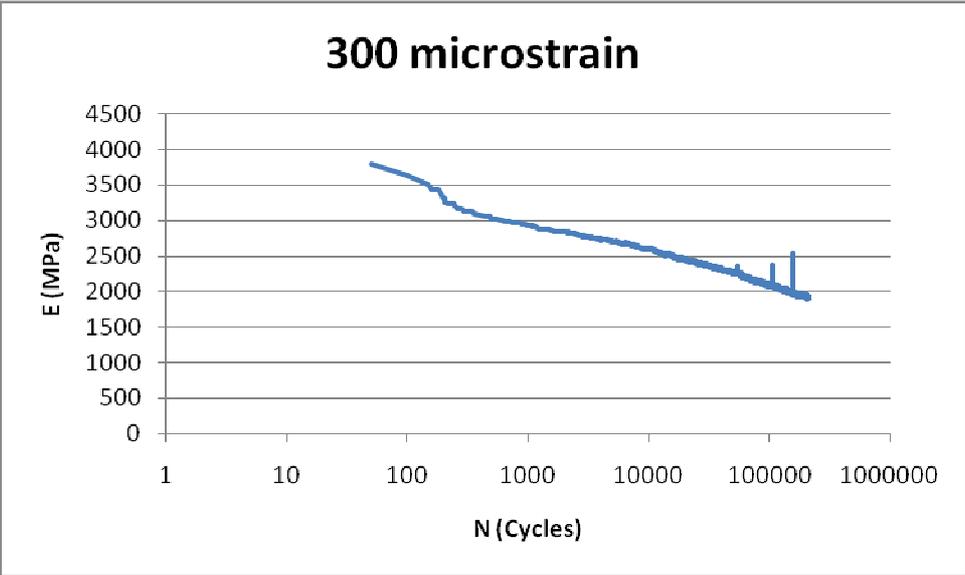
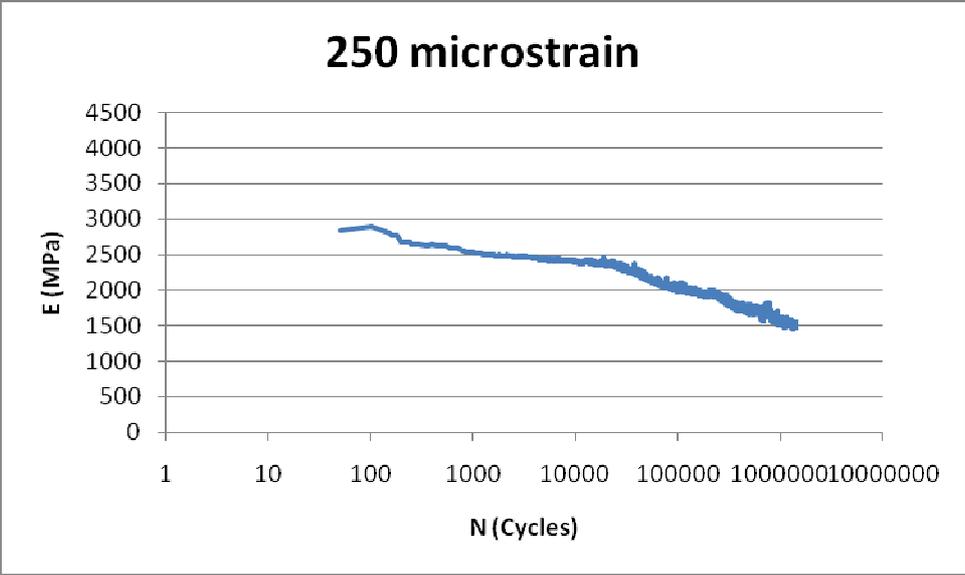


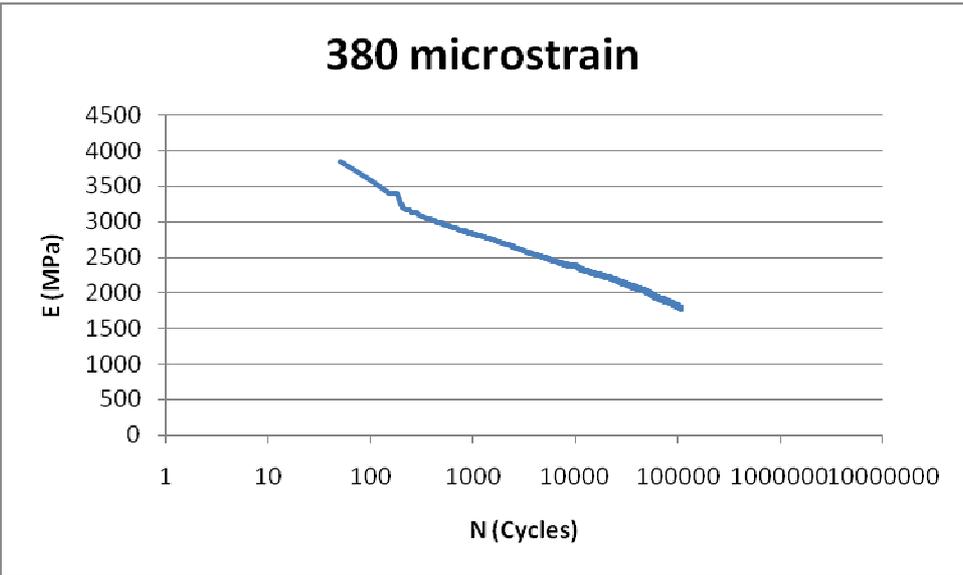
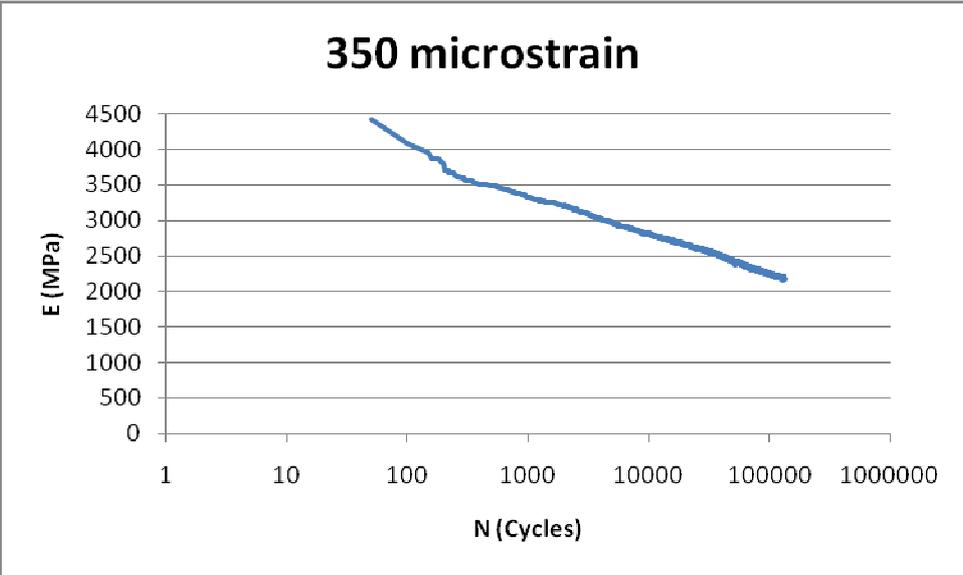






**E. FATIGUE CURVES OBTAIN FROM THE FOUR-POINT
BENDING FATIGUE TESTS WITH CONTROLLED
DEFORMATION**





400 microstrain

