

Main component(s)	Curing agent(s)	Young's modulus [MPa]	Tensile strength [MPa]	Elongation at break [%]	Reagent ratios / notes	Comments / methodological notes	Ref.
GAP	CA1	5.36 0.65	2.53 0.33	47.6 81.6	N3/alkyne 2:1 N3/alkyne 3:1	10mm wide strips, tensile rate 50mm/min, CMT6503 universal testing machine (SANS, Shenzhen, China)	17
GAP	CA2	174.1 9.1	13.1 4.5	~28 81.7	CA2/GAP 5:1 CA2/GAP 3:1	10mm wide strips, tensile rate 50mm/min, CMT6503 universal testing machine (SANS, Shenzhen, China)	18
GAP	CA3	0.07 0.16 0.25 - 0.53 0.72 4.17	0.08 0.11 0.12 0.18 0.19 0.20 1.04	147 73.2 48.3 47.78 38.5 27 28.11	GAP/CA3 0,9:1 GAP/CA3 1:1 GAP/CA3 1,1:1 GAP/CA3 1,2:1 GAP/CA3 1,3:1 GAP/CA3 1,4:1 GAP/CA3 2,5:1	Universal testing machine (UTM) model: Hounsfield, H25KS, UK [dumbbell shaped test specimens, at ambient temperature (27 8C) and rate of testing 50 mm/min	19
GAP	CI2 CA3 2-nitroderivative of CA3	0.21 8.22 5.72	0.25 3.58 1.83	148.47 47.78 35.84	not given not given not given	Universal Testing Machine((Hounsfield, H25KS)	20
GAP	CA4	1.52 3.60	0.21 0.41	47.6 25.4	alkyne / azide 1,2:1 alkyne / azide 2:1	INSTRON 6022 universal testing machine with a cross-head speed of 20 mm/min and a mean value of four replicates was taken	22
pAMMO		0.89 2.56	0.41 0.67	66.4 37	alkyne / azide 1,2:1 alkyne / azide 2:1		
Acyl-GAP		-	-	-	-		
Acyl-GAP	CA2	-	2.69	86	10% CA2	Dumbbell shape samples, universal testing machine Instron-6022, Shimadzu Co., Ltd., constant rate of 100 mm/min and mean values of five samples were taken	125
		-	1.28	464	Acyl-GAP+CA2/HTPB+CI1 0:1		
		-	2.69	86	Acyl-GAP+CA2/HTPB+CI1 1:0		
		-	5.26	318	Acyl-GAP+CA2/HTPB+CI1 1:1		
MWCNT-HTPB + MWCNT-Acyl-GAP	CI1, CI2	-	8.17	312	NCO/OH=0,8; 50% Acyl-GAP	Instron-6022, Shimadzu Co., Ltd, dumbbell-shape specimens, constant rate of 100 mm/min, based on ASTM D638	24
HTPB+GAP		-	5.89	359	NCO/OH=1; 50% GAP		25
GAP	CA9	3.23	0.80	28.3	Azide / alkyne 1:2,5	CMT6503 universal testing machine (SANS, Shenzhen, China) at a speed of 50 mm/min. Five samples were tested for each composite and the average value was presented graphically	26
	CA10	7.44	1.77	36.3	Azide / alkyne 1:2,5 + 1% MWCNT		
	CA11	6.33	1.41	19.7	Azide / alkyne 1:2,5 + 1% MWCNT-COOH		
GAP	dual isocyanate/CA6	1.68	-	-	NCO/OH 1,1:1; GAP / dipolarophile 100:1 (w/w)	Dumbbell-shaped specimens (measuring 68.58x8.7x12.6 for the composite propellants) were determined using a universal testing machine (Model 5567, 1597 * 909 * 700 mm, Instron) at a crosshead rate of 50 mm/min at room temperature	27
		3.29	-	-	NCO/OH 1,1:1; GAP / dipolarophile 100:1.5 (w/w)		
		4.69	-	-	NCO/OH 1,1:1; GAP / dipolarophile 100:2 (w/w)		
		7.64	-	-	NCO/OH 1,1:1; GAP / dipolarophile 100:5 (w/w)		
	dual isocyanate/CA5	3.07	-	-	NCO/OH 1,1:1; GAP / dipolarophile 100:1.5 (w/w)		
		5.42	-	-	NCO/OH 1,1:1; GAP / dipolarophile 100:2 (w/w)		
		7.6	-	-	NCO/OH 1,1:1; GAP / dipolarophile 100:5 (w/w)		
GAP	CI2	0.18 0.47 1.09	0.26 0.5 0.7	161 122 69	NCO/OH 1:0,8 NCO/OH 1:1 NCO/OH 1:1,2	810 MTS (Material Testing System), using microtensile specimens prepared according to ASTM D1708. All tensile testing was conducted at room temperature, using a crosshead speed of 50 mm/min	28
		0.082	0.23	285	NCO/OH 1:1		
		0.315	0.52	192	NCO/OH 1:1,2		
	CI1, CI2 (1:1)	0.6	0.76	147	NCO/OH 1:1,4		
		0.55	0.34	68	CA3/GAP: 1:1		
	CA3	1.24	0.57	48	CA3/GAP: 1,3:1		
		0.71	0.6	95	CA3/GAP: 0,5:1; NCO/OH 1:1		
	CA3, CI1	1.28	0.85	72	CA3/GAP: 0,7:1; NCO/OH 1:1		
		0.57	0.79	157	CA7/GAP: 0,5:1; NCO/OH 1:1		
	CA7, CI1	1.11	1.2	117	CA7/GAP: 0,7:1; NCO/OH 1:1		
		1.48	0.26	45.6	Blank sample		
		1.86	0.29	37.9	BA1 0,1%		
GAP/AI/NH4CIO4/HMX/BuNENA	-	2.17	0.35	36.7	BA1 0,2%	Dumbbell specimens, Instron-6022, Shimadzu Co., Ltd.), crosshead speed of 100 mm/min, room temperature. Five specimens were tested for each sample	36
		2.26	0.36	33.1	BA1 0,3%		
		1.57	0.3	35.2	BA2 0,1%		
		1.59	0.36	33.8	BA2 0,2%		
		1.8	0.41	32.7	BA2 0,3%		
		1.85	0.32	45.2	BA3 0,1%		
		2.07	0.39	44.2	BA3 0,2%		
		2.1	0.39	43.1	BA3 0,3%		
		-	-	-	-		
		-	-	-	-		
GAP	toluene diisocyanate	-	1.6	1041	R = NCO/OH, R=1,6	Instron 26022 Universal testing machine in accordance with GB/T528-1998	37
FGAP	CI2	-	1.5	81.6	NCO/OH = 1	AG-X Plus testing machine (Shimadzu, Japan), with a tensile rate of 50 mm/min. The test films were cut into dumbbell-shaped samples with a width of 20mm and the distance between testing marks was 30 mm. The test strips were kept at 0% humidity for 7 days before measurement. A mean value of five replicates from each film was taken.	47
GAP		-	0.66	51.1			
GAP	CI1	-	2.4	101	NCO/OH = 1	Shimadzu AG-X Plus universal testing machine (Shimadzu, Japan) with a tensile rate of 50 mm/min. The copolyurethane networks were cut into dumbbell-shaped specimens (dimensions: 35 mm x 6 mm x 2 mm) and kept at 0% humidity for 7 days before measurement. A mean value of five replicates from each film was taken	50
FGAP		-	5.52	162.8			
ETPE+NC	-	-	7.5	490	NC 0%	Instron 6022 (Shimadzu Co. Ltd, Japan), constant strain rate of 100mm/min, room temperature. The dimensions of the dumb-bell samples were 20mm (neck area length) × 4mm (width) × 2mm (thickness). The reported values were calculated as average values from five specimens of each sample	52
		-	8.9	485.6	NC 10%		
		-	7.8	110.5	NC 20%		
		-	8.7	96.8	NC 30%		
		-	13.3	45.1	NC 40%		
PBAMO/GAP	toluene diisocyanate + 1,4-butanediol	-	2.55	217	TDI+BDO = 30%	Instron-6022 (Shimadzu Co., Ltd.), strain rate of 100 mm/min, 25 °C.The dimensions of the samples were 20 mm (neck area length) 9 4 mm (width) 9 2 mm (thickness). We usually take 5 samples and use the method of averaging the results	53
		-	-	-	-		
		-	-	-	-		
		-	-	-	-		
		-	-	-	-		
GAP/P(EO-co-THF)	CI1, CI2 NCO/OH = 1,2:1	-	0.662	212.4	Flexible polyether: 0 %(w/w)	Dumbbell specimens, tensile testing machine [AGS-X, Shimadzu Co., Ltd. (Kyoto, Japan)], crosshead speed of 100mm/min, at 25 and -40°C. Five specimens were tested for each sample to obtain average values. Samples were measured after conditioning the specimen at a given temperature for a minimum duration of 4h	54
		-	0.694	237.4	Flexible polyether: 5 %(w/w)		
		-	0.824	279.6	Flexible polyether: 10 %(w/w)		
		-	0.857	280.7	Flexible polyether: 15 %(w/w)		
		-	0.933	284.1	Flexible polyether: 20 %(w/w)		
		-	0.953	289.9	Flexible polyether: 25 %(w/w)		
		-	0.986	296.1	Flexible polyether: 30 %(w/w)		
GAP/PAO	CI1, CI2 NCO/OH = 1,2:1	-	0.662	212.4	Flexible polyether: 0 %(w/w)		
		-	0.753	256.7	Flexible polyether: 5 %(w/w)		
		-	0.885	260.4	Flexible polyether: 10 %(w/w)		
		-	1.633	271.4	Flexible polyether: 15 %(w/w)		
		-	1.917	276.1	Flexible polyether: 20 %(w/w)		
		-	2.528	330.1	Flexible polyether: 25 %(w/w)		
		-	3.512	435.4	Flexible polyether: 30 %(w/w)		
GAP-based PU	CI1	0.12	0.21	286	Alkyne/azide = 0/1; 2,27mmol CI1 for 1,62 mmol GAP	texture analyzer (TA-HD+1500, Stable Micro Systems Ltd.)	
DNPMP (n=1)/GAP-based PU		0.13 0.06	0.27 0.43	293 505	Alkyne/azide = 0.1/1 Alkyne/azide = 0.3/1		

		1.05	1.71	390	Alkyne/azide = 0.5/1	with a 50 kgf load cell, TA-51 needle jig, and software (Texture Expert, Stable Micro Systems Ltd.). The probe moving velocity was 0.8 mms $\phi$ 1 . The tensile test samples were cut from the cast film with the specification (DIN-53504, type (S2)). All tensile strengths, ultimate elongations and initial moduli reported were the averages of three measured values	70
DNPMB (n=2)/GAP-based PU	CI1	0.09	0.3	402	Alkyne/azide = 0.1/1		
		0.08	0.41	539	Alkyne/azide = 0.3/1		
		0.34	1.21	461	Alkyne/azide = 0.5/1		
PDNP (n=1)/GAP-based PU		0.1	0.32	425	Alkyne/azide = 0.1/1		
		0.15	0.55	638	Alkyne/azide = 0.3/1		
		6.06	2.9	687	Alkyne/azide = 0.5/1		
BDNP (n=2)/GAP-based PU		0.09	0.28	421	Alkyne/azide = 0.1/1		
		0.11	0.57	574	Alkyne/azide = 0.3/1		
		3.2	1.67	684	Alkyne/azide = 0.5/1		
GAP doped NC and NG propellants	-	-	44.97	7.314	30% GAP / NC	Instron-6022, Shimadzu Co., Ltd., China, constant rate of 100 mm/min, at room temperature	84
		-	44.93	7.311	30% GAP / NC		
		-	44.82	7.727	30% GAP / NC		
		-	37.71	37.4	40% GAP / NC		
		-	37.37	36.94	40% GAP / NC		
		-	38.42	36.57	40% GAP / NC		
		-	29.92	75.78	50% GAP / NC		
		-	30.16	74.37	50% GAP / NC		
		-	29.45	74.9	50% GAP / NC		
		-	31.38	35.11	40% GAP / NG		
		-	31.05	35.17	40% GAP / NG		
		-	31.61	35.29	40% GAP / NG		
GAP doped propellants	CI2	5.26	0.72	26.3	0% GAP / -40°C	Instron 4505 tensile tester. Cured propellants were cut into slices, from which JANNAF dog bones were stamped. The tests were carried out at temperatures of -40, 20 and 50 degrees Celsius with 100 mm/min cross-head speed	85
	CI3	7.18	1.18	30.2	10% GAP / -40°C		
	CI4	7.17	1.16	29.8	20% GAP / -40°C		
	CI5	3.02	0.41	34.9	0% GAP / +20°C		
	CI6	3.81	0.54	52.5	10% GAP / +20°C		
	CI7	3.71	0.55	52.1	20% GAP / +20°C		
	CI8	2.14	0.4	39.5	0% GAP / +50°C		
	CI9	2.23	0.5	52.4	10% GAP / +50°C		
	CI10	2.2	0.45	52.6	20% GAP / +50°C		
	GAP (21%) doped propellants	CI2	4.71	0.29	18.9		
4.53			0.26	14.7	Propellant 2		
2.25			0.22	24.4	Propellant 3		