Table S1. Thermal damage raw dataset.

Temp, ^{0}C	Feldspar content, %	Quartz content, %	Biotite content, %	Other minerals, %	Elastic modulus, GPa	Porosity, %	Density g/cm^3	UCS, MPa	Tensile strength, MPa	P-wave velocity, km/s	Reference
25	60	11	22	7	37.35	0.83	2.64	80.06		4.52	[1]
100	60	11	22	7							
200	60	11	22	7	36.26		2.63	90.19		3.78	
300	60	11	22	7	40.73	0.69	2.63	102.04		3.52	
400	60	11	22	7	32.45	1.44	2.63	81.73		3.02	
500	60	11	22	7	25.18		2.61	72.28		2.72	
600	60	11	22	7	16.88	2.17	2.57	55.59		1.65	
700	60	11	22	7	4.842		2.45	27.7		0.67	
800	60	11	22	7	2.068	3.46	2.36	15.35		0.44	
25	61	34	5	0			2.61				[2]
100	61	34	5	0	22.29	0.63		183		4.14	
200	61	34	5	0	22.64	0.82		182.82		3.95	
300	61	34	5	0	22.74	1.08		188.52		3.88	
400	61	34	5	0	21.52	1.26		187.5		3.49	
500	61	34	5	0	20.5	1.43		187		3.09	
600	61	34	5	0	17.17	2.98		162.87		1.52	
700	61	34	5	0	12.41	5.35		112.98		0.86	
800	61	34	5	0							
25	84	9	0	7	8.1		2.65	101.7	6.13	5.07	[3]
100	84	9	0	7							
200	84	9	0	7	7.96			90.33	6.08	4.55	
300	84	9	0	7	7.73			77.47	5.9	3.57	
400	84	9	0	7	7.36			72.51	4.85	3.03	
500	84	9	0	7	7.16			64.6	4.01	2.91	
600	84	9	0	7	6.2			58.84	1.9	1.56	
700	84	9	0	7							
800	84	9	0	7							
25	72	12	16	0	24.18			163		4.17	[4]
100	72	12	16	0							
200	72	12	16	0	22.25			149		3.57	
300	72	12	16	0	21.84			131		2.97	
400	72	12	16	0	20.94			127		2.54	
500	72	12	16	0	18.72			121		2.01	

600	72	12	16	0	12.44		71		1.09	
700	72	12	16	0						
800	72	12	16	0						
25	75	20	5	0	12.81	2.63	130.11	7.93	4.09	[5]
100	75	20	5	0	12.96	2.64	134.1	7.62	4.04	
200	75	20	5	0	11.92	2.63	118.27	7.39	3.67	
300	75	20	5	0	11.26	2.62	111.85	6.85	3.28	
400	75	20	5	0	11.04	2.62	105.54	6.46	2.76	
500	75	20	5	0	10.78	2.61	93.12	4.06	2.21	
600	75	20	5	0	6.46	2.58	58.21	2.17	1.24	
700	75	20	5	0						
800	75	20	5	0						
25					53.94	2.61			4.55	[6]
100										
200					44.33	2.60			4.13	
300										
400					31.31	2.60			3.47	
500					22.3	2.59			2.94	
600					8.35	2.56			1.81	
700										
800					3.98	2.53			1.25	
25	39	41	0	20	7.21		144.01		3.71	[7]
100	39	41	0	20	8.31		146.95		3.41	
200	39	41	0	20	8.24		138.83		3.20	
300	39	41	0	20	8.1		137.3		2.77	
400	39	41	0	20	7.92		132.29		2.60	
500	39	41	0	20	7.55		127.66		1.96	
600	39	41	0	20	7.45		110.19		1.33	
700	39	41	0	20						
800	39	41	0	20						
25	48	42	4	6	32.6		115.39	9.24		[8]
100	48	42	4	6						
200	48	42	4	6	31.78	2.64	108.54	7.51	3.45	
300	48	42	4	6						
400	48	42	4	6	25.79	2.59	94.48	6.42	2.48	
500	48	42	4	6						
600	48	42	4	6	10.59	2.53	49.87	2.04	0.87	
700	48	42	4	6						
800	48	42	4	6	6.96	2.49	38.07		0.49	

25					30.52			129.01			[9]
100					27.08			119.63			
200					28.79			123.8			
300					27.53			120.96			
400					25.35			119.58			
500					24.12			116.6			
600					13.96			92.05			
700					12.72			82.28			
800					1.94			29.62			
25					8.98			215.97			[10]
100					8.28			190.63			
200					8.48			234.02			
300					7.95						
400					5.78			203.66			
500					3.72						
600					1.71			119.56			
700					1.34						
800					0.23			96.01			
25	78	11	0	12	18.39			118.55		3.81	[11]
100	78	11	0	12							
200	78	11	0	12							
300	78	11	0	12	14.32			97.31		2.51	
400	78	11	0	12	13.52			89.63		2.06	
500	78	11	0	12	11.25			79		1.60	
600	78	11	0	12							
700	78	11	0	12							
800	78	11	0	12							
25	50	40	5	5		0.2	2.63		9.03	4.71	[12]
100	50	40	5	5							
200	50	40	5	5		0.4	2.62		7.98	4.25	
300	50	40	5	5							
400	50	40	5	5		0.5	2.62		6.84	3.74	
500	50	40	5	5							
600	50	40	5	5		1.6	2.59		2.84	2.64	
700	50	40	5	5		2.7	2.58		2.17	2.03	
800	50	40	5	5		5.6	2.53		2.89	0.61	
25	29	50	15	6							[13]
100	29	50	15	6	16.35			135.13			
200	29	50	15	6	15.88			133.21			

300	29	50	15	6	14.93			121.55			
400	29	50	15	6	13.1			95.61			
500	29	50	15	6	10.18			74.1			
600	29	50	15	6	6.61			50.54			
700	29	50	15	6	1.82			22.43			
800	29	50	15	6	1.06			15.03			
25									8.78		[14]
100											
200									8.14		
300											
400									6.92		
500											
600									3.07		
700									2.2		
800									1.02		
25	29	46	17	8	16.20			144.81			[15]
100	29	46	17	8	16.51			152.22			
200	29	46	17	8	15.53			142.66			
300	29	46	17	8	15.40			141.56			
400	29	46	17	8	14.68			115.36			
500	29	46	17	8							
600	29	46	17	8	8.09			75.23			
700	29	46	17	8							
800	29	46	17	8	1.62			21.56			
25	63	25	9	3	51.88		2.61		8.87		[16]
100	63	25	9	3							
200	63	25	9	3	47.76		2.6		9.91		
300	63	25	9	3	28.95		2.55		8.51		
400	63	25	9	3	21.37		2.53		3.9		
500	63	25	9	3	14.63		2.47		2.65		
600	63	25	9	3	8.52		2.41		1.35		
700	63	25	9	3							
800	63	25	9	3							
25					24.77	2.6				4.17	[17]
100											
200					23.12	2.6				3.57	
300					22.39	2.6				2.99	
400					22.33	2.6				2.55	
500					20.37	2.6				2.01	

600					14.97	2.5			1.09	
700										
800										
25	60	19	16	5	44.05					[18]
100	60	19	16	5	35.19					
200	60	19	16	5	28.22					
300	60	19	16	5	26.79					
400	60	19	16	5						
500	60	19	16	5						
600	60	19	16	5						
700	60	19	16	5						
800	60	19	16	5						
25					32.80		3.01		5.20	[19]
100					30.20				4.90	
200					31.10				4.30	
300					30.00				3.50	
400					28.70				3.20	
500					25.60				2.10	
600					24.60				1.70	
700					21.00				0.90	
800										
25									3.47	[20]
100									3.40	
200									3.25	
300									2.98	
400									2.72	
500									1.99	
600									1.39	
700									1.16	
800									1.12	
25						0.9				[21]
100						0.7				
200						1.0				
300						1.2				
400										
500						1.6				
600										
700										
800						2.6				

25	45	17	18	20	39.30		2.75	90.42	4.26	[22]
100	45	17	18	20	34.92		2.73	83.54	4.70	
200	45	17	18	20	29.22		2.74	86.35	3.84	
300	45	17	18	20						
400	45	17	18	20	18.97		2.73	83.77	3.12	
500	45	17	18	20						
600	45	17	18	20	19.87		2.76	69.56	1.30	
700	45	17	18	20						
800	45	17	18	20	9.36		2.73	54.07	0.71	
25	55	35	10	0	32.50			175		
100	55	35	10	0						
200	55	35	10	0	28.50			174		
300	55	35	10	0	22.50			168		
400	55	35	10	0	16.00			153.5		
500	55	35	10	0	13.60			134		
600	55	35	10	0	6.00			84		
700	55	35	10	0						
800	55	35	10	0						
25	59	11	22	8		0.3				
100	59	11	22	8		0.3				
200	59	11	22	8						
300	59	11	22	8						
400	59	11	22	8						
500	59	11	22	8						
600	59	11	22	8						
700	59	11	22	8						
800	59	11	22	8						
25						0.3				[23]
100										
200						0.2				
300										
400						0.3				
500						2.0				
600						9.1				
700										
800						16.4				
25	65	18	8	9	52.73			185.18		[24]
100	65	18	8	9	56.58			186.96		
200	65	18	8	9	47.25			173.93		

300	65	18	8	9							
400	65	18	8	9	44.79			149.39			
500	65	18	8	9							
600	65	18	8	9	23.88			107.29			
700	65	18	8	9							
800	65	18	8	9							
25					8.97						[25]
100											
200					13.96						
300											
400					14.06						
500											
600					11.91						
700											
800					10.81						
25					8.57						
100											
200					11.76						
300											
400					13.49						
500											
600					9.63						
700											
800					1.99						
25					8.57						
100											
200					14.33						
300											
400					14.56						
500											
600					8.11						
700											
800					3.51						
25						1.1	2.63		4.37		[26]
100						1.2	2.62		4.23		
200						1.2	2.62		3.80		
300						1.2	2.62		3.19		
400						1.2	2.62		3.07		
500						1.4	2.61		2.41		

600		2.0	2.57	1.60	
700					
800	0.97	5.5	2.33	0.02	
25	31.31				[27]
100					
200	28.57				
300					
400	27.55				
500					
600	10.79				
700					
800	8.74				
25	33.02	0.5	2.59		[28]
100					
200	31.97	0.4	2.60		
300					
400	26.92	0.5	2.60		
500					
600	24.32	1.0	2.55		
700					
800					
25			2.72	5.29	[29]
100					
200					
300			2.68	4.49	
400					
500			2.69	3.32	
600					
700			2.49		
800				0.76	
25			2.60		[30]
100					
200					
300			2.58		
400					
500			2.54		
600					
700					
800					

25									[31]
100								4.06	
200								3.68	
300								3.23	
400								2.74	
500								2.20	
600									
700									
800									
25	45	45	10	0			287	4.37	[32]
100	45	45	10	0			241	4.09	
200	45	45	10	0			261	3.98	
300	45	45	10	0					
400	45	45	10	0			254	3.35	
500	45	45	10	0			240	3.05	
600	45	45	10	0			191	2.08	
700	45	45	10	0					
800	45	45	10	0			163	1.75	
25	62	28	5	5	14.78				[33]
100	62	28	5	5					
200	62	28	5	5	14.49				
300	62	28	5	5					
400	62	28	5	5	14.45				
500	62	28	5	5					
600	62	28	5	5	7.39				
700	62	28	5	5					
800	62	28	5	5	1.50				
25									
100									
200						2.67		4.50	
300						2.67		4.10	
400						2.66		3.70	
500						2.66		3.08	
600						2.65		2.60	
700									
800						2.64		1.70	
25					9.10				[34]
100					8.90				
200					8.50				

300					8.00					
400										
500										
600										
700										
800										
25	59	32	4	6	47.20					[35]
100	59	32	4	6						
200	59	32	4	6	37.10					
300	59	32	4	6						
400	59	32	4	6	25.30					
500	59	32	4	6						
600	59	32	4	6	61.90					
700	59	32	4	6						
800	59	32	4	6	19.00					
25	37	29	15	19	42.70	2.69	242.3	9.31	3.93	[24]
100	37	29	15	19						
200	37	29	15	19	37.46	2.69	233.05	7.61	3.56	
300	37	29	15	19						
400	37	29	15	19	32.51	2.67	221.2	5.72	2.74	
500	37	29	15	19						
600	37	29	15	19	12.45	2.65	143.83	2.23	1.24	
700	37	29	15	19						
800	37	29	15	19	8.57	2.62	115.19	1.06	0.98	
25	64	28	5	4	40.43	2.68	111.97	8.39	3.82	
100	64	28	5	4						
200	64	28	5	4	35.75	2.70	123.22	7.51	3.65	
300	64	28	5	4						
400	64	28	5	4	22.07	2.68	97.67	4.92	2.65	
500	64	28	5	4						
600	64	28	5	4	5.69	2.61	54.88	1.51	0.87	
700	64	28	5	4						
800	64	28	5	4	2.62	2.57	48.72		0.60	

References

1. Yang, S.-Q., et al., *An experimental investigation on thermal damage and failure mechanical behavior of granite after exposure to different high temperature treatments.* Geothermics, 2017. **65**: p. 180-197.
2. Chen, S., C. Yang, and G. Wang, *Evolution of thermal damage and permeability of Beishan granite.* Applied Thermal Engineering, 2017. **110**: p. 1533-1542.

3. Xiao, P., et al., *Mechanical Behaviors of Granite after Thermal Shock with Different Cooling Rates.* Energies, 2021. **14**(13): p. 3721.
4. Zhu, Z., et al., *Changes in thermomechanical properties due to air and water cooling of hot dry granite rocks under unconfined compression.* Renewable Energy, 2021. **170**: p. 562-573.
5. Jin, P., et al., *Influence of different thermal cycling treatments on the physical, mechanical and transport properties of granite.* Geothermics, 2019. **78**: p. 118-128.
6. Fan, L.F., et al., *Experimental investigation of thermal effects on dynamic behavior of granite.* Applied Thermal Engineering, 2017. **125**: p. 94-103.
7. Li, C., et al., *Experimental study of the influence of temperature and cooling method on mechanical properties of granite: Implication for geothermal mining.* Energy Science & Engineering, 2020. **8**(5): p. 1716-1728.
8. Kang, F., et al., *Experimental study on the physical and mechanical variations of hot granite under different cooling treatments.* Renewable Energy, 2021. **179**: p. 1316-1328.
9. Pan, P.-Z. and C.-Y. Shao, *Experimental studies on the physical and mechanical properties of heated rock by air, water and high-viscosity fluid cooling.* Geomechanics for Energy and the Environment, 2022. **31**: p. 100315.
10. Shao, S., et al., *Experimental and numerical studies on the mechanical behaviour of Australian Strathbogie granite at high temperatures: an application to geothermal energy.* Geothermics, 2015. **54**: p. 96-108.
11. Zhang, B., et al., *Macroscopic and microscopic experimental research on granite properties after high-temperature and water-cooling cycles.* Geothermics, 2021. **93**: p. 102079.
12. Alcock, T., et al., *Temperature-driven micro-fracturing in granite: The interplay between microstructure, mineralogy and tensile strength.* Heliyon, 2023. **9**(3): p. e13871.
13. Kumari, W.G.P., et al., *Temperature-dependent mechanical behaviour of Australian Strathbogie granite with different cooling treatments.* Engineering Geology, 2017. **229**: p. 31-44.
14. Wu, Q., et al., *On the tensile mechanical characteristics of fine-grained granite after heating/cooling treatments with different cooling rates.* Engineering Geology, 2019. **253**: p. 94-110.
15. Isaka, B.L.A., et al., *An Influence of Thermally-Induced Micro-Cracking under Cooling Treatments: Mechanical Characteristics of Australian Granite.* Energies, 2018. **11**(6): p. 1338.
16. Gautam, P.K., et al., *Effect of high temperature on physical and mechanical properties of Jalore granite.* Journal of Applied Geophysics, 2018. **159**: p. 460-474.
17. Zhu, Z., et al., *Experimental investigation on mechanical behaviors of Nanan granite after thermal treatment under conventional triaxial compression.* Environmental Earth Sciences, 2021. **80**(2): p. 46.
18. Yin, T.-b., et al., *Combined effects of temperature and axial pressure on dynamic mechanical properties of granite.* Transactions of Nonferrous Metals Society of China, 2016. **26**(8): p. 2209-2219.
19. Su, G., et al., *Influence of temperature on the strainburst characteristics of granite under true triaxial loading conditions.* Engineering Geology, 2017. **222**: p. 38-52.
20. Zhu, S., et al., *Thermally induced variation of primary wave velocity in granite from Yantai: Experimental and modeling results.* International Journal of Thermal Sciences, 2017. **114**: p. 320-326.
21. Sun, Q., et al., *Thermal damage pattern and thresholds of granite.* Environmental Earth Sciences, 2015. **74**(3): p. 2341-2349.
22. Liu, S. and J. Xu, *An experimental study on the physico-mechanical properties of two post-high-temperature rocks.* Engineering Geology, 2015. **185**: p. 63-70.
23. Fan, L.F., et al., *An investigation of thermal effects on micro-properties of granite by X-ray CT technique.* Applied Thermal Engineering, 2018. **140**: p. 505-519.
24. Kang, F., Y. Li, and C.a. Tang, *Grain size heterogeneity controls strengthening to weakening of granite over high-temperature treatment.* International Journal of Rock Mechanics and Mining Sciences, 2021. **145**: p. 104848.
25. Shao, S., et al., *Effect of cooling rate on the mechanical behavior of heated Strathbogie granite with different grain sizes.* International Journal of Rock Mechanics and Mining Sciences, 2014. **70**: p. 381-387.

26. Shao, Z., Y. Wang, and X. Tang, *The influences of heating and uniaxial loading on granite subjected to liquid nitrogen cooling.* Engineering Geology, 2020. **271**: p. 105614.
27. Xu, X.L. and M. Karakus, *A coupled thermo-mechanical damage model for granite.* International Journal of Rock Mechanics and Mining Sciences, 2018. **103**: p. 195-204.
28. Zhang, F., et al., *Influence of cooling rate on thermal degradation of physical and mechanical properties of granite.* International Journal of Rock Mechanics and Mining Sciences, 2020. **129**: p. 104285.
29. Németh, A., Á. Antal, and Á. Török *Physical Alteration and Color Change of Granite Subjected to High Temperature*. Applied Sciences, 2021. **11**, DOI: 10.3390/app11198792.
30. Wang, F., T. Frühwirt, and H. Konietzky, *Influence of repeated heating on physical-mechanical properties and damage evolution of granite.* International Journal of Rock Mechanics and Mining Sciences, 2020. **136**: p. 104514.
31. Inserra, C., S. Biwa, and Y. Chen, *Influence of thermal damage on linear and nonlinear acoustic properties of granite.* International Journal of Rock Mechanics and Mining Sciences, 2013. **62**: p. 96-104.
32. Griffiths, L., et al., *Quantification of microcrack characteristics and implications for stiffness and strength of granite.* International Journal of Rock Mechanics and Mining Sciences, 2017. **100**: p. 138-150.
33. Chen, Y.-L., et al., *Experimental study on the influence of temperature on the mechanical properties of granite under uni-axial compression and fatigue loading.* International Journal of Rock Mechanics and Mining Sciences, 2012. **56**: p. 62-66.
34. Kumari, W.G.P., et al., *Mechanical behaviour of Australian Strathbogie granite under in-situ stress and temperature conditions: An application to geothermal energy extraction.* Geothermics, 2017. **65**: p. 44-59.
35. Guo, P.Y., et al., *Effect of water saturation and temperature in the range of 193 to 373K on the thermal conductivity of sandstone.* Tectonophysics, 2017. **699**: p. 121-128.

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