Brian R Lawn

List of Publications by Year
in descending order

138 papers	14,828 citations	19608 61 h-index	24915 109 g-index
140 all docs	140 docs citations	140 times ranked	6107 citing authors

#	Article	IF	Citations
1	Indentation fracture: principles and applications. Journal of Materials Science, 1975, 10, 1049-1081.	1.7	1,183
2	Indentation of Ceramics with Spheres: A Century after Hertz. Journal of the American Ceramic Society, 1998, 81, 1977-1994.	1.9	582
3	Crack-Interface Grain Bridging as a Fracture Resistance I, Mechanism in Ceramics: I, Experimental Study on Alumina. Journal of the American Ceramic Society, 1987, 70, 279-289.	1.9	529
4	Effect of sandblasting on the long-term performance of dental ceramics. Journal of Biomedical Materials Research Part B, 2004, 71B, 381-386.	3.0	400
5	Crack-Interface Grain Bridging as a Fracture Resistance Mechanism in Ceramics: II, Theoretical Fracture Mechanics Model. Journal of the American Ceramic Society, 1987, 70, 289-294.	1.9	378
6	Role of Grain Size in the Strength and R-Curve Properties of Alumina. Journal of the American Ceramic Society, 1990, 73, 2419-2427.	1.9	337
7	Dental enamel as a dietary indicator in mammals. BioEssays, 2008, 30, 374-385.	1.2	268
8	Grain-Size and R-Curve Effects in the Abrasive Wear of Alumina. Journal of the American Ceramic Society, 1989, 72, 1249-1252.	1.9	266
9	Toughness Properties of a Silicon Carbide with an in Situ Induced Heterogeneous Grain Structure. Journal of the American Ceramic Society, 1994, 77, 2518-2522.	1.9	254
10	Microstructure-Strength Properties in Ceramics: I, Effect of Crack Size on Toughness. Journal of the American Ceramic Society, 1985, 68, 604-615.	1.9	237
11	Fatigue of dental ceramics. Journal of Dentistry, 2013, 41, 1135-1147.	1.7	231
12	Effect of Grain Size on Hertzian Contact Damage in Alumina. Journal of the American Ceramic Society, 1994, 77, 1825-1831.	1.9	230
13	Remarkable resilience of teeth. Proceedings of the National Academy of Sciences of the United States of America, 2009, 106, 7289-7293.	3.3	209
14	Evaluation of elastic modulus and hardness of thin films by nanoindentation. Journal of Materials Research, 2004, 19, 3076-3080.	1.2	208
15	Materials design in the performance of all-ceramic crowns. Biomaterials, 2004, 25, 2885-2892.	5.7	198
16	Deformation and fracture of mica-containing glass-ceramics in Hertzian contacts. Journal of Materials Research, 1994, 9, 762-770.	1.2	184
17	Edge chipping and flexural resistance of monolithic ceramics. Dental Materials, 2013, 29, 1201-1208.	1.6	180
18	Overview: Damage in brittle layer structures from concentrated loads. Journal of Materials Research, 2002, 17, 3019-3036.	1.2	169

#	Article	IF	Citations
19	A Modified Indentation Toughness Technique. Journal of the American Ceramic Society, 1983, 66, c200-c201.	1.9	167
20	Fracture modes in brittle coatings with large interlayer modulus mismatch. Journal of Materials Research, 1999, 14, 3805-3817.	1.2	166
21	Indentation fatigue. Philosophical Magazine A: Physics of Condensed Matter, Structure, Defects and Mechanical Properties, 1993, 68, 1003-1016.	0.8	148
22	Contact Damage Accumulation in Tic₃SiC₂. Journal of the American Ceramic Society, 1998, 81, 225-228.	1.9	147
23	Brittle Fracture versus Quasi Plasticity in Ceramics: A Simple Predictive Index. Journal of the American Ceramic Society, 2001, 84, 561-565.	1.9	141
24	Objective Evaluation of Short-Crack Toughness Curves Using Indentation Flaws: Case Study on Alumina-Based Ceramics. Journal of the American Ceramic Society, 1992, 75, 3049-3057.	1.9	139
25	Science and art of ductile grinding of brittle solids. International Journal of Machine Tools and Manufacture, 2021, 161, 103675.	6.2	138
26	A universal relation for edge chipping from sharp contacts in brittle materials: A simple means of toughness evaluation. Acta Materialia, 2007, 55, 2555-2561.	3.8	123
27	Tooth chipping can reveal the diet and bite forces of fossil hominins. Biology Letters, 2010, 6, 826-829.	1.0	109
28	Damage-resistant alumina-based layer composites. Journal of Materials Research, 1996, 11, 204-210.	1.2	107
29	Crack Stability and Toughness Characteristics in Brittle Materials. Annual Review of Materials Research, 1986, 16, 415-439.	5.5	103
30	Contactâ€induced Damage in Ceramic Coatings on Compliant Substrates: Fracture Mechanics and Design. Journal of the American Ceramic Society, 2001, 84, 1066-1072.	1.9	103
31	Role of microstructure on contact damage and strength degradation of micaceous glass-ceramics. Dental Materials, 1998, 14, 80-89.	1.6	100
32	Theory of Fatigue for Brittle Flaws Originating from Residual Stress Concentrations. Journal of the American Ceramic Society, 1983, 66, 314-321.	1.9	99
33	Sharp vs Blunt Crack Hypotheses in the Strength of Glass: A Critical Study Using Indentation Flaws. Journal of the American Ceramic Society, 1985, 68, 25-34.	1.9	99
34	Analysis of fracture and deformation modes in teeth subjected to occlusal loading. Acta Biomaterialia, 2009, 5, 2213-2221.	4.1	97
35	Stress Analysis of Contact Deformation in Quasiâ€Plastic Ceramics. Journal of the American Ceramic Society, 1996, 79, 2609-2618.	1.9	93
36	Role of Microstructure in Hertzian Contact Damage in Silicon Nitride: I, Mechanical Characterization. Journal of the American Ceramic Society, 1997, 80, 2367-2381.	1.9	91

#	Article	IF	Citations
37	Teeth: Among Nature's Most Durable Biocomposites. Annual Review of Materials Research, 2010, 40, 55-75.	4.3	91
38	Contact Fatigue of a Silicon Carbide with a Heterogeneous Grain Structure. Journal of the American Ceramic Society, 1995, 78, 1431-1438.	1.9	89
39	Fracture and deformation in brittle solids: A perspective on the issue of scale. Journal of Materials Research, 2004, 19, 22-29.	1.2	87
40	Evaluating dental zirconia. Dental Materials, 2019, 35, 15-23.	1.6	84
41	Fracture-resistant monolithic dental crowns. Dental Materials, 2016, 32, 442-449.	1.6	83
42	Indentation Deformation and Fracture of Sapphire. Journal of the American Ceramic Society, 1988, 71, 29-35.	1.9	82
43	Mechanical characterization of plasma sprayed ceramic coatings on metal substrates by contact testing. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 1996, 208, 158-165.	2.6	78
44	Nonlinear stress-strain curves for solids containing closed cracks with friction. Journal of the Mechanics and Physics of Solids, 1998, 46, 85-113.	2.3	77
45	Crack opening profiles of indentation cracks in normal and anomalous glasses. Acta Materialia, 2004, 52, 293-297.	3.8	77
46	Model for Toughness Curves in Two-Phase Ceramics: I, Basic Fracture Mechanics. Journal of the American Ceramic Society, 1993, 76, 2235-2240.	1.9	76
47	Crack Suppression in Strongly Bonded Homogeneous/Heterogeneous Laminates: A Study on Glass/Glassâ€Ceramic Bilayers. Journal of the American Ceramic Society, 1996, 79, 634-640.	1.9	74
48	Contact damage in brittle coating layers: Influence of surface curvature. Journal of Biomedical Materials Research - Part B Applied Biomaterials, 2005, 73B, 179-185.	1.6	74
49	Contactâ€Induced Transverse Fractures in Brittle Layers on Soft Substrates: A Study on Silicon Nitride Bilayers. Journal of the American Ceramic Society, 1998, 81, 571-580.	1.9	73
50	Probing material properties with sharp indenters: a retrospective. Journal of Materials Science, 2012, 47, 1-22.	1.7	73
51	Deep-penetrating conical cracks in brittle layers from hydraulic cyclic contact. Journal of Biomedical Materials Research - Part B Applied Biomaterials, 2005, 73B, 186-193.	1.6	71
52	Rate Effects in Critical Loads for Radial Cracking in Ceramic Coatings. Journal of the American Ceramic Society, 2002, 85, 2019-2024.	1.9	70
53	Long-term strength of ceramics for biomedical applications. Journal of Biomedical Materials Research Part B, 2004, 69B, 166-172.	3.0	69
54	Failure Modes in Ceramic-Based Layer Structures: A Basis for Materials Design of Dental Crowns. Journal of the American Ceramic Society, 2007, 90, 1671-1683.	1.9	69

#	Article	IF	Citations
55	Cyclic fatigue of a mica-containing glass-ceramic at Hertzian contacts. Journal of Materials Research, 1994, 9, 2654-2661.	1.2	68
56	On the chipping and splitting of teeth. Journal of the Mechanical Behavior of Biomedical Materials, 2011, 4, 315-321.	1.5	68
57	Model for Toughness Curves in Two-Phase Ceramics: II, Microstructural Variables. Journal of the American Ceramic Society, 1993, 76, 2241-2247.	1.9	67
58	The Compelling Case for Indentation as a Functional Exploratory and Characterization Tool. Journal of the American Ceramic Society, 2015, 98, 2671-2680.	1.9	67
59	Strength and Fatigue Properties of Optical Glass Fibers Containing Microindentation Flaws. Journal of the American Ceramic Society, 1985, 68, 563-569.	1.9	65
60	Enhanced Machinability of Silicon Carbide via Microstructural Design. Journal of the American Ceramic Society, 1995, 78, 215-217.	1.9	65
61	Fracture in teeth-a diagnostic for inferring bite force and tooth function. Biological Reviews, 2011, 86, 959-974.	4.7	65
62	Micromechanics of machining and wear in hard and brittle materials. Journal of the American Ceramic Society, 2021, 104, 5-22.	1.9	63
63	Hertzian Contact Response of Tailored Silicon Nitride Multilayers. Journal of the American Ceramic Society, 1996, 79, 1009-1014.	1.9	62
64	Margin failures in brittle dome structures: Relevance to failure of dental crowns. Journal of Biomedical Materials Research - Part B Applied Biomaterials, 2007, 80B, 78-85.	1.6	61
65	Stress Analysis of Elasticâ€Plastic Contact Damage in Ceramic Coatings on Metal Substrates. Journal of the American Ceramic Society, 1996, 79, 2619-2625.	1.9	60
66	Properties of tooth enamel in great apes. Acta Biomaterialia, 2010, 6, 4560-4565.	4.1	60
67	Predicting failure in mammalian enamel. Journal of the Mechanical Behavior of Biomedical Materials, 2009, 2, 33-42.	1.5	59
68	Critique of materialsâ€based models of ductile machining in brittle solids. Journal of the American Ceramic Society, 2020, 103, 6096-6100.	1.9	59
69	Effect of Flaw State on the Strength of Brittle Coatings on Soft Substrates. Journal of the American Ceramic Society, 2001, 84, 2377-2384.	1.9	58
70	Hertzian Contact Damage in Porous Alumina Ceramics. Journal of the American Ceramic Society, 1997, 80, 1027-1031.	1.9	58
71	Model of Strength Degradation from Hertzian Contact Damage in Tough Ceramics. Journal of the American Ceramic Society, 1998, 81, 1509-1520.	1.9	58
72	Contact fracture of brittle bilayer coatings on soft substrates. Journal of Materials Research, 2001, 16, 115-126.	1.2	57

#	Article	IF	Citations
73	Wear of ceramic-based dental materials. Journal of the Mechanical Behavior of Biomedical Materials, 2019, 92, 144-151.	1.5	57
74	Microstructural Effects on Grinding of Alumina and Glass-Ceramics. Journal of the American Ceramic Society, 1987, 70, C-139-C-140.	1.9	55
75	Effect of an adhesive interlayer on the fracture of a brittle coating on a supporting substrate. Journal of Materials Research, 2003, 18, 222-227.	1.2	55
76	Contact Damage in Plasma-Sprayed Alumina-Based Coatings. Journal of the American Ceramic Society, 1996, 79, 1907-1914.	1.9	54
77	Fatigue in ceramics with interconnecting weak interfaces: A study using cyclic Hertzian contacts. Acta Metallurgica Et Materialia, 1995, 43, 1609-1617.	1.9	52
78	Role of Adhesive Interlayer in Transverse Fracture of Brittle Layer Structures. Journal of Materials Research, 2000, 15, 1017-1024.	1.2	50
79	Transverse fracture of brittle bilayers: Relevance to failure of all-ceramic dental crowns. Journal of Biomedical Materials Research - Part B Applied Biomaterials, 2006, 79B, 58-65.	1.6	50
80	Mechanics of microwear traces in tooth enamel. Acta Biomaterialia, 2015, 14, 146-153.	4.1	48
81	Effect of property gradients on enamel fracture in human molar teeth. Journal of the Mechanical Behavior of Biomedical Materials, 2012, 15, 121-130.	1.5	47
82	Competing Fracture Modes in Brittle Materials Subject to Concentrated Cyclic Loading in Liquid Environments: Monoliths. Journal of Materials Research, 2005, 20, 2021-2029.	1.2	46
83	Competing fracture modes in brittle materials subject to concentrated cyclic loading in liquid environments: Bilayer structures. Journal of Materials Research, 2005, 20, 2792-2800.	1.2	45
84	Failure of curved brittle layer systems from radial cracking in concentrated surface loading. Journal of Materials Research, 2005, 20, 2812-2819.	1.2	44
85	Edge chipping of brittle materials: effect of side-wall inclination and loading angle. International Journal of Fracture, 2007, 145, 159-165.	1.1	44
86	A model for predicting wear rates in tooth enamel. Journal of the Mechanical Behavior of Biomedical Materials, 2014, 37, 226-234.	1.5	44
87	Morphology and fracture of enamel. Journal of Biomechanics, 2009, 42, 1947-1951.	0.9	43
88	Model for Cyclic Fatigue of Quasiâ€Plastic Ceramics in Contact with Spheres. Journal of the American Ceramic Society, 2000, 83, 2255-2262.	1.9	42
89	Contact Damage and Strength Degradation in Brittle/Quasiâ€Plastic Silicon Nitride Bilayers. Journal of the American Ceramic Society, 1998, 81, 2394-2404.	1.9	40
90	Thresholds and reversibility in brittle cracks: An atomistic surface force model. Journal of Materials Science, 1987, 22, 4036-4050.	1.7	39

#	Article	IF	Citations
91	Competing fracture modes in brittle materials subject to concentrated cyclic loading in liquid environments: Trilayer structures. Journal of Materials Research, 2006, 21, 512-521.	1.2	39
92	Damage accumulation and cyclic fatigue in Mg-PSZ at Hertzian contacts. Journal of Materials Research, 1995, 10, 2613-2625.	1.2	37
93	In Situ Processing of Silicon Carbide Layer Structures. Journal of the American Ceramic Society, 1995, 78, 3160-3162.	1.9	35
94	Hertzian Contact Damage in Magnesia-Partially-Stabilized Zirconia. Journal of the American Ceramic Society, 1995, 78, 1083-1086.	1.9	33
95	Contact damage in porcelain/Pd-alloy bilayers. Journal of Materials Research, 2000, 15, 676-682.	1.2	33
96	Inferring biological evolution from fracture patterns in teeth. Journal of Theoretical Biology, 2013, 338, 59-65.	0.8	33
97	Contact Fatigue in Silicon Nitride. Journal of the American Ceramic Society, 1999, 82, 1281-1288.	1.9	32
98	Interfacial forces and the fundamental nature of brittle cracks. Applied Physics Letters, 1985, 47, 809-811.	1.5	30
99	Strength of silicon, sapphire and glass in the subthreshold flaw region. Acta Materialia, 2004, 52, 3459-3466.	3.8	30
100	The Indentation Crack as a Model Surface Flaw. , 1983, , 1-25.		29
101	Effect of Tangential Loading on Critical Conditions for Radial Cracking in Brittle Coatings. Journal of the American Ceramic Society, 2001, 84, 2719-2721.	1.9	27
102	Cracking in Ceramic/metal/polymer Trilayer Systems. Journal of Materials Research, 2002, 17, 1102-1111.	1.2	27
103	Hydraulically pumped cone fracture in brittle solids. Acta Materialia, 2005, 53, 4237-4244.	3.8	26
104	Role of Microstructure in Hertzian Contact Damage in Silicon Nitride: II, Strength Degradation. Journal of the American Ceramic Society, 1998, 81, 997-1003.	1.9	25
105	Application of Hertzian Tests to Measure Stress?Strain Characteristics of Ceramics at Elevated Temperatures. Journal of the American Ceramic Society, 2007, 90, 149-153.	1.9	25
106	Role of tooth elongation in promoting fracture resistance. Journal of the Mechanical Behavior of Biomedical Materials, 2012, 8, 37-46.	1.5	25
107	Mechanics analysis of molar tooth splitting. Acta Biomaterialia, 2015, 15, 237-243.	4.1	25
108	Simulation of enamel wear for reconstruction of diet and feeding behavior in fossil animals: A micromechanics approach. BioEssays, 2016, 38, 89-99.	1.2	25

#	Article	IF	Citations
109	Thermal Shock Resistance of Silicon Nitrides Using an Indentationâ€"Quench Test. Journal of the American Ceramic Society, 2002, 85, 279-281.	1.9	24
110	Effect of Starting Powder on Damage Resistance of Silicon Nitrides. Journal of the American Ceramic Society, 1998, 81, 2061-2070.	1.9	23
111	Fracture susceptibility of worn teeth. Journal of the Mechanical Behavior of Biomedical Materials, 2012, 5, 247-256.	1.5	23
112	Cracking of Brittle Coatings Adhesively Bonded to Substrates of Unlike Modulus. Journal of Materials Research, 2000, 15, 1653-1656.	1.2	22
113	Role of particulate concentration in tooth wear. Journal of the Mechanical Behavior of Biomedical Materials, 2018, 80, 77-80.	1.5	21
114	Scratch Damage in Zirconia Ceramics. Journal of the American Ceramic Society, 2000, 83, 1428-1432.	1.9	20
115	Study of Microstructural Effects in the Strength of Alumina Using Controlled Flaws. Journal of the American Ceramic Society, 1984, 67, c67.	1.9	20
116	Threshold damage mechanisms in brittle solids and their impact on advanced technologies. Acta Materialia, 2022, 232, 117921.	3.8	19
117	Transverse fracture of canine teeth. Journal of Biomechanics, 2013, 46, 1561-1567.	0.9	17
118	On the evolutionary advantage of multi-cusped teeth. Journal of the Royal Society Interface, 2016, 13, 20160374.	1.5	17
119	Phytoliths can cause tooth wear. Journal of the Royal Society Interface, 2020, 17, 20200613.	1.5	15
120	Thermal wave analysis of contact damage in ceramics: Case study on alumina. Journal of Materials Research, 1996, 11, 939-947.	1.2	14
121	Strength of silicon containing nanoscale flaws. Journal of Materials Research, 2004, 19, 657-660.	1.2	14
122	Effect of oxide and nitride films on strength of silicon: A study using controlled small-scale flaws. Journal of Materials Research, 2004, 19, 3569-3575.	1.2	13
123	Role of Microstructure in Dynamic Fatigue of Glassâ€Ceramics after Contact with Spheres. Journal of the American Ceramic Society, 2000, 83, 1545-1547.	1.9	12
124	Inverse correlations between wear and mechanical properties in biphasic dental materials with ceramic constituents. Journal of the Mechanical Behavior of Biomedical Materials, 2020, 105, 103722.	1.5	11
125	Effect of mechanical damage on thermal conduction of plasma-sprayed coatings. Journal of Materials Research, 1996, 11, 1329-1332.	1.2	10
126	Role of multiple cusps in tooth fracture. Journal of the Mechanical Behavior of Biomedical Materials, 2014, 35, 85-92.	1.5	10

#	Article	IF	Citations
127	High-Pressure Transformation Toughening: A Case Study on Zirconia. Journal of the American Ceramic Society, 1986, 69, C-125-C-126.	1.9	8
128	Mechanisms of tooth damage and <i>Paranthropus</i> dietary reconstruction. Biosurface and Biotribology, 2018, 4, 73-78.	0.6	8
129	Reply to "Comment on 'Role of Grain Size in the Strength and R-Curve Properties of Alumina'". Journal of the American Ceramic Society, 1993, 76, 1900-1901.	1.9	7
130	On the vital role of enamel prism interfaces and graded properties in human tooth survival. Biology Letters, 2020, 16, 20200498.	1.0	7
131	Fatigue Damage in Ceramic Coatings From Cyclic Contact Loading With a Tangential Component. Journal of the American Ceramic Society, 2008, 91, 198-202.	1.9	6
132	Precipitous weakening of quartz at the <i>Î±</i>â€“<i>Î²</i> phase inversion. Journal of the American Ceramic Society, 2021, 104, 23-26.	1.9	6
133	Chipping: a pervasive presence in nature, science and technology. Journal of Materials Science, 2021, 56, 8396-8405.	1.7	6
134	Brittle Solids: From Physics and Chemistry to Materials Applications. Annual Review of Materials Research, 2022, 52, 441-471.	4.3	6
135	Contact fatigue of silicon. Journal of Materials Research, 2008, 23, 1175-1184.	1.2	5
136	Fundamental mechanics of tooth fracture and wear: implications for humans and other primates. Interface Focus, 2021, 11, 20200070.	1.5	5
137	Short-Crack T-Curves and Damage Tolerance in Alumina-Based Composites. Ceramic Engineering and Science Proceedings, 0, , 156-163.	0.1	1
138	Fracture and deformation in brittle solids: A perspective on the issue of scale. , 2004, 19, 22.		1