Supplementary materials

Table S1 Collected datasets

No.	Rock type	UCS/MPa	TS/MPa	Cutting depth/mm	Tip angle/(°)	Attack angle/(°)	Mean cutting force/kN	Reference
1	Anhydrite	82	5.5	5	80	55	3.31	
2	Anhydrite	82	5.5	9	80	55	5.09	
3	Copper ore (black)	41	5.7	5	80	55	2.65	
4	Copper ore (black)	41	5.7	9	80	55	8.90	
5	Copper ore (yellow)	33	3.4	5	80	55	1.67	
6	Copper ore (yellow)	33	3.4	9	80	55	4.99	
7	Harsburgite	58	5.5	5	80	55	5.21	
8	Harsburgite	58	5.5	9	80	55	9.04	
9	High-Grade chromite	32	3.7	5	80	55	2.74	
10	High-Grade chromite	32	3.7	9	80	55	5.20	
11	Jips	3	3	5	80	55	3.93	
12	Jips	3	3	9	80	55	3.31	
13	Limestone	121	7.8	5	80	55	7.32	
14	Limestone	121	7.8	9	80	55	11.93	
15	Low-Grade Chromite	46	3.7	5	80	55	3.13	
16	Low-Grade Chromite	46	3.7	9	80	55	6.50	
17	Medium-Grade Chromite	47	4.5	5	80	55	3.40	
18	Medium-Grade Chromite	47	4.5	9	80	55	9.13	BILGIN et al [1]
19	Sandstone	114	6.6	5	80	55	7.43	
20	Sandstone	114	6.6	9	80	55	9.73	
21	Sandstone	174	11.6	5	80	55	8.04	
22	Sandstone	174	11.6	9	80	55	16.53	
23	Sandstone	87	8.3	5	80	55	3.72	
24	Sandstone	87	8.3	9	80	55	6.42	
25	Selestite	29	4	5	80	55	1.47	
26	Selestite	29	4	9	80	55	3.36	
27	Serpantinite	38	5.7	5	80	55	2.89	
28	Serpantinite	38	5.7	9	80	55	6.96	
29	Siltstone	58	5.3	5	80	55	7.27	
30	Siltstone	58	5.3	9	80	55	8.27	
31	Trona	30	2.2	5	80	55	1.36	
32	Trona	30	2.2	9	80	55	4.12	
33	Tuff	10	0.9	5	80	55	0.73	
34	Tuff	10	0.9	9	80	55	1.58	
35	Tuff	11	1.2	5	80	55	1.92	
36	Tuff	11	1.2	9	80	55	3.80	
37	Tuff	27	2.6	5	80	55	1.23	
38	Tuff	27	2.6	9	80	55	2.69	
39	Tuff	14	1.5	5	80	55	0.91	
40	Tuff	14	1.5	9	80	55	2.43	

to be continued

Contined

No.	Rock type	UCS/MPa	TS/MPa	Cutting depth/mm	Tip angle/°	Attack angle/°	Mean cutting force/kN	Reference
41	Tuff	19	2.3	5	80	55	1.34	
42	Tuff	19	2.3	9	80	55	2.93	
43	Tuff	6	0.2	5	80	55	0.46	
44	Tuff	6	0.2	9	80	55	1.02	
45	Claystone	58	5.6	3	80	56	1.17	
46	Claystone	58	5.6	5	80	56	2.95	
47	Claystone	58	5.6	7	80	56	3.17	
48	Claystone	58	5.6	9	80	56	5.25	
49	Harzburgite	58	5.5	5	80	56	5.21	
50	Harzburgite	58	5.5	9	80	56	9.04	
51	High-Grade Chromite	32	3.7	5	80	56	2.74	
52	High-Grade Chromite	32	3.7	9	80	56	5.20	
53	Limestone	121	7.8	3	80	56	3.87	
54	Limestone	121	7.8	5	80	56	7.32	
55	Limestone	121	7.8	9	80	56	11.93	
56	Low-Grade Chromite	46	3.7	5	80	56	3.13	COPUR et al [2]
57	Low-Grade Chromite	46	3.7	9	80	56	6.50	
58	Medium-Grade Chromite	47	4.5	5	80	56	3.40	
59	Medium-Grade Chromite	47	4.5	9	80	56	9.13	
60	Sandstone	114	6.6	3	80	56	3.83	
61	Sandstone	114	6.6	5	80	56	7.43	
62	Sandstone	114	6.6	9	80	56	9.73	
63	Sandstone	174	11.6	3	80	56	4.02	
64	Sandstone	174	11.6	5	80	56	8.04	
65	Sandstone	174	11.6	9	80	56	16.53	
66	Serpentinite	38	5.7	5	80	56	2.89	
67	Serpentinite	38	5.7	9	80	56	6.96	
68	Siltstone	58	5.3	3	80	56	3.07	
69	Siltstone	58	5.3	5	80	56	7.27	
70	Siltstone	58	5.3	9	80	56	8.27	
71	Trona	30	2.2	5	80	56	1.36	
72	Trona	30	2.2	9	80	56	4.12	
73	Artificial rock	42.52	4.9	10	90	55	12.94	LI et al [3]
74	Artificial rock	42.52	4.9	15	90	55	15.97	
75	Artificial rock	42.52	4.9	20	90	55	23.01	
76	Coal	3.1	0.45	10	90	55	1.12	
77	Coal	3.1	0.45	20	90	55	2.93	
78	Limestone	116.4	8.2	2	90	55	8.71	

to be continued

Contined

No.	Rock type	UCS/MPa	TS/MPa	Cutting depth/mm	Tip angle/°	Attack angle/°	Mean cutting force/kN	Reference
79	Limestone	116.4	8.2	3	90	55	17.98	LI et al [3]
80	Limestone	116.4	8.2	5	90	55	19.51	
81	Sandstone	76.3	6.6	5	90	55	10.00	
82	Sandstone	76.3	6.6	10	90	55	16.45	
83	Carbonaceous slate	55.26	2.11	4	90	54	2.67	LIAO et al [4]
84	Carbonaceous slate	55.26	2.11	4	90	54	2.95	
85	Carbonaceous slate	55.26	2.11	4	90	54	2.74	
86	Carbonaceous slate	55.26	2.11	4	90	54	3.43	
87	Carbonaceous slate	55.26	2.11	8	90	54	4.71	
88	Carbonaceous slate	55.26	2.11	8	90	54	6.28	
89	Carbonaceous slate	55.26	2.11	8	90	54	5.79	
90	Carbonaceous slate	55.26	2.11	8	90	54	5.53	
91	Carbonaceous slate	55.26	2.11	12	90	54	7.12	
92	Carbonaceous slate	55.26	2.11	12	90	54	8.58	
93	Carbonaceous slate	55.26	2.11	12	90	54	9.27	
94	Carbonaceous slate	55.26	2.11	12	90	54	8.65	
95	Carbonaceous slate	55.26	2.11	16	90	54	8.86	
96	Carbonaceous slate	55.26	2.11	16	90	54	11.43	
97	Carbonaceous slate	55.26	2.11	16	90	54	10.82	
98	Carbonaceous slate	55.26	2.11	16	90	54	9.64	
99	Rhyolitic clastic rock	79.78	3.6	4	90	54	4.65	
100	Rhyolitic clastic rock	79.78	3.6	4	90	54	4.47	
101	Rhyolitic clastic rock	79.78	3.6	4	90	54	3.86	
102	Rhyolitic clastic rock	79.78	3.6	4	90	54	4.16	
103	Rhyolitic clastic rock	79.78	3.6	8	90	54	7.62	
104	Rhyolitic clastic rock	79.78	3.6	8	90	54	8.17	
105	Rhyolitic clastic rock	79.78	3.6	8	90	54	8.37	
106	Rhyolitic clastic rock	79.78	3.6	8	90	54	8.67	
107	Rhyolitic clastic rock	79.78	3.6	12	90	54	9.24	
108	Rhyolitic clastic rock	79.78	3.6	12	90	54	10.36	

to be continued

Contined

No.	Rock type	UCS/MPa	TS/MPa	Cutting depth/mm	Tip angle/°	Attack angle/°	Mean cutting force/kN	Reference
109	Rhyolitic clastic rock	79.78	3.6	12	90	54	11.01	
110	Rhyolitic clastic rock	79.78	3.6	12	90	54	9.68	
111	Rhyolitic clastic rock	79.78	3.6	16	90	54	13.55	
112	Rhyolitic clastic rock	79.78	3.6	16	90	54	12.49	
113	Rhyolitic clastic rock	79.78	3.6	16	90	54	13.25	
114	Rhyolitic 11clastic rock	79.78	3.6	16	90	54	14.28	
115	Beige Marble	160.7	7.82	5	60	45	2.46	
116	Beige Marble	160.7	7.82	5	85	45	8.78	
117	Finike Limra	52.6	4.4	2	60	45	0.29	
118	Finike Limra	52.6	4.4	3.5	60	45	0.53	
119	Finike Limra	52.6	4.4	5	60	45	0.89	
120	G.Sandstone	11.26	1.5	5	85	45	1.54	
121	G.Sandstone	11.26	1.5	5	60	45	0.60	Polat [5]
122	K. Beyaz	79.3	6.4	2	60	45	1.08	
123	K. Beyaz	79.3	6.4	3.5	60	45	1.86	
124	K. Beyaz	79.3	6.4	5	60	45	3.67	
125	K. Limestone	15.6	1.14	5	85	45	0.87	
126	K. Limestone	15.6	1.14	5	60	45	0.59	
127	Limestone	70.2	7.73	5	60	45	2.34	
128	Limestone	70.2	7.73	5	85	45	7.67	
129	Sandstone	120.6	11.94	5	60	45	4.05	
130	Sandstone	120.6	11.94	5	85	45	11.36	
131	Travertine	9.1	3.17	5	60	45	1.77	
132	Travertine	9.1	3.17	5	85	45	3.39	
133	Travertine	11	4.8	2	60	45	0.44	
134	Travertine	11	4.8	3.5	60	45	0.79	
135	Travertine	11	4.8	5	60	45	1.20	
136	Limestone	121	7.8	3	80	57	4.00	
137	Limestone	121	7.8	6	80	57	7.50	
138	Limestone	121	7.8	9	80	57	11.60	
139	Sandstone	113.6	6.6	3	80	57	3.90	
140	Sandstone	113.6	6.6	6	80	57	6.70	
141	Sandstone	113.6	6.6	9	80	57	8.80	
142	Sandstone	173.7	11.6	3	80	57	4.10	Su and Ali Akcin [6]
143	Sandstone	173.7	11.6	6	80	57	8.20	
144	Sandstone	173.7	11.6	9	80	57	16.90	
145	Sandstone	87.4	8.3	3	80	57	1.80	
146	Sandstone	87.4	8.3	6	80	57	3.80	
147	Sandstone	87.4	8.3	9	80	57	6.60	

to be continued

Contined

No.	Rock type	UCS/MPa	TS/MPa	Cutting depth/mm	Tip angle/°	Attack angle/°	Mean cutting force/kN	Reference
148	Sandstone	17.91	1.64	6	70	55	0.74	
149	Sandstone	17.91	1.64	6	80	50	1.04	
150	Sandstone	17.91	1.64	6	90	45	3.39	
151	Sandstone	17.91	1.64	6	60	55	0.67	
152	Sandstone	17.91	1.64	6	70	50	0.76	
153	Sandstone	17.91	1.64	6	80	45	2.24	
154	Sandstone	17.91	1.64	6	70	60	0.99	
155	Sandstone	17.91	1.64	6	80	55	1.26	WANG et al [7]
156	Sandstone	17.91	1.64	6	90	50	2.08	
157	Sandstone	17.91	1.64	6	60	50	0.63	
158	Sandstone	17.91	1.64	6	70	45	1.26	
159	Sandstone	17.91	1.64	6	80	40	3.85	
160	Sandstone	17.91	1.64	6	80	60	1.18	
161	Sandstone	17.91	1.64	6	90	55	1.29	
162	Sandstone	17.91	1.64	6	100	50	4.07	
163	Sandstone	17.91	1.64	3	80	55	0.55	
164	Sandstone	17.91	1.64	6	80	55	1.26	
165	Sandstone	17.91	1.64	9	80	55	2.03	
166	Sandstone	17.91	1.64	12	80	55	2.74	
167	Sandstone	17.91	1.64	15	80	55	3.42	
168	Sandstone	17.91	1.64	18	80	55	4.33	
169	Sandstone	79.20	4.97	3	80	55	1.41	
170	Sandstone	79.20	4.97	6	80	55	2.66	
171	Sandstone	79.20	4.97	9	80	55	4.11	
172	Sandstone	79.20	4.97	12	80	55	6.60	
173	Sandstone	79.20	4.97	15	80	55	8.25	
174	Sandstone	52.99	3.67	3	80	55	0.93	
175	Sandstone	52.99	3.67	6	80	55	1.61	WANG et al [8]
176	Sandstone	52.99	3.67	9	80	55	2.99	
177	Sandstone	52.99	3.67	12	80	55	4.60	
178	Sandstone	52.99	3.67	15	80	55	6.22	
179	Sandstone	59.80	3.93	3	80	55	0.93	
180	Sandstone	59.80	3.93	6	80	55	2.37	
181	Sandstone	59.80	3.93	9	80	55	3.71	
182	Sandstone	59.80	3.93	12	80	55	5.71	
183	Sandstone	59.80	3.93	15	80	55	8.18	
184	Sandstone	85.98	3.69	3	80	55	1.35	
185	Sandstone	85.98	3.69	6	80	55	2.22	
186	Sandstone	85.98	3.69	9	80	55	3.28	
187	Sandstone	85.98	3.69	12	80	55	5.58	

to be continued

Contined

No.	Rock type	UCS/MPa	TS/MPa	Cutting depth/mm	Tip angle/°	Attack angle/°	Mean cutting force/kN	Reference
188	Crystal tuff	2.44	0.74	5	80	48	0.22	YASAR [9]
189	Metasiltstone	1.89	0.67	5	80	48	0.16	
190	Volcanic sandstone	12.34	1.33	5	80	48	1.26	
191	Brown vitric tuff	88.15	8.38	1	80	48	0.43	YASAR and YILMAZ [10]
192	Brown vitric tuff	88.15	8.38	3	80	48	1.21	
193	Brown vitric tuff	88.15	8.38	5	80	48	2.06	
194	Brown vitric tuff	88.15	8.38	7	80	48	3.37	
195	Brown vitric tuff	88.15	8.38	9	80	48	4.41	
196	Green tuff	51.65	5.84	1	80	48	0.20	
197	Green tuff	51.65	5.84	3	80	48	0.90	
198	Green tuff	51.65	5.84	5	80	48	1.58	
199	Green tuff	51.65	5.84	7	80	48	1.76	
200	Green tuff	51.65	5.84	9	80	48	2.38	
201	Grey andesite	99.92	8.34	1	80	48	1.26	
202	Grey andesite	99.92	8.34	3	80	48	3.04	
203	Grey andesite	99.92	8.34	5	80	48	4.85	
204	Grey andesite	99.92	8.34	7	80	48	6.03	
205	Grey andesite	99.92	8.34	9	80	48	7.51	
206	Grey tuff	62.63	7.08	1	80	48	0.41	
207	Grey tuff	62.63	7.08	3	80	48	1.02	
208	Grey tuff	62.63	7.08	5	80	48	1.64	
209	Grey tuff	62.63	7.08	7	80	48	2.26	
210	Grey tuff	62.63	7.08	9	80	48	2.78	
211	Red andesite	72.85	7.91	1	80	48	0.32	
212	Red andesite	72.85	7.91	3	80	48	1.17	
213	Red andesite	72.85	7.91	5	80	48	2.20	
214	Red andesite	72.85	7.91	7	80	48	2.34	
215	Red andesite	72.85	7.91	9	80	48	2.91	
216	Yellow vitric tuff	62.48	5.47	1	80	48	0.30	
217	Yellow vitric tuff	62.48	5.47	3	80	48	0.88	
218	Yellow vitric tuff	62.48	5.47	5	80	48	1.65	
219	Yellow vitric tuff	62.48	5.47	7	80	48	1.99	
220	Yellow vitric tuff	62.48	5.47	9	80	48	2.97	

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