

$k = 8$ search results discussed in
D-optimal and near *D*-optimal 2^k fractional
 factorial designs of resolution V
 by Bulutoglu and Ryan (2006)

The table below lists search results for $k = 8$ factor designs. Column definitions are the number of runs N , the number of factors k , determinant of the information matrix $\det(\mathbf{X}_M^T \mathbf{X}_M)$, a lower bound for *D*-efficiency $\underline{e}(\mathbf{X})$, an indicator for type 1 optimality I_1 , and an indicator for type 2 optimality I_2 . For $N \equiv 1$ or $2 \pmod{16}$, type 1 optimality is restricted generalized type 1 optimality as studied in Chadjiconstantinidis et al. (1989). For the remaining cases, generalized type 1 optimality is as in Cheng (1980).

N	k	$\det(\mathbf{X}_M^T \mathbf{X}_M)$	$\underline{e}(\mathbf{X})$	I_1	I_2
37	8	3.71759589862103e+54	81.3339%	0	0
38	8	2.32696264258870e+55	83.85013%	0	0
39	8	1.47840849699212e+56	86.31397%	0	0
40	8	5.11347896414129e+56	85.23305%	0	0
41	8	2.29575851785708e+57	87.20633%	0	0
42	8	8.31934846941051e+57	88.71053%	0	0
43	8	2.3489327741024e+58	89.44983%	0	0
44	8	7.89837935544326e+58	88.79176%	0	0
45	8	2.62663605722246e+59	90.22232%	0	0
46	8	7.11785943901655e+59	91.17045%	0	0
47	8	1.91728218374417e+60	91.91378%	0	0
48	8	5.13774876933562e+60	91.11512%	0	0
49	8	1.44876424617648e+61	92.26802%	0	0
50	8	3.80266767770505e+61	93.25499%	0	0
51	8	1.00719774293032e+62	94.06281%	0	0
52	8	2.74191716899188e+62	93.65083%	0	0

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N	k	$\det(\mathbf{X}_M^T \mathbf{X}_M)$	$\underline{e}(\mathbf{X})$	I_1	I_2
53	8	6.49148959807839e+62	94.47564%	0	0
54	8	1.6865454270255e+63	95.54774%	0	0
55	8	3.89372420003095e+63	96.10045%	0	0
56	8	8.85466019752391e+63	95.52431%	0	0
57	8	1.94572630426130e+64	96.25002%	0	0
58	8	4.3427176052816e+64	97.0224%	0	0
59	8	9.64728666818948e+64	97.55719%	0	0
60	8	2.24061902835387e+65	97.2915%	0	0
61	8	5.02945896844356e+65	98.15833%	0	0
62	8	1.19792731772983e+66	99.19202%	0	0
63	8	2.84343187505103e+66	99.98633%	0	1
64	8	6.73998666678763e+66	100%	1	1
65	8	1.06365414585243e+67	100%	1	0
66	8	1.67841464846762e+67	100%	1	0
67	8	2.64823389693881e+67	99.7578%	0	0
68	8	4.17803891507337e+67	98.87465%	0	0
69	8	6.65414019550479e+67	98.95737%	0	0
70	8	1.06493514194452e+68	99.05343%	0	0
71	8	1.73044858725782e+68	98.94838%	0	0
72	8	2.84677086944272e+68	98.35244%	0	0
73	8	4.47854481211294e+68	98.45465%	0	0
74	8	7.04464243703711e+68	98.55681%	0	0
75	8	1.19744326112010e+69	98.62734%	0	0
76	8	1.86206791594624e+69	98.02762%	0	0
77	8	3.23416545885286e+69	98.44028%	0	0

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N	k	$\det(\mathbf{X}_M^T \mathbf{X}_M)$	$\underline{e}(\mathbf{X})$	I_1	I_2
78	8	5.67071048536934e+69	98.88016%	0	0
79	8	9.51995575246517e+69	98.97182%	0	0
80	8	1.59100108796860e+70	98.6853%	0	0
81	8	2.62994729051193e+70	99.01244%	0	0
82	8	4.14527672606117e+70	99.21316%	0	0
83	8	6.44219360297448e+70	99.15031%	0	0
84	8	1.06962548241798e+71	98.95316%	0	0
85	8	1.58581192462610e+71	99.03025%	0	0
86	8	2.35108835353832e+71	99.10757%	0	0
87	8	3.60091226754336e+71	99.05524%	0	0
88	8	5.33257300343255e+71	98.64684%	0	0
89	8	8.17809408817965e+71	98.85141%	0	0
90	8	1.25890040099436e+72	99.06658%	0	0
91	8	2.01481635745426e+72	99.17888%	0	0
92	8	3.05769561885013e+72	98.91835%	0	0
93	8	4.80197211769725e+72	99.22183%	0	0
94	8	7.53619561736127e+72	99.52459%	0	0
95	8	1.17936583063681e+73	99.6213%	0	0
96	8	1.86478550161868e+73	99.54422%	0	0
97	8	2.77700455655551e+73	99.73872%	0	0
98	8	4.23810669511251e+73	100%	1	0
99	8	5.87088474089742e+73	99.80952%	0	0
100	8	8.1322625670209e+73	99.44279%	0	0
101	8	1.13306352724239e+74	99.48811%	0	0
102	8	1.58572703058037e+74	99.54556%	0	0

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N	k	$\det(\mathbf{X}_M^T \mathbf{X}_M)$	$\underline{e}(\mathbf{X})$	I_1	I_2
103	8	2.2612658848312e+74	99.4729%	0	0
104	8	3.19597215319633e+74	99.22122%	0	0
105	8	4.43223634303194e+74	99.28197%	0	0
106	8	6.16786389116485e+74	99.3521%	0	0
107	8	8.91665431005514e+74	99.35295%	0	0
108	8	1.27770740793701e+75	99.19272%	0	0
109	8	1.86960440345818e+75	99.4237%	0	0
110	8	2.71693258107262e+75	99.6368%	0	0
111	8	3.91136914088904e+75	99.66091%	0	0
112	8	5.67146034234397e+75	99.58161%	0	0
113	8	7.89035798381738e+75	99.70211%	0	0
114	8	1.09074892316908e+76	99.80566%	0	0
115	8	1.55924065139621e+76	99.84329%	0	0
116	8	2.01732386196727e+76	99.50233%	0	0
117	8	2.73021467289762e+76	99.57163%	0	0
118	8	3.70061527746251e+76	99.64516%	0	0
119	8	5.0062617615514e+76	99.56477%	0	0
120	8	6.7451085097436e+76	99.37518%	0	0
121	8	9.23989375448917e+76	99.49869%	0	0
122	8	1.27671227616377e+77	99.64571%	0	0
123	8	1.75451923424374e+77	99.63635%	0	0
124	8	2.39980384639725e+77	99.52551%	0	0
125	8	3.32254382725965e+77	99.69841%	0	0
126	8	4.68143798283681e+77	99.91904%	0	0
127	8	6.58567507537232e+77	100%	0	1

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N	k	$\det(\mathbf{X}_M^T \mathbf{X}_M)$	$\underline{e}(\mathbf{X})$	I_1	I_2
128	8	9.26336713898529e+77	100%	1	1
129	8	1.19410592025982e+78	100%	1	0
130	8	1.53922062372886e+78	100%	1	0
131	8	1.98400670381617e+78	99.87038%	0	0
132	8	2.55723019758341e+78	99.66783%	0	0
133	8	3.33510272338813e+78	99.71762%	0	0
134	8	4.3857643032155e+78	99.78987%	0	0
135	8	5.70677764755751e+78	99.71014%	0	0
136	8	7.3478826868747e+78	99.53573%	0	0
137	8	9.46048787371094e+78	99.56822%	0	0
138	8	1.25310977072686e+79	99.67722%	0	0
139	8	1.64926484670249e+79	99.65114%	0	0
140	8	2.19855388976618e+79	99.59879%	0	0
141	8	2.96255686741138e+79	99.77053%	0	0
142	8	3.94662111263947e+79	99.91174%	0	0
143	8	5.23314052678484e+79	99.92739%	0	0
144	8	6.96990906310298e+79	99.89933%	0	0
145	8	9.09344177348111e+79	100%	1	0
146	8	1.14296022290991e+80	100%	1	0
147	8	1.43655028016837e+80	99.89163%	0	0
148	8	1.80550035212419e+80	99.73223%	0	0
149	8	2.29219913510020e+80	99.7741%	0	0
150	8	2.90388452428770e+80	99.8103%	0	0
151	8	3.70739079109851e+80	99.76381%	0	0
152	8	4.65550622971729e+80	99.62578%	0	0

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N	k	$\det(\mathbf{X}_M^T \mathbf{X}_M)$	$\underline{e}(\mathbf{X})$	I_1	I_2
153	8	5.94391458413531e+80	99.69703%	0	0
154	8	7.69550293984673e+80	99.80602%	0	0
155	8	9.80883150919977e+80	99.77364%	0	0
156	8	1.25414971789182e+81	99.70632%	0	0
157	8	1.61818347607488e+81	99.8196%	0	0
158	8	2.10853545852107e+81	99.95966%	0	0
159	8	2.74299165941927e+81	100%	0	1
160	8	3.56811923176490e+81	100%	1	1
161	8	4.39324680411052e+81	100%	1	0
162	8	5.40904574790362e+81	100%	1	0
163	8	6.65954609694548e+81	99.90833%	0	0
164	8	8.19979641232082e+81	99.77982%	0	0
165	8	1.01823038902303e+82	99.81516%	0	0
166	8	1.27048156240049e+82	99.86351%	0	0
167	8	1.57351734322815e+82	99.80395%	0	0
168	8	1.93582249568432e+82	99.69194%	0	0
169	8	2.41780717954314e+82	99.75469%	0	0
170	8	3.04928889915163e+82	99.84377%	0	0
171	8	3.79811805197995e+82	99.81479%	0	0
172	8	4.7419879390657e+82	99.76012%	0	0
173	8	5.96718691271173e+82	99.85448%	0	0
174	8	7.56746629954823e+82	99.96996%	0	0
175	8	9.58232378634306e+82	100%	0	1
176	8	1.21330142906214e+83	100%	1	1
177	8	1.46837047948998e+83	100%	1	0

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N	k	$\det(\mathbf{X}_M^T \mathbf{X}_M)$	$\underline{e}(\mathbf{X})$	I_1	I_2
178	8	1.77702283166617e+83	100%	1	0
179	8	2.15050713326635e+83	99.92159%	0	0
180	8	2.60285498913021e+83	99.81576%	0	0
181	8	3.17321024774698e+83	99.84596%	0	0
182	8	3.88341555322266e+83	99.88659%	0	0
183	8	4.72257632734176e+83	99.83472%	0	0
184	8	5.71142931184079e+83	99.74198%	0	0
185	8	7.0022365183304e+83	99.79735%	0	0
186	8	8.64455211964455e+83	99.87153%	0	0
187	8	1.05642521703916e+84	99.84565%	0	0
188	8	1.29338938519355e+84	99.80037%	0	0
189	8	1.59439518972738e+84	99.88016%	0	0
190	8	1.97782710253669e+84	99.97702%	0	0
191	8	2.45005555159392e+84	100%	0	1
192	8	3.03490752197438e+84	100%	1	1
193	8	3.61975949235488e+84	100%	1	0
194	8	4.31723498405861e+84	100%	1	0
195	8	5.14900661549818e+84	99.93224%	0	0
196	8	6.14208843482678e+84	99.84356%	0	0
197	8	7.37251757218228e+84	99.86965%	0	0
198	8	8.87723372623478e+84	99.90428%	0	0
199	8	1.06307613758615e+85	99.85881%	0	0
200	8	1.26717992407678e+85	99.78074%	0	0
201	8	1.52915646087649e+85	99.82978%	0	0
202	8	1.85463956299077e+85	99.89253%	0	0

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N	k	$\det(\mathbf{X}_M^T \mathbf{X}_M)$	$\underline{e}(\mathbf{X})$	I_1	I_2
203	8	2.23050468956742e+85	99.8694%	0	0
204	8	2.68644608934664e+85	99.83126%	0	0
205	8	3.25508332011040e+85	99.8996%	0	0
206	8	3.96455175762135e+85	99.98203%	0	0
207	8	4.82254367014622e+85	100%	0	1
208	8	5.86601803152288e+85	100%	1	1
209	8	6.90949239289961e+85	100%	1	0
210	8	8.13844920312802e+85	100%	1	0
211	8	9.5858360024648e+85	99.9409%	0	0
212	8	1.12927396246632e+86	99.8655%	0	0
213	8	1.33760091492127e+86	99.88827%	0	0
214	8	1.58849625575668e+86	99.91813%	0	0
215	8	1.87747625727281e+86	99.87801%	0	0
216	8	2.21029324983869e+86	99.81137%	0	0
217	8	2.63111505588564e+86	99.85501%	0	0
218	8	3.1437735618467e+86	99.90878%	0	0
219	8	3.72966899723074e+86	99.88806%	0	0
220	8	4.42997060077243e+86	99.85549%	0	0
221	8	5.28973118366026e+86	99.91468%	0	0
222	8	6.34382852177125e+86	99.98567%	0	0
223	8	7.59924185312156e+86	100%	0	1
224	8	9.10283516095844e+86	100%	1	1
225	8	1.06064284687953e+87	100%	1	0
226	8	1.23582017531188e+87	100%	1	0
227	8	1.43990907149377e+87	99.94803%	0	0

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N	k	$\det(\mathbf{X}_M^T \mathbf{X}_M)$	$\underline{e}(\mathbf{X})$	I_1	I_2
228	8	1.67802179049429e+87	99.88312%	0	0
229	8	1.96486256336283e+87	99.90316%	0	0
230	8	2.30580064292209e+87	99.92918%	0	0
231	8	2.69456935597291e+87	99.89356%	0	0
232	8	3.13820768565181e+87	99.83601%	0	0
233	8	3.69168105023588e+87	99.87502%	0	0
234	8	4.35490774038259e+87	99.92162%	0	0
235	8	5.10609806810245e+87	99.90299%	0	0
236	8	5.99267246902825e+87	99.87485%	0	0
237	8	7.06636834821711e+87	99.9266%	0	0
238	8	8.36324841266948e+87	99.9884%	0	0
239	8	9.88782427356968e+87	100%	0	1
240	8	1.16900385500331e+88	100%	1	1
241	8	1.34922528264965e+88	100%	1	0
242	8	1.55721055185232e+88	100%	1	0
243	8	1.79723383295618e+88	99.95396%	0	0
244	8	2.07464499706150e+88	99.8975%	0	0
245	8	2.40501682733773e+88	99.91526%	0	0
246	8	2.79323711997644e+88	99.93814%	0	0
247	8	3.23208466074845e+88	99.90632%	0	0
248	8	3.72883903265536e+88	99.85611%	0	0
249	8	4.34116605578819e+88	99.89116%	0	0
250	8	5.0646937317529e+88	99.93194%	0	0