

Base sets for EK designs

1. \mathbb{Z}_m -BASE-SETS FOR EK $(m, 2)$ DESIGNS

A \mathbb{Z}_9 -base-set for $(9, 2)$ EK design:

$$\{\{0, 1\}, \{2, 4\}\}$$

A \mathbb{Z}_{17} -base-set for $(17, 2)$ EK design:

$$\{\{0, 1\}, \{2, 8\}\} \quad \{\{0, 2\}, \{5, 13\}\}$$

A \mathbb{Z}_{25} -base-set for $(25, 2)$ EK design:

$$\{\{0, 1\}, \{3, 7\}\} \quad \{\{0, 10\}, \{1, 14\}\} \\ \{\{0, 3\}, \{8, 13\}\}$$

2. \mathbb{Z}_m -BASE-SETS FOR EK $(m, 3)$ DESIGNS

A \mathbb{Z}_{19} -base-set for $(19, 3)$ EK design:

$$\{\{0, 1, 4\}, \{3, 8, 14\}\}$$

A \mathbb{Z}_{37} -base-set for $(37, 3)$ EK design:

$$\{\{0, 6, 18\}, \{2, 19, 26\}\} \quad \{\{0, 1, 3\}, \{6, 10, 15\}\}$$

A \mathbb{Z}_{55} -base-set for $(55, 3)$ EK design:

$$\{\{0, 1, 32\}, \{18, 21, 33\}\} \quad \{\{0, 2, 19\}, \{7, 15, 28\}\} \\ \{\{0, 6, 39\}, \{8, 36, 45\}\}$$

A \mathbb{Z}_{73} -base-set for $(73, 3)$ EK design:

$$\{\{2, 23, 39\}, \{14, 34, 53\}\} \quad \{\{1, 43, 71\}, \{24, 64, 70\}\} \\ \{\{0, 2, 24\}, \{39, 44, 57\}\} \quad \{\{2, 32, 43\}, \{26, 30, 40\}\}$$

A \mathbb{Z}_{91} -base-set for $(91, 3)$ EK design:

$$\{\{1, 26, 48\}, \{23, 25, 39\}\} \quad \{\{32, 58, 67\}, \{47, 51, 75\}\} \\ \{\{34, 67, 73\}, \{39, 46, 69\}\} \quad \{\{0, 1, 11\}, \{52, 55, 60\}\} \\ \{\{1, 13, 49\}, \{19, 59, 78\}\}$$

A \mathbb{Z}_{109} -base-set for $(109, 3)$ EK design:

$$\{\{0, 9, 62\}, \{49, 50, 84\}\} \quad \{\{21, 64, 81\}, \{35, 66, 107\}\} \\ \{\{2, 30, 88\}, \{34, 49, 91\}\} \quad \{\{2, 28, 48\}, \{12, 20, 39\}\} \\ \{\{0, 11, 36\}, \{6, 35, 67\}\} \quad \{\{3, 74, 88\}, \{30, 36, 95\}\}$$

A \mathbb{Z}_{127} -base-set for $(127, 3)$ EK design:

$$\{\{18, 119, 123\}, \{66, 94, 104\}\} \quad \{\{11, 77, 126\}, \{33, 42, 84\}\} \\ \{\{25, 60, 125\}, \{30, 105, 124\}\} \quad \{\{44, 97, 108\}, \{71, 100, 121\}\} \\ \{\{43, 66, 123\}, \{54, 57, 102\}\} \quad \{\{0, 14, 58\}, \{18, 52, 125\}\} \\ \{\{18, 74, 90\}, \{28, 35, 41\}\}$$

A \mathbb{Z}_{145} -base-set for $(145, 3)$ EK design:

$$\{\{22, 52, 113\}, \{38, 49, 64\}\} \quad \{\{3, 20, 79\}, \{14, 38, 102\}\} \\ \{\{17, 70, 125\}, \{77, 117, 123\}\} \quad \{\{12, 91, 122\}, \{63, 113, 121\}\} \\ \{\{12, 26, 101\}, \{80, 105, 114\}\} \quad \{\{15, 66, 108\}, \{34, 41, 46\}\} \\ \{\{0, 18, 38\}, \{33, 55, 76\}\} \quad \{\{28, 102, 141\}, \{52, 68, 112\}\}$$

A \mathbb{Z}_{163} -base-set for $(163, 3)$ EK design:

$$\{\{79, 141, 153\}, \{133, 139, 158\}\} \quad \{\{55, 56, 105\}, \{92, 123, 146\}\} \\ \{\{24, 44, 66\}, \{28, 63, 106\}\} \quad \{\{32, 83, 130\}, \{54, 95, 129\}\} \\ \{\{13, 132, 148\}, \{34, 44, 90\}\} \quad \{\{2, 59, 73\}, \{25, 120, 158\}\} \\ \{\{16, 95, 147\}, \{40, 67, 122\}\} \quad \{\{0, 11, 37\}, \{43, 130, 148\}\} \\ \{\{38, 77, 137\}, \{68, 127, 148\}\}$$

A \mathbb{Z}_{181} -base-set for $(181, 3)$ EK design:

$$\{\{0, 1, 3\}, \{5, 10, 21\}\} \quad \{\{0, 59, 177\}, \{114, 47, 153\}\} \\ \{\{0, 42, 126\}, \{29, 58, 158\}\} \quad \{\{0, 125, 13\}, \{82, 164, 91\}\} \\ \{\{0, 135, 43\}, \{132, 83, 120\}\} \quad \{\{0, 6, 25\}, \{33, 131, 146\}\} \\ \{\{0, 173, 27\}, \{137, 127, 107\}\} \quad \{\{0, 71, 145\}, \{119, 72, 159\}\} \\ \{\{0, 26, 48\}, \{143, 85, 150\}\} \quad \{\{0, 86, 117\}, \{111, 128, 162\}\}$$

A \mathbb{Z}_{199} -base-set for $(199, 3)$ EK design:

$$\{\{0, 1, 3\}, \{4, 25, 94\}\} \quad \{\{0, 125, 176\}, \{102, 140, 9\}\} \\ \{\{0, 103, 110\}, \{14, 187, 130\}\} \quad \{\{0, 139, 19\}, \{158, 92, 131\}\} \\ \{\{0, 62, 186\}, \{49, 157, 57\}\} \quad \{\{0, 188, 166\}, \{155, 123, 160\}\} \\ \{\{0, 18, 54\}, \{72, 52, 100\}\} \quad \{\{0, 61, 183\}, \{45, 132, 162\}\} \\ \{\{0, 63, 189\}, \{53, 182, 151\}\} \quad \{\{0, 114, 143\}, \{58, 64, 169\}\} \\ \{\{0, 121, 164\}, \{86, 40, 31\}\}$$

3. $(\mathbb{Z}_m \times [2])$ -BASE-SETS FOR EK $(2m, 3)$ DESIGNS

A $(\mathbb{Z}_{23} \times [2])$ -base-set for $(23, 3)$ EK design:

$$\{\{0_1, 0_2, 1_1\}, \{1_2, 3_1, 4_2\}\} \quad \{\{0_1, 2_1, 5_2\}, \{10_1, 19_1, 21_2\}\} \\ \{\{0_1, 4_2, 8_1\}, \{14_2, 15_2, 22_1\}\} \quad \{\{0_1, 5_1, 11_1\}, \{13_2, 16_1, 22_2\}\} \\ \{\{0_1, 7_2, 18_2\}, \{10_2, 12_2, 16_2\}\}$$

A $(\mathbb{Z}_{41} \times [2])$ -base-set for $(41, 3)$ EK design:

$$\{\{3_1, 5_2, 22_1\}, \{23_2, 24_1, 36_2\}\} \quad \{\{6_1, 13_1, 40_2\}, \{19_1, 24_1, 40_1\}\} \\ \{\{1_2, 19_1, 20_1\}, \{4_1, 18_2, 30_2\}\} \quad \{\{3_2, 20_2, 22_2\}, \{6_2, 9_2, 14_1\}\} \\ \{\{8_2, 26_2, 39_1\}, \{22_1, 27_2, 31_1\}\} \quad \{\{3_1, 22_2, 38_1\}, \{29_2, 35_1, 39_1\}\} \\ \{\{3_2, 23_1, 31_1\}, \{5_2, 35_1, 36_2\}\} \quad \{\{0_1, 4_2, 29_1\}, \{10_1, 19_2, 25_2\}\} \\ \{\{0_1, 8_2, 10_1\}, \{3_2, 12_2, 17_2\}\}$$

A $(\mathbb{Z}_{59} \times [2])$ -base-set for $(59, 3)$ EK design:

$$\{\{0_2, 30_2, 35_1\}, \{5_1, 6_2, 9_1\}\} \quad \{\{0_2, 15_1, 19_2\}, \{11_1, 11_2, 34_2\}\} \\ \{\{0_1, 9_2, 21_2\}, \{12_1, 41_1, 58_1\}\} \quad \{\{0_2, 37_1, 56_1\}, \{1_2, 24_1, 43_2\}\} \\ \{\{0_2, 1_2, 49_1\}, \{31_2, 44_1, 47_1\}\} \quad \{\{0_1, 15_1, 36_1\}, \{14_2, 22_1, 47_2\}\} \\ \{\{0_1, 49_2, 58_2\}, \{40_2, 51_1, 53_2\}\} \quad \{\{0_1, 8_1, 34_1\}, \{28_1, 44_1, 50_1\}\} \\ \{\{0_2, 21_1, 35_2\}, \{49_2, 52_2, 56_1\}\} \quad \{\{0_2, 28_1, 44_2\}, \{12_2, 39_1, 57_2\}\} \\ \{\{0_1, 2_1, 39_2\}, \{2_2, 21_1, 36_2\}\} \quad \{\{0_1, 6_2, 52_1\}, \{26_2, 42_2, 44_2\}\} \\ \{\{0_1, 20_2, 27_2\}, \{1_2, 3_1, 34_1\}\}$$

4. $(\mathbb{Z}_m \times [4])$ -BASE-SETS FOR EK $(4m, 3)$ DESIGNS

A $(\mathbb{Z}_7 \times [4])$ -base-set for $(7, 3)$ EK design:

$$\{\{2_1, 4_1, 5_2\}, \{2_3, 5_3, 6_2\}\} \quad \{\{0_2, 2_1, 4_3\}, \{0_4, 6_3, 6_4\}\} \\ \{\{0_4, 1_1, 4_3\}, \{2_4, 3_3, 5_1\}\} \quad \{\{1_1, 5_1, 5_2\}, \{1_2, 1_4, 6_1\}\} \\ \{\{0_2, 0_3, 2_4\}, \{1_4, 3_3, 5_2\}\} \quad \{\{0_4, 3_3, 4_1\}, \{2_2, 3_4, 5_2\}\}$$