

Olerup SSP™ HLA-A*02

Product number: 101.412-24/04 – licensed for PCR
101.412-24u/04u – not licensed for PCR
Lot number: Y41
Expiry date: 2009-October-01
Number of tests: 24 tests – Product No. 101.412-24
4 tests – Product No. 101.412-04
Number of tubes per test: 85
Storage - pre-aliquoted primers: dark at -20°C
- PCR Master Mix: -20°C

This Product Description is only valid for Lot No. Y41.

CHANGES COMPARED TO THE PREVIOUS OLERUP SSP™ HLA-A*02 LOT

The HLA-A*02 specificity and interpretation tables have been updated for the HLA-A alleles described since the previous Olerup SSP™ HLA-A*02 lot was made (Lot No. V96).

Thirty-five tubes have been added to the HLA-A*02 kit,
wells **49 to 85**.

The primers of the tubes detailed below have been exchanged, added or modified compared to the previous lot.

Tube	5'-primer	3'-primer	rationale
7	Removed	Removed	Primer pair moved to vial 52.
8	-	Modified	Increased specificity of specific primer pair.
15	Removed	Removed	Primer pair moved to vial 53.
19	Removed	Removed	Primer pair moved to vial 49.
20	Removed	Removed	Primer pair moved to vial 54.
21	Removed	Removed	Primer pair moved to vial 55.
24	Removed	Removed	Primer pair moved to vial 56.
26	-	Modified	Increased specificity of specific primer pair.
33	Removed	Removed	Primer pair moved to vial 57.
34	Removed	Removed	Primer pair moved to vial 51.
37	Removed	Removed	Primer pair moved to vial 58.

38	Removed	Removed	Primer pair moved to vial 61.
38	Removed	Removed	Primer pair moved to vial 62.
40	-	Modified	Increased specificity of specific primer pair.
47	Removed	Removed	Primer pair moved to vial 50.
49	New	New	Primer pair from vial 19.
50	New	New	Primer pair from vial 47.
51	New	New	Primer pair from vial 34.
52	New	New	Primer pair from vial 7.
53	New	New	Primer pair from vial 15.
54	New	New	Primer pair from vial 20.
55	New	New	Primer pair from vial 21.
56	New	New	Primer pair from vial 24.
57	New	New	Primer pair from vial 33.
58	New	New	Primer pair from vial 37.
59	New	New	Primer pair from vial 39.
60	New	New	Primer pair to separate the A*0201,68xx and A*0273,68xx genotypes.
61	New	New	Primer pair from vial 38.
62	New	New	Primer pair from vial 39.
63	New	New	New primer pair for the A*9205 allele.
64	New	New	New primer pair for the A*9206 allele.
65	New	New	New primer pair for the A*9207 allele.
66	New	New	New primer pair for the A*9209 allele.
67	New	New	New primer pair for the A*9211 allele.
68	New	New	New primer pair for the A*9213N allele.
69	New	New	New primer pair for the A*9214 allele.
70	New	New	New primer pair for the A*9215 allele.
71	New	New	New primer pair for the A*9216 allele.
72	New	New	New primer pair for the A*9218 allele.
73	New	New	New primer pair for the A*9219 allele.
74	New	New	New primer pair for the A*9220 allele.
75	New	New	New primer pair for the A*9221 allele.
76	New	New	New primer pair for the A*9222 allele.
77	New	New	New primer pair for the A*9223 allele.
78	New	New	New primer pair for the A*9224 allele.
79	New	New	New primer pair for the A*9225N allele.
80	New	New	New primer pair for the A*9226 allele.
81	New	New	New primer pair for the A*9227 allele.
82	New	New	New primer pair for the A*9231 allele.
83	New	New	New primer pair for the A*9232 allele.
84	New	New	New primer pair for the A*9233 allele.
85	New	New	New primer pair for the A*9234 allele.

Change in revision R01 compared to R00:

1. 3 x 92 = 176 µl corrected to 276 µl on page 37.

Change1 in revision R02 compared to R01:

1. Only the A*9227 allele is amplified by primer mix 81.

PRODUCT DESCRIPTION

HLA-A*02 SSP subtyping

CONTENT

The primer set contains 5'- and 3'-primers for identifying the the A*0201 to A*9234 alleles.

The primer solutions are pre-aliquoted into 0.2 ml PCR tubes. Each tube in the set contains a dried primer solution consisting of a specific primer mix, i.e. allele- and group-specific primers as well as a **control primer pair** matching non-allelic sequences.

PCR Master Mix complete with Taq, Taq polymerase, nucleotides, buffer, glycerol and cresol red, as well as PCR lids are included in the licensed kit.

PCR Master Mix without Taq, nucleotides, buffer, glycerol and cresol red, as well as PCR lids are included in the unlicensed kit.

85 PCR reactions with a reaction volume of 10 µl are performed per sample.

Note: The pellets in the tubes may vary in form and colour. This does not affect the performance of the product.

PLATE LAYOUT

Each test consists of 85 PCR reactions in a 96 well cut PCR plate. Wells 86 to 96 are empty.

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80
81	82	83	84	85	empty	empty	empty
empty	empty	empty	empty	empty	empty	empty	empty

The 96 well cut PCR plate is marked with 'HLA-A*02 Y41'.

Well No. 1 is marked with '1'.

The PCR plates are covered with a PCR-compatible foil.

INTERPRETATION

The interpretation of HLA-A*02 SSP subtypings will be influenced by three A*01, most A*03, three A*11, most A*23, most A*24, eight A*26, the A*2907, sixteen A*30, the A*3208, two A*33, the A*3408, the A*68, the A*6901, two A*74 and the A*8001 alleles when present on the other haplotype.

UNIQUELY IDENTIFIED ALLELES

All the HLA-A*02 alleles, i.e. **A*0201 to A*9234 alleles**, recognized by the HLA Nomenclature Committee in October 2007¹ will give rise to unique amplification patterns by the primers in the HLA-A*02 subtyping kit.

The HLA-A*02 subtyping kit cannot distinguish the A*02010101, A*020102 and the A*020104 to A*020115 alleles, the A*020601 to A*020605 alleles, the A*021701 and A*021702 alleles, the A*022001 and A*022002 alleles and the A*027401 and A*027402 alleles.

¹**Nomenclature for factors of the HLA system, 1998.** *Tissue Antigens* 1999; **53**: 407-446.
HLA-A alleles listed on the IMGT/HLA web page 2007-October-05, release 2.19.0, www.ebi.ac.uk/imgt/hla.

RESOLUTION IN HOMO- AND HETEROZYGOTES

The HLA-A*02 alleles generate 136 different amplification patterns¹ that can be combined in 9 316 homozygous and heterozygous combinations. 2 819 of these genotypes do not give rise to unique amplification patterns. (The different sizes of the specific PCR products generated by the primers in tubes 8, 11, 12, 17, 23, 24, 26, 27, 31, 32, 34 to 37, 40, 43, 45, 46 and 55 have not been considered in these calculations.)

¹The A*02010102L and A*020103 and A*020117 amplification patterns differ from the amplification pattern of the other A*0201 alleles. The A*023501, A*023502 and A*023503 amplification patterns differ. These different A*02 amplification patterns have been considered in these calculations.

0202,0225 = 0225,9202
0202,0299 = 0299,9202
0202,0226 = 0226,9202
0204,0205 = 0205,0289
0202,9208 = 9202,9208
0202,0257 = 0257,9202
0202,9210 = 9202,9210
0202,0217 = 0217,9202
0204,0247 = 0247,0289
0204,0263 = 0263,0289
0204,9215 = 0289,9215
0202,0204 = 0202,0289 = 0204,9202 = 0289,9202
0205,0220 = 0208,0232N
0205,0270 = 0247,0284
0205,0260 = 0205,0286
0205,0258 = 0214,9202
0201,0205 = 0202,0284 = 0205,0232N = 0205,0275 = 0205,0285 = 0284,9202
0202,0291 = 0291,9202
0202,0221 = 0221,9202

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+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0210 = 0210,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0228 = 0228,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0206,0247 = 0247,0285
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0251 = 0251,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0241 = 0241,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0279 = 0279,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0261 = 0261,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0206,0263 = 0263,0285
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0272 = 0272,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,9206 = 9202,9206
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0206,9215 = 0285,9215
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,9226 = 9202,9226
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,9227 = 9202,9227
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0206 = 0202,0285 = 0206,9202 = 0285,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,9212 = 9202,9212
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0215N = 0215N,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,9230 = 9202,9230
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0218 = 0218,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0207 = 0207,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0263,0287 = 0263,0296
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0287,9215 = 0296,9215
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0287 = 0202,0296 = 0287,9202 = 0296,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0273 = 0273,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0293 = 0293,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0209 = 0209,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0239 = 0239,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0283N = 0283N,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,9228 = 9202,9228
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0269 = 0269,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0211 = 0211,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0229 = 0229,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0236 = 0236,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0231 = 0231,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,9231 = 9202,9231
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0216 = 0216,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0252 = 0252,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
0202,0233 = 0233,9202
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+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9214 = 9202,9214
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0295 = 0295,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0256 = 0256,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0278 = 0278,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0262 = 0262,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0220 = 0220,9202 = 0255,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0245 = 0245,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0246 = 0246,0247 = 0246,9202 = 0247,0292
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0292 = 0292,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0243N = 0243N,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0282N = 0282N,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0247,0260 = 0247,0286
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0247 = 020103,0247 = 0202,0270 = 0232N,0247 = 0247,0270 = 0247,0275 = 0270,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,023501 = 023501,9202 = 023502,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0234 = 0234,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0288N = 0288N,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0240 = 0240,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0277 = 0277,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0294N = 0294N,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9201 = 9201,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0268 = 0268,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0280 = 0280,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0267 = 0267,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,023503 = 023503,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0271 = 0271,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0259 = 0259,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0260,0263 = 0263,0286
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0260,9215 = 0286,9215
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0260 = 0202,0286 = 0260,9202 = 0286,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0266 = 0266,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0253N,0263 = 0263,0281
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0263 = 020103,0263 = 0232N,0263 = 0263,0275
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0264 = 0264,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      02010102L,0202 = 02010102L,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0276 = 0276,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0258 = 0258,9202
+++++++ +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0274 = 0274,9202
  
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+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0230 = 0230,9202
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0253N,9215 = 0281,9215
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9224 = 9202,9224
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0253N = 0202,0281 = 0253N,9202 = 0281,9202
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0242 = 0242,9202
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0290 = 0290,9202
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,0297 = 0297,9202
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9205 = 9202,9205
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9207 = 9202,9207
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9209 = 9202,9209
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9211 = 9202,9211
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9213N = 9202,9213N
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0201,9215 = 020103,9215 = 0232N,9215 = 0275,9215
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9216 = 9202,9216
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9218 = 9202,9218
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9219 = 9202,9219
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9220 = 9202,9220
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9221 = 9202,9221
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9223 = 9202,9223
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9225N = 9202,9225N
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9232 = 9202,9232
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9233 = 9202,9233
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0202,9234 = 9202,9234
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0202 = 0201,9202 = 020103,0202 = 020103,9202 = 020117,9202 = 0202,0232N = 0202,0275
= 0232N,9202 = 0275,9202
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0204,0208 = 0208,0289
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0208,0234 = 0208,0262
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0208,0260 = 0208,0286
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0208 = 0208,0220 = 0208,0275 = 0208,0285
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0217,9217 = 9210,9217
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0204,9217 = 0289,9217
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0203,0204 = 0203,0289
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9217 = 0228,9217 = 0241,9217 = 0285,9217 = 0299,9217
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0203,0206 = 0203,0285 = 0203,0299
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0287,9217 = 0296,9217
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0203,0287 = 0203,0296
+++++++ ----- +-----+-----+-----+-----+-----+-----+-----+-----+
      0233,9217 = 0252,9217
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+++++-- ++----- -----++----- +-----+----- +-----+----- +-----+----- +-----+-----
0220,9217 = 0255,9217
+++++-- ++----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
023501,9217 = 023502,9217
+++++-- ++----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0260,9217 = 0286,9217
+++++-- ++----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0253N,9217 = 0281,9217
+++++-- ++----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0201,9217 = 020103,9217 = 020117,9217 = 0225,9217 = 0226,9217 = 0271,9217 = 0280,9217 =
0295,9217
+++++-- ++----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0203,0220 = 0203,0255
+++++-- ++----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0203,023501 = 0203,023502
+++++-- ++----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0203,0260 = 0203,0286
+++++-- ++----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0203,0253N = 0203,0281
+++++-- ++----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0201,0203 = 020103,0203 = 020117,0203 = 0203,0225 = 0203,0226 = 0203,0271
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0217,9222 = 9210,9222
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0204,9222 = 0289,9222
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0217,0250 = 0250,9210
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0204,0249 = 0249,0289
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0204,0250 = 0250,0289
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0204,9204 = 0289,9204
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0204,0222 = 0222,0289
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0206,0249 = 0249,0285
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0233,9222 = 0252,9222
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0260,9222 = 0286,9222
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0201,9222 = 0209,9222 = 0230,9222 = 0273,9222 = 0285,9222 = 0293,9222 = 0295,9222
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0206,0250 = 0228,0250 = 0250,0285
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0206,9204 = 0285,9204
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0206,0222 = 0222,0285
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0249,0287 = 0249,0296
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0250,0287 = 0250,0296
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0287,9204 = 0296,9204
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0222,0287 = 0222,0296
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0220,0249 = 0249,0255
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
023501,0249 = 023502,0249
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0249,0260 = 0249,0286
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0249,0253N = 0249,0281
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0201,0249 = 020103,0249 = 020117,0249 = 0209,0249 = 0249,0271
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0233,0250 = 0250,0252
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0222,0273 = 0250,0271
+++++-- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+----- +-----+-----
0250,0260 = 0250,0286
```


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+++++-----+-----+-----+-----+-----+-----+-----+-----+
0250,0253N = 0250,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0201,0250 = 020103,0250 = 0209,0250 = 0230,0250 = 0250,0273 = 0250,0293 = 0250,0295
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0220,9204 = 0255,9204
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0220,0222 = 0222,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+
023501,9204 = 023502,9204
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0260,9204 = 0286,9204
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9204 = 0281,9204
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0201,9204 = 020103,9204 = 020117,9204 = 0222,0243N = 0243N,9204 = 0271,9204
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0222,023501 = 0222,023502
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0222,0260 = 0222,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0222,0253N = 0222,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0201,0222 = 020103,0222 = 020117,0222 = 0222,0271
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0214 = 0214,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0214,0224 = 0214,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0214,0260 = 0214,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0201,0214 = 0214,0232N = 0214,0258 = 0214,0275 = 0214,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0232N = 0232N,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0206,0232N = 0232N,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0232N,0287 = 0232N,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0220,0232N = 0232N,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0232N,023501 = 0232N,023502
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0224,0232N = 0232N,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0232N,0260 = 0232N,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0232N,0253N = 0232N,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0201,0232N = 020103,0232N = 020117,0232N = 0232N,0232N
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0238 = 0238,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0206,0238 = 0238,0285 = 0238,0299
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0238,0287 = 0238,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0220,0238 = 0238,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+
023501,0238 = 023502,0238
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0238,0260 = 0238,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0238,0253N = 0238,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0201,0238 = 020103,0238 = 020117,0238 = 0225,0238 = 0226,0238 = 0238,0268 = 0238,9201
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0225 = 0225,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0206,0225 = 0225,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0225,0287 = 0225,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0220,0225 = 0225,0255
```

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+++++--- +----- +----- +----- +----- +----- +----- +-----
      0225,023501 = 0225,023502
+++++--- +----- +----- +----- +----- +----- +----- +-----
      0224,0225 = 0225,0294N
+++++--- +----- +----- +----- +----- +----- +----- +-----
      0225,0260 = 0225,0286
+++++--- +----- +----- +----- +----- +----- +----- +-----
      0225,0253N = 0225,0281
+++++--- +----- +----- +----- +----- +----- +----- +-----
      0201,0225 = 020103,0225 = 020117,0225 = 0225,0225
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0217,0299 = 0226,9208
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0204,0299 = 0289,0299
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0204,0213 = 0213,0289
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0204,0226 = 0226,0289
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0207,0299 = 0226,0291
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0221,0226 = 0296,0299
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0226,0254 = 0237,0299
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0206,0213 = 0212,0299 = 0213,0285 = 0213,0299
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0226,0228 = 0295,0299
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0220,0299 = 0255,0299
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0226,0251 = 0240,0299
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0224,0299 = 0294N,0299
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0226,0279 = 0260,0299 = 0286,0299
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0226,0261 = 0266,0299
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0226,0272 = 0264,0299
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0201,0299 = 020117,0299 = 0206,0226 = 0226,0285 = 0226,0299 = 0285,0299
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0213,0287 = 0213,0296
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0226,0287 = 0226,0296
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0213,0236 = 0226,0237
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0213,0220 = 0213,0255
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0213,023501 = 0213,023502
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0213,0260 = 0213,0286
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0213,0253N = 0213,0281
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0201,0213 = 020103,0213 = 020117,0213 = 0212,0226 = 0213,0226
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0220,0226 = 0226,0255
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0226,023501 = 0226,023502
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0224,0226 = 0226,0294N
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0226,0260 = 0226,0286
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0226,0253N = 0226,0281
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0201,0226 = 020103,0226 = 020117,0226 = 0226,0226
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0204,0284 = 0284,0289
+++++--- -+++++--- +----- +----- +----- +----- +----- +-----
      0204,0291 = 0289,0291
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+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0217,0221 = 0296,9208
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0221 = 0221,0289
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0217,0254 = 0237,9208
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,9210 = 0217,0228 = 0228,9210 = 0285,9210 = 0295,9208
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,9208 = 0255,9208
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0217,0251 = 0240,9208
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9208 = 0294N,9208
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0217,0261 = 0266,9208
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0217,0272 = 0264,9208
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9208 = 020117,9208 = 0206,0217 = 0217,0285 = 0231,9208 = 0258,9208 = 0275,9208 =
0283N,9208 = 0285,9208 = 0289,9208
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0210 = 0210,0289
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0254 = 0254,0289
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0228 = 0228,0289
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0257 = 0255,0257
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0251 = 0251,0289
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0257 = 0257,0294N
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0265 = 0265,0285
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0241 = 0241,0289
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0257 = 020117,0257 = 0257,0258 = 0257,0275 = 0257,0285 = 0257,0289
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0261 = 0261,0289
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0272 = 0272,0289
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,9206 = 0289,9206
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,9226 = 0289,9226
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,9227 = 0289,9227
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0206 = 0204,0285 = 0206,0289 = 0285,0289
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,9212 = 0289,9212
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0215N = 0215N,0289
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,9203 = 0289,9203
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,9230 = 0289,9230
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0218 = 0218,0289
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0207 = 0207,0289
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,9229 = 0289,9229
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0265,0287 = 0265,0296
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0287 = 0204,0296 = 0287,0289 = 0289,0296
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0217,0273 = 0273,9210
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0217,0293 = 0293,9210
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+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0273 = 0273,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0293 = 0289,0293
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0209 = 0209,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0217,0252 = 0252,9210
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,9210 = 0255,9210
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9210 = 0294N,9210
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0217,9214 = 9210,9214
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9210 = 020103,9210 = 020117,9210 = 0217,0295 = 0231,9210 = 0258,9210 = 0275,9210 =
0283N,9210 = 0289,9210 = 0295,9210
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0217,0220 = 0217,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0217,0224 = 0217,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0217 = 020103,0217 = 020117,0217 = 0217,0231 = 0217,0258 = 0217,0275 = 0217,0283N =
0217,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0283N = 0283N,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,9228 = 0289,9228
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0269 = 0269,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0211 = 0211,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0229 = 0229,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0237 = 0237,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0227 = 0227,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0212 = 0212,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0236 = 0236,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0231 = 0231,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,9231 = 0289,9231
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0216 = 0216,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0252 = 0252,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0233 = 0233,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,9214 = 0289,9214
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0295 = 0289,0295
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0256 = 0256,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0278 = 0278,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0262 = 0262,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0265 = 0255,0265
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0220 = 0204,0255 = 0220,0289 = 0255,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0245 = 0245,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0248 = 0248,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0246 = 0246,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0204,0292 = 0289,0292
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+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0243N = 0243N,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0282N = 0282N,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0270 = 0270,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
023501,0265 = 023502,0265
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,023501 = 0204,023502 = 023501,0289 = 023502,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0234 = 0234,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0288N = 0288N,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0240 = 0240,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0277 = 0277,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0265 = 0265,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0201,0265 = 020103,0265 = 020117,0265 = 0265,0289 = 0265,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0224 = 0204,0294N = 0224,0289 = 0289,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,9201 = 0289,9201
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0268 = 0268,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0280 = 0280,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0267 = 0267,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0258 = 0258,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0275 = 0275,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,023503 = 023503,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0271 = 0271,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0259 = 0259,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0260 = 0260,0289 = 0286,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0266 = 0266,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0264 = 0264,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
02010102L,0204 = 02010102L,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0276 = 0276,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0274 = 0274,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0230 = 0230,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,9224 = 0289,9224
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0253N = 0204,0281 = 0253N,0289 = 0281,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0242 = 0242,0289
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0290 = 0289,0290
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,0297 = 0289,0297
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,9205 = 0289,9205
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,9207 = 0289,9207
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,9209 = 0289,9209
+++++-----+-----+-----+-----+-----+-----+-----+-----+
0204,9211 = 0289,9211

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+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,0266 = 0261,0296
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,0264 = 0272,0296
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0221 = 020117,0221 = 0206,0296 = 0221,0285 = 0221,0296 = 0285,0287 = 0285,0296
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0273 = 0228,0273 = 0273,0285
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0293 = 0228,0293 = 0285,0293
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0209 = 0209,0285
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0210,0220 = 0210,0255
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0210,0224 = 0210,0294N
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0210,0260 = 0210,0286 = 0228,0239
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0210 = 020117,0210 = 0210,0283N = 0210,0285 = 0210,0295 = 0228,0283N
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0239 = 0239,0285 = 0279,0283N
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0283N = 0283N,0285
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0229 = 0229,0285
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0228,0237 = 0254,0295
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0254 = 0254,0255
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0237,0251 = 0240,0254
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0237,0279 = 0254,0260 = 0254,0286
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0237,0261 = 0254,0266
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0237,0272 = 0254,0264
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0254 = 020117,0254 = 0206,0237 = 0236,0254 = 0237,0285 = 0254,0285
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0219 = 0219,0285
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0227 = 0227,0285
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0244 = 0244,0255
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0244 = 020117,0244 = 0244,0260 = 0244,0285 = 0244,9218
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0212 = 0212,0285
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0236 = 0236,0285
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0231 = 0231,0285
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,9231 = 0285,9231 = 9227,9231
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0216 = 0216,0285 = 0216,9227
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0252 = 0228,0233 = 0228,0252 = 0252,0285
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,0233 = 0233,0285
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0228 = 0228,0255
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0228,0240 = 0251,0295
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0228 = 0228,0294N
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0228,0260 = 0228,0286 = 0279,0295
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0228,0266 = 0261,0295
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0228,0264 = 0272,0295
```

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+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9214 = 0228,9214 = 0285,9214
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0228 = 020117,0228 = 0206,0295 = 0228,0285 = 0228,0295 = 0285,0295
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0256 = 0256,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0262 = 0262,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0251 = 0251,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0241 = 0241,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0279 = 0255,0279
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0261 = 0255,0261
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0272 = 0255,0272
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9206 = 0255,9206
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9226 = 0255,9226
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9227 = 0255,9227
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0220 = 0206,0255 = 0220,0285 = 0255,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0245 = 0245,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0246 = 0246,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0292 = 0285,0292
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0243N = 0243N,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0282N = 0282N,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0270 = 0270,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      023501,0285 = 023502,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0234 = 0234,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0288N = 0285,0288N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0251 = 0251,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0240,0279 = 0251,0260 = 0251,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0240,0261 = 0251,0266
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0240,0272 = 0251,0264
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0251 = 020117,0251 = 0206,0240 = 0240,0251 = 0240,0285 = 0251,0267 = 0251,0277 =
      0251,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0277 = 0277,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0241 = 0241,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0279 = 0279,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0261 = 0261,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0272 = 0272,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,9206 = 0294N,9206
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,9226 = 0294N,9226
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,9227 = 0294N,9227
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0224 = 0206,0294N = 0224,0285 = 0285,0294N
```



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+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9201 = 0285,9201
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0268 = 0268,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0241,0260 = 0241,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0280 = 0241,0280 = 0280,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0241 = 020117,0241 = 0241,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0267 = 0267,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0258 = 0258,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0275 = 0275,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0271 = 0271,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0259 = 0259,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0260,0261 = 0261,0286 = 0266,0279
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0260,0272 = 0264,0279 = 0272,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0260,9206 = 0286,9206
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0260,9226 = 0286,9226
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0260,9227 = 0286,9227
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0279 = 020117,0279 = 0206,0260 = 0206,0286 = 0260,0279 = 0260,0285 = 0279,0285 =
      0285,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0261,0264 = 0266,0272
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0261 = 020117,0261 = 0206,0266 = 0261,0266 = 0261,0285 = 0266,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0272 = 020117,0272 = 0206,0264 = 0264,0272 = 0264,0285 = 0272,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      02010102L,0206 = 02010102L,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0276 = 0276,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0274 = 0274,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0230 = 0230,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0253N = 0253N,0285 = 0281,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0242 = 0242,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,0297 = 0285,0297
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9205 = 0285,9205
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,9206 = 020117,9206 = 0285,9206
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9207 = 0285,9207
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9209 = 0285,9209
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9211 = 0285,9211
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9213N = 0285,9213N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9216 = 0285,9216
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9218 = 0285,9218
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9219 = 0285,9219
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9220 = 0285,9220
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+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9221 = 0285,9221
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9223 = 0285,9223
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9225N = 0285,9225N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,9226 = 020117,9226 = 0285,9226
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,9227 = 020117,9227 = 0285,9227
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9232 = 0285,9232
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9233 = 0285,9233
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0206,9234 = 0285,9234
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0206 = 0201,0285 = 020103,0285 = 020117,0206 = 020117,0285 = 0206,0285 = 0285,0285
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0256,9212 = 0296,9203
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9212 = 0255,9212
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0240,9212 = 0296,9230
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,9212 = 0294N,9212
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0260,9212 = 0286,9212
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,9212 = 020117,9212 = 0207,0296 = 0296,9212
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0215N,0220 = 0215N,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0215N,0224 = 0215N,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0215N,0260 = 0215N,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0215N = 020103,0215N = 020117,0215N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0246,9203 = 0270,9203
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0240,9203 = 0256,9230
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,9203 = 0294N,9203
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0260,9203 = 0286,9203
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,9203 = 020103,9203 = 0207,0256 = 0220,9203 = 0234,9203 = 0245,9203 = 0256,9203 =
      0262,9203 = 0282N,9203 = 0288N,9203 = 0292,9203
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9230 = 0255,9230
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0218,0220 = 0218,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0207,0220 = 0207,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,9230 = 0294N,9230
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0260,9230 = 0286,9230
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,9230 = 020103,9230 = 020117,9230 = 0207,0240 = 0240,9230 = 0267,9230 = 0277,9230
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0218,0224 = 0218,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0207,0224 = 0207,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0218,0260 = 0218,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0218 = 020103,0218 = 020117,0218
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0207,0260 = 0207,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0207 = 020103,0207 = 020117,0207
  
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+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0267,0287 = 0267,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0258,0287 = 0258,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0275,0287 = 0275,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0271,0287 = 0271,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0259,0287 = 0259,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0287 = 0260,0296 = 0286,0287 = 0286,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0266,0287 = 0266,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0264,0287 = 0264,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
02010102L,0287 = 02010102L,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0276,0287 = 0276,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0274,0287 = 0274,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0230,0287 = 0230,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0287 = 0253N,0296 = 0281,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0242,0287 = 0242,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,0297 = 0296,0297
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9205 = 0296,9205
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9207 = 0296,9207
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9209 = 0296,9209
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9211 = 0296,9211
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9213N = 0296,9213N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9216 = 0296,9216
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9218 = 0296,9218
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9219 = 0296,9219
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9220 = 0296,9220
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9221 = 0296,9221
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9223 = 0296,9223
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9225N = 0296,9225N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9232 = 0296,9232
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9233 = 0296,9233
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9234 = 0296,9234
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0287 = 0201,0296 = 020103,0296 = 020117,0287 = 020117,0296 = 0287,0296 = 0296,0296
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0233,0273 = 0252,0273
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0233,0293 = 0252,0293
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0273 = 0255,0273
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0293 = 0255,0293
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0273 = 023502,0273
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0293 = 023502,0293
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+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0273 = 0273,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0293 = 0293,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0260,0273 = 0273,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0260,0293 = 0286,0293
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0253N,0273 = 0273,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0253N,0293 = 0281,0293
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0273 = 020103,0273 = 020117,0273 = 0209,0273 = 0230,0273 = 0273,0273 = 0273,0293 =
0273,0295
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0293 = 020103,0293 = 020117,0293 = 0209,0293 = 0230,0293 = 0293,0293 = 0293,0295
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0209,0220 = 0209,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0209,023501 = 0209,023502
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0209,0224 = 0209,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0209,0260 = 0209,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0209,0253N = 0209,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0209 = 020103,0209 = 020117,0209 = 0209,0209
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0239 = 0239,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0283N = 0255,0283N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      023501,0283N = 023502,0283N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0239 = 0239,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0283N = 0283N,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0239 = 020103,0239 = 020117,0239 = 0239,0260 = 0239,0283N = 0260,0283N = 0283N,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0253N,0283N = 0281,0283N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0283N = 020103,0283N = 020117,0283N = 0283N,0283N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0211,0256 = 0256,9228
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0211,0262 = 0234,9228 = 0262,9228
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,9228 = 0294N,9228
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0260,9228 = 0286,9228
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0269 = 0255,0269
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,9228 = 020117,9228 = 0211,0220 = 0211,0255 = 0220,9228 = 0229,9228 = 0255,9228
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0229 = 0229,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0211,0246 = 0229,0248
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0211,0234 = 0229,023501 = 0229,023502
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0269 = 0269,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0211,0224 = 0211,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0229 = 0229,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0260,0269 = 0269,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0211,0260 = 0211,0286
```



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+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0229,0260 = 0229,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0229,0253N = 0229,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0269 = 020117,0269 = 0229,0269
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0211 = 020117,0211 = 0211,0229 = 0229,0290
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0229 = 020103,0229 = 020117,0229 = 0229,0229
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0237 = 0237,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0219,0220 = 0219,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0237 = 023502,0237
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0237,0260 = 0237,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0237,0253N = 0237,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0237 = 020103,0237 = 020117,0237 = 0212,0236 = 0236,0237
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0219,023501 = 0219,023502
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0219,0253N = 0219,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0219 = 020103,0219 = 020117,0219 = 0219,0260 = 0219,9218
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0227 = 0227,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0227,023501 = 0227,023502
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0227,0260 = 0227,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0227,0253N = 0227,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0227 = 020103,0227 = 020117,0227
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0212,0220 = 0212,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0212,023501 = 0212,023502
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0212,0260 = 0212,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0212,0253N = 0212,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0212 = 020103,0212 = 020117,0212
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0236 = 0236,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0236 = 023502,0236
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0236 = 0236,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0236,0260 = 0236,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0236,0253N = 0236,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0236 = 020103,0236 = 020117,0236 = 0236,0236
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0231 = 0231,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0231,023501 = 0231,023502
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0231 = 0231,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0231,0260 = 0231,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0231,0253N = 0231,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0231 = 020103,0231 = 020117,0231 = 0231,0231
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,9231 = 0255,9231
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+++++-----+--+-----+-----+-----+-----+-----+-----+-----+-----+
0216,0220 = 0216,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,9231 = 023502,9231
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0216,023501 = 0216,023502
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9231 = 0294N,9231
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0216,0224 = 0216,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9231 = 0286,9231
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0216,0260 = 0216,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9231 = 0281,9231
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0216,0253N = 0216,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9231 = 020103,9231 = 020117,9231 = 0216,9231 = 9231,9231
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0216 = 020103,0216 = 020117,0216 = 0216,0216
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0252 = 0252,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0252 = 023502,0252
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0252 = 0252,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0252,0260 = 0252,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0233,9214 = 0252,9214
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0252,0253N = 0252,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0252 = 020103,0252 = 020117,0252 = 0233,0252 = 0233,0295 = 0252,0252 = 0252,0295
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0233 = 0233,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0233 = 0233,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0233,0260 = 0233,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0233 = 020103,0233 = 020117,0233
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,9214 = 0255,9214
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0295 = 0255,0295
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,9214 = 023502,9214
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0295 = 023502,0295
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9214 = 0294N,9214
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0295 = 0294N,0295
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9214 = 0286,9214
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0295 = 0286,0295
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9214 = 0281,9214
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9214 = 020103,9214 = 020117,9214 = 0295,9214 = 9214,9214
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0295 = 0281,0295
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0295 = 020103,0295 = 020117,0295 = 0295,0295
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0246,0256 = 0256,0270
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0246,0278 = 0270,0278
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0256 = 0256,0294N
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+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0278 = 0278,0294N
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0256,0260 = 0256,0286
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0256 = 0256,0281
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0234,0278 = 023501,0256 = 023502,0256 = 023503,0256 = 0256,0278 = 0256,0290 = 0262,0278
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0256 = 020103,0256 = 020117,0256 = 0220,0256 = 0234,0256 = 0245,0256 = 0245,0262 =
0255,0256 = 0256,0256 = 0256,0262 = 0256,0282N = 0256,0288N = 0256,0292
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0278 = 0278,0286
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0278 = 020117,0278 = 0220,0278 = 0245,0278 = 0255,0278 = 0278,0282N = 0278,0288N =
0278,0292
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0245 = 0245,0255
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0246 = 0246,0255
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0292 = 0255,0292
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0243N = 0243N,0255
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0282N = 0255,0282N
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0270 = 0255,0270
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0262 = 0262,0294N
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0262 = 0262,0286
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0262 = 0262,0281
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,023501 = 0220,023502 = 023501,0255 = 023501,0262 = 023502,0262 = 023503,0262 =
0262,0290
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0262 = 020103,0262 = 020117,0262 = 0220,0234 = 0220,0262 = 0234,0255 = 0234,0262 =
0255,0262 = 0262,0262 = 0262,0288N
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0288N = 0255,0288N
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0240 = 0240,0255
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0277 = 0255,0277
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0224 = 0220,0294N = 0224,0255 = 0255,0294N
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,9201 = 0255,9201
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0268 = 0255,0268
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0280 = 0255,0280
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0267 = 0255,0267
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0258 = 0255,0258
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0275 = 0255,0275
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,023503 = 023503,0255
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0271 = 0255,0271
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0259 = 0255,0259
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0260 = 0220,0286 = 0255,0260 = 0255,0286
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0266 = 0255,0266
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0220,0264 = 0255,0264
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
02010102L,0220 = 02010102L,0255
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+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0276 = 0255,0276
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0274 = 0255,0274
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0230 = 0230,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9224 = 0255,9224
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0253N = 0220,0281 = 0253N,0255 = 0255,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0242 = 0242,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0290 = 0255,0290
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,0297 = 0255,0297
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9205 = 0255,9205
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9207 = 0255,9207
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9209 = 0255,9209
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9211 = 0255,9211
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9213N = 0255,9213N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9216 = 0255,9216
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9218 = 0255,9218
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9219 = 0255,9219
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9220 = 0255,9220
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9221 = 0255,9221
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9223 = 0255,9223
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9225N = 0255,9225N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9232 = 0255,9232
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9233 = 0255,9233
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0220,9234 = 0255,9234
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0220 = 0201,0255 = 020103,0220 = 020103,0255 = 020117,0220 = 0220,0220 = 0220,0255
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0245,0248 = 0248,0282N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0245,0246 = 0245,0270 = 0246,0282N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      023501,0245 = 023502,0245
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0245 = 0245,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0245,0260 = 0245,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0245,0253N = 0245,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0201,0245 = 020103,0245 = 020117,0245 = 0245,0245 = 0245,0282N = 0245,0292 = 0282N,0292
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0234,0248 = 023501,0246 = 023502,0246
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0248 = 0248,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0224,0246 = 0246,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0248,0260 = 0248,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0246,0260 = 0246,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
      0246,0253N = 0246,0281
  
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+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0248 = 0246,0248 = 0246,0290 = 0248,0270 = 0248,0292
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0246 = 020103,0246 = 020117,0246 = 0246,0246 = 0246,0270 = 0246,0292 = 0270,0292
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0292 = 023502,0292
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0292 = 0292,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0292 = 0286,0292
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0292 = 0281,0292
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0292 = 020103,0292 = 020117,0292 = 0292,0292
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0243N = 023502,0243N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0243N = 0243N,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0243N,0260 = 0243N,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0243N,0253N = 0243N,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0243N = 020103,0243N = 020117,0243N = 0243N,0243N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0282N = 023502,0282N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0282N = 0282N,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0282N = 0282N,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0282N = 0281,0282N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0282N = 020103,0282N = 020117,0282N = 0282N,0282N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0270 = 023502,0270
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0270 = 0270,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0270 = 0270,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0270 = 0270,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0270 = 020103,0270 = 020117,0270 = 0270,0270
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0240 = 023502,0240
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0277 = 023502,0277
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,023501 = 0224,023502 = 023501,0294N = 023502,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0234 = 0234,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0288N = 0288N,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,9201 = 023502,9201
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0268 = 023502,0268
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0280 = 023502,0280
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0267 = 023502,0267
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0258 = 023502,0258
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0275 = 023502,0275
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0271 = 023502,0271
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0259 = 023502,0259
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0260 = 023501,0286 = 023502,0260 = 023502,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0234,0260 = 0234,0286

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+++++-----
023501,0266 = 023502,0266
+++++-----
023501,0264 = 023502,0264
+++++-----
02010102L,023501 = 02010102L,023502
+++++-----
023501,0276 = 023502,0276
+++++-----
023501,0274 = 023502,0274
+++++-----
0230,023501 = 0230,023502
+++++-----
023501,0253N = 023502,0253N
+++++-----
0234,0253N = 0234,0281
+++++-----
023501,0242 = 023502,0242
+++++-----
023501,0297 = 023502,0297
+++++-----
023501,9205 = 023502,9205
+++++-----
023501,9207 = 023502,9207
+++++-----
023501,9209 = 023502,9209
+++++-----
023501,9211 = 023502,9211
+++++-----
023501,9213N = 023502,9213N
+++++-----
023501,9216 = 023502,9216
+++++-----
023501,9218 = 023502,9218
+++++-----
023501,9219 = 023502,9219
+++++-----
023501,9220 = 023502,9220
+++++-----
023501,9221 = 023502,9221
+++++-----
023501,9223 = 023502,9223
+++++-----
023501,9225N = 023502,9225N
+++++-----
023501,9232 = 023502,9232
+++++-----
023501,9233 = 023502,9233
+++++-----
023501,9234 = 023502,9234
+++++-----
0201,023501 = 0201,023502 = 020117,023501 = 0234,023501 = 0234,023502 = 0234,023503 =
0234,0290 = 023501,0288N = 023502,0288N = 023503,0288N
+++++-----
0201,0234 = 020103,0234 = 020117,0234 = 0234,0234 = 0234,0288N
+++++-----
0260,0288N = 0286,0288N
+++++-----
0253N,0288N = 0281,0288N
+++++-----
0201,0288N = 020103,0288N = 020117,0288N = 0288N,0288N
+++++-----
0224,0240 = 0240,0294N
+++++-----
0224,0277 = 0277,0294N
+++++-----
0240,0260 = 0240,0286
+++++-----
0240,0253N = 0240,0281
+++++-----
0201,0240 = 020103,0240 = 020117,0240 = 0240,0240 = 0240,0267 = 0240,0277 = 0267,0277
+++++-----
0260,0277 = 0277,0286

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+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0277 = 0277,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0277 = 020103,0277 = 020117,0277 = 0277,0277
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9201 = 0294N,9201
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0268 = 0268,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0280 = 0280,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0267 = 0267,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0258 = 0258,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0275 = 0275,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,023503 = 023503,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0271 = 0271,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0259 = 0259,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0260 = 0224,0286 = 0260,0294N = 0286,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0266 = 0266,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0264 = 0264,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
02010102L,0224 = 02010102L,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0276 = 0276,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0274 = 0274,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0230 = 0230,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9224 = 0294N,9224
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0253N = 0224,0281 = 0253N,0294N = 0281,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0242 = 0242,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0290 = 0290,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,0297 = 0294N,0297
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9205 = 0294N,9205
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9207 = 0294N,9207
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9209 = 0294N,9209
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9211 = 0294N,9211
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9213N = 0294N,9213N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9216 = 0294N,9216
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9218 = 0294N,9218
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9219 = 0294N,9219
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9220 = 0294N,9220
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9221 = 0294N,9221
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9223 = 0294N,9223
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9225N = 0294N,9225N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9232 = 0294N,9232
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9233 = 0294N,9233
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+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0224,9234 = 0294N,9234
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0224 = 0201,0294N = 020103,0224 = 020103,0294N = 020117,0224 = 020117,0294N =
0224,0294N = 0294N,0294N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9201 = 0286,9201
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0268 = 0268,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9201 = 0281,9201
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9201 = 020103,9201 = 020117,9201 = 0268,9201 = 9201,9201
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0268 = 0268,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0268 = 020103,0268 = 020117,0268 = 0268,0268
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0280 = 0280,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0280 = 0280,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0280 = 020103,0280 = 020117,0280 = 0280,0280
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0267 = 0267,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0267 = 0267,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0267 = 020103,0267 = 020117,0267 = 0267,0267
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0258,0260 = 0258,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0275 = 0275,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0258 = 0258,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0258 = 020103,0258 = 020117,0258 = 0258,0258 = 0258,0275
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0275 = 0275,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0275 = 020103,0275 = 020117,0275 = 0275,0275
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
023503,0260 = 023503,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,023503 = 020117,023503
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0271 = 0271,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0271 = 0271,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0271 = 020103,0271 = 020117,0271 = 0271,0271
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0259,0260 = 0259,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0259 = 0259,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0259 = 020103,0259 = 020117,0259 = 0259,0259
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0266 = 0266,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0264 = 0264,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
02010102L,0260 = 02010102L,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0276 = 0276,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0274 = 0274,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0230,0260 = 0230,0286
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9224 = 0286,9224
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0260 = 0253N,0286 = 0260,0281 = 0281,0286
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+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0242,0260 = 0242,0286
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0290 = 0286,0290
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,0297 = 0286,0297
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9205 = 0286,9205
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9207 = 0286,9207
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9209 = 0286,9209
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9211 = 0286,9211
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9213N = 0286,9213N
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9216 = 0286,9216
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9218 = 0286,9218
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9219 = 0286,9219
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9220 = 0286,9220
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9221 = 0286,9221
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9223 = 0286,9223
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9225N = 0286,9225N
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9232 = 0286,9232
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9233 = 0286,9233
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0260,9234 = 0286,9234
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0260 = 0201,0286 = 020103,0260 = 020103,0286 = 020117,0260 = 020117,0286 = 0260,0260
= 0260,0286
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0266 = 0266,0281
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0266 = 020103,0266 = 020117,0266 = 0266,0266
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0264 = 0264,0281
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0264 = 020103,0264 = 020117,0264 = 0264,0264
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
02010102L,0253N = 02010102L,0281
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,02010102L = 02010102L,02010102L = 02010102L,020103 = 02010102L,020117
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0276 = 0276,0281
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0276 = 020103,0276 = 020117,0276 = 0276,0276
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0274 = 0274,0281
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0274 = 020103,0274 = 020117,0274 = 0274,0274
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0230,0253N = 0230,0281
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0230 = 020103,0230 = 020117,0230 = 0230,0230
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0242,0253N = 0242,0281
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,0297 = 0281,0297
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9205 = 0281,9205
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9207 = 0281,9207
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9209 = 0281,9209
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+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9211 = 0281,9211
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9213N = 0281,9213N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9216 = 0281,9216
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9218 = 0281,9218
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9219 = 0281,9219
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9220 = 0281,9220
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9221 = 0281,9221
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9223 = 0281,9223
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9224 = 020117,9224 = 0253N,9224
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9225N = 0281,9225N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9232 = 0281,9232
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9233 = 0281,9233
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0253N,9234 = 0281,9234
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0253N = 0201,0281 = 020103,0253N = 020117,0253N = 020117,0281 = 0253N,0253N =
0253N,0281
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0242 = 020103,0242 = 020117,0242 = 0242,0242
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0290 = 020117,0290
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0297 = 020103,0297 = 020117,0297 = 0297,0297
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9205 = 020103,9205 = 020117,9205 = 9205,9205
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9207 = 020103,9207 = 020117,9207 = 9207,9207
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9209 = 020103,9209 = 020117,9209 = 9209,9209
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9211 = 020103,9211 = 020117,9211 = 9211,9211
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9213N = 020103,9213N = 020117,9213N = 9213N,9213N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9216 = 020103,9216 = 020117,9216 = 9216,9216
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9218 = 020103,9218 = 020117,9218 = 9218,9218
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9219 = 020103,9219 = 020117,9219 = 9219,9219
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9220 = 020103,9220 = 020117,9220 = 9220,9220
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9221 = 020103,9221 = 020117,9221 = 9221,9221
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9223 = 020103,9223 = 020117,9223 = 9223,9223
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9225N = 020103,9225N = 020117,9225N = 9225N,9225N
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9232 = 020103,9232 = 020117,9232 = 9232,9232
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9233 = 020103,9233 = 020117,9233 = 9233,9233
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,9234 = 020103,9234 = 020117,9234 = 9234,9234
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0201,0201 = 0201,020103 = 0201,020117 = 020103,020117
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0202,0238 = 0238,9202
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0202,9217 = 9202,9217
+++++-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0202,0203 = 0203,9202
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+++++++ -+----- --+----- ----- +----- -----
          0202,0213 = 0213,9202
+++++++ -+----- --+----- ----- +----- -----
          0202,0265 = 0265,9202
+++++++ -+----- --+----- ----- +----- -----
          0202,0254 = 0254,9202
+++++++ -+----- --+----- ----- +----- -----
          0202,0244 = 0244,9202
+++++++ -+----- --+----- ----- +----- -----
          0202,0249 = 0249,9202
+++++++ -+----- --+----- ----- +----- -----
          0202,0237 = 0237,9202
+++++++ -+----- --+----- ----- +----- -----
          0202,0219 = 0219,9202
+++++++ -+----- --+----- ----- +----- -----
          0202,0227 = 0227,9202
+++++++ -+----- --+----- ----- +----- -----
          0202,0212 = 0212,9202
+++++++ -+----- --+----- ----- +----- -----
          0202,9204 = 9202,9204
+++++++ -+----- --+----- ----- +----- -----
          0202,0224 = 0224,9202
+++++++ -+----- --+----- ----- +----- -----
          0202,0222 = 0222,9202
+++++++ -+----- --+----- ----- +----- -----
          0202,9202 = 9202,9202
+++++--+ ++----- --+----- ----- +----- --+-----
          0212,9217 = 0213,9217
+++++--+ ++----- --+----- ----- +----- +-----
          0203,0238 = 0222,0238
+++++--+ ++----- --+----- ----- +----- -----
          0203,0212 = 0203,0213
+++++--+ ++----- --+----- ----- +----- --+-----
          0203,9217 = 0222,9217 = 9217,9217
+++++--+ ++----- --+----- ----- +----- -----
          0203,0203 = 0203,0222
+++++--+ ++----- --+----- ----- +----- -----
          0222,0249 = 0249,0249
+++++--+ ++----- --+----- ----- +----- -----
          0222,9204 = 9204,9204
+++++--+ ++----- --+----- ----- +----- +-----
          0212,0238 = 0213,0238 = 0238,0238
+++++--+ ++----- --+----- ----- +----- -----
          0212,0213 = 0213,0213
+++++--+ ++----- --+----- ----- +----- --+-----
          0219,0254 = 0237,0244
+++++--+ ++----- --+----- ----- +----- -----
          0212,0254 = 0237,0254
+++++--+ ++----- --+----- ----- +----- -----
          0212,0237 = 0237,0237
+++++--+ ++----- --+----- ----- +----- -----
          0212,0227 = 0227,0227
+++++---- ++----- --+----- ----- +----- -----
          020117,0208 = 0208,0255
+++++--+ ++----- --+----- ----- +----- -----
          020117,9203 = 0255,9203
+++++--+ ++----- --+----- ----- +----- -----
          020117,0255 = 0255,0255
+++++---- ++----- --+----- ----- +----- +-----
          0202,0263 = 0263,0263
+++++---- ++----- --+----- ----- +----- --+-----
          0202,9215 = 9215,9215
+++++--+ ++----- --+----- ----- +----- +-----
          0217,0279 = 0286,9208
+++++--+ ++----- --+----- ----- +----- +-----
          0204,9208 = 0217,0257
+-----+ ++----- --+----- ----- +----- -----
          0205,0221 = 0205,0287
+-----+ ++----- --+----- ----- +----- -----
          020103,0205 = 0205,0206 = 0205,0284
+-----+ ++----- --+----- ----- +----- -----
          0208,0221 = 0208,0287
+-----+ ++----- --+----- ----- +----- +-----
          0208,0211 = 0208,9228
```


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+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0208 = 0206,0208 = 0208,0284
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,9222 = 0287,9222
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,9222 = 0206,9222 = 0228,9222
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0214,0221 = 0214,0287
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0214 = 0206,0214 = 0214,0284
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,0299 = 0287,0299
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0299 = 023502,0299
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0299 = 0206,0299 = 0299,0299
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,0257 = 0257,0287
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,9208 = 0206,9208
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0257 = 023502,0257
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0257 = 0206,0257
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,0284 = 0284,0287
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0284 = 023502,0284
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0284 = 0206,0284 = 0284,0284
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,9212 = 0221,0291 = 0221,9212 = 0287,0291 = 0291,9212
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0291 = 023502,0291
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0291 = 0206,0291 = 0291,0291
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,0254 = 0254,0287
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,0244 = 0244,0287
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,0228 = 0228,0287
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,9229 = 0221,9229
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,023501 = 0221,023502
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,0251 = 0251,0287
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,0241 = 0241,0287
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,0279 = 0279,0287
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,0261 = 0261,0287
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,0272 = 0272,0287
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,9206 = 0287,9206
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,9226 = 0287,9226
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0221,9227 = 0287,9227
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0221 = 0206,0221 = 0206,0287 = 0221,0221 = 0221,0287
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0210 = 0206,0210 = 0210,0228
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0254 = 023502,0254
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0254 = 0206,0254
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0244 = 023502,0244
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0244 = 0206,0244
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+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0228,023501 = 0228,023502
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0228 = 0206,0228 = 0228,0228
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0251 = 023502,0251
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0241 = 023502,0241
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0279 = 023502,0279
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0261 = 023502,0261
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,0272 = 023502,0272
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,9206 = 023502,9206
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,9226 = 023502,9226
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,9227 = 023502,9227
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0206,023501 = 0206,023502
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0251 = 0206,0251 = 0251,0251
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0241 = 0206,0241 = 0241,0241
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0279 = 0206,0279
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0261 = 0206,0261 = 0261,0261
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0272 = 0206,0272 = 0272,0272
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,9206 = 0206,9206 = 9206,9206
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,9226 = 0206,9226 = 9226,9226
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,9227 = 0206,9227 = 9227,9227
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,0206 = 0206,0206
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
020103,023501 = 020103,023502
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0210,0217 = 0210,9210
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,9210 = 023502,9210
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0217,023501 = 0217,023502
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0215N,0287 = 0215N,9212
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9203 = 9203,9212
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0287,9230 = 9212,9230
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0218,0287 = 0218,9212
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0207,0287 = 0207,9212
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0211,9203 = 9203,9228
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0215N,023501 = 0215N,023502
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0207,0215N = 0215N,0215N
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023501,9203 = 023503,9203 = 0278,9203 = 0290,9203
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
023501,9230 = 023502,9230
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0218,023501 = 0218,023502
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0207,023501 = 0207,023502
+----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
0207,9230 = 9230,9230
```



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-+++++-----+-----+-----+-----+-----+-----+-----+-----
      0207,0218 = 0218,0218
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      023501,0239 = 023502,0239
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      0233,023501 = 0233,023502
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      0217,9210 = 9210,9210
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      023501,9208 = 023502,9208
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      0210,023501 = 0210,023502
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      023501,9212 = 023502,9212
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      0287,9212 = 9212,9212
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      0248,0287 = 0290,9229
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      023501,0287 = 023502,0287
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      0211,0278 = 0278,9228
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      023501,9228 = 023502,9228
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      0211,9228 = 0290,9228 = 9228,9228
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      023501,0269 = 023502,0269
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      0211,023501 = 0211,023502
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      0211,0269 = 0269,0269 = 0269,0290
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      0211,0211 = 0211,0290
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      023501,0278 = 023502,0278 = 023503,0278
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      0278,0278 = 0278,0290
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      023501,9224 = 023502,9224
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      023501,0281 = 023502,0281
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      023501,023501 = 023501,023502 = 023501,023503 = 023501,0290 = 023502,023503 = 023502,0290
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      023503,023503 = 023503,0290
-+++++-----+-----+-----+-----+-----+-----+-----+-----
      0281,9224 = 9224,9224

```

(0201 = 02010101, 020102 and 020104 to 020115)

LICENSES

101.412-24/04 – licensed for PCR.

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101.412-24/04 and 101.412-24u/04u

These products use ARMS™ technology and is sold under license from Zeneca Limited. ARMS is the subject of European Patent No. 0332435, US Patent No. 5595890 and corresponding world-wide patents. ARMS is a trademark of Zeneca Limited.

GUARANTEE

Olerup SSP AB guarantees that the primers in the HLA-A*02 subtyping kit have the specificities given in the Specificity and Interpretation Tables of the product insert and in the GenoVision version of the HELMBERG-SCORE™ software.

When stored at –20°C, the dried primers are stable for 22 months from the date of manufacture.

When stored at –20°C, the PCR Master Mix complete with *Taq* and the PCR Master Mix without *Taq* are stable for 24 months from the date of manufacture.

The kit is shipped at ambient temperature.

PROTOCOL

DNA EXTRACTION

Extracted, highly pure DNA is needed for SSP typings. We recommend isolation of DNA using GenoPrep B200 or GenoPrep B350 cartridges on the GenoM™-6 robotic workstation (GenoVision Europe Tel: +43 1 710 15 00 or GenoVision Inc. USA Tel: +1 610 430 88 41; <http://www.genovision.com>). Using GenoM™-6-extracted DNA ACD, EDTA and heparinised blood can be used as starting material. Because of its high purity, GenoM™-6-extracted DNA can be diluted when used in combination with Olerup SSP™ products. The recommended DNA concentration is 15 ng/μl.

Alternatively – BUT DO NOT USE HEPARINISED BLOOD WITH THESE METHODS - the DNA can be extracted using trimethylammoniumbromide salts (DTAB/CTAB) or by salting out. Dissolve the extracted DNA in dH₂O.

IMPORTANT:

Optimal DNA concentration using: GenoM™-6-extracted DNA, 15 ng/μl.

DNA extracted by other methods, 30 ng/μl.

Concentration exceeding 50 ng/μl will increase the risk for nonspecific amplifications and weak extra bands, especially for HLA Class I high resolution SSP typings.

PCR AMPLIFICATION

101.412-24/04 – licensed for PCR

For one HLA-A*02 subtyping, add at room temperature in a 0.5 ml tube:

92 x 2 μl = 184 μl DNA (30 ng/μl)

92 x 3 μl = 276 μl PCR Master Mix complete with *Taq* – mix well before taking your aliquot

92 x 5 μl = 460 μl dH₂O

Mix well, dispense 10 μl of the DNA-PCR Master Mix-H₂O mixture into each of the 85 wells of an HLA-A*02 subtyping. **Well No. 1 of the 96 well PCR plate is marked with '1'**. Close the 96 well PCR plate with the provided lids.

101.412-24u/04u – not licensed for PCR

For one HLA-A*02 subtyping, add at room temperature in a 0.5 ml tube:

92 x 2 μl = 184 μl DNA (30 ng/μl)

92 x 3 μl = 276 μl PCR Master Mix without *Taq* – mix well before taking your aliquot

7.4 μl *Taq* polymerase (5 units/μl)

92 x 5 μl – 7.4 μl = 452.6 μl dH₂O

Mix well, dispense 10 μl of the DNA-PCR Master Mix-*Taq*-H₂O mixture into each of the 85 wells of an HLA-A*02 subtyping. **Well No. 1 of the 96 well PCR plate is marked with '1'**. Close the 96 well PCR plate with the provided lids.

Use a 96 well thermal cycler with a heated lid. The temperature gradient across the heating block should be < 1°C.

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PCR cycling parameters:

1. 1 cycle	94°C	2 min	denaturation
2. 10 cycles	94°C	10 sec.	denaturation
	65°C	60 sec.	annealing and extension
3. 20 cycles	94°C	10 sec.	denaturation
	61°C	50 sec.	annealing
	72°C	30 sec.	extension

The same PCR cycling parameters are used for all the *Olerup* SSP kits.

AGAROSE GEL ELECTROPHORESIS

Prepare a 2% (w/v) agarose gel in 0.5 x TBE buffer. Dissolve the agarose by boiling in a microwave oven. Let the gel solution cool to 60°C. Stain the gel prior to casting with ethidium bromide (10 mg/ml), 5 µl per 100 ml gel solution. For maximal ease of handling use our ethidium bromide dropper bottles (Product No. 103.301-10), 1 drop of ethidium bromide solution per 50-75 ml of gel. **Note:** Ethidium bromide is a powerful carcinogen.

Load the PCR products, preferably using an 8-channel pipette. Load a DNA size marker (100 base pair ladder, Product No. 103.201-100) in one well per row.

Run the gel in 0.5 x TBE buffer, without re-circulation of the buffer, for 15-20 minutes at 8-10 V/cm.

DOCUMENTATION AND INTERPRETATION

Put the gel on a UV transilluminator and document by photography.

Record the presence and absence of specific PCR products. The relative lengths of the specific PCR products are helpful in the interpretation of the results.

Record the presence and relative lengths of the internal positive control bands. The differently sized control bands will help in the correct orientation of the typing as well as in kit identification.

Lanes without either control band or specific PCR products should be repeated.

Interpret the typings with the ***lot-specific Interpretation and Specificity Tables***.

INTERPRETATION SOFTWARE

The interpretation software (Product No. 110.101) can be helpful in the interpretation of the typings.

PCR MASTER MIXES

The PCR Master Mix complete with *Taq* contains:

<i>Taq</i> polymerase	0.4 unit per 10 μ l SSP reaction
nucleotides	final concentration of each dNTP is 200 μ M
PCR buffer	final concentrations: 50 mM KCl, 1.5 mM MgCl ₂ , 10 mM Tris-HCl pH 8.3, 0.001% w/v gelatin
glycerol	final concentration of glycerol is 5%
cresol red	final concentration of cresol red is 100 μ g/ml

The same PCR Master Mix complete with *Taq* is used for all the licensed *Olerup* SSP kits.

The PCR Master Mix without *Taq* contains:

nucleotides	final concentration of each dNTP is 200 μ M
PCR buffer	final concentrations: 50 mM KCl, 1.5 mM MgCl ₂ , 10 mM Tris-HCl pH 8.3, 0.001% w/v gelatin
glycerol	final concentration of glycerol is 5%
cresol red	final concentration of cresol red is 100 μ g/ml

The same PCR Master Mix without *Taq* is used for all the unlicensed *Olerup* SSP kits.

The PCR Master Mix complete with *Taq* and the PCR Master Mix without *Taq* can be shipped at ambient temperature.

When stored at -20°C , the PCR Master Mix complete with *Taq* and the PCR Master Mix without *Taq* are stable for 24 months from the date of manufacture.

Vials with the PCR Master Mixes can be kept at $+4^{\circ}\text{C}$ for 4 weeks, but the PCR Master Mixes are then no longer stable for 24 months.

SPECIFICITY TABLE

HLA-A*02 SSP subtyping

Specificities and sizes of the PCR products of the 85 primer mixes used for HLA-A*02 SSP subtyping

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	Amplified HLA-A*02 alleles ³	Other amplified HLA-A alleles ⁴
1	360 bp	800 bp	02010101-020115, 020117-020605, 0208, 0209, 0212-0214, 0216, 0219-0222, 0224-0232N, 0234, 0236-0238, 0240- 0246, 0249-0268, 0270-0277, 0279, 0280, 0282N-0286, 0288N, 0289, 0291- 0297, 0299, 9201, 9202, 9204-9207, 9209, 9211, 9213N- 9223, 9225N-9227, 9231-9234	0309, 1106, 1118, 2603, 2606, 2621, 2630, 3013, 3016, 3208, 6805, 6815, 6820, 7406, 8001 ^{weakly}
2	230 bp	1070 bp	02010101-020102, 020104-020115, 020117-0204, 0207, 0209, 0212, 0213, 0215N-022002, 0222, 0224-0227, 0229- 0234, 0236- 0240, 0242, 0243N, 0245- 0247, 0249, 0250, 0252, 0253N, 0255, 0256, 0258-0260, 0262-0268, 0270, 0271, 0273-0277, 0280, 0282N, 0283N, 0285, 0286, 0288N, 0289, 0292-0297, 9201-9205, 9207, 9209-9211, 9213N- 9221, 9223, 9225N, 9230-9234	0309, 7406
3 ⁵	175 bp	1070 bp	02010101-020115, 020117-020302, 0205-	68020101- 68020103, 6815,

			0216, 0218, 022001-0222, 0224-0238, 0240-0243N, 0245-0256, 0258-0264, 0266-0278, 0280-0285, 0287-0297, 0299, 9201-9207, 9209, 9211-9234	6818N, 6823, 6827, 6828, 6831, 6834, 6840, 6901
4^{6,7}	80 bp	1070 bp	02010101-020115, 020301-0204, 020601-0207, 0209-0213, 0215N-0222, 0224-023501, 023503-0244, 0245 ^{weakly} , 0246, 0249, 0251-0254, 0256 ^{weakly} , 0257-0262, 0264-0277, 0278 ^{weakly} , 0279-0297, 0299, 9201, 9202, 9204-9214, 9216-9221, 9223-9228, 9230-9234	030103 ^{weakly} , 0323, 260702, 3308, 3309, 6830, 7404
5⁶	125 bp	1070 bp	02010101-020115, 020117, 0204, 020601-0207, 0209-0211, 0214-0218, 022001-0221, 0225, 0226, 0228-0236, 0239- 0243N, 0245, 0246, 0248, 0251-0253N, 0255-0262, 0264, 0266, 0267, 0268 ^{weakly} , 0269-0297, 0299, 9201, 9203, 9205-9214, 9216, 9218-9221, 9223-9234	0317 ^{weakly} , 2301, 2304-2316, 241301-241302, 2418 ^{weakly} , 2424, 6808, 6901
6^{5,6,8}	75 bp	800 bp	0202-020302, 0205, 0208, 0222, 0247, 0249, 0250, 0263, 9202, 9204, 9215, 9217, 9222	680101-6807, 6810-6825, 6827-6841
7⁷	175 bp	800 bp	0202, 0205, 0208, 0214, 0247, 0263, 9202, 9215	
8⁹	415, 505 bp	1070 bp	0202, 0205, 0214, 0232N, 0247, 0263, 9202, 9215	
9⁶	105 bp	1070 bp	020301, 020302 ^{weakly} ,	2610

10^{6,8}	115 bp	800 bp	0225, 0238, 9217 020301, 020302 ^{weakly} , 0213, 0226, 0238, 0299, 9217	0317, 2418, 2456, 2610
11^{5,10}	225, 335 bp	800 bp	0204, 021701-021702, 0257, 0265, 0289, 9208, 9210	2312, 2428, 2430, 2442, 3208, 6805, 6820, 7406
12^{5,8,11}	195, 235 bp	1070 bp	0205-020605, 0208, 0210, 0214, 0221, 0228, 0241, 0244, 0251, 0254, 0257, 0261, 0272, 0279, 0284, 0285, 0291, 0299, 9206, 9208, 9222, 9226, 9227	1106, 1118, 2603, 2606, 2621, 2630, 6805, 6815, 6820
13⁶	145 bp	800 bp	0205, 0208, 0214, 0284	
14^{6,7,12}	95, 170 bp	1070 bp	0207, 0215N, 0218, 0291, 9203, 9212, 9230	
15^{5,6,13}	125, 265, 305 bp	800 bp	0221, 0287, 0296, 9212, 9229	
16	155 bp	1070 bp	0209, 0249, 0250, 0273, 0293, 9222	1116, 68020101- 68020103, 6815, 6818N, 6825, 6827, 6828, 6831, 6834, 6840
17^{5,14}	205, 360 bp	1070 bp	0210, 021701-021702, 0239, 0283N, 9208, 9210	2312, 2428, 2430, 2442
18⁸	175 bp	1070 bp	0211, 0229, 0269, 9228	
19^{6,7}	125 bp	1070 bp	0212, 0213, 0219, 0227, 0237, 0238, 0244, 0254	24020101-2405, 2407-2411N, 2414, 2415, 2417, 2419, 2420, 2423, 2425- 2464, 2466-2483N, 6809, 6826
20^{6,7}	295 bp	1070 bp	0249	
21⁷	220 bp	1070 bp	0215N	
22	160 bp	1070 bp	0219, 0236, 0237, 0254	2301, 2302, 2305- 2316, 24020101- 240214, 2404- 2409N, 2411N, 241301-2415, 2417, 2419, 2420, 2423 ^{weakly} , 2424-

				2432, 2434-2464, 2466-2474, 2476- 2483N, 6826
23 ^{5,6,7,15}	85, 170 bp	800 bp	021701-021702, 0231, 9208, 9210	
24 ^{6,7}	115 bp	1070 bp	0227	2459
25 ⁶	145 bp	1070 bp	0216, 9231	2455 ^{weakly}
26 ^{6,8,16}	125, 165 bp	800 bp	0233, 0252	
27 ^{6,17}	95, 145 bp	1070 bp	0210, 0228, 0250, 0252, 0273, 0293, 0295, 9210, 9214, 9217, 9222	1116, 3013, 3016, 680101-6811N, 6813-6841
28	235 bp	800 bp	0208, 022001-022002, 0255, 0256, 0262, 0278, 9203, 9228	2620, 3008, 680302
29 ⁶	220 bp	1070 bp	0245, 0246, 0248, 0256 ^{weakly} , 0278 ^{weakly} , 0292, 9203, 9229 ^{weakly}	3008
30 ^{7,8}	160 bp	800 bp	0243N, 9204	
31 ^{6,18}	95, 220 bp	1070 bp	0245, 0256, 0278, 0282N, 9203	3008
32 ¹⁹	230, 255 bp	1070 bp	0246-0248, 0270, 9229	
33 ^{6,7,8}	105 bp	1070 bp	0236, 0237, 0254	6826
34 ^{6,20}	120, 180 bp	800 bp	0234-023502, 0256, 0262, 0278, 0288N, 9203	300101-300102, 3008, 301101- 301102, 3014L- 3020, 3023, 3024
35 ^{6,21}	110, 155 bp	1070 bp	0240, 0251, 0277, 9230	2301, 2302 ^{weakly} , 2304-2316, 2424, 2471
36 ^{5,6,22}	85, 445 bp	1070 bp	0224, 0265, 0294N	0309, 1106, 1118, 2603, 2606, 2621, 2630, 3013, 3016, 3208, 7406, 8001 ^{weakly}
37 ^{6,23}	130, 145 bp	1070 bp	0238, 0268, 9201	2310 ^{weakly} , 2410, 2446 ^{weakly} , 2610
38 ^{6,7}	125 bp	800 bp	0241, 0280, 9217	
39 ^{6,7}	75 bp	1070 bp	0218	
40 ^{6,7,8,24}	90, 210 bp	1070 bp	0240, 0251, 0267, 9230	
41 ⁸	185 bp	1070 bp	0202, 0205, 0208, 0214, 021701-021702, 0247, 0257, 0258, 0263, 0275, 9202,	

42⁵	225 bp	800 bp	9208, 9210, 9215 0234-023503, 0256, 0262, 9203	0113, 0117, 03010101-0307, 0309-0311N, 0313- 0331, 0333-0335, 0337, 0338, 3408
43^{7,25}	180, 225 bp	800 bp	020301-020302, 0222, 0249, 0271, 9204, 9217	2622
44	155 bp	800 bp	0259	
45^{6,26}	105, 185 bp	1070 bp	0219, 0239, 0244, 0260, 0279, 0286	0120, 2414
46^{6,27}	70, 205 bp	800 bp	0261, 0266	
47^{6,8}	165 bp	800 bp	0263	
48⁶	110 bp	1070 bp	0264, 0272	
49	145 bp	1070 bp	0238, 9201	2310 ^{weakly} , 2410, 2446 ^{weakly} , 2610
50	45 bp	800 bp	02010102L	
51	410 bp	1070 bp	0265, 0280, 9214, 9217	0309, 1106, 1118, 3208, 6805, 6820, 7406, 8001 ^{weakly}
52	185 bp	800 bp	0276	3022
53	225 bp	1070 bp	0214, 021701-021702, 0257, 0258, 9208, 9210	2301, 2303-2313, 2315, 2316, 241301, 2418, 2424, 2907
54	350 bp	800 bp	027401-027402	
55^{7,28}	155, 200 bp	1070 bp	0230, 0250, 0273, 0293, 9222	1116, 68020101- 68020103, 6815, 6818N, 6825, 6827, 6828, 6831, 6834, 6840
56	275 bp	1070 bp	0253N, 0281, 9224	
57⁶	105 bp	1070 bp	0242	
58	255 bp	800 bp	0211, 023501-023503, 0248, 0269, 0278, 0290, 9228	3008, 680302
59^{6,7}	145 bp	800 bp	0297	
60	345 bp	1070 bp	0250, 0265, 0273, 9222	2603, 2606, 2621, 2630, 3208, 6805, 6815, 6820, 7406
61	185 bp	1070 bp	0250, 0273, 9222	1116, 680101- 6811N, 6813-6841
62	180 bp	800 bp	0269	680101-6832, 6834- 6841
63	160 bp	800 bp	9205	
64⁶	125 bp	1070 bp	9206	2472

65	185 bp	1070 bp	9207	
66	170 bp	800 bp	9209	
67⁶	120 bp	800 bp	9211	
68	215 bp	1070 bp	9213N	
69⁸	170 bp	1070 bp	9214	
70⁶	125 bp	800 bp	9215	
71	260 bp	800 bp	9216	
72^{5,6}	95 bp	1070 bp	0219, 0244, 9218	0317, 2301 ^{weakly} , 2302 ^{weakly} , 2304- 2316 ^{weakly} , 24020101-2411N, 241301-2415, 2417- 2420, 2422-2464, 2466-2483N
73	200 bp	1070 bp	9219	
74	175 bp	800 bp	9220	
75	205 bp	1070 bp	9221	6814
76	230 bp	800 bp	9222	
77⁶	85 bp	1070 bp	9223	
78	240 bp	1070 bp	9224	
79	225 bp	1070 bp	9225N	
80	230 bp	1070 bp	9226	
81	315 bp	1070 bp	9227	
82⁶	130 bp	1070 bp	9231	
83⁶	100 bp	800 bp	9232	
84	185 bp	800 bp	9233	
85	260 bp	800 bp	9234	

¹Alleles are assigned by the presence of specific PCR product(s). However, the sizes of the specific PCR products may be helpful in the interpretation of HLA-A*02 SSP subtypings.

When the primers in a primer mix can give rise to specific PCR products of more than one length this is indicated if the size difference is 20 bp or more. Size differences shorter than 20 bp are not given. For high resolution SSP kits the length of the specific PCR product(s) of the alleles amplified by these primer mixes are given.

Nonspecific amplifications, i.e. a ladder or a smear of bands, may sometimes be seen. GC-rich primers have a higher tendency of giving rise to nonspecific amplifications than other primers, e.g. the primer pairs in tubes 10 and 12.

PCR fragments longer than the control band may sometimes be observed. Such bands can be disregarded and do not influence the interpretation of the SSP typings.

²The internal positive control primer pairs amplify segments of the human growth hormone gene. The two different control primer pairs give rise to either an internal positive control band of 1070 base pairs, for most tubes, or a band of 800 base pairs, for some tubes.

Tube number 1 contains the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to help in the correct orientation of the HLA-A*02 subtyping.

In addition, tubes number 6, 7, 10, 11, 13, 15, 23, 26, 28, 30, 34, 38, 42, 43, 44, 46, 47, 50, 52, 54, 58, 59, 62, 63, 66, 67, 70, 74, 76, 83, 84 and 85 contain the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to allow kit identification.

PLEASE NOTE: All the SSP kits, except the B*37, B*41, B*42, B*46, B*47, B*48, B*49, B*50, B*53, B*67, B*78, B*81 and B*82 kits and the Cw*01, Cw*02, Cw*08, Cw*12, Cw*14, Cw*15, Cw*16, Cw*17 and Cw*18 kits, from *Olerup* SSP AB can be uniquely identified by the number of tubes and the kit-specific pattern of the two differently sized control bands.

In the presence of a specific amplification the intensity of the control band often decreases.

³For several HLA-B alleles 1st and 4th exon nucleotide sequences are not available. In these instances it is not known whether some of the primers of the SSP sets are completely matched with the target sequences or not. We assume that unknown sequences in the 1st and 4th exons are conserved within allelic groups.

⁴Due to the sharing of sequence motifs between HLA-A alleles non-HLA-A*02 alleles will be amplified by primer mixes 1 to 6, 9 to 12, 16, 17, 19, 22, 24, 25, 27 to 29, 31, 33 to 37, 42, 43, 45, 49, 51 to 53, 55, 58, 60 to 62, 64, 72 and 75.

⁵The specific primers in primer mixes 3, 6, 11, 12, 15, 17, 23, 36, 42 and 72 may yield less specific PCR products than the other HLA-A*02 primer mixes, most pronounced for primer mixes 3 and 72.

⁶Short specific PCR fragments are less intense and not as sharp as longer specific bands.

⁷Primer mixes 4, 7, 14, 19, 20, 21, 22, 23, 24, 30, 33, 38, 39, 40, 43, 55 and 59 have a tendency of giving rise to a primer oligomer artefact, most pronounced for primer mixes 14, 23, 33, 39 and 55.

⁸Primer mixes 6, 10, 12, 18, 26, 30, 33, 40, 41, 47 and 69 have a tendency of giving rise to nonspecific amplifications.

⁹Primer mix 8: Specific PCR fragment of 415 bp in the A*0202, 0205, 0214, 0247, 0263, 9202 and 9215 alleles. Specific PCR fragment of 505 bp in the A*0232N allele.

¹⁰Primer mix 11: Specific PCR fragment of 225 bp in the A*0289 allele. Specific PCR fragment of 335 bp in the A*0204, 021701-021702, 0257, 0265, 9208, 9210 and the A*2312, 2428, 2430, 2442, 3208, 6805, 6820 and 7406 alleles.

Primer mix 11 may give rise to a long fragment of approx. 600 bp in some HLA-A alleles. This band should not be considered in the interpretation of HLA-A*02 typings.

¹¹Primer mix 12: Specific PCR fragment of 195 bp in A*0285 allele. Specific PCR fragment of 235 bp in the A*0205 to 020605, 0208, 0210, 0214, 0221, 0228, 0241, 0244, 0251, 0254, 0257, 0261, 0272, 0279, 0284, 0291, 0299, 9206, 9208, 9222, 9226, 9227 and the A*1106, 1118, 2603, 2606, 2621, 2630, 6805, 6815 and 6820 alleles.

¹²Primer mix 14: Specific PCR fragment of 95 bp in A*9203 allele. Specific PCR fragment of 170 bp in the A*0207, 0215N, 0218, 0291, 9212 and 9230 alleles.

¹³Primer mix 15: Specific PCR fragment of 125 bp in the A*0221 allele. Specific PCR fragment of 265 bp in the A*0287, 9212 and 9229 alleles. Specific PCR fragment of 305 bp in the A*0296 allele.

¹⁴Primer mix 17: Specific PCR fragment of 205 bp in the A*0283N allele. Specific PCR fragment of 360 bp in the A*0210, 021701-021702, 0239, 9208, 9210 and the A*2312, 2428, 2430 and 2442 alleles.

¹⁵Primer mix 23: Specific PCR fragment of 85 bp in the A*0231 allele. Specific PCR fragment of 170 bp in the A*021701-021702, 9208 and 9210 alleles.

¹⁶Primer mix 26: Specific PCR fragment of 125 bp in the A*0233 allele. Specific PCR fragment of 165 bp in the A*0252 allele.

¹⁷Primer mix 27: Specific PCR fragments of 95 bp in the A*0228 and the A*3013 and 3016 alleles. Specific PCR fragments of 145 bp in A*0210, 0250, 0252, 0273, 0293, 0295, 9210, 9214, 9217, 9222 and the A*1116, 6801010 to 6811N, 6813 to 6842.

¹⁸Primer mix 31: Specific PCR fragment of 95 bp in A*0282N allele. Specific PCR fragments of 220 bp in A*0245, 0256, 0278, 9203 and the A*3008 alleles.

¹⁹Primer mix 32: Specific PCR fragment of 230 bp in the A*0246, 0248, 0270 and 9229 alleles. Specific PCR fragment of 255 bp in the A*0247 allele.

²⁰Primer mix 34: Specific PCR fragment of 120 bp in the A*0288N allele. Specific PCR fragment of 180 bp in the A**0234 to 023502, 0256, 0262, 0278, 9203 and the A*300101-300102, 3008, 301101-301102, 3014L to 3020, 3023 and 3024 alleles.

Primer mix 34 may give rise to a long fragment of approx. 600 bp in some HLA-A alleles. This band should not be considered in the interpretation of HLA-A*02 typings.

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²¹Primer mix 35: Specific PCR fragment of 110 bp in A*0240, 0251, 9230 and the A*2301, 2302^{weakly}, 2304 to 2316, 2424 and 2471 alleles. Specific PCR fragment of 155 bp in A*0277 allele.

²²Primer mix 36: Specific PCR fragment of 85 bp in A*0294N allele. Specific PCR fragments of 445 bp in the A*0224, 0265 and the A*0309, 1106, 1118, 2603, 2606, 2621, 2630, 3013, 3016, 3208, 7406 and 8001^{weakly} alleles.

²³Primer mix 37: Specific PCR fragment of 130 bp in the A*0268 allele. Specific PCR fragments of 145 bp in A*0238, 9201 and the A*2310^{weakly}, 2410, 2446^{weakly} and 2610 alleles.

²⁴Primer mix 40: Specific PCR fragment of 90 bp in the A*0267 allele. Specific PCR fragment of 210 bp in the A*0240, 0251 and 9230 alleles.

²⁵Primer mix 43: Specific PCR fragment of 180 bp in the A*0271 allele. Specific PCR fragment of 225 bp in the A*020301-020302, 0222, 0249, 9204, 9217 and the A*2622 alleles.

²⁶Primer mix 45: Specific PCR fragment of 105 bp in the A*0260 allele. Specific PCR fragment of 185 bp in the A*0219, 0239, 0244, 0279, 0286 and the A*0120, 2414 alleles.

²⁷Primer mix 46: Specific PCR fragment of 70 bp in the A*0266 allele. Specific PCR fragment of 205 bp in the A*0261 allele.

²⁸Primer mix 55: Specific PCR fragments of 155 bp in the A*0250, 0273, 0293, 9222 and the A*1116, 68020101-68020103, 6815, 6818N, 6825, 6827, 6828, 6831, 6834, 6840 and 8001^{weakly} alleles. Specific PCR fragment of 200 bp in the A*0230 allele.

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9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5																				
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¹The internal positive control primer pairs amplify segments of the human growth hormone gene. The two different control primer pairs give rise to either an internal positive control band of 1070 base pairs, for most tubes, or a band of 800 base pairs, for some tubes. Tube number 1 contains the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to help in the correct orientation of the HLA-A*02 subtyping. In addition, tubes number 6, 7, 10, 11, 13, 15, 23, 26, 28, 30, 34, 38, 42, 43, 44, 46, 47, 50, 52, 54, 58, 59, 62, 63, 66, 67, 70, 74, 76, 83, 84 and 85 contain the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to allow kit identification.

PLEASE NOTE: All the SSP kits, except the B*37, B*41, B*42, B*46, B*47, B*48, B*49, B*50, B*53, B*67, B*78, B*81 and B*82 kits and the Cw*01, Cw*02, Cw*08, Cw*12, Cw*14, Cw*15, Cw*16, Cw*17 and Cw*18 kits, from Olerup SSP AB can be uniquely identified by the number of tubes and the kit-specific pattern of the two differently sized control bands.

²The sequence of A*020116 has been renamed to A*9234. The sequence of the A*0223 allele has been shown to be identical to A*0222. The sequence of the A*0298 allele has been shown to be identical to A*0296.

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4	5	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8			
9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	
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4	5	5	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	HLA-A allele ²		
9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	Tube No.

³Primer mix 8: Specific PCR fragment of 415 bp in the A*0202, 0205, 0214, 0247, 0263, 9202 and 9215 alleles. Specific PCR fragment of 505 bp in the A*0232N allele.

¹⁰Primer mix 11: Specific PCR fragment of 225 bp in the A*0289 allele. Specific PCR fragment of 335 bp in the A*0204, 021701-021702, 0257, 0265, 9208, 9210 and the A*2312, 2428, 2430, 2442, 3208, 6805, 6820 and 7406 alleles.

Primer mix 11 may give rise to a long fragment of approx. 600 bp in some HLA-A alleles. This band should not be considered in the interpretation of HLA-A*02 typings.

Primer mix 12: Specific PCR fragment of 195 bp in A*0285 allele. Specific PCR fragment of 235 bp in the A*0205 to 020605, 0208, 0210, 0214, 0221, 0228, 0241, 0244, 0251, 0254, 0257, 0261, 0272, 0279, 0284, 0291, 0299, 9206, 9208, 9222, 9226, 9227 and the A*1106, 1118, 2603, 2606, 2621, 2630, 6805, 6815 and 6820 alleles.

Primer mix 14: Specific PCR fragment of 95 bp in A*9203 allele. Specific PCR fragment of 170 bp in the A*0207, 0215N, 0218, 0291, 9212 and 9230 alleles.

Primer mix 15: Specific PCR fragment of 125 bp in the A*0221 allele. Specific PCR fragment of 265 bp in the A*0287, 9212 and 9229 alleles. Specific PCR fragment of 305 bp in the A*0296 allele.

Primer mix 17: Specific PCR fragment of 205 bp in the A*0283N allele. Specific PCR fragment of 360 bp in the A*0210, 021701-021702, 0239, 9208, 9210 and the A*2312, 2428, 2430 and 2442 alleles.

Primer mix 23: Specific PCR fragment of 85 bp in the A*0231 allele. Specific PCR fragment of 170 bp in the A*021701-021702, 9208 and 9210 alleles.

Primer mix 26: Specific PCR fragment of 125 bp in the A*0233 allele. Specific PCR fragment of 165 bp in the A*0252 allele.

Primer mix 27: Specific PCR fragments of 95 bp in the A*0228 and the A*3013 and 3016 alleles. Specific PCR fragments of 145 bp in A*0210, 0250, 0252, 0273, 0293, 0295, 9210, 9214, 9217, 9222 and the A*1116, 6801010 to 6811N, 6813 to 6842.

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Primer mix 31: Specific PCR fragment of 95 bp in A*0282N allele. Specific PCR fragments of 220 bp in A*0245, 0256, 0278, 9203 and the A*3008 alleles.

Primer mix 32: Specific PCR fragment of 230 bp in the A*0246, 0248, 0270 and 9229 alleles. Specific PCR fragment of 255 bp in the A*0247 allele.

Primer mix 34: Specific PCR fragment of 120 bp in the A*0288N allele. Specific PCR fragment of 180 bp in the A**0234 to 023502, 0256, 0262, 0278, 9203 and the A*300101-300102, 3008, 301101-301102, 3014L to 3020, 3023 and 3024 alleles.

Primer mix 34 may give rise to a long fragment of approx. 600 bp in some HLA-A alleles. This band should not be considered in the interpretation of HLA-A*02 typings.

Primer mix 35: Specific PCR fragment of 110 bp in A*0240, 0251, 9230 and the A*2301, 2302^{weakly}, 2304 to 2316, 2424 and 2471 alleles. Specific PCR fragment of 155 bp in A*0277 allele.

Primer mix 36: Specific PCR fragment of 85 bp in A*0294N allele. Specific PCR fragments of 445 bp in the A*0224, 0265 and the A*0309, 1106, 1118, 2603, 2606, 2621, 2630, 3013, 3016, 3208, 7406 and 8001^{weakly} alleles.

Primer mix 37: Specific PCR fragment of 130 bp in the A*0268 allele. Specific PCR fragments of 145 bp in A*0238, 9201 and the A*2310^{weakly}, 2410, 2446^{weakly} and 2610 alleles.

Primer mix 40: Specific PCR fragment of 90 bp in the A*0267 allele. Specific PCR fragment of 210 bp in the A*0240, 0251 and 9230 alleles.

Primer mix 43: Specific PCR fragment of 180 bp in the A*0271 allele. Specific PCR fragment of 225 bp in the A*020301-020302, 0222, 0249, 9204, 9217 and the A*2622 alleles.

Primer mix 45: Specific PCR fragment of 105 bp in the A*0260 allele. Specific PCR fragment of 185 bp in the A*0219, 0239, 0244, 0279, 0286 and the A*0120, 2414 alleles.

Primer mix 46: Specific PCR fragment of 70 bp in the A*0266 allele. Specific PCR fragment of 205 bp in the A*0261 allele.

Primer mix 55: Specific PCR fragments of 155 bp in the A*0250, 0273, 0293, 9222 and the A*1116, 68020101-68020103, 6815, 6818N, 6825, 6827, 6828, 6831, 6834, 6840 and 8001^{weakly} alleles. Specific PCR fragment of 200 bp in the A*0230 allele.

w', might be weakly amplified.

Tube No.	1	2	3	4	5	6	7	8	9	10	11	12
Length of spec.	360	230	175	80	125	75	175	415	105	115	225	195
PCR product								505			335	235
Length of int.	800	1070	1070	1070	1070	800	800	1070	1070	800	800	1070
pos. control ¹												
5'-primer(s) ²	292	102	362	200	453	506	402	270	453	453	292	98
	5'-CT C 3'	5'-ACA 3'	5'-g Ag 3'	5'-C CA 3'	5'-AAA 3'	5'-g CA 3'	5'-CTg 3'	5'-AAA 3'	5'-AAA 3'	5'-AAA 3'	5'-CT C 3'	5'-C TA 3'
											648	362
											5'-CAA 3'	5'-g Ag 3'
3'-primer(s) ³	368	292	497	240	539	539	538	402	517	527	362	292
	5'-CA T 3'	5'-gTg 3'	5'-Tg g 3'	5'-g gA 3'	5'-TC A 3'	5'-TC C 3'	5'-CCA 3'	5'-C gC 3'	5'-CgT 3'	5'-CC T 3'	5'-TC A 3'	5'-gTg 3'
				241			538	493			831	518
				5'-CgC 3'			5'-CAA 3'	5'-CTA 3'			5'-T CC 3'	5'-CCA 3'
Tube No.	1	2	3	4	5	6	7	8	9	10	11	12

Tube No.	13	14	15	16	17	18	19	20	21	22	23	24
Length of spec.	145	95	125	155	205	175	125	295	220	160	85	115
PCR product		170	265		360						170	
			305									
Length of int.	800	1070	800	1070	1070	1070	1070	1070	1070	1070	800	1070
pos. control ¹												
5'-primer(s) ²	98	368	78	385	292	144	453	2 nd	666	453	194	453
	5'-C TA 3'	5'-g Tg 3'	5'-TCT 3'	5'-gg C 3'	5'-CT C 3'	5'-gCA 3'	5'-AAA 3'	5'-CCA 3'	5'-gAA 3'	5'-AAA 3'	5'-C gg 3'	5'-AAA 3'
	355	445		666	666						368	
	5'-CC T 3'	5'-TC T 3'		5'-gAA 3'	5'-gAA 3'						5'-g TT 3'	
3'-primer(s) ³	200	497	160	497	368	268	538	538	843	570	240	527
	5'-TC C 3'	5'-Tg g 3'	5'-gTT 3'	5'-Tg g 3'	5'-CA A 3'	5'-TTg 3'	5'-CTg 3'	5'-CCg 3'	5'-g TT 3'	5'-C Cg 3'	5'-g gA 3'	5'-CC g 3'
	453		302	779	829	290					497	
	5'-T CT 3'		5'-gg T 3'	5'-CT T 3'	5'-CTA 3'	5'-CA A 3'					5'-Tg g 3'	
			343									
			5'-ACA 3'									
Tube No.	13	14	15	16	17	18	19	20	21	22	23	24

Tube No.	25	26	27	28	29	30	31	32	33	34	35	36
Length of spec.	145	125	95	235	220	160	95	230	105	120	110	85
PCR product		165	145				220	255		180	155	445
Length of int.	1070	800	1070	800	1070	800	1070	1070	1070	800	1070	1070
pos. control ¹												
5'-primer(s) ²	453	2 nd	238	78	78	666	78	78	506	144	453	292
	5'-AAA 3'	5'-CCA 3'	5'-Ag A 3'	5'-TCT 3'	5'-TCT 3'	5'-gAA 3'	5'-TCT 3'	5'-TCT 3'	5'-g CA 3'	5'-gCA 3'	5'-AAA 3'	5'-CT C 3'
			391				564			420		
			5'-AC g 3'				5'-TgA 3'			5'-TAg 3'		
			391									
			5'-AC g 3'									
3'-primer(s) ³	559	368	292	270	257	781	256	265	570	282	524	335
	5'-CTC 3'	5'-CA g 3'	5'-gTg 3'	5'-A Cg 3'	5'-CC T 3'	5'-C CC 3'	5'-CTg 3'	5'-CCC 3'	5'-C Cg 3'	5'-g AC 3'	5'-CA C 3'	5'-g C 3'
		411	497	270		791	616	290		497	569	453
		5'-T CA 3'	5'-Tg g 3'	5'-A CA 3'		5'-Ag T 3'	5'-CgT 3'	5'-gA C 3'		5'-Tg g 3'	5'-AC A 3'	5'-T Cg 3'
Tube No.	25	26	27	28	29	30	31	32	33	34	35	36

Lot No.: **Y41**

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Tube No.	37	38	39	40	41	42	43	44	45	46	47	48
Length of spec.	130	125	75	90	185	225	180	155	105	70	165	110
PCR product	145			210			225		185	205		
Length of int.	1070	800	1070	1070	1070	800	800	800	1070	800	800	1070
pos. control ¹												
5'-primer(s) ²	453	414	453	355	355	98	355	125	355	78	78	235
	5'-AAA 3'	5'-CAG 3'	5'-AAA 3'	5'-CC g 3'	5'-CC C 3'	5'-C TT 3'	5'-CC g 3'	5'-C gA 3'	5'-CC g 3'	5'-TCT 3'	5'-TCT 3'	5'-Ag A 3'
					692					746		419
					5'-g AA 3'					5'-g AT 3'		5'-g TC 3'
3'-primer(s) ³	542	497	485	403	506	282	494	240	419	241	203	292
	5'-CT T 3'	5'-Tg g 3'	5'-CC T 3'	5'-gCA 3'	5'-Tg T 3'	5'-g AC 3'	5'-TC C 3'	5'-g gA 3'	5'-Cg A 3'	5'-CgC 3'	5'-TC A 3'	5'-gTg 3'
	559			524	831		539		497	777		497
	5'-CCg 3'			5'-CA C 3'	5'-T CC 3'		5'-TC C 3'		5'-Tg A 3'	5'-g CA 3'		5'-Tg g 3'
Tube No.	37	38	39	40	41	42	43	44	45	46	47	48

Tube No.	49	50	51	52	53	54	55	56	57	58	59	60
Length of spec.	145	45	410	185	225	350	155	275	105	255	145	345
PCR product							200					
Length of int.	1070	800	1070	800	1070	800	1070	1070	1070	800	800	1070
pos. control ¹												
5'-primer(s) ²	453	2	292	98	355	2 nd I	81	78	78	78	666	292
	5'-AAA 3'	5'-AT 3'	5'-CT C 3'	5'-C TC 3'	5'-CC C 3'	5'-CCA 3'	5'-CAg 3'	5'-TCT 3'	5'-TCT 3'	5'-TCT 3'	5'-gAA 3'	5'-CT C 3'
							385					
							5'-gg C 3'					
3'-primer(s) ³	559	4	418	240	538	595	240	302	142	292	768	355
	5'-CCg 3'	5'-ggC 3'	5'-gTC 3'	5'-g gA 3'	5'-CAA 3'	5'-CCg 3'	5'-g gA 3'	5'-gg C 3'	5'-TgA 3'	5'-gT C 3'	5'-g Tg 3'	5'-gA T 3'
						595	497	324				
						5'-CCT 3'	5'-Tg g 3'	5'-T AC 3'				
Tube No.	49	50	51	52	53	54	55	56	57	58	59	60

Tube No.	61	62	63	64	65	66	67	68	69	70	71	72
Length of spec.	185	180	160	125	185	170	130	215	170	125	260	95
PCR product												
Length of int.	1070	800	800	1070	1070	800	800	1070	1070	800	800	1070
pos. control ¹												
5'-primer(s) ²	355	666	420	530	78	112	406	78	2 nd I	78	78	453
	5'-CC A 3'	5'-gAA 3'	5'-TAT 3'	5'-g gT 3'	5'-TCT 3'	5'-CC T 3'	5'-gC A 3'	5'-TCT 3'	5'-CCA 3'	5'-TCT 3'	5'-TCT 3'	5'-AAA 3'
3'-primer(s) ³	497	806	538	616	221	240	497	251	413	164	298	506
	5'-Tg g 3'	5'-CC A 3'	5'-CAA 3'	5'-CgT 3'	5'-AC A 3'	5'-g gA 3'	5'-Tg g 3'	5'-CC T 3'	5'-gC C 3'	5'-gC T 3'	5'-CAg 3'	5'-Tg C 3'
Tube No.	61	62	63	64	65	66	67	68	69	70	71	72

Tube No.	73	74	75	76	77	78	79	80	81	82	83	84	85
Length of spec. PCR product	200	175	205	230	85	240	225	230	315	130	100	185	260
Length of int. pos. control ¹	1070	800	1070	800	1070	1070	1070	1070	1070	1070	800	800	800
5'-primer(s) ²	78	104	453	48	78	666	78	666	2 nd I	666	808	78	666
	5' -TCT 3'	5' -A TA 3'	5' -AAA 3'	5' -gCT 3'	5' -TCT 3'	5' -gAA 3'	5' -TCT 3'	5' -gAA 3'	5' -CCA 3'	5' -gAA 3'	5' -Cg A 3'	5' -TCT 3'	5' -gAA 3'
3'-primer(s) ³	239	240	616	106	121	866	260	853	559	755	868	221	884
	5' -gA T 3'	5' -g gA 3'	5' -CgC 3'	5' -CAT 3'	5' -gCA 3'	5' -AA A 3'	5' -T. T 3'	5' -CAT 3'	5' -C TT 3'	5' -CC A 3'	5' -CAA 3'	5' -AC C 3'	5' -gg A 3'
Tube No.	73	74	75	76	77	78	79	80	81	82	83	84	85

¹The internal positive control primer pairs amplify segments of the human growth hormone gene. The two different control primer pairs give rise to either an internal positive control band of 1070 base pairs, for most tubes, or a band of 800 base pairs, for some tubes.

Tube number 1 contains the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to help in the correct orientation of the HLA-A*02 subtyping. .

In addition, tubes number 6, 7, 10, 11, 13, 15, 23, 26, 28, 30, 34, 38, 42, 43, 44, 46, 47, 50, 52, 54, 58, 59, 62, 63, 66, 67, 70, 7, 74, 76, 83, 84 and 85 contain the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to allow kit identification.

²The nucleotide position, in the 5' upstream region, 2nd, 3rd or 4th exons or the 2nd intron, matching the specificity-determining 3'-end of the primer is given. Nucleotide numbering as in *Tissue Antigens* 1998, **51:II**, 417-466. The sequence of the 3 terminal nucleotides of the primer is given.

³The nucleotide position, in the 2nd, 3rd or 4th exons, matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide numbering as in *Tissue Antigens* 1998, **51:II**, 417-466. The sequence of the 3 terminal nucleotides of the primer is given.

CELL LINE VALIDATION SHEET																				
HLA-A*02 SSP subtyping kit																				
				Lot No.:	Tube															
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	cell line	A*	A*		200738501	200738502	200738503	200738504	200738505	200738506	200738507	200738508	200738509	200738510	200738511	200738512	200738513	200738514	200738515	200738516
1	9001 SA	*2402			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280 LK707	*0201			+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
3	9011 E4181324	*0101			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	9275 GU373	*3001			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	9009 KAS011	*0101			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	9353 SM	*0201	*2603		+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
7	9020 QBL	*2601			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	9007 DEM	*0201	*3101		+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
9	9026 YAR	*2601			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	9107 LKT3	*2402			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	9051 PITOUT	*2902			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	9052 DBB	*0201			+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
13	9004 JESTHOM	*0201			+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
14	9071 OLGA	*31012			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	9075 DKB	*2402			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	9037 SWEIG007	*s902			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	9282 CTM3953549	*0301	*8001		W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	9257 32367	*3301	*7401		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	9038 BM16	*0201			+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
20	9059 SLE005	*0201			+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
21	9064 AMALA	*0217			-	+	-	+	+	-	-	-	-	-	+	-	-	-	-	-
22	9056 KOSE	*0201			+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
23	9061 31227ABO	*0201			+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
24	9035 JBUSH	*3201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	9049 IBW9	*3301			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	9285 WT49	*0205			+	-	+	+	-	+	+	+	-	-	-	+	+	-	-	-
27	9191 CJ1007	*2410	*2901		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	9320 BEL5GB	*0201	*2902		+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
29	9050 MOU	*2902			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	9021 RSH	*3001	*6802		-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	+
31	9019 DUCAF	*3002			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	9297 HAG	*0201			+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
33	9098 MT14B	*31012			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	9104 DHIF	*31012			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	9302 SSTO	*3201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	9024 KT17	*0206	*1101		+	-	+	+	+	-	-	-	-	-	-	+	-	-	-	-
37	9065 HHKB	*0301			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	9099 LZL	*0217			-	+	-	+	+	-	-	-	-	-	+	-	-	-	-	-
39	9315 CML	*0101	*0301		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	9134 WHONP199	*0207	*3001		-	+	+	+	+	-	-	-	-	-	-	-	-	+	-	-
41	9055 H0301	*0301			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	9066 TAB089	*0201	*0207		+	+	+	+	+	-	-	-	-	-	-	-	-	+	-	-
43	9076 T7526	*0206	*0207		+	+	+	+	+	-	-	-	-	-	-	+	-	+	-	-
44	9057 TEM	*6601			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	9239 SHJO	*2301	*2402		-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-
46	9013 SCHU	*0301			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045 TUBO	*0216	*0301		+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
48	9303 TER-ND	*0201	*1101		+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-

CELL LINE VALIDATION SHEET																					
HLA-A*02 SSP subtyping kit																					
					Tube																
					17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
					Lot No.:				Lot No.:				Lot No.:				Lot No.:				
cell line		A*	A*	Lot No.:	200738517	200738518	200738519	200738520	200738521	200738522	200738523	200738524	200738525	200738526	200738527	200738528	200738529	200738530	200738531	200738532	
1	9001	SA	*2402		-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-
2	9280	LK707	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	9011	E4181324	*0101		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	9275	GU373	*3001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	9009	KAS011	*0101		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	9353	SM	*0201	*2603	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	9020	QBL	*2601		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	9007	DEM	*0201	*3101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	9026	YAR	*2601		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	9107	LKT3	*2402		-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-
11	9051	PITOUT	*2902		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	9052	DBB	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	9004	JESTHOM	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071	OLGA	*31012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	9075	DKB	*2402		-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-
16	9037	SWEIG007	*s902		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	9282	CTM3953549	*0301	*8001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	9257	32367	*3301	*7401	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	9038	BM16	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	9059	SLE005	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	9064	AMALA	*0217		+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	9061	31227ABO	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	9035	JBUSH	*3201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	9049	IBW9	*3301		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	9285	WT49	*0205		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	9191	CJ1007	*2410	*2901	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	9320	BEL5GB	*0201	*2902	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	9050	MOU	*2902		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	9021	RSH	*3001	*6802	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
31	9019	DUCAF	*3002		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	9297	HAG	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	9098	MT14B	*31012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	9104	DHIF	*31012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	9302	SSTO	*3201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	9024	KT17	*0206	*1101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	9065	HHKB	*0301		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	9099	LZL	*0217		+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
39	9315	CML	*0101	*0301	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	9134	WHONP199	*0207	*3001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	9055	H0301	*0301		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	9066	TAB089	*0201	*0207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	9076	T7526	*0206	*0207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	9057	TEM	*6601		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	9239	SHJO	*2301	*2402	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-
46	9013	SCHU	*0301		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045	TUBO	*0216	*0301	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
48	9303	TER-ND	*0201	*1101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CELL LINE VALIDATION SHEET																					
HLA-A*02 SSP subtyping kit																					
				Lot No.:	Tube																
					33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
	cell line	A*	A*		200738533	200738534	200738535	200738536	200738537	200738538	200738539	200738540	200738541	200738542	200738543	200738544	200738545	200738546	200738547	200738548	
1	9001 SA	*2402			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280 LK707	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	9011 E4181324	*0101			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	9275 GU373	*3001			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	9009 KAS011	*0101			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	9353 SM	*0201	*2603		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
7	9020 QBL	*2601			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	9007 DEM	*0201	*3101		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	9026 YAR	*2601			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	9107 LKT3	*2402			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	9051 PITOUT	*2902			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	9052 DBB	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	9004 JESTHOM	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071 OLGA	*31012			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	9075 DKB	*2402			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	9037 SWEIG007	*s902			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	9282 CTM3953549	*0301	*8001		-	-	-	W	-	-	-	-	-	+	-	-	-	-	-	-	-
18	9257 32367	*3301	*7401		-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
19	9038 BM16	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	9059 SLE005	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	9064 AMALA	*0217			-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
22	9056 KOSE	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	9061 31227ABO	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	9035 JBUSH	*3201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	9049 IBW9	*3301			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	9285 WT49	*0205			-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
27	9191 CJ1007	*2410	*2901		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
28	9320 BEL5GB	*0201	*2902		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	9050 MOU	*2902			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	9021 RSH	*3001	*6802		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	9019 DUCAF	*3002			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	9297 HAG	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	9098 MT14B	*31012			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	9104 DHIF	*31012			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	9302 SSTO	*3201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	9024 KT17	*0206	*1101		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	9065 HHKB	*0301			-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
38	9099 LZL	*0217			-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
39	9315 CML	*0101	*0301		-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
40	9134 WHONP199	*0207	*3001		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	9055 H0301	*0301			-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
42	9066 TAB089	*0201	*0207		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	9076 T7526	*0206	*0207		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	9057 TEM	*6601			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	9239 SHJO	*2301	*2402		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	9013 SCHU	*0301			-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
47	9045 TUBO	*0216	*0301		-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
48	9303 TER-ND	*0201	*1101		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CELL LINE VALIDATION SHEET																				
HLA-A*02 SSP subtyping kit																				
				Lot No.:	Tube															
					49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
		cell line	A*	A*	200738549	200738550	200738551	200738552	200738553	200738554	200738555	200738556	200738557	200738558	200738559	200738560	200738561	200738562	200738563	200738564
1	9001	SA	*2402		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280	LK707	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	9011	E4181324	*0101		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	9275	GU373	*3001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	9009	KAS011	*0101		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	9353	SM	*0201	*2603	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
7	9020	QBL	*2601		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	9007	DEM	*0201	*3101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	9026	YAR	*2601		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	9107	LKT3	*2402		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	9051	PITOUT	*2902		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	9052	DBB	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	9004	JESTHOM	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071	OLGA	*31012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	9075	DKB	*2402		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	9037	SWEIG007	*s902		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	9282	CTM3953549	*0301	*8001	-	-	W	-	-	-	-	-	-	-	-	-	-	-	-	-
18	9257	32367	*3301	*7401	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	9038	BM16	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	9059	SLE005	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	9064	AMALA	*0217		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	9061	31227ABO	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	9035	JBUSH	*3201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	9049	IBW9	*3301		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	9285	WT49	*0205		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	9191	CJ1007	*2410	*2901	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	9320	BEL5GB	*0201	*2902	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	9050	MOU	*2902		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	9021	RSH	*3001	*6802	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-
31	9019	DUCAF	*3002		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	9297	HAG	*0201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	9098	MT14B	*31012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	9104	DHIF	*31012		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	9302	SSTO	*3201		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	9024	KT17	*0206	*1101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	9065	HHKB	*0301		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	9099	LZL	*0217		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
39	9315	CML	*0101	*0301	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	9134	WHONP199	*0207	*3001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	9055	H0301	*0301		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	9066	TAB089	*0201	*0207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	9076	T7526	*0206	*0207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	9057	TEM	*6601		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	9239	SHJO	*2301	*2402	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
46	9013	SCHU	*0301		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045	TUBO	*0216	*0301	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	9303	TER-ND	*0201	*1101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CELL LINE VALIDATION SHEET																					
HLA-A*02 SSP subtyping kit																					
				Lot No.:	Tube																
					65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
	cell line	A*	A*		200738565	200738566	200738567	200738568	200738569	200738570	200738571	200738572	200738573	200738574	200738575	200738576	200738577	200738578	200738579	200738580	
1	9001 SA	*2402			-	-	-	-	-	-	-	W	-	-	-	-	-	-	-	-	-
2	9280 LK707	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	9011 E4181324	*0101			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	9275 GU373	*3001			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	9009 KAS011	*0101			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	9353 SM	*0201	*2603		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	9020 QBL	*2601			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	9007 DEM	*0201	*3101		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	9026 YAR	*2601			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	9107 LKT3	*2402			-	-	-	-	-	-	-	W	-	-	-	-	-	-	-	-	-
11	9051 PITOUT	*2902			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	9052 DBB	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	9004 JESTHOM	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071 OLGA	*31012			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	9075 DKB	*2402			-	-	-	-	-	-	-	W	-	-	-	-	-	-	-	-	-
16	9037 SWEIG007	*s902			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	9282 CTM3953549	*0301	*8001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	9257 32367	*3301	*7401		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	9038 BM16	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	9059 SLE005	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	9064 AMALA	*0217			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	9056 KOSE	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	9061 31227ABO	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	9035 JBUSH	*3201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	9049 IBW9	*3301			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	9285 WT49	*0205			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	9191 CJ1007	*2410	*2901		-	-	-	-	-	-	-	W	-	-	-	-	-	-	-	-	-
28	9320 BEL5GB	*0201	*2902		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	9050 MOU	*2902			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	9021 RSH	*3001	*6802		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	9019 DUCAF	*3002			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	9297 HAG	*0201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	9098 MT14B	*31012			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	9104 DHIF	*31012			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	9302 SSTO	*3201			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	9024 KT17	*0206	*1101		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	9065 HHKB	*0301			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	9099 LZL	*0217			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	9315 CML	*0101	*0301		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	9134 WHONP199	*0207	*3001		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	9055 H0301	*0301			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	9066 TAB089	*0201	*0207		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	9076 T7526	*0206	*0207		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	9057 TEM	*6601			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	9239 SHJO	*2301	*2402		-	-	-	-	-	-	-	W	-	-	-	-	-	-	-	-	-
46	9013 SCHU	*0301			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045 TUBO	*0216	*0301		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	9303 TER-ND	*0201	*1101		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

HLA-A*02
 101.412-24/04 – licensed for PCR
 101.412-24u/04u – not licensed for PCR
 Lot No.: Y41

CELL LINE VALIDATION SHEET									
HLA-A*02 SSP subtyping kit									
					Tube				
					81	82	83	84	85
					200738581	200738582	200738583	200738584	200738585
					Lot No.:				
	cell line	A*	A*						
1	9001 SA	*2402		-	-	-	-	-	
2	9280 LK707	*0201		-	-	-	-	-	
3	9011 E4181324	*0101		-	-	-	-	-	
4	9275 GU373	*3001		-	-	-	-	-	
5	9009 KAS011	*0101		-	-	-	-	-	
6	9353 SM	*0201	*2603	-	-	-	-	-	
7	9020 QBL	*2601		-	-	-	-	-	
8	9007 DEM	*0201	*3101	-	-	-	-	-	
9	9026 YAR	*2601		-	-	-	-	-	
10	9107 LKT3	*2402		-	-	-	-	-	
11	9051 PITOUT	*2902		-	-	-	-	-	
12	9052 DBB	*0201		-	-	-	-	-	
13	9004 JESTHOM	*0201		-	-	-	-	-	
14	9071 OPGA	*31012		-	-	-	-	-	
15	9075 DKB	*2402		-	-	-	-	-	
16	9037 SWEIG007	*s902		-	-	-	-	-	
17	9282 CTM3953549	*0301	*8001	-	-	-	-	-	
18	9257 32367	*3301	*7401	-	-	-	-	-	
19	9038 BM16	*0201		-	-	-	-	-	
20	9059 SLE005	*0201		-	-	-	-	-	
21	9064 AMALA	*0217		-	-	-	-	-	
22	9056 KOSE	*0201		-	-	-	-	-	
23	9061 31227ABO	*0201		-	-	-	-	-	
24	9035 JBUSH	*3201		-	-	-	-	-	
25	9049 IBW9	*3301		-	-	-	-	-	
26	9285 WT49	*0205		-	-	-	-	-	
27	9191 CJ1007	*2410	*2901	-	-	-	-	-	
28	9320 BEL5GB	*0201	*2902	-	-	-	-	-	
29	9050 MOU	*2902		-	-	-	-	-	
30	9021 RSH	*3001	*6802	-	-	-	-	-	
31	9019 DUCAF	*3002		-	-	-	-	-	
32	9297 HAG	*0201		-	-	-	-	-	
33	9098 MT14B	*31012		-	-	-	-	-	
34	9104 DHIF	*31012		-	-	-	-	-	
35	9302 SSTO	*3201		-	-	-	-	-	
36	9024 KT17	*0206	*1101	-	-	-	-	-	
37	9065 HHKB	*0301		-	-	-	-	-	
38	9099 LZL	*0217		-	-	-	-	-	
39	9315 CML	*0101	*0301	-	-	-	-	-	
40	9134 WHONP199	*0207	*3001	-	-	-	-	-	
41	9055 H0301	*0301		-	-	-	-	-	
42	9066 TAB089	*0201	*0207	-	-	-	-	-	
43	9076 T7526	*0206	*0207	-	-	-	-	-	
44	9057 TEM	*6601		-	-	-	-	-	
45	9239 SHJO	*2301	*2402	-	-	-	-	-	
46	9013 SCHU	*0301		-	-	-	-	-	
47	9045 TUBO	*0216	*0301	-	-	-	-	-	
48	9303 TER-ND	*0201	*1101	-	-	-	-	-	

HLA-A*02
 101.412-24/04 – licensed for PCR
 101.412-24u/04u – not licensed for PCR
 Lot No.: Y41

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CERTIFICATE OF ANALYSIS

Olerup SSP™ HLA-A*02 SSP

Product number: 101.412-24/04 – licensed for PCR
 101.412-24u/04u – not licensed for PCR

Lot number: Y41

Expiry date: 2009-October-01

Number of tests: 24 tests – Product No. 101.412-24
 4 tests – Product No. 101.412-04

Number of tubes per test: 85

Tube specifications:

Tube No.	Production No.	Tube No.	Production No.	Tube No.	Production No.
1	2007-385-01	33	2007-385-33	65	2007-385-65
2	2007-385-02	34	2007-385-34	66	2007-385-66
3	2007-385-03	35	2007-385-35	67	2007-385-67
4	2007-385-04	36	2007-385-36	68	2007-385-68
5	2007-385-05	37	2007-385-37	69	2007-385-69
6	2007-385-06	38	2007-385-38	70	2007-385-70
7	2007-385-07	39	2007-385-39	71	2007-385-71
8	2007-385-08	40	2007-385-40	72	2007-385-72
9	2007-385-09	41	2007-385-41	73	2007-385-73
10	2007-385-10	42	2007-385-42	74	2007-385-74
11	2007-385-11	43	2007-385-43	75	2007-385-75
12	2007-385-12	44	2007-385-44	78	2007-385-76
13	2007-385-13	45	2007-385-45	77	2007-385-77
14	2007-385-14	46	2007-385-46	78	2007-385-78
15	2007-385-15	47	2007-385-47	79	2007-385-79
16	2007-385-16	48	2007-385-48	80	2007-385-80
17	2007-385-17	49	2007-385-49	81	2007-385-81
18	2007-385-18	50	2007-385-50	82	2007-385-82
19	2007-385-19	51	2007-385-51	83	2007-385-83
20	2007-385-20	52	2007-385-52	84	2007-385-84
21	2007-385-21	53	2007-385-53	85	2007-385-85
22	2007-385-22	54	2007-385-54		
23	2007-385-23	55	2007-385-55		
24	2007-385-24	56	2007-385-56		
25	2007-385-25	57	2007-385-57		
26	2007-385-26	58	2007-385-58		
27	2007-385-27	59	2007-385-59		
28	2007-385-28	60	2007-385-60		
29	2007-385-29	61	2007-385-61		
30	2007-385-30	62	2007-385-62		
31	2007-385-31	63	2007-385-63		
32	2007-385-32	64	2007-385-64		

Lot No.: **Y41**

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The specificity of each primer solution of the kit has been tested against 48 well characterized cell line DNAs.

No DNAs carrying the alleles to be amplified by primer solutions 9, 10, 20, 21, 24, 26, 29, 30, 31, 32, 33, 38, 39, 40, 43, 44, 45, 46, 47, 48, 50, 52, 54, 56, 57, 58, 59, 60, 63 to 71 and 73 to 85 were available. The specificities of the primers in primer solutions 9, 10, 20, 26, 31, 32, 33, 40, 43, 45, 46, 52, 56, 58, 69, 70 and 75 were tested by separately adding one additional 5'-primer, respectively one additional 3'-primer. In primer solutions 21, 24, 29, 30, 39, 47, 50, 54, 57, 59, 60, 65, 68, 71, 73, 76 to 82, 84 and 85 it was only possible to test the 5'-primer, the 3'-primer were not possible to test. In primer solutions 38, 44, 48, 63, 64, 66, 67, 74 and 83 it was only possible to test the 3'-primer, the 5'-primer was not possible to test.

Results: No false positive or false negative amplifications were obtained.

Date of approval: 2007-December-18

Approved by:

Quality Control, Supervisor

Declaration of Conformity

Product name: Olerup SSP™ HLA-A*02
Product number: 101.412-24/04, 101.412-24u/04u
Lot number: Y41

Intended use: HLA-A*02 high resolution histocompatibility testing

Manufacturer: Olerup SSP AB
Hasselstigen 1
SE-133 33 Saltsjöbaden, Sweden
Phone: +46-8-717 88 27
Fax: +46-8-717 88 18

We, Olerup SSP AB, hereby declare that this product, to which this Declaration of Conformity relates is in conformity with the following Standard(s) and other normative document(s) ISO 9001:2000 and ISO 13485:2003, following the provisions of the 98/79/EC Directive on *in vitro* diagnostic medical devices, Annex II List B, as transposed into the national laws of the Member States of the European Union.

The Technical Documentation File is maintained at Olerup SSP AB, Hasselstigen 1, SE-133 33 Saltsjöbaden, Sweden.

The Authorized Representative located within the Community is: Olerup SSP AB.

Notified Body: Lloyd's Register Quality Assurance Limited, Hiramford, Middlemarch Office Village, Siskin Drive, Coventry CV3 4FJ, United Kingdom. (Notified Body number: 0088.)

Saltsjöbaden, Sweden
2007-December-18

Olle Olerup
Managing Director

WARRANTY

Olerup SSP AB warrants its products to the original purchaser against defects in materials and workmanship under normal use and application. *Olerup* SSP AB's sole obligation under this warranty shall be to replace, at no charge, any product that does not meet the performance standards stated on the product specification sheet.

This warranty applies only to products that have been handled and stored in accordance with *Olerup* SSP AB's recommendations, and does not apply to products that have been the subject of alternation, misuse, or abuse.

All claims under this warranty must be directed to *Olerup* SSP AB in writing and must be accompanied by a copy of the purchaser's invoice. This warranty is in lieu of all other warranties, expressed or implied, including the warranties of merchantability and fitness for a particular purpose. In no case shall *Olerup* SSP AB be liable for incidental or consequential damages.

This product may not be reformulated, repacked or resold in any form without the written consent of *Olerup* SSP AB, Hasselstigen 1, SE-133 33 Saltsjöbaden, Sweden.

Handle all samples as if capable of transmitting disease. All work should be performed wearing gloves and appropriate protection.

Olerup SSP™ is a trademark of *Olerup* SSP AB.
PCR™ is a trademark of F. Hoffmann-La Roche Ltd.
ARMS™ is a trademark of Zeneca Ltd.

HLA-A*02
101.412-24/04 – licensed for PCR
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Lot No.: **Y41**

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