

Olerup SSP[®] HLA-B*51

Product number:	101.561-24u/03u – without <i>Taq</i> pol.
Lot number:	48M
Expiry date:	2014-February-01
Number of tests:	24 tests – Product No. 101.561-24u 3 tests – Product No. 101.561-03u
Number of wells per test:	64
Storage - pre-aliquoted primers:	dark at -20°C
- PCR Master Mix:	-20°C
- Adhesive PCR seals	RT
- Product Insert	RT

This Product Description is only valid for Lot No. 48M.

**CHANGES COMPARED TO THE PREVIOUS *OLERUP SSP*[®]
HLA-B*51 LOT.**

The HLA-B*51 specificity and interpretation tables have been updated for the HLA-B alleles described since the previous *Olerup SSP*[®] HLA-B*51 lot was made (Lot No. 15K).

The HLA-B*51 primer set is unchanged compared to the previous lot.

PRODUCT DESCRIPTION

HLA-B*51 SSP subtyping

CONTENT

The primer set contains 5'- and 3'-primers for identifying the B*51:01 to B*51:95 alleles.

PLATE LAYOUT

Each test consists of 64 PCR reactions in a 96 well PCR plate. Wells 65 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	42	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
empty	empty	empty	empty	empty	empty	empty	empty
empty	empty	empty	empty	empty	empty	empty	empty
empty	empty	empty	empty	empty	empty	empty	empty
empty	empty	empty	empty	empty	empty	empty	empty

The 96 well cut PCR plate is marked with 'HLA-B*51' in silver/gray ink.

Well No. 1 is marked with the Lot No. '48M'.

A faint row of numbers is seen between wells 1 and 2 or wells 7 and 8 of the PCR trays. These stem from the manufacture of the trays, and should be disregarded.

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

INTERPRETATION

The interpretation of HLA-B*51 SSP subtypings will be influenced by most B*07, twelve B*08, most B*13, the B*14, many B*15, the B*18, eleven B*27, most B*35, the B*37, two B*38, eleven B*39, many B*40, six B*41, two B*42, most B*44, the B*45, two B*46, most B*48, the B*49, the B*50, the B*52, the B*53, the B*54, the B*55, the B*56, most B*57, most B*58, the B*59, the B*73:01, the B*78, the B*81, the B*82 and the B*83:01 alleles when present on the other haplotype.

In addition, primer mixes 2 and 7 will amplify the C*01:30 allele, primer mix 50 will amplify the C*03:05, C*03:25, C*03:27 and C*08:08 alleles, primer mix 41 will amplify the C*08:24 allele and primer mixes 34 and 35 will amplify the C*15:15 allele.

UNIQUELY IDENTIFIED ALLELES

All the HLA-B*51 alleles, i.e. **B*51:01 to B*51:95**, recognized by the HLA Nomenclature Committee in April 2010¹ will give rise to unique amplification patterns by the primers in the HLA-B*51 subtyping kit.

The HLA-B*51 subtyping kit cannot distinguish the B*51:01:01, 51:01:03-51:01:07, 51:01:10-51:01:14 and 51:01:16-51:01:17 alleles, the B*51:01:08 and 51:01:15 alleles, the B*51:02:01 and 51:02:03-51:02:04 alleles, the B*51:13:01-51:13:02 alleles or the B*51:24:02-51:24:03 alleles.

The B*51:51 and 51:76 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 44.

The B*51:66 and 51:67 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 64.

The B*51:68 and 51:72 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 51.

The B*51:70 and 51:71 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 53.

The B*51:75 and 51:77 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 55.

The B*51:83 and 51:88 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 59.

The B*51:84 and 51:94 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 60.

The B*51:86 and 51:95 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 62.

¹HLA-B alleles listed on the IMGT/HLA web page 2010-April-01, release 3.0.0, www.ebi.ac.uk/imgt/hla.

RESOLUTION IN HOMO- AND HETEROZYGOTES

A total of 148 alleles generate 90 amplification patterns that can be combined in 4095 homozygous and heterozygous combinations. 1501 of these genotypes do not give rise to unique amplification patterns. The different lengths of the specific PCR products were not considered in these calculations.

+++++--	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:03, *51:05 = *51:03, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:46 = *51:46, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:04, *51:05 = *51:04, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:64 = *51:54, *51:64
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:07:01 = *51:07:01, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:07:02 = *51:07:02, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:35 = *51:35, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:15, *51:17 = *51:15, *51:35
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:17 = *51:17, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:10, *51:49 = *51:10, *51:60
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:10, *51:50 = *51:10, *51:58
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:01:02, *51:10 = *51:01:09, *51:10
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:10, *51:78 = *51:10, *51:79
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:10, *51:85 = *51:10, *51:87
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:10, *51:89 = *51:10, *51:91
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:01:01, *51:10 = *51:01:08, *51:10 =
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:10, *51:24:01 = *51:10, *51:24:02 =
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:24:02 = *51:24:02, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:21 = *51:21, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:01:09, *51:05 = *51:01:09, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:15, *51:16 = *51:18, *51:93
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:16 = *51:05, *51:82 = *51:16,
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:54 = *51:29, *51:93 = *51:54, *51:82
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:49, *51:93 = *51:60, *51:93
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:50, *51:93 = *51:58, *51:93
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:85, *51:93 = *51:87, *51:93
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:01:01, *51:93 = *51:01:08, *51:93
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:11N = *51:11N, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:12 = *51:12, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:18 = *51:15, *51:29 = *51:18,
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:15, *51:49 = *51:15, *51:60
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:01:01, *51:15 = *51:15, *51:18
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:22 = *51:22, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:28 = *51:28, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:24:01 = *51:24:01, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:26 = *51:26, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:38 = *51:38, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:27N = *51:27N, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:30 = *51:30, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:32 = *51:32, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:33 = *51:33, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:39 = *51:39, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:41N = *51:41N, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:43 = *51:43, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:55 = *51:54, *51:55
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:65 = *51:54, *51:65
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:49 = *51:05, *51:60 = *51:49,
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:50 = *51:05, *51:58 = *51:54,
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:58
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:51 = *51:51, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:52 = *51:52, *51:54
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:57 = *51:54, *51:57
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:61 = *51:05, *51:90 = *51:54,
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:61
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:68 = *51:54, *51:68
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:69 = *51:54, *51:69
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:70 = *51:54, *51:70
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:74 = *51:54, *51:74
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:75 = *51:54, *51:75
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:79 = *51:54, *51:79
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:80 = *51:54, *51:80
+++--++	-----	-----++	-----++	-----++	-----++	-----++	-----++	*51:05, *51:83 = *51:54, *51:83

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+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:05, *51:85 = *51:05, *51:87 = *51:54, *51:87
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:05, *51:86 = *51:54, *51:86
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:05, *51:91 = *51:54, *51:91
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:05, *51:66 = *51:54, *51:66
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:01:01, *51:05 = *51:01:01, *51:54 = *51:01:08, *51:05 = *51:05, *51:29 = *51:05, *51:48 = *51:29, *51:54 = *51:48, *51:54
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:40, *51:49 = *51:40, *51:60
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:40, *51:50 = *51:40, *51:58
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:40, *51:78 = *51:40, *51:79
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:40, *51:85 = *51:40, *51:87
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:40, *51:89 = *51:40, *51:91
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:01:01, *51:40 = *51:01:08, *51:40
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:05, *51:89 = *51:54, *51:89
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:01:02, *51:05 = *51:01:02, *51:54
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:02:01, *51:07:02 = *51:02:02, *51:07:01
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:24:01, *51:36 = *51:24:02, *51:36
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:36, *51:49 = *51:36, *51:60
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:36, *51:50 = *51:36, *51:58
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:01:02, *51:36 = *51:01:09, *51:36
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:36, *51:78 = *51:36, *51:79
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:36, *51:85 = *51:36, *51:87
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:36, *51:89 = *51:36, *51:91
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:01:01, *51:36 = *51:01:08, *51:36 = *51:28, *51:36
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:01:09, *51:02:01 = *51:02:02, *51:21
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:02:01, *51:82 = *51:29, *51:34
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:34, *51:49 = *51:34, *51:60
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:34, *51:50 = *51:34, *51:58
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:01:02, *51:34 = *51:02:02, *51:16
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:34, *51:78 = *51:34, *51:79
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:34, *51:85 = *51:34, *51:87
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:34, *51:89 = *51:34, *51:91
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:01:01, *51:34 = *51:01:08, *51:34 = *51:02:01, *51:16
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:02:01, *51:33 = *51:23, *51:33 = *51:23, *51:39
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:23, *51:49 = *51:23, *51:60
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:23, *51:50 = *51:23, *51:58
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:23, *51:78 = *51:23, *51:79
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:23, *51:85 = *51:23, *51:87
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:23, *51:89 = *51:23, *51:91
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:01:01, *51:23 = *51:01:08, *51:23
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:02:02, *51:49 = *51:02:02, *51:60
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:02:01, *51:49 = *51:02:01, *51:60
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:02:02, *51:50 = *51:02:02, *51:58
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:02:01, *51:50 = *51:02:01, *51:58
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:02:02, *51:85 = *51:02:02, *51:87
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:01:01, *51:02:02 = *51:01:02, *51:02:01 = *51:01:08, *51:02:02
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:02:01, *51:78 = *51:02:01, *51:79
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:02:01, *51:85 = *51:02:01, *51:87
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:02:01, *51:89 = *51:02:01, *51:91
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:01:01, *51:02:01 = *51:01:08, *51:02:01
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:03, *51:09:01 = *51:03, *51:73
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:03, *51:30 = *51:03, *51:53
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:03, *51:49 = *51:03, *51:60
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:03, *51:50 = *51:03, *51:58
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:03, *51:78 = *51:03, *51:79
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:03, *51:85 = *51:03, *51:87
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:03, *51:89 = *51:03, *51:91
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:01:01, *51:03 = *51:01:08, *51:03 = *51:03, *51:03
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:09:01, *51:46 = *51:46, *51:73
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:04, *51:09:01 = *51:04, *51:73
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:04, *51:64 = *51:46, *51:64
+++--+-	-----	-----++	-----+-	-----+	-----	-----+	-----	*51:30, *51:46 = *51:46, *51:53

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++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:04, *51:30 = *51:04, *51:53
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:46, *51:49 = *51:46, *51:60
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:46, *51:50 = *51:46, *51:58
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:46, *51:78 = *51:46, *51:79
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:46, *51:85 = *51:46, *51:87
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:46, *51:89 = *51:46, *51:91
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:01:01, *51:46 = *51:01:08, *51:46 = *51:04, *51:65 = *51:39, *51:46 = *51:46, *51:65
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:04, *51:49 = *51:04, *51:60
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:04, *51:50 = *51:04, *51:58
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:04, *51:78 = *51:04, *51:79
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:04, *51:85 = *51:04, *51:87
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:04, *51:89 = *51:04, *51:91
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:01:01, *51:04 = *51:01:08, *51:04 = *51:04, *51:39
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:04, *51:46 = *51:46, *51:46
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:62 = *51:62, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:64 = *51:64, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:45 = *51:45, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:07:01, *51:09:02 = *51:07:02, *51:09:01 = *51:07:02, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:07:01, *51:09:01 = *51:07:01, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:35 = *51:35, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:17 = *51:17, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:24:02 = *51:24:02, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:01:09, *51:09:01 = *51:01:09, *51:73 = *51:09:02, *51:21
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:21 = *51:21, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:14, *51:31 = *51:16, *51:19
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:82 = *51:29, *51:31 = *51:73, *51:82
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:31, *51:49 = *51:31, *51:60
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:31, *51:50 = *51:31, *51:58
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:01:02, *51:31 = *51:09:02, *51:16
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:31, *51:78 = *51:31, *51:79
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:31, *51:85 = *51:31, *51:87
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:31, *51:89 = *51:31, *51:91
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:01:01, *51:31 = *51:01:08, *51:31 = *51:09:01, *51:16 = *51:16, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:11N = *51:11N, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:12 = *51:12, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:92 = *51:73, *51:92
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:13:01 = *51:13:01, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:19, *51:49 = *51:19, *51:60
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:19, *51:50 = *51:19, *51:58
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:01:02, *51:19 = *51:09:02, *51:14
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:19, *51:78 = *51:19, *51:79
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:19, *51:85 = *51:19, *51:87
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:19, *51:89 = *51:19, *51:91
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:01:01, *51:19 = *51:01:08, *51:19 = *51:09:01, *51:14 = *51:14, *51:19 = *51:14, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:18 = *51:18, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:22 = *51:22, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:28 = *51:28, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:24:01 = *51:24:01, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:26 = *51:26, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:38 = *51:38, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:27N = *51:27N, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:30 = *51:30, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:37 = *51:37, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:63 = *51:63, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:32 = *51:32, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:33 = *51:33, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:39 = *51:39, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:61 = *51:61, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:29 = *51:29, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:41N = *51:41N, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:43 = *51:43, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:55 = *51:55, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:65 = *51:65, *51:73
++-++-+-	-----	-----++	+--+--	-----+	-----	-----+	-----	*51:09:01, *51:48 = *51:48, *51:73

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++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:02, *51:49 = *51:09:02, *51:60
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:49 = *51:09:01, *51:60 =
								*51:49, *51:73
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:02, *51:50 = *51:09:02, *51:58
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:50 = *51:09:01, *51:58 =
								*51:50, *51:73 = *51:58, *51:73
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:51 = *51:51, *51:73
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:52 = *51:52, *51:73
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:57 = *51:57, *51:73
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:90 = *51:73, *51:90
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:02, *51:85 = *51:09:02, *51:87
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:01:01, *51:09:02 = *51:01:02,
								*51:09:01 = *51:01:02, *51:73 = *51:01:08,
								*51:09:02
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:68 = *51:68, *51:73
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:69 = *51:69, *51:73
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:70 = *51:70, *51:73
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:74 = *51:73, *51:74
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:75 = *51:73, *51:75
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:78 = *51:09:01, *51:79 =
								*51:73, *51:79
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:80 = *51:73, *51:80
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:83 = *51:73, *51:83
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:84/51:94 = *51:73,
								*51:84/51:94
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:85 = *51:09:01, *51:87 =
								*51:73, *51:85 = *51:73, *51:87
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:86 = *51:73, *51:86
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:89 = *51:09:01, *51:91 =
								*51:73, *51:89 = *51:73, *51:91
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:09:01, *51:66 = *51:66, *51:73
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:01:01, *51:09:01 = *51:01:01, *51:73 =
								*51:01:08, *51:09:01 = *51:01:08, *51:73
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:17, *51:62 = *51:35, *51:62
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:30, *51:62 = *51:53, *51:62
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:49, *51:62 = *51:60, *51:62
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:62, *51:89 = *51:62, *51:91
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:01:01, *51:62 = *51:18, *51:62
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:30, *51:64 = *51:53, *51:64
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:30, *51:45 = *51:45, *51:53
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:49, *51:64 = *51:60, *51:64
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:50, *51:64 = *51:58, *51:64
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:64, *51:78 = *51:64, *51:79
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:64, *51:85 = *51:64, *51:87
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:64, *51:89 = *51:64, *51:91
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:01:01, *51:64 = *51:01:08, *51:64 =
								*51:64, *51:65
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:45, *51:49 = *51:45, *51:60
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:45, *51:89 = *51:45, *51:91
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:59, *51:64 = *51:64, *51:64
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:01:09, *51:07:01 = *51:07:02, *51:21
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:07:02, *51:30 = *51:07:02, *51:53
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:07:01, *51:30 = *51:07:01, *51:53
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:07:02, *51:49 = *51:07:02, *51:60
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:07:01, *51:49 = *51:07:01, *51:60
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:07:02, *51:50 = *51:07:02, *51:58
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:07:01, *51:50 = *51:07:01, *51:58
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:07:02, *51:85 = *51:07:02, *51:87
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:01:01, *51:07:02 = *51:01:02,
								*51:07:01 = *51:01:08, *51:07:02
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:07:01, *51:78 = *51:07:01, *51:79
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:07:01, *51:85 = *51:07:01, *51:87
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:07:01, *51:89 = *51:07:01, *51:91
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:01:01, *51:07:01 = *51:01:08,
								*51:07:01
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:18, *51:44N = *51:35, *51:44N
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:18, *51:20 = *51:20, *51:35
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:08, *51:18 = *51:08, *51:35 = *51:28,
								*51:35
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:30, *51:35 = *51:35, *51:53
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:35, *51:49 = *51:35, *51:60
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:35, *51:50 = *51:35, *51:58
++-+--	-----	-----++	---+---	-----+	-+-----	+-----+	-----	*51:35, *51:78 = *51:35, *51:79

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++-----	+-----+	-----++	-----++	-----+	-----	-----+	-----+	*51:35, *51:89 = *51:35, *51:91
++-----	+-----+	-----++	-----++	-----+	-----	-----+	-----	*51:01:01, *51:35 = *51:01:08, *51:35 = *51:17, *51:18 = *51:17, *51:35 = *51:18, *51:35 = *51:35, *51:35
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:44N, *51:49 = *51:44N, *51:60
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:44N, *51:50 = *51:44N, *51:58
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	+-----	*51:44N, *51:78 = *51:44N, *51:79
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:44N, *51:85 = *51:44N, *51:87
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:44N, *51:89 = *51:44N, *51:91
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:01:01, *51:44N = *51:01:08, *51:44N = *51:08, *51:55 = *51:17, *51:44N = *51:28, *51:44N = *51:44N, *51:55
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:20, *51:49 = *51:20, *51:60
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:08, *51:49 = *51:08, *51:60
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:20, *51:50 = *51:20, *51:58
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:08, *51:50 = *51:08, *51:58
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	+-----	*51:20, *51:78 = *51:20, *51:79
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:20, *51:85 = *51:20, *51:87
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:20, *51:89 = *51:20, *51:91
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:01:01, *51:20 = *51:01:08, *51:20 = *51:17, *51:20 = *51:20, *51:28
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	+-----	*51:08, *51:78 = *51:08, *51:79
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:08, *51:85 = *51:08, *51:87
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:08, *51:89 = *51:08, *51:91
++-----	+-----	-+-----	-----++	-----+	-+-----	-----+	-----	*51:01:01, *51:08 = *51:01:08, *51:08 = *51:08, *51:17 = *51:08, *51:28 = *51:17, *51:28
++-----	+-----	-----++	+-----++	-----+	-----	-----+	-----	*51:17, *51:30 = *51:17, *51:53
++-----	+-----	-----++	+-----++	-----+	-+-----	-----+	-----	*51:17, *51:49 = *51:17, *51:60
++-----	+-----	-----++	+-----++	-----+	-+-----	-----+	-----	*51:17, *51:50 = *51:17, *51:58
++-----	+-----	-----++	+-----++	-----+	-+-----	-----+	+-----	*51:17, *51:78 = *51:17, *51:79
++-----	+-----	-----++	+-----++	-----+	-+-----	-----+	-----	*51:17, *51:85 = *51:17, *51:87
++-----	+-----	-----++	+-----++	-----+	-+-----	-----+	-----	*51:17, *51:89 = *51:17, *51:91
++-----	+-----	-----++	+-----++	-----+	-+-----	-----+	-----	*51:01:01, *51:17 = *51:01:08, *51:17 = *51:17, *51:17
++-----	-+-----	-+-----	+-----++	-----+	-----	-----+	-----	*51:24:02, *51:30 = *51:24:02, *51:53
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:24:02, *51:49 = *51:24:02, *51:60
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:24:02, *51:50 = *51:24:02, *51:58
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:01:02, *51:24:02 = *51:01:09, *51:24:01 = *51:01:09, *51:24:02
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	+-----	*51:24:02, *51:78 = *51:24:02, *51:79
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:24:02, *51:85 = *51:24:02, *51:87
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:24:02, *51:89 = *51:24:02, *51:91
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:01:01, *51:24:02 = *51:01:08, *51:24:02 = *51:21, *51:24:01 = *51:21, *51:24:02 = *51:24:01, *51:24:02 = *51:24:02, *51:24:02
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:01:09, *51:30 = *51:01:09, *51:53
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:21, *51:30 = *51:21, *51:53
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:01:09, *51:49 = *51:01:09, *51:60
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:21, *51:49 = *51:21, *51:60
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:01:09, *51:50 = *51:01:09, *51:58
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:21, *51:50 = *51:21, *51:58
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:01:09, *51:85 = *51:01:09, *51:87
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:01:01, *51:01:09 = *51:01:02, *51:21 = *51:01:08, *51:01:09 = *51:01:09, *51:21
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	+-----	*51:21, *51:78 = *51:21, *51:79
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:21, *51:85 = *51:21, *51:87
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:21, *51:89 = *51:21, *51:91
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:01:01, *51:21 = *51:01:08, *51:21
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:01:02, *51:01:09 = *51:01:09, *51:01:09
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:30, *51:82 = *51:53, *51:82
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:16, *51:30 = *51:16, *51:53
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:49, *51:82 = *51:60, *51:82
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:50, *51:82 = *51:58, *51:82
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:16, *51:61 = *51:61, *51:82 = *51:82, *51:90
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	+-----	*51:78, *51:82 = *51:79, *51:82
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:82, *51:85 = *51:82, *51:87
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:82, *51:89 = *51:82, *51:91
++-----	-+-----	-+-----	+-----++	-----+	-+-----	-----+	-----	*51:01:01, *51:82 = *51:01:08, *51:82 =

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								*51:16, *51:29 = *51:29, *51:82 = *51:48, *51:82
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:16, *51:49 = *51:16, *51:60
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:16, *51:50 = *51:16, *51:58
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:16, *51:78 = *51:16, *51:79
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:16, *51:85 = *51:16, *51:87
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:16, *51:89 = *51:16, *51:91
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:01:01, *51:16 = *51:01:08, *51:16
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:16, *51:82 = *51:82, *51:82
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:11N, *51:30 = *51:11N, *51:53
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:11N, *51:49 = *51:11N, *51:60
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:11N, *51:50 = *51:11N, *51:58
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:11N, *51:78 = *51:11N, *51:79
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:11N, *51:85 = *51:11N, *51:87
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:11N, *51:89 = *51:11N, *51:91
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:01:01, *51:11N = *51:01:08, *51:11N = *51:11N, *51:11N
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:12, *51:30 = *51:12, *51:53
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:12, *51:49 = *51:12, *51:60
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:12, *51:50 = *51:12, *51:58
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:12, *51:78 = *51:12, *51:79
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:12, *51:85 = *51:12, *51:87
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:12, *51:89 = *51:12, *51:91
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:01:01, *51:12 = *51:01:08, *51:12 = *51:12, *51:12
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:30, *51:92 = *51:53, *51:92
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:13:01, *51:30 = *51:13:01, *51:53
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:13:01, *51:37 = *51:37, *51:92 = *51:63, *51:92
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:13:01, *51:61 = *51:29, *51:92 = *51:48, *51:92 = *51:61, *51:92
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:13:01, *51:29 = *51:13:01, *51:48
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:49, *51:92 = *51:60, *51:92
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:13:01, *51:49 = *51:13:01, *51:60
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:89, *51:92 = *51:91, *51:92
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:01:01, *51:92 = *51:32, *51:92
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:01:08, *51:92 = *51:13:01, *51:90 = *51:13:01, *51:92 = *51:90, *51:92 = *51:92, *51:92
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:13:01, *51:89 = *51:13:01, *51:91
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:01:01, *51:13:01 = *51:13:01, *51:32
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:01:08, *51:13:01 = *51:13:01, *51:13:01
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:14, *51:30 = *51:14, *51:53
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:14, *51:49 = *51:14, *51:60
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:14, *51:89 = *51:14, *51:91
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:01:08, *51:14 = *51:14, *51:14
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:18, *51:30 = *51:18, *51:53
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:18, *51:49 = *51:18, *51:60
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:18, *51:50 = *51:18, *51:58
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:18, *51:78 = *51:18, *51:79
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:18, *51:85 = *51:18, *51:87
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:18, *51:89 = *51:18, *51:91
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:01:01, *51:18 = *51:01:08, *51:18 = *51:18, *51:18
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:22, *51:30 = *51:22, *51:53
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:22, *51:49 = *51:22, *51:60
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:22, *51:50 = *51:22, *51:58
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:22, *51:78 = *51:22, *51:79
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:22, *51:85 = *51:22, *51:87
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:22, *51:89 = *51:22, *51:91
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:01:01, *51:22 = *51:01:08, *51:22
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:28, *51:30 = *51:28, *51:53
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:28, *51:49 = *51:28, *51:60
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:28, *51:50 = *51:28, *51:58
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:28, *51:78 = *51:28, *51:79
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:28, *51:85 = *51:28, *51:87
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:28, *51:89 = *51:28, *51:91
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:01:01, *51:28 = *51:01:08, *51:28 = *51:28, *51:28
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:24:01, *51:30 = *51:24:01, *51:53
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:24:01, *51:49 = *51:24:01, *51:60
++-----	--+-----	-----+++	-----+++	-----++	-----++	-----++	-----++	*51:24:01, *51:50 = *51:24:01, *51:58

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++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:24:01, *51:78 = *51:24:01, *51:79
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:24:01, *51:85 = *51:24:01, *51:87
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:24:01, *51:89 = *51:24:01, *51:91
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:01:01, *51:24:01 = *51:01:08, *51:24:01 = *51:24:01, *51:24:01
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:26, *51:30 = *51:26, *51:53
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:26, *51:49 = *51:26, *51:60
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:26, *51:50 = *51:26, *51:58
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:26, *51:78 = *51:26, *51:79
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:26, *51:85 = *51:26, *51:87
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:26, *51:89 = *51:26, *51:91
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:01:01, *51:26 = *51:01:08, *51:26 = *51:26, *51:26
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:38, *51:49 = *51:38, *51:60
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:38, *51:50 = *51:38, *51:58
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:38, *51:78 = *51:38, *51:79
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:38, *51:85 = *51:38, *51:87
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:38, *51:89 = *51:38, *51:91
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:01:01, *51:38 = *51:01:08, *51:38 = *51:27N, *51:30 = *51:27N, *51:38 = *51:27N, *51:53 = *51:30, *51:38 = *51:38, *51:38 = *51:38, *51:53
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:27N, *51:49 = *51:27N, *51:60
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:27N, *51:50 = *51:27N, *51:58
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:27N, *51:78 = *51:27N, *51:79
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:27N, *51:85 = *51:27N, *51:87
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:27N, *51:89 = *51:27N, *51:91
++-----	-----	-++-++	-----	-----	-----	-----	++-----	*51:01:01, *51:27N = *51:01:08, *51:27N = *51:27N, *51:27N
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:37 = *51:37, *51:53
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:63 = *51:53, *51:63
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:32 = *51:32, *51:53
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:33 = *51:33, *51:53
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:39 = *51:39, *51:53
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:61 = *51:53, *51:61
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:29, *51:30 = *51:29, *51:53
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:41N = *51:41N, *51:53
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:43 = *51:43, *51:53
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:55 = *51:53, *51:55
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:65 = *51:53, *51:65
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:48 = *51:48, *51:53
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:49 = *51:30, *51:60 = *51:49, *51:53 = *51:53, *51:60
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:50 = *51:30, *51:58 = *51:50, *51:53 = *51:53, *51:58
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:51 = *51:51, *51:53
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:52 = *51:52, *51:53
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:57 = *51:53, *51:57
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:90 = *51:53, *51:90
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:01:02, *51:30 = *51:01:02, *51:53
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:68 = *51:53, *51:68
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:69 = *51:53, *51:69
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:70 = *51:53, *51:70
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:74 = *51:53, *51:74
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:75 = *51:53, *51:75
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:78 = *51:30, *51:79 = *51:53, *51:78 = *51:53, *51:79
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:80 = *51:53, *51:80
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:83 = *51:53, *51:83
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:84/51:94 = *51:53, *51:84/51:94
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:85 = *51:30, *51:87 = *51:53, *51:85 = *51:53, *51:87
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:86 = *51:53, *51:86
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:89 = *51:30, *51:91 = *51:53, *51:89 = *51:53, *51:91
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:30, *51:66 = *51:53, *51:66
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:01:01, *51:30 = *51:01:01, *51:53 = *51:01:08, *51:30 = *51:01:08, *51:53 = *51:30, *51:30 = *51:30, *51:53
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:29, *51:37 = *51:37, *51:48 = *51:37, *51:61 = *51:61, *51:63
++-----	-----	-++-++	++-----	-----	-----	-----	++-----	*51:29, *51:63 = *51:48, *51:63

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++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:37, *51:49 = *51:37, *51:60
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:49, *51:63 = *51:60, *51:63
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:37, *51:89 = *51:37, *51:91
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:01:01, *51:37 = *51:32, *51:37
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:01:08, *51:37 = *51:37, *51:37 =
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:37, *51:63 = *51:37, *51:90 = *51:63,
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:90
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:63, *51:89 = *51:63, *51:91
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:01:01, *51:63 = *51:32, *51:63
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:01:08, *51:63 = *51:63, *51:63
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:32, *51:49 = *51:32, *51:60
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:32, *51:50 = *51:32, *51:58
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:32, *51:78 = *51:32, *51:79
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:32, *51:85 = *51:32, *51:87
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:32, *51:89 = *51:32, *51:91
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:01:01, *51:32 = *51:01:08, *51:32 =
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:32, *51:32
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:33, *51:49 = *51:33, *51:60
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:33, *51:50 = *51:33, *51:58
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:33, *51:78 = *51:33, *51:79
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:33, *51:85 = *51:33, *51:87
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:33, *51:89 = *51:33, *51:91
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:01:01, *51:33 = *51:01:08, *51:33 =
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:33, *51:33 = *51:33, *51:39
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:39, *51:49 = *51:39, *51:60
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:39, *51:50 = *51:39, *51:58
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:39, *51:78 = *51:39, *51:79
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:39, *51:85 = *51:39, *51:87
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:39, *51:89 = *51:39, *51:91
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:01:01, *51:39 = *51:01:08, *51:39 =
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:39, *51:39
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:49, *51:59 = *51:59, *51:60
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:50, *51:59 = *51:58, *51:59
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:59, *51:78 = *51:59, *51:79
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:59, *51:85 = *51:59, *51:87
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:59, *51:89 = *51:59, *51:91
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:01:01, *51:59 = *51:01:08, *51:59
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:49, *51:61 = *51:60, *51:61
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:29, *51:49 = *51:29, *51:60
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:50, *51:61 = *51:58, *51:61
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:29, *51:50 = *51:29, *51:58
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:61, *51:78 = *51:61, *51:79
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:61, *51:85 = *51:61, *51:87
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:61, *51:89 = *51:61, *51:91
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:01:01, *51:61 = *51:01:08, *51:61 =
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:29, *51:61 = *51:29, *51:90 = *51:48,
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:61 = *51:61, *51:61 = *51:61, *51:90
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:29, *51:78 = *51:29, *51:79
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:29, *51:85 = *51:29, *51:87
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:29, *51:89 = *51:29, *51:91
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:01:01, *51:29 = *51:01:08, *51:29 =
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:29, *51:29 = *51:29, *51:48
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:41N, *51:49 = *51:41N, *51:60
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:41N, *51:50 = *51:41N, *51:58
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:41N, *51:78 = *51:41N, *51:79
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:41N, *51:85 = *51:41N, *51:87
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:41N, *51:89 = *51:41N, *51:91
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:01:01, *51:41N = *51:01:08, *51:41N =
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:41N, *51:41N
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:42, *51:49 = *51:42, *51:60
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:42, *51:89 = *51:42, *51:91
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:43, *51:49 = *51:43, *51:60
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:43, *51:50 = *51:43, *51:58
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:43, *51:78 = *51:43, *51:79
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:43, *51:85 = *51:43, *51:87
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:43, *51:89 = *51:43, *51:91
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:01:01, *51:43 = *51:01:08, *51:43 =
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:43, *51:43
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:49, *51:55 = *51:55, *51:60
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:50, *51:55 = *51:55, *51:58
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:55, *51:78 = *51:55, *51:79
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:55, *51:85 = *51:55, *51:87
++-----	-----	-----++	-+---+--	-----++	-+-----	-----+	-----	*51:55, *51:89 = *51:55, *51:91

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++-----	-----	-----+-+	-----+--	-----+-+	-----	-----+	-----	*51:01:01, *51:55 = *51:01:08, *51:55 = *51:55, *51:55
++-----	-----	-----+-+	-----+--	-----++	+------	-----+	-----	*51:49, *51:65 = *51:60, *51:65
++-----	-----	-----+-+	-----+--	-----++	--+------	-----+	-----	*51:50, *51:65 = *51:58, *51:65
++-----	-----	-----+-+	-----+--	-----++	-----	-----+	-----	*51:65, *51:78 = *51:65, *51:79
++-----	-----	-----+-+	-----+--	-----++	-----	-----+	-----+-	*51:65, *51:85 = *51:65, *51:87
++-----	-----	-----+-+	-----+--	-----++	-----	-----+	-----+-	*51:65, *51:89 = *51:65, *51:91
++-----	-----	-----+-+	-----+--	-----++	-----	-----+	-----	*51:01:01, *51:65 = *51:01:08, *51:65 = *51:65, *51:65
++-----	-----	-----+-+	-----+--	-----+	++-----	-----+	-----	*51:48, *51:49 = *51:48, *51:60
++-----	-----	-----+-+	-----+--	-----+	+-----+	-----+	-----	*51:48, *51:50 = *51:48, *51:58
++-----	-----	-----+-+	-----+--	-----+	+-----	-----+	-----	*51:48, *51:78 = *51:48, *51:79
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----+-	*51:48, *51:85 = *51:48, *51:87
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----+-	*51:48, *51:89 = *51:48, *51:91
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:01:01, *51:48 = *51:01:08, *51:48 = *51:48, *51:48
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:50 = *51:49, *51:58 = *51:50, *51:60 = *51:58, *51:60
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:51 = *51:51, *51:60
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:52 = *51:52, *51:60
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:57 = *51:57, *51:60
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:90 = *51:60, *51:90
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:01:02, *51:49 = *51:01:02, *51:60
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:81 = *51:60, *51:81
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:68 = *51:60, *51:68
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:69 = *51:60, *51:69
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:70 = *51:60, *51:70
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:74 = *51:60, *51:74
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:75 = *51:60, *51:75
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:78 = *51:49, *51:79 = *51:60, *51:79
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:80 = *51:60, *51:80
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:83 = *51:60, *51:83
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:84/51:94 = *51:60, *51:84/51:94
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:85 = *51:49, *51:87 = *51:60, *51:85 = *51:60, *51:87
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:86 = *51:60, *51:86
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:89 = *51:49, *51:91 = *51:60, *51:89 = *51:60, *51:91
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:49, *51:66 = *51:60, *51:66
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:01:01, *51:49 = *51:01:01, *51:60 = *51:01:08, *51:49 = *51:01:08, *51:60 = *51:49, *51:49 = *51:49, *51:60
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:51 = *51:51, *51:58
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:52 = *51:52, *51:58
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:57 = *51:57, *51:58
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:01:02, *51:50 = *51:01:02, *51:58
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:81 = *51:58, *51:81
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:68 = *51:58, *51:68
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:69 = *51:58, *51:69
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:70 = *51:58, *51:70
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:74 = *51:58, *51:74
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:75 = *51:58, *51:75
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:79 = *51:58, *51:78 = *51:58, *51:79
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:80 = *51:58, *51:80
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:83 = *51:58, *51:83
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:84/51:94 = *51:58, *51:84/51:94
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:87 = *51:58, *51:85 = *51:58, *51:87
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:86 = *51:58, *51:86
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:89 = *51:50, *51:91 = *51:58, *51:89 = *51:58, *51:91
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:50, *51:66 = *51:58, *51:66
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:01:01, *51:50 = *51:01:01, *51:58 = *51:01:08, *51:58 = *51:50, *51:58 = *51:58, *51:58
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:01:08, *51:50 = *51:50, *51:50
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:51, *51:78 = *51:51, *51:79
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:51, *51:85 = *51:51, *51:87
++-----	-----	-----+-+	-----+--	-----+	+-	-----+	-----	*51:51, *51:89 = *51:51, *51:91

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++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:52, *51:78 = *51:52, *51:79
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:52, *51:85 = *51:52, *51:87
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:52, *51:89 = *51:52, *51:91
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:01:01, *51:52 = *51:01:08, *51:52 = *51:52, *51:52
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:57, *51:78 = *51:57, *51:79
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:57, *51:85 = *51:57, *51:87
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:57, *51:89 = *51:57, *51:91
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:01:01, *51:57 = *51:01:08, *51:57 = *51:57, *51:57
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:89, *51:90 = *51:90, *51:91
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:01:08, *51:90 = *51:90, *51:90
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:01:02, *51:85 = *51:01:02, *51:87
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:01:01, *51:01:02 = *51:01:02, *51:01:08
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:78, *51:81 = *51:79, *51:81
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:81, *51:85 = *51:81, *51:87
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:81, *51:89 = *51:81, *51:91
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:01:01, *51:81 = *51:01:08, *51:81
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:68, *51:78 = *51:68, *51:79
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:68, *51:85 = *51:68, *51:87
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:68, *51:89 = *51:68, *51:91
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:01:01, *51:68 = *51:01:08, *51:68 = *51:68, *51:68
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:69, *51:78 = *51:69, *51:79
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:69, *51:85 = *51:69, *51:87
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:69, *51:89 = *51:69, *51:91
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++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:70, *51:78 = *51:70, *51:79
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:70, *51:85 = *51:70, *51:87
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++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:74, *51:78 = *51:74, *51:79
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++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:75, *51:78 = *51:75, *51:79
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:75, *51:85 = *51:75, *51:87
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:75, *51:89 = *51:75, *51:91
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++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:78, *51:91 = *51:79, *51:89 = *51:79, *51:91
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:66, *51:78 = *51:66, *51:79
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:01:01, *51:78 = *51:01:01, *51:79 = *51:01:08, *51:79 = *51:78, *51:79 = *51:79, *51:79
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:80, *51:85 = *51:80, *51:87
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:80, *51:89 = *51:80, *51:91
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++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:83, *51:85 = *51:83, *51:87
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:83, *51:89 = *51:83, *51:91
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:01:01, *51:83 = *51:01:08, *51:83 = *51:83, *51:83
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:84/51:94, *51:85 = *51:84/51:94, *51:87
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:84/51:94, *51:89 = *51:84/51:94, *51:91
++-----	-----	-----++	-----	-----+	-----	-----+	-----	*51:01:01, *51:84/51:94 = *51:01:08, *51:84/51:94 = *51:84/51:94, *51:84/51:94

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++-----	-----	-----++	-----	-----+	-----	-----+	-----++	*51:66, *51:85 = *51:66, *51:87
++-----	-----	-----++	-----	-----+	-----	-----+	-----++	*51:01:01, *51:85 = *51:01:01, *51:87 = *51:01:08, *51:87 = *51:85, *51:87 = *51:87, *51:87
++-----	-----	-----++	-----	-----+	-----	-----+	-----++	*51:86, *51:89 = *51:86, *51:91
++-----	-----	-----++	-----	-----+	-----	-----+	-----++	*51:01:01, *51:86 = *51:01:08, *51:86 = *51:86, *51:86
++-----	-----	-----++	-----	-----+	-----	-----+	-----++	*51:66, *51:89 = *51:66, *51:91
++-----	-----	-----++	-----	-----+	-----	-----+	-----++	*51:01:01, *51:89 = *51:01:01, *51:91 = *51:01:08, *51:89 = *51:01:08, *51:91 = *51:89, *51:91 = *51:91, *51:91
++-----	-----	-----++	-----	-----+	-----	-----+	-----++	*51:01:01, *51:66 = *51:01:08, *51:66 = *51:66, *51:66
++-----	-----	-----++	-----	-----+	-----	-----+	-----++	*51:01:01, *51:01:01 = *51:01:01, *51:01:08
++-----	-----	-----++	-----	-----+	-----	-----+	-----++	*51:01:08, *51:85 = *51:85, *51:85
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:05, *51:44N = *51:44N, *51:54
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:05, *51:20 = *51:20, *51:54
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:05, *51:08 = *51:08, *51:54
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:05, *51:10 = *51:10, *51:54
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:02:02, *51:10 = *51:09:02, *51:10
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:02:01, *51:10 = *51:09:01, *51:10 = *51:10, *51:40 = *51:10, *51:73
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:10, *51:31 = *51:10, *51:34
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:05, *51:36 = *51:36, *51:54
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:09:01, *51:36 = *51:36, *51:40 = *51:36, *51:73
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:15, *51:31 = *51:15, *51:34
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:05, *51:31 = *51:05, *51:34 = *51:31, *51:54 = *51:34, *51:54
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:02:01, *51:93 = *51:02:02, *51:31 = *51:09:01, *51:93 = *51:09:02, *51:34 = *51:40, *51:93 = *51:73, *51:93
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:02:01, *51:31 = *51:09:01, *51:34 = *51:31, *51:40 = *51:34, *51:40 = *51:34, *51:73
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:31, *51:93 = *51:34, *51:93
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:05, *51:93 = *51:54, *51:93
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:02:02, *51:93 = *51:09:02, *51:93
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:05, *51:19 = *51:19, *51:54
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:02:01, *51:19 = *51:19, *51:40
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:02:01, *51:15 = *51:09:01, *51:15 = *51:15, *51:40 = *51:15, *51:73
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:02:02, *51:15 = *51:09:02, *51:15
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:05, *51:53 = *51:53, *51:54
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:05, *51:23 = *51:23, *51:54
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:09:01, *51:23 = *51:23, *51:40 = *51:23, *51:73
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:05, *51:59 = *51:54, *51:59
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:05, *51:81 = *51:54, *51:81
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:02:01, *51:05 = *51:02:01, *51:54 = *51:05, *51:09:01 = *51:05, *51:40 = *51:05, *51:73 = *51:09:01, *51:54 = *51:40, *51:54
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:02:01, *51:09:02 = *51:02:02, *51:09:01 = *51:02:02, *51:40 = *51:02:02, *51:73 = *51:09:02, *51:40
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:02:01, *51:09:01 = *51:02:01, *51:40 = *51:02:01, *51:73 = *51:09:01, *51:40 = *51:40, *51:40 = *51:40, *51:73
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:02:02, *51:05 = *51:02:02, *51:54 = *51:05, *51:05 = *51:05, *51:09:02 = *51:05, *51:54 = *51:09:02, *51:54
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:02:01, *51:23 = *51:23, *51:23
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:09:01, *51:44N = *51:44N, *51:73
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:09:01, *51:20 = *51:20, *51:73
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:08, *51:09:01 = *51:08, *51:73
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:09:01, *51:31 = *51:31, *51:73
+--+-----	+-----	-+-----	-+-----	-+-----	+-----	+-----	+-----	*51:09:01, *51:19 = *51:19, *51:19 = *51:19, *51:73

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+-----+--	-----	-----++	+---+---	-----+	-----	-----+	-----	*51:09:01, *51:53 = *51:53, *51:73
+-----+--	-----	-----++	---+---	-----+	-----	-----+	-----	*51:09:01, *51:59 = *51:59, *51:73
+-----+--	-----	-----++	---+---	---+---	---+---	---+---	---+---	*51:09:01, *51:42 = *51:42, *51:73
+-----+--	-----	-----++	---+---	---+---	---+---	---+---	---+---	*51:09:01, *51:09:02 = *51:09:02, *51:73
+-----+--	-----	-----++	---+---	---+---	---+---	---+---	---+---	*51:09:01, *51:81 = *51:73, *51:81
+-----+--	-----	-----++	---+---	---+---	---+---	---+---	---+---	*51:09:01, *51:09:01 = *51:09:01, *51:73
+-----+--	-----	-----++	---+---	---+---	---+---	---+---	---+---	*51:08, *51:44N = *51:44N, *51:44N
+-----+--	-----	-----++	---+---	---+---	---+---	---+---	---+---	*51:08, *51:20 = *51:20, *51:20

*51:01:01 = *51:01:01, 51:01:03-51:01:07, 51:01:10-51:01:14 and 51:01:16-51:01:17

*51:01:08 = *51:01:08 and 51:01:15

*51:02:01 = *51:02:01 and 51:02:03-51:02:04

*51:13:01 = *51:13:01-51:13:02

*51:24:02 = *51:24:02-51:24:03

*51:51 = *51:51 and 51:76

*51:66 = *51:66 and 51:67

*51:68 = *51:68 and 51:72

*51:70 = *51:70 and 51:71

*51:75 = *51:75 and 51:77

*51:83 = *51:83 and 51:88

*51:84 = *51:84 and 51:94

*51:86 = *51:86 and 51:95

SPECIFICITY TABLE

HLA-B*51 SSP subtyping

Specificities and sizes of the PCR products of the 64 primer mixes used for HLA-B*51 SSP subtyping

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	Amplified HLA-B*51 alleles ³	Other amplified HLA-B alleles ⁴
1⁵	105 bp	800 bp	*51:01:01-51:06, 51:08-51:21, 51:23-51:24:03, 51:26-51:46, 51:48-51:95	*08:32, 18:07:01-18:07:02, 18:29, 35:01:01:01-35:08:01, 35:08:03-35:18, 35:21-35:24:02, 35:27, 35:29-35:45, 35:48, 35:50-35:62, 35:64-35:71, 35:74-35:75, 35:77, 35:79-35:81, 35:83-35:84, 35:86-35:94, 35:96-35:99, 37:21, 38:06-38:07, 44:06, 52:06:01-52:06:02, 53:01:01-53:08:02, 53:10-53:16, 53:18-53:23, 78:01-78:02:02, 78:04, 78:07
2⁵	95 bp	1070 bp	*51:01:01-51:01:17, 51:03-51:04, 51:06-51:07:02, 51:11N-51:14, 51:16-51:18, 51:21-51:22, 51:24:01-51:24:03, 51:26-51:30, 51:32-51:33, 51:35, 51:37-51:39, 51:41N, 51:43, 51:45-51:46, 51:48-51:52, 51:55-51:58, 51:60-51:72, 51:74-51:80, 51:82-51:92, 51:94-51:95	*14:01:01-14:18, 15:37-15:38:02, 18:15, 18:19, 18:30, 35:21, 35:96, 40:28, 40:51, 49:09, 52:01:01:01-52:02, 52:04-52:09, 52:12-52:18, 52:20, 53:06, 56:05:01-56:06, 56:21, 58:08, 78:01-78:03, 78:05-78:07, C*01:30
3⁶	265 bp	1070 bp	*51:02:01-51:02:04, 51:05, 51:10, 51:15, 51:23, 51:34, 51:36, 51:40, 51:54, 51:93	*07:78, 07:84, 08:09, 13:02:01-13:04, 13:08Q-13:09, 13:14, 13:16, 13:18-13:19, 13:27, 13:30-13:35, 13:37, 15:04, 15:16:01, 15:42, 15:67, 15:83, 15:95, 15:137, 15:155, 27:14, 35:37, 35:60, 39:06:01-39:06:02, 39:33-39:34, 39:50, 39:57, 40:06:01:01-40:06:02, 40:44, 40:53, 40:70, 40:75, 40:83, 40:86, 40:93, 40:95-40:96, 41:01, 41:05-41:07, 41:09, 41:12, 42:04, 44:15, 44:18,

				44:20, 44:47, 45:01-45:11, 46:11, 46:18, 49:01:01-49:08, 49:10, 50:01:01-50:02, 50:04-50:09, 52:03, 52:11, 54:01:01-54:05N, 54:07-54:08N, 54:10-54:22, 55:01:01-55:02:02, 55:02:04-55:03, 55:05, 55:07, 55:09-55:13, 55:15-55:40, 56:01:01-56:01:04, 56:07-56:08, 56:13-56:17, 56:19N-56:20, 56:22-56:29, 59:01:01:01-59:05, 78:04
4	255 bp	1070 bp	*51:03	
5	270 bp	1070 bp	*51:04, 51:46, 51:56	*14:10, 18:22, 35:21, 35:24:01-35:24:02, 35:81, 35:96, 37:04:01 ^w -37:04:02 ^w , 40:28, 53:02, 53:06, 57:14, 58:09
6	210 bp	800 bp	*51:05 ^w , 51:09:01-51:10, 51:15, 51:19, 51:31, 51:40, 51:54 ^w , 51:73, 51:93	*13:02:01-13:04, 13:08Q-13:09, 13:14-13:15, 13:18 ^w , 13:19, 13:27, 13:30, 13:32-13:35, 13:37, 15:155, 27:14, 35:37, 35:60, 39:06:01-39:06:02, 39:33 ^w , 39:34, 39:50, 39:57, 40:06:01:01-40:06:02, 40:44, 40:53, 40:70, 40:75, 40:83, 40:86, 40:93, 40:96, 44:47, 46:11, 46:18, 52:03, 52:10, 54:01:01-54:05N, 54:07-54:08N, 54:10 ^w , 54:11-54:19, 54:21-54:22, 55:02:01-55:02:05, 55:07, 55:10, 55:12-55:13, 55:16, 55:18-55:19, 55:22-55:23, 55:26-55:27, 55:30, 55:32, 55:34-55:35, 55:37 ^w , 55:39, 56:01:01-56:01:04, 56:07-56:08, 56:14-56:17, 56:19N-56:20, 56:22-56:24, 56:26-56:29, 59:01:01:01-59:05, 73:01, 78:04
7	270 bp	1070 bp	*51:06, 51:45, 51:62, 51:64	*14:01:01-14:09, 14:11-14:18, 15:37-15:38:02, 15:185, 18:01:01-18:09, 18:12-18:15, 18:17N-18:20, 18:23N-18:34, 18:36-18:38, 18:40-18:49, 27:28, 27:62, 39:32, 39:43, 39:48, 40:51, C*01:30
8⁵	105 bp	800 bp	*51:07:01-51:07:02	*18:01:01-18:06, 18:08-18:15, 18:17N-18:28, 18:30-18:32, 18:34-18:36, 18:38-18:47, 18:49, 35:20:01-35:20:02, 35:28, 35:72,

				35:95, 37:01:01-37:01:05, 37:01:07-37:05, 37:07-37:20, 37:22, 44:83, 49:03, 52:01:01:01- 52:01:05, 52:03-52:05, 52:07- 52:15, 52:17-52:20, 53:09, 53:17:01, 78:05-78:06
9^{5,6,9}	85 bp, 195 bp, 215 bp	1070 bp	*51:08, 51:17, 51:20, 51:35, 51:44N	*37:04:01-37:04:02, 52:19
10¹⁰	160 bp, 245 bp	1070 bp	*51:01:09, 51:10, 51:21, 51:24:02- 51:24:03, 51:36	*07:78, 07:84, 08:09, 15:42, 15:83, 27:14, 35:60, 39:06:01- 39:06:02, 39:34, 39:57, 40:06:01:01-40:06:02, 40:44, 40:53, 40:70, 40:75, 40:83, 40:86, 40:93, 40:96, 41:01, 41:05-41:07, 41:09, 41:12, 42:04, 45:08, 46:18, 54:01:01-54:02, 54:04-54:05N, 54:07-54:08N, 54:10-54:22, 55:01:01-55:03, 55:05, 55:07, 55:10-55:13, 55:15-55:21, 55:23, 55:25-55:40, 56:23, 59:01:01:01- 59:03, 59:05, 73:01, 78:07
11	245 bp	1070 bp	*51:10, 51:16, 51:31, 51:34, 51:82, 51:93	*07:78, 07:84, 13:02:01-13:02:07, 13:08Q-13:09, 13:14-13:16, 13:18-13:19, 13:27, 13:30-13:35, 13:37, 27:14, 39:50, 40:06:01:01- 40:06:02, 40:44, 40:53, 40:70, 40:75, 40:83, 40:86, 40:93, 40:95-40:96, 45:10, 49:07, 52:08, 55:09, 55:22, 55:24, 73:01
12	495 bp	1070 bp	*51:11N	
13	200 bp	1070 bp	*51:12	
14⁵	105 bp	1070 bp	*51:13:01-51:13:02, 51:92	*15:137, 39:06:01-39:06:02, 39:33-39:34, 39:50, 39:57, 40:86, 45:02, 50:09, 52:14, 55:13, 56:22, 59:03, 73:01
15^{5,11}	100 bp, 230 bp	800 bp	*51:14, 51:19	*39:06:01-39:06:02, 39:57
16	180 bp	1070 bp	*51:15, 51:18, 51:35, 51:62	*13:03, 15:73, 40:71, 44:10, 44:15, 44:18, 45:01, 45:04-45:07, 45:11, 46:11, 49:01:01-49:03, 49:06, 49:08-49:10, 50:01:01- 50:02, 50:04-50:08, 54:03, 56:01:01-56:02, 56:04, 56:07- 56:08, 56:13-56:14, 56:16-56:17, 56:20, 56:24-56:29, 59:04, 82:01- 82:03

17⁵	105 bp	800 bp	*51:22	*18:33, 35:82, 35:85, 39:19:01-39:19:02, 78:03
18¹²	140 bp, 220 bp	800 bp	*51:08, 51:20, 51:28, 51:36, 51:44N	*08:09, 15:83, 41:01, 41:05-41:07, 41:09, 41:12, 42:04, 44:15, 44:18, 44:20, 45:01-45:11, 52:19, 55:20, 56:13
19	145 bp	800 bp	*51:10, 51:24:01-51:24:03	*07:78, 07:84, 08:09, 40:06:01:01-40:06:02, 40:44, 40:53, 40:70, 40:75, 40:83, 40:86, 40:93, 40:96, 41:01, 41:05-41:07, 41:09, 41:12, 42:04, 54:11, 55:20, 56:20, 59:02, 73:01
20⁵	110 bp	1070 bp	*51:26	
21¹³	130 bp, 185 bp	1070 bp	*51:27N, 51:38	
22	160 bp	1070 bp	*51:01:01, 51:01:03-51:01:08, 51:01:10-51:02:01, 51:02:03-51:04, 51:06-51:07:01, 51:08-51:09:01, 51:10-51:14, 51:16-51:24:03, 51:26-51:46, 51:48-51:53, 51:55-51:88, 51:90-51:92, 51:94-51:95	*07:65 ^w , 18:04, 35:42:02, 44:06, 53:06, 56:05:01 ^w , 56:06 ^w , 78:01, 78:02:02-78:03, 78:07
23	210 bp	1070 bp		*07:65, 18:04, 35:42:02, 40:58, 56:05:01, 56:06, 78:01, 78:02:02-78:03, 78:07
24	210 bp	1070 bp	*51:01:01, 51:01:03-51:01:08, 51:01:10-51:02:01, 51:02:03-51:04, 51:06-51:07:01, 51:08-51:09:01, 51:10-51:14, 51:16-51:24:03, 51:26-51:42, 51:43 ^w , 51:44N-51:46, 51:48-51:53, 51:55-51:77, 51:79-51:88, 51:90-51:92, 51:94-51:95	*44:06, 49:03, 52:01:02, 52:01:04, 52:02-52:03, 52:06:01-52:06:02, 52:09, 53:06, 58:08
25^{7,14}	130 bp, 175 bp, 205 bp	800 bp	*51:30, 51:38, 51:53	

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26^{5,15}	105 bp, 155 bp	1070 bp	*51:13:01-51:13:02, 51:32, 51:37, 51:63, 51:92	*13:04, 15:04, 15:16:01, 15:67, 15:95, 15:137, 15:155, 35:37, 39:06:01-39:06:02, 39:33-39:34, 39:50, 39:57, 40:86, 45:02, 45:09, 49:04-49:05, 50:09, 52:14, 54:14, 55:13, 55:23, 55:32, 56:22, 59:03, 73:01
27¹⁶	205 bp, 270 bp, 345 bp	800 bp	*51:04, 51:33, 51:39, 51:46, 51:56	*14:10, 18:22, 35:21, 35:24:01- 35:24:02, 35:81, 35:96, 37:04:01 ^w -37:04:02 ^w , 40:28, 44:24, 53:02, 53:06, 57:14, 58:09
28¹⁷	205 bp, 255 bp	1070 bp	*51:23, 51:33	*44:15, 44:18, 44:20, 44:47, 45:01-45:03, 45:05-45:07, 45:09, 45:11, 50:02, 52:15
29	245 bp	1070 bp	*51:01:01-51:03, 51:05, 51:07:01- 51:09:02, 51:11N- 51:15, 51:17-51:20, 51:22-51:24:03, 51:26-51:30, 51:32- 51:33, 51:35, 51:37- 51:41N, 51:43- 51:44N, 51:48-51:55, 51:57-51:58, 51:60- 51:61, 51:63, 51:65- 51:80, 51:83-51:92, 51:94-51:95	*13:03-13:04, 15:04, 15:16:01, 15:67, 15:95, 15:137, 15:155, 35:37, 39:33, 44:15, 44:18, 44:20, 44:47, 45:01-45:07, 45:09, 45:11, 46:11, 49:01:01-49:06, 49:08- 49:10, 50:01:01-50:02, 50:04- 50:09, 52:01:01:01-52:07, 52:09- 52:20, 54:03, 56:01:01-56:01:04, 56:05:01-56:08, 56:13-56:17, 56:20-56:22, 56:24-56:29, 58:08, 59:04, 78:01-78:06
30⁵	105 bp	800 bp	*51:06, 51:56, 51:59, 51:64	*07:02:11, 07:05:03, 15:01:02, 15:09, 40:01:06, 40:26, 44:62
31^{5,18}	105 bp, 225 bp	1070 bp	*51:05, 51:13:01- 51:13:02, 51:29, 51:37, 51:54, 51:61, 51:63, 51:82, 51:92	*07:78, 07:84, 13:04, 13:18, 13:31, 15:04, 15:16:01, 15:67, 15:95, 15:137, 15:155, 35:37, 39:06:01-39:06:02, 39:33-39:34, 39:50, 39:57, 40:86, 45:02, 45:09, 49:04-49:05, 50:09, 52:14, 54:10, 54:14, 54:20, 55:09, 55:13, 55:21, 55:23, 55:32, 55:37, 56:22, 59:03, 73:01
32	165 bp	1070 bp	*51:16, 51:31, 51:34, 51:82, 51:93	*07:02:11, 07:05:03, 27:04:03, 40:01:06, 40:95, 52:08
33	195 bp	1070 bp	*51:41N	
34	260 bp	1070 bp	*51:42	*35:45, 35:71, 44:02:01:01- 44:02:07, 44:02:09-44:14, 44:17, 44:19N, 44:21-44:30, 44:32- 44:36, 44:38-44:40, 44:43:01- 44:46, 44:48-44:53, 44:55-44:63,

				44:66-44:90, 44:92-44:98, 53:22, 57:07, 83:01, C*15:25
35	225 bp	1070 bp		*08:49, 08:60, 35:38, 37:01:01-37:01:07, 37:03N-37:06, 37:08, 37:10-37:22, 42:13, 44:02:01:01-44:02:13, 44:05:01-44:06, 44:08-44:09, 44:11-44:12, 44:14, 44:16-44:17, 44:19N, 44:21-44:25, 44:27:01, 44:33-44:34, 44:42, 44:44, 44:48-44:49, 44:51-44:53, 44:55, 44:58N-44:59, 44:62-44:63, 44:66-44:68, 44:70-44:75, 44:78, 44:80, 44:83-44:84, 44:86-44:91, 44:93, 44:95, 44:97, 53:22, 57:09, 57:24, 83:01, C*15:25
36	215 bp	1070 bp	*51:43	
37^{8,19}	165 bp, 225 bp	1070 bp	*51:44N, 51:55	
38	205 bp	1070 bp	*51:37, 51:45, 51:63	*15:38:01-15:38:02, 15:185, 18:01:01-18:09, 18:12-18:15, 18:17N-18:20, 18:22-18:25, 18:27-18:34, 18:36-18:40, 18:42-18:49, 35:21, 35:24:01-35:24:02, 39:43, 53:02, 53:06, 57:14, 58:09
39	250 bp	1070 bp	*51:46, 51:64-51:65	*14:05, 14:13, 18:14
40	185 bp	1070 bp	*51:01:01-51:24:03, 51:26-51:46, 51:48-51:53, 51:55-51:59, 51:61-51:72, 51:74-51:77, 51:79-51:95	*07:36, 07:38, 07:81, 15:13, 15:17:01:01-15:17:02, 15:24, 15:87, 15:157, 15:162, 15:168, 15:177, 44:06, 48:18, 49:03, 52:01:01:01-52:19, 53:01:01-53:02, 53:04-53:08:02, 53:10, 53:14-53:23, 57:01:01-57:11, 57:13-57:31, 58:01:01-58:02, 58:04-58:16, 58:18-58:28
41²⁰	225 bp, 315 bp	1070 bp	*51:05, 51:29, 51:48, 51:54, 51:61, 51:82	*07:78, 07:84, 13:18, 13:31, 15:04, 15:137, 39:33, 54:10, 54:20, 55:09, 55:21, 55:37, C*08:24
42^{5,21}	100 bp, 135 bp	800 bp	*51:49, 51:60	
43^{5,22}	115 bp, 215 bp	800 bp	*51:50, 51:58	
44²³	280 bp, 385 bp	800 bp	*51:51, 51:76	*08:39
45	190 bp	1070 bp	*51:52	
46⁵	80 bp	800 bp	*51:57	

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Lot-specific Information

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47⁵	125 bp	800 bp	*51:20	*07:65, 08:32, 18:03, 35:29, 35:69, 35:76, 39:19:01-39:19:02, 53:23, 56:06, 78:01, 78:03, 78:07
48^{5,24}	95 bp, 220 bp	1070 bp	*51:37, 51:61, 51:90, 51:92	*07:84, 13:04, 13:31, 13:35, 15:04, 15:16:01, 15:67, 15:95, 15:137, 15:155, 35:37, 40:44, 44:20, 44:47, 45:09, 49:04-49:05, 52:12, 54:14-54:16, 55:21, 55:23, 55:27
49	160 bp	1070 bp	*51:01:02, 51:01:09, 51:02:02, 51:05, 51:07:02, 51:09:02, 51:15, 51:54, 51:93	*07:56, 07:72, 08:26, 08:56, 15:02:01-15:02:04, 15:08, 15:11:01-15:11:04, 15:13, 15:15, 15:21, 15:31, 15:44, 15:55, 15:76, 15:88-15:89, 15:112, 15:121, 15:139, 15:143-15:144, 15:148, 15:170, 15:189, 15:191, 18:29, 35:01:01:01-35:09:02, 35:11:01-35:12:02, 35:14:01-35:15, 35:17-35:24:02, 35:26-35:27, 35:29-35:42:01, 35:43:01-35:62, 35:64-35:68:02, 35:70-35:72, 35:74-35:79, 35:81-35:83, 35:85-35:89, 35:91-35:99, 53:01:01-53:05, 53:07-53:16, 53:18-53:23, 54:01:01-54:20, 54:22, 55:01:01-55:05, 55:07-55:09, 55:11-55:17, 55:19-55:33, 55:35, 55:37-55:39, 56:01:01-56:04, 56:05:02, 56:07, 56:09-56:13, 56:15, 56:17-56:29, 59:01:01:01-59:05, 78:02:01, 78:04
50	155 bp	1070 bp	*51:81	*07:02:01-07:02:13, 07:02:15-07:06, 07:08-07:11, 07:13, 07:15-07:17, 07:19-07:21, 07:23-07:67N, 07:69-07:76, 07:79-07:83, 07:85-07:99, 08:01:02, 08:06, 08:20, 27:07, 27:11, 27:24, 27:32-27:34, 27:43, 35:31, 37:07, 37:09, 40:02:01-40:03, 40:05, 40:08-40:09, 40:13, 40:15-40:16, 40:18-40:19, 40:24, 40:27:01, 40:29, 40:31-40:32, 40:35, 40:37, 40:39-40:40, 40:45, 40:50, 40:56-40:58, 40:80, 40:82, 40:85, 40:89-40:91, 40:94, 40:97-40:98, 48:01:01-48:01:02, 48:04-48:11, 48:13, 48:15-48:16, 48:18-48:20,

				48:22, 55:04, 58:27, 81:01-81:04N, C*03:05, C*03:25, C*03:27, C*08:08
51 ^{5,25}	85 bp, 215 bp	800 bp	*51:68, 51:72	
52	150 bp	1070 bp	*51:69	
53 ²⁶	165 bp, 260 bp	1070 bp	*51:70-51:71	
54 ^{5,7}	120 bp	1070 bp	*51:74	*35:46-35:47, 40:07-40:08, 40:13, 40:68
55 ^{5,27}	75 bp, 200 bp	1070 bp	*51:75, 51:77	
56	380 bp	1070 bp	*51:01:01-51:01:07, 51:01:09-51:01:14, 51:01:16-51:12, 51:16-51:24:03, 51:26-51:36, 51:38- 51:41N, 51:43- 51:44N, 51:46, 51:48-51:49, 51:51- 51:53, 51:55-51:61, 51:64-51:77, 51:79- 51:84, 51:86-51:89, 51:91, 51:93-51:95	*08:03, 08:52, 40:13, 40:19, 48:18, 52:01:01:01-52:11, 52:13, 52:15-52:19, 53:19, 56:21, 57:02:01-57:03:02, 57:05, 57:07, 57:09, 57:17, 58:08, 58:27-58:28, 59:02
57 ²⁸	145 bp, 210 bp	1070 bp	*51:78-51:79	*44:02:10, 44:34
58	165 bp	1070 bp	*51:80	
59 ^{5,29}	120 bp, 240 bp	1070 bp	*51:83, 51:88	
60 ^{5,30}	85 bp, 190 bp	1070 bp	*51:84, 51:94	
61 ^{5,31}	100 bp, 210 bp	1070 bp	*51:85, 51:87	*27:14, 44:20, 44:47
62 ³²	175 bp, 250 bp	1070 bp	*51:86, 51:95	*39:57
63 ^{5,33}	70 bp, 175 bp	1070 bp	*51:89, 51:91	
64 ^{5,34}	115 bp, 170 bp	1070 bp	*51:66-51:67	

¹ Alleles 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-B*51 SSP typings.

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 base pairs or more. Size differences shorter than 20 base pairs are not given. For high resolution SSP kits the respective lengths 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, e.g. the primers in wells number 4, 5, 6, 7, 8, 9, 15, 17, 18 and 19 have a higher tendency of giving rise to

nonspecific amplifications than other primers.

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

PCR fragments migrating faster than the control bands, but slower than a 400 bp fragment may be seen in some gel read-outs. Such bands can be disregarded and do not influence the interpretation of the SSP typings.

Some primers may give rise to primer oligomer artifacts. Sometimes this phenomenon is an inherent feature of the primer pair(s) of a primer mix. More often it is due to other factors such as too low amount of DNA in the PCR reactions, taking too long time in setting up the PCR reactions, working at elevated room temperature or using thermal cyclers that are not pre-heated.

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 wells, or a band of 800 base pairs, for some wells.

Well 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-B*51 subtyping.

In addition, wells number 6, 8, 15, 17 to 19, 25, 27, 30, 42 to 44, 46, 47 and 51 contain the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to allow kit identification.

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

³For several HLA-B alleles fourth 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 fourth exon are conserved within allelic groups.

The B*51:51 and 51:76 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 44.

The B*51:66 and 51:67 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 64.

The B*51:68 and 51:72 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 51.

The B*51:70 and 51:71 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 53.

The B*51:75 and 51:77 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 55.

The B*51:83 and 51:88 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 59.

The B*51:84 and 51:94 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 60.

The B*51:86 and 51:95 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 62.

⁴Due to the sharing of sequence motifs between HLA-B alleles non-HLA-B*51 alleles will be amplified by many the HLA-B*51 primer mixes.

⁵Short specific PCR fragments are less intense and not as sharp as longer specific bands.

⁶Primer mixes 3 and 9 may give a lower yield of specific PCR product than the other HLA-B*51 mixes.

⁷Primer mixes 25 and 54 have a tendency to giving rise to nonspecific amplifications.

⁸Primer mix 37 has a tendency to giving rise to primer oligomer formation.

⁹Primer mix 9: Specific PCR fragment of 85 bp in the B*51:08, 51:20 and 51:44N and in the B*37:04:01-37:04:02 and 52:19 alleles. Specific PCR fragment of 195 bp in the B*51:35 allele. Specific PCR fragment of 215 bp in the B*51:17 allele.

¹⁰Primer mix 10: Specific PCR fragment of 160 bp in the B*51:01:09, 51:10 and 51:24:02-51:24:03 and in the B*07:78, 07:84, 27:14, 40:06:01:01-40:06:02, 40:44, 40:53, 40:70, 40:75, 40:83, 40:86, 40:93, 40:96 and 73:01 alleles. Specific PCR fragment of 245 bp in the B*51:21, 51:36, 08:09, 15:42, 15:83, 35:60, 39:06:01-39:06:02, 39:34, 39:57, 41:01, 41:05-41:07, 41:09, 41:12, 42:04, 45:08, 46:18, 54:01-54:02, 54:04-54:05N, 54:07-54:08N, 54:10, 54:12-54:22, 55:01:01-55:03, 55:05, 55:07, 55:10-55:13, 55:15-55:21, 55:23, 55:25-55:40, 56:23, 59:01-59:03, 59:05 and 78:07 alleles. Specific PCR fragment of 160 and 245 bp in the B*54:11 allele.

¹¹Primer mix 15: Specific PCR fragment of 100 bp in the B*51:14 allele. Specific PCR fragment of 230 bp in the B*51:19 and in the B*39:06:01-39:06:02 and 39:57 alleles.

¹²Primer mix 18: Specific PCR fragment of 140 bp in the B*51:28 allele. Specific PCR fragment of 220 bp in the B*51:08, 51:20, 51:36 and 51:44N and in the B*08:09, 15:83, 41:01, 41:05-41:07, 41:09, 41:12, 42:04, 44:15, 44:18, 44:20, 45:01-45:11, 52:19, 55:20 and 56:13 alleles.

¹³Primer mix 21: Specific PCR fragment of 130 bp in the B*51:38 allele. Specific PCR fragment of 185 bp in the B*51:27N allele.

¹⁴Primer mix 25: Specific PCR fragment of 130 bp in the B*51:38 allele. Specific PCR fragment of 175 bp in the B*51:30 allele. Specific PCR fragment of 205 bp in the B*51:53 allele.

¹⁵Primer mix 26: Specific PCR fragment of 105 bp in the B*51:13:01-51:13:02, 51:37, 51:63 and 51:92 and in the B*13:04, 15:04, 15:16, 15:67, 15:95, 15:137, 15:155, 35:37, 39:06:01-39:06:02, 39:33-39:34, 39:50, 39:57, 40:86, 45:02, 45:09, 49:04-49:05, 50:09, 52:14, 54:14, 55:13, 55:23, 55:32, 56:22, 59:03 and 73:01 alleles. Specific PCR fragment of 155 bp in the B*51:32 allele.

¹⁶Primer mix 27: Specific PCR fragment of 205 bp in the B*51:33 allele. Specific PCR fragment of 270 bp in the B*51:04, 51:46 and 51:56 and in the B*14:10, 18:22, 35:21, 35:24:01-35:24:02, 35:81, 35:96, 37:04:01-37:04:02, 40:28, 53:02, 53:06, 57:14 and 58:09 alleles. Specific PCR fragment of 345 bp in the B*51:39 and B*44:24 alleles.

¹⁷Primer mix 28: Specific PCR fragment of 205 bp in the B*51:33 allele. Specific PCR fragment of 255 bp in the B*51:23 and in the B*44:15, 44:18, 44:20, 44:47, 45:01-45:03, 45:05-45:07, 45:09, 45:11, 50:02 and 52:15 alleles.

¹⁸Primer mix 31: Specific PCR fragment of 105 bp in the B*51:13:01-51:13:02, 51:37, 51:63, 51:92, 13:04, 15:16, 15:67, 15:95, 15:155, 35:37, 39:06:01-39:06:02, 39:34, 39:50, 39:57, 40:86, 45:02, 45:09, 49:04-49:05, 50:09, 52:14, 54:14, 55:13, 55:23, 55:32, 56:22, 59:03, 73:01 alleles. Specific PCR fragment of 225 bp in the B*51:05, 51:29, 51:54, 51:61 and 51:82 and in the B*07:78, 07:84, 13:18, 13:31, 54:10, 54:20, 55:09, 55:21 and 55:37 alleles. Specific PCR fragment of 105 and 225 bp in the B*15:04, 15:137 and 39:33 alleles.

¹⁹Primer mix 37: Specific PCR fragment of 165 bp in the B*51:44N allele. Specific PCR fragment of 225 bp in the B*51:55 allele.

²⁰Primer mix 41: Specific PCR fragment of 225 bp in the B*51:05, 51:29, 51:54, 51:61 and 51:82 and in the B*07:78, 07:84, 13:18, 13:31, 15:04, 15:137, 39:33, 54:10, 54:20, 55:09, 55:21 and 55:37 alleles. Specific PCR fragment of 315 bp in the B*51:48 and C*08:24 alleles.

²¹Primer mix 42: Specific PCR fragment of 100 bp in the B*51:60 allele. Specific PCR fragment of 135 bp in the B*51:49 allele.

²²Primer mix 43: Specific PCR fragment of 115 bp in the B*51:58 allele. Specific PCR fragment of 215 bp in the B*51:50 allele.

²³Primer mix 44: Specific PCR fragment of 280 bp in the B*51:76 and B*08:39 alleles. Specific PCR fragment of 385 bp in the B*51:51 allele.

²⁴Primer mix 48: Specific PCR fragment of 95 bp in the B*51:37, 51:90 and 51:92 and in the B*07:84, 13:04, 13:35, 15:16, 15:67, 15:95, 15:155, 35:37, 40:44, 44:20, 44:47, 45:09, 49:04-49:05, 52:12, 54:14-54:16, 55:23 and 55:27 alleles. Specific PCR fragment of 220 bp in the B*51:61 and in the B*13:31, 15:137 and 55:21 alleles. Specific PCR fragment of 95 and 220 bp in the B*15:04 allele.

²⁵Primer mix 51: Specific PCR fragment of 85 bp in the B*51:68 allele. Specific PCR fragment of 215 bp in the B*51:72 allele.

²⁶Primer mix 53: Specific PCR fragment of 165 bp in the B*51:71 allele. Specific PCR fragment of 260 bp in the B*51:70 allele.

²⁷Primer mix 55: Specific PCR fragment of 75 bp in the B*51:77 allele. Specific PCR fragment of 200 bp in the B*51:75 allele.

²⁸Primer mix 57: Specific PCR fragment of 145 bp in the B*51:79 allele. Specific PCR fragment of 210 bp in the B*51:78 and in the B*44:02:10 and 44:34 alleles.

²⁹Primer mix 59: Specific PCR fragment of 120 bp in the B*51:83 allele. Specific PCR fragment of 240 bp in the B*51:88 allele.

³⁰Primer mix 60: Specific PCR fragment of 85 bp in the B*51:94 allele. Specific PCR fragment of 190 bp in the B*51:84 allele.

³¹Primer mix 61: Specific PCR fragment of 100 bp in the B*51:85 and in the B*27:14, 44:20 and 44:47 alleles. Specific PCR fragment of 210 bp in the B*51:87 allele.

³²Primer mix 62: Specific PCR fragment of 175 bp in the B*51:86 allele. Specific PCR fragment of 250 bp in the B*51:95 and in the B*39:57 alleles.

³³Primer mix 63: Specific PCR fragment of 70 bp in the B*51:91 allele. Specific PCR fragment of 175 bp in the B*51:89 allele.

³⁴Primer mix 64: Specific PCR fragment of 115 bp in the B*51:67 allele. Specific PCR fragment of 170 bp in the B*51:66 allele.

‘w’, might be weakly amplified.

INTERPRETATION TABLE																																	
HLA-B*51 SSP subtyping																																	
Amplification patterns of the B*51:01 to B*51:95 alleles																																	
	Well ³																																
	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	
Length of spec.	105	95	265	255	270	210	270	105	85	160	245	495	200	105	100	180	105	140	145	110	130	160	210	210	130	105	205	205	245	105	105	165	
PCR product(s)									195	245					230			220			185				175	155	270	255			225		
									215																205		345						
Length of int. pos. control ¹	800	1070	1070	1070	1070	800	1070	800	1070	1070	1070	1070	1070	1070	800	1070	800	800	800	1070	1070	1070	1070	1070	800	1070	800	1070	1070	800	1070	1070	
Well No.	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	
HLA-B allele ²																																	
*51:01:01, 51:01:03-51:01:07, 51:01:10-51:01:14, 51:01:16- 51:01:17	1	2																			22	24							29				
*51:01:02	1	2																												29			
*51:01:08, 51:01:15	1	2																			22	24							29				
*51:01:09	1	2							10																					29			
*51:02:01, 51:02:03-51:02:04	1		3																		22	24							29				
*51:02:02	1		3																											29			
*51:03	1	2		4																	22	24							29				
*51:04	1	2			5																22	24				27							
*51:05	1		3			w																							29	31			
*51:06	1	2					7														22	24							30				
*51:07:01		2						8													22	24							29				
*51:07:02		2						8																					29				
*51:08	1								9								18				22	24							29				
*51:09:01	1					6															22	24							29				
*51:09:02	1					6																							29				
*51:10	1		3		6					10	11							19			22	24											
*51:11N	1	2										12									22	24							29				
*51:12	1	2											13								22	24							29				
*51:13:01-51:13:02	1	2												14							22	24			26				29	31			
*51:14	1	2													15						22	24							29				
*51:15	1		3			6										16													29				
*51:16	1	2									11										22	24									32		
*51:17	1	2							9												22	24							29				
*51:18	1	2														16					22	24							29				
*51:19	1				6										15						22	24							29				
*51:20	1								9								18				22	24							29				
*51:21	1	2								10											22	24											
*51:22		2															17				22	24							29				
*51:23	1		3																		22	24					28	29					
*51:24:01	1	2																19			22	24							29				
*51:24:02-51:24:03	1	2								10								19			22	24							29				
*51:26	1	2																	20		22	24							29				
*51:27N	1	2																		21	22	24							29				
*51:28	1	2															18				22	24							29				
*51:29	1	2																			22	24							29	31			
*51:30	1	2																			22	24	25						29				
*51:31	1				6					11											22	24									32		
*51:32	1	2																			22	24			26				29				
*51:33	1	2																			22	24				27	28	29					
*51:34	1		3							11											22	24									32		
*51:35	1	2							9							16					22	24							29				
*51:36	1		3							10								18				22	24										
*51:37	1	2																			22	24				26				31			
*51:38	1	2																			21	22	24	25					29				
*51:39	1	2																			22	24				27			29				
*51:40	1		3			6															22	24							29				
*51:41N	1	2																			22	24							29				
*51:42	1																				22	24											
*51:43	1	2																			22	w							29				
*51:44N	1								9								18				22	24							29				
Well No.	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	

INTERPRETATION TABLE																																																																			
HLA-B*51 SSP subtyping																																																																			
Amplification patterns of the B*51:01 to B*51:95 alleles																																																																			
Well ³																																																																			
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																																				
195	260	225	215	165	205	250	185	225	100	115	280	190	80	125	95	160	155	85	150	165	120	75	380	145	165	120	85	100	175	70	115																																				
				225				315	135	215	385				220			215		260		200		210		240	190	210	250	175	170																																				
1070	1070	1070	1070	1070	1070	1070	1070	1070	800	800	800	1070	800	800	1070	1070	1070	800	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070																																				
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	Well No.																																			
																																HLA-B allele ²																																			
							40																56									*51:01:01, 51:01:03-51:01:07, 51:01:10-51:01:14, 51:01:16-51:01:17																																			
							40									49							56									*51:01:02																																			
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					38											49																*18:29		
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*44:62																														30		
*44:83								8																								
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*45:10			3								11							18														
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*52:16		2																											29			
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*55:02:03						6				10																						
*55:09			3								11																				31	
*55:13, 59:03			3			6				10				14												26				31		
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*55:21			3							10																					31	
*55:22			3			6					11																					
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*56:05:02		2																												29		
*56:06		2																				w	23							29		
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*56:15			3			6																								29		
*56:19N			3			6																										
*56:20			3			6										16			19											29		
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*56:22			3			6								14												26			29	31		
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*59:02			3			6				10									19													
*73:01						6				10	11			14					19							26					31	
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*78:02:01	1	2																											29			
*78:02:02	1	2																				22	23						29			
*78:03		2															17					22	23						29			
*78:04	1		3			6																							29			
*78:07	1	2								10												22	23									
C*08:24																																
HLA-B allele ⁴																																
Well No.	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

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 wells, or a band of 800 base pairs, for some wells.

Well 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-B*51 subtyping. .

In addition, wells number 6, 8, 15, 17 to 19, 25, 27, 30, 42 to 44, 46, 47 and 51 contain the primer pair giving rise to the shorter, 800 bp, internal positive control band in order to allow kit identification.

²The B*51:25 nucleotide sequence has been shown to be identical to B*51:22.

The B*51:47 nucleotide sequence has been renamed to B*51:09:02.

³Primer mix 9: Specific PCR fragment of 85 bp in the B*51:08, 51:20 and 51:44N and in the B*37:04:01-37:04:02 and 52:19 alleles. Specific PCR fragment of 195 bp in the B*51:35 allele. Specific PCR fragment of 215 bp in the B*51:17 allele.

Primer mix 10: Specific PCR fragment of 160 bp in the B*51:01:09, 51:10 and 51:24:02-51:24:03 and in the B*07:78, 07:84, 27:14, 40:06:01:01-40:06:02, 40:44, 40:53, 40:70, 40:75, 40:83, 40:86, 40:93, 40:96 and 73:01 alleles. Specific PCR fragment of 245 bp in the B*51:21, 51:36, 08:09, 15:42, 15:83, 35:60, 39:06:01-39:06:02, 39:34, 39:57, 41:01, 41:05-41:07, 41:09, 41:12, 42:04, 45:08, 46:18, 54:01-54:02, 54:04-54:05N, 54:07-54:08N, 54:10, 54:12-54:22, 55:01:01-55:03, 55:05, 55:07, 55:10-55:13, 55:15-55:21, 55:23, 55:25-55:40, 56:23, 59:01-59:03, 59:05 and 78:07 alleles. Specific PCR fragment of 160 and 245 bp in the B*54:11 allele.

Primer mix 15: Specific PCR fragment of 100 bp in the B*51:14 allele. Specific PCR fragment of 230 bp in the B*51:19 and in the B*39:06:01-39:06:02 and 39:57 alleles.

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								41								49																*54:20		
																49																	*55:01:01-55:01:06, 55:03, 55:05, 55:11, 55:15, 55:17, 55:25, 55:28-55:29, 55:31, 55:33, 55:38	
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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	Well No.		

Primer mix 18: Specific PCR fragment of 140 bp in the B*51:28 allele. Specific PCR fragment of 220 bp in the B*51:08, 51:20, 51:36 and 51:44N and in the B*08:09, 15:83, 41:01, 41:05-41:07, 41:09, 41:12, 42:04, 44:15, 44:18, 44:20, 45:01-45:11, 52:19, 55:20 and 56:13 alleles.

Primer mix 21: Specific PCR fragment of 130 bp in the B*51:38 allele. Specific PCR fragment of 185 bp in the B*51:27N allele.

Primer mix 25: Specific PCR fragment of 130 bp in the B*51:38 allele. Specific PCR fragment of 175 bp in the B*51:30 allele. Specific PCR fragment of 205 bp in the B*51:53 allele.

Primer mix 26: Specific PCR fragment of 105 bp in the B*51:13:01-51:13:02, 51:37, 51:63 and 51:92 and in the B*13:04, 15:04, 15:16, 15:67, 15:95, 15:137, 15:155, 35:37, 39:06:01-39:06:02, 39:33-39:34, 39:50, 39:57, 40:86, 45:02, 45:09, 49:04-49:05, 50:09, 52:14, 54:14, 55:13, 55:23, 55:32, 56:22, 59:03 and 73:01 alleles. Specific PCR fragment of 155 bp in the B*51:32 allele.

Primer mix 27: Specific PCR fragment of 205 bp in the B*51:33 allele. Specific PCR fragment of 270 bp in the B*51:04, 51:46 and 51:56 and in the B*14:10, 18:22, 35:21, 35:24:01-35:24:02, 35:81, 35:96, 37:04:01-37:04:02, 40:28, 53:02, 53:06, 57:14 and 58:09 alleles. Specific PCR fragment of 345 bp in the B*51:39 and B*44:24 alleles.

Primer mix 28: Specific PCR fragment of 205 bp in the B*51:33 allele. Specific PCR fragment of 255 bp in the B*51:23 and in the B*44:15, 44:18, 44:20, 44:47, 45:01-45:03, 45:05-45:07, 45:09, 45:11, 50:02 and 52:15 alleles.

Primer mix 31: Specific PCR fragment of 105 bp in the B*51:13:01-51:13:02, 51:37, 51:63, 51:92, 13:04, 15:16, 15:67, 15:95, 15:155, 35:37, 39:06:01-39:06:02, 39:34, 39:50, 39:57, 40:86, 45:02, 45:09, 49:04-49:05, 50:09, 52:14, 54:14, 55:13, 55:23, 55:32, 56:22, 59:03, 73:01 alleles. Specific

PCR fragment of 225 bp in the B*51:05, 51:29, 51:54, 51:61 and 51:82 and in the B*07:78, 07:84, 13:18, 13:31, 54:10, 54:20, 55:09, 55:21 and 55:37 alleles. Specific PCR fragment of 105 and 225 bp in the B*15:04, 15:137 and 39:33 alleles.

Primer mix 37: Specific PCR fragment of 165 bp in the B*51:44N allele. Specific PCR fragment of 225 bp in the B*51:55 allele.

Primer mix 41: Specific PCR fragment of 225 bp in the B*51:05, 51:29, 51:54, 51:61 and 51:82 and in the B*07:78, 07:84, 13:18, 13:31, 15:04, 15:137, 39:33, 54:10, 54:20, 55:09, 55:21 and 55:37 alleles. Specific PCR fragment of 315 bp in the B*51:48 and C*08:24 alleles.

Primer mix 42: Specific PCR fragment of 100 bp in the B*51:60 allele. Specific PCR fragment of 135 bp in the B*51:49 allele.

Primer mix 43: Specific PCR fragment of 115 bp in the B*51:58 allele. Specific PCR fragment of 215 bp in the B*51:50 allele.

Primer mix 44: Specific PCR fragment of 280 bp in the B*51:76 and B*08:39 alleles. Specific PCR fragment of 385 bp in the B*51:51 allele.

Primer mix 48: Specific PCR fragment of 95 bp in the B*51:37, 51:90 and 51:92 and in the B*07:84, 13:04, 13:35, 15:16, 15:67, 15:95, 15:155, 35:37, 40:44, 44:20, 44:47, 45:09, 49:04-49:05, 52:12, 54:14-54:16, 55:23 and 55:27 alleles. Specific PCR fragment of 220 bp in the B*51:61 and in the B*13:31, 15:137 and 55:21 alleles. Specific PCR fragment of 95 and 220 bp in the B*15:04 allele.

Primer mix 51: Specific PCR fragment of 85 bp in the B*51:68 allele. Specific PCR fragment of 215 bp in the B*51:72 allele.

Primer mix 53: Specific PCR fragment of 165 bp in the B*51:71 allele. Specific PCR fragment of 260 bp in the B*51:70 allele.

Primer mix 55: Specific PCR fragment of 75 bp in the B*51:77 allele. Specific PCR fragment of 200 bp in the B*51:75 allele.

Primer mix 57: Specific PCR fragment of 145 bp in the B*51:79 allele. Specific PCR fragment of 210 bp in the B*51:78 and in the B*44:02:10 and 44:34 alleles.

Primer mix 59: Specific PCR fragment of 120 bp in the B*51:83 allele. Specific PCR fragment of 240 bp in the B*51:88 allele.

Primer mix 60: Specific PCR fragment of 85 bp in the B*51:94 allele. Specific PCR fragment of 190 bp in the B*51:84 allele.

Primer mix 61: Specific PCR fragment of 100 bp in the B*51:85 and in the B*27:14, 44:20 and 44:47 alleles. Specific PCR fragment of 210 bp in the B*51:87 allele.

Primer mix 62: Specific PCR fragment of 175 bp in the B*51:86 allele. Specific PCR fragment of 250 bp in the B*51:95 and in the B*39:57 alleles.

Primer mix 63: Specific PCR fragment of 70 bp in the B*51:91 allele. Specific PCR fragment of 175 bp in the B*51:89 allele.

Primer mix 64: Specific PCR fragment of 115 bp in the B*51:67 allele. Specific PCR fragment of 170 bp in the B*51:66 allele.

⁴The B*51:51 and 51:76 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 44.

⁵The B*51:66 and 51:67 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 64.

⁶The B*51:68 and 51:72 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 51.

⁷The B*51:70 and 51:71 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 53.

⁸The B*51:75 and 51:77 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 55.

⁹The B*51:83 and 51:88 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 59.

¹⁰The B*51:84 and 51:94 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 60.

¹¹The B*51:86 and 51:95 alleles may be distinguished by the different sizes of the specific PCR products generated by primer mix 62.

'w', might be weakly amplified.

Primers

Well No.	1	2	3	4	5	6	7	8	9	10	11	12
5'-primer(s) ¹	206 5'-gAC 3'	527 5'-TgA 3'	357 5'-Tgg 3'	357 5'-Tgg 3'	355 5'-TCA 3'	357 5'-Tgg 3'	355 5'-CCC 3'	206 5'-gAC 3'	408 5'-ggT 3'	357 5'-Tgg 3'	357 5'-Tgg 3'	3 rd I 5'-CTT 3'
									431 5'-CgA 3'			
									540 5'-gAC 3'			
3'-primer(s) ²	272 5'-TgA 3'	583 5'-gTg 3'	583 5'-gTA 3'	571 5'-CCC 3'	583 5'-gTg 3'	527 5'-CCA 3'	583 5'-gTg 3'	272 5'-Tgg 3'	583 5'-gTg 3'	477 5'-gCg 3'	559 5'-CTC 3'	621 5'-ggg 3'
						527 5'-CCA 3'				559 5'-CgT 3'		
Well No.	1	2	3	4	5	6	7	8	9	10	11	12

Well No.	13	14	15	16	17	18	19	20	21	22	23	24
5'-primer(s) ¹	165 5'-ACC 3'	357 5'-Tgg 3'	357 5'-Tgg 3'	404 5'-CCC 3'	206 5'-gAC 3'	141 5'-ATT 3'	357 5'-Tgg 3'	141 5'-ATT 3'	357 5'-Tgg 3'	141 5'-ATT 3'	141 5'-ATT 3'	141 5'-ATT 3'
				420 5'-TTA 3'		357 5'-Tgg 3'						
				431 5'-CgA 3'								
3'-primer(s) ²	322 5'-gTC 3'	419 5'-CgA 3'	414 5'-TgT 3'	559 5'-CAg 3'	272 5'-TgC 3'	242 5'-CCC 3'	463 5'-gCg 3'	211 5'-ggT 3'	445 5'-ggA 3'	259 5'-gTT 3'	311 5'-ggT 3'	309 5'-ATC 3'
			544 5'-ggT 3'			538 5'-gTC 3'			502 5'-CTA 3'			
			544 5'-ggT 3'									
Well No.	13	14	15	16	17	18	19	20	21	22	23	24

Well No.	25	26	27	28	29	30	31	32	33	34	35	36
5'-primer(s) ¹	357 5'-Tgg 3'	357 5'-Tgg 3'	49 5'-CAg 3'	49 5'-CAg 3'	357 5'-Tgg 3'	369 5'-TAC 3'	357 5'-Tgg 3'	435 5'-AAA 3'	141 5'-ATT 3'	355 5'-TCA 3'	355 5'-TCA 3'	133 5'-CCg 3'
	652 5'-CCg 3'	756 5'-ACT 3'	355 5'-TCA 3'	357 5'-Tgg 3'		369 5'-TAC 3'						
3'-primer(s) ²	445 5'-ggA 3'	419 5'-Cgg 3'	83 5'-TgA 3'	83 5'-TgA 3'	559 5'-CAg 3'	435 5'-TCT 3'	419 5'-Cgg 3'	559 5'-CTC 3'	295 5'-TCA 3'	572 5'-gCg 3'	538 5'-gTC 3'	309 5'-ATC 3'
	523 5'-ACA 3'	419 5'-CgA 3'	226 5'-CAC 3'	572 5'-gCg 3'			419 5'-CgA 3'					
	787 5'-TCC 3'	872 5'-TCA 3'	583 5'-gTg 3'				539 5'-TCC 3'					
Well No.	25	26	27	28	29	30	31	32	33	34	35	36

Well No.	37	38	39	40	41	42	43	44	45	46	47	48
5'-primer(s) ¹	141 5'-ATT 3'	419 5'-gTC 3'	362 5'-gAC 3'	165 5'-ACC 3'	357 5'-Tgg 3'	106 5'-CCA 3'	141 5'-ATT 3'	106 5'-CCA 3'	141 5'-ATT 3'	103 5'-CCT 3'	209 5'-ggA 3'	357 5'-Tgg 3'
	357 5'-Tgg 3'		363 5'-AgC 3'		736 5'-gCA 3'	488 5'-Cgg 3'		667 5'-AgA 3'				
			383 5'-ggA 3'									
3'-primer(s) ²	265 5'-CTA 3'	583 5'-gTg 3'	583 5'-gTg 3'	309 5'-ATC 3'	539 5'-TCC 3'	163 5'-ggC 3'	214 5'-CCA 3'	343 5'-T 3'	292 5'-gTg 3'	141 5'-gCA 3'	292 5'-gTC 3'	412 5'-gTC 3'
	539 5'-TCT 3'				916 5'-gAT 3'	583 5'-gTg 3'	314 5'-gCC 3'	916 5'-gAT 3'			292 5'-gTC 3'	412 5'-gTC 3'
												538 5'-CCA 3'
Well No.	37	38	39	40	41	42	43	44	45	46	47	48

Well No.	49	50	51	52	53	54	55	56	57	58	59	60
5'-primer(s) ¹	142	363	97	475	357	193	141	317	141	457	141	357
	5'-TCg 3'	5'-AgC 3'	5'-TCg 3'	5'-CCA 3'	5'-Tgg 3'	5'-CCA 3'	5'-ATT 3'	5'-gCT 3'	5'-ATT 3'	5'-AgC 3'	5'-ATT 3'	5'-Tgg 3'
			357				357				357	
			5'-Tgg 3'				5'-Tgg 3'				5'-Tgg 3'	
3'-primer(s) ²	259	477	141	583	481	272	177	412	246	583	218	403
	5'-gTT 3'	5'-gCg 3'	5'-gCA 3'	5'-gTg 3'	5'-gTg 3'	5'-TgA 3'	5'-AAA 3'	5'-gTT 3'	5'-TAA 3'	5'-gTg 3'	5'-gCC 3'	5'-gCA 3'
	259		530		578		514		309		555	505
	5'-gTT 3'		5'-CCT 3'		5'-TgA 3'		5'-CTg 3'		5'-gTg 3'		5'-CCg 3'	5'-gCC 3'
Well No.	49	50	51	52	53	54	55	56	57	58	59	60

Well No.	61	62	63	64
5'-primer(s) ¹	357	357	138	145
	5'-Tgg 3'	5'-Tgg 3'	5'-TTg 3'	5'-CAA 3'
			529	200
			5'-AgA 3'	5'-TCg 3'
3'-primer(s) ²	418	493	272	272
	5'-gTC 3'	5'-CCT 3'	5'-TgA 3'	5'-TgA 3'
	528	565	559	
	5'-gCA 3'	5'-CAT 3'	5'-CAg 3'	
Well No.	61	62	63	64

¹The nucleotide position, in the 2nd, 3rd or 4th exon or 3rd intron, matching the specificity-determining 3'-end of the primer is given. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

²The nucleotide position, in the 2nd, 3rd, 4th or 5th exon, matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Nucleotide numbering as on the www.ebi.ac.uk/imgt/hla web site. The sequence of the 3 terminal nucleotides of the primer is given.

CELL LINE VALIDATION SHEET																				
HLA-B*51 SSP subtyping kit																				
					Well															
					17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
				Prod. No.:	201073117	201073118	201073119	201073120	201073121	201073122	201073123	201073124	201073125	201073126	201073127	201073128	201073129	201189130	201073131	201073132
	IHWC cell line		B*																	
1	9001	SA	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280	LK707	*52:01	*73:01	-	-	+	-	-	-	-	-	-	+	-	-	+	-	+	-
3	9011	E4181324	*52:01		-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
4	9275	GU373	*15:10	*53:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	9009	KAS011	*37:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	9353	SM	*39:01	*51:01	-	-	-	-	-	+	-	+	-	-	-	-	+	-	-	-
7	9020	QBL	*18:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	9025	DEU	*35:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	9026	YAR	*38:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	9107	LKT3	*54:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	9051	PITOUT	*44:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	9052	DBB	*57:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	9004	JESTHOM	*27:05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071	OLGA	*15:01	*15:20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	9075	DKB	*40:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	9037	SWEIG007	*40:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	9282	CTM3953540	*08:01	*55:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	9257	32367	*14:01	*56:01	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
19	9038	BM16	*18:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	9059	SLE005	*40:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	9064	AMALA	*15:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*35:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	9124	IHL	*40:02	*56:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	9035	JBUSH	*38:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	9049	IBW9	*14:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	9285	WT49	*58:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	9191	CH1007	*07:05	*51:01	-	-	-	-	-	+	-	+	-	-	-	-	+	-	-	-
28	9320	BEL5GB	*44:02	*44:03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	9050	MOU	*44:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	9021	RSH	*42:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	9019	DUCAF	*18:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	9297	HAG	*41:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	9098	MT14B	*40:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	9104	DHIF	*38:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	9302	SSTO	*44:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	9024	KT17	*15:01	*35:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	9065	HHKB	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	9099	LZL	*15:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	9315	CML	*08:01	*27:05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	9134	WHONP199	*13:02	*46:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	9055	H0301	*14:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	9066	TAB089	*46:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	9076	T7526	*46:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	9057	TEM	*38:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	9239	SHJO	*42:01	*50:01	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
46	9013	SCHU	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045	TUBO	*51:01		-	-	-	-	-	+	-	+	-	-	-	-	+	-	-	-
48	9303	TER-ND	*35:01	*44:03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CELL LINE VALIDATION SHEET																					
HLA-B*51 SSP subtyping kit																					
					Well																
						33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
				Prod. No.:		201073133	201073134	201073135	201073136	201073137	201073138	201073139	201073140	201073141	201073142	201073143	201073144	201073145	201073146	201073147	201073148
	IHCW cell line		B*																		
1	9001	SA	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	9280	LK707	*52:01	*73:01	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
3	9011	E4181324	*52:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
4	9275	GU373	*15:10	*53:01	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
5	9009	KAS011	*37:01		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	9353	SM	*39:01	*51:01	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
7	9020	QBL	*18:01		-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
8	9025	DEU	*35:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
9	9026	YAR	*38:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	9107	LKT3	*54:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	9051	PITOUT	*44:03		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	9052	DBB	*57:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
13	9004	JESTHOM	*27:05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	9071	OLGA	*15:01	*15:20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	9075	DKB	*40:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	9037	SWEIG007	*40:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	9282	CTM3953540	*08:01	*55:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	9257	32367	*14:01	*56:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	9038	BM16	*18:01		-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
20	9059	SLE005	*40:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	9064	AMALA	*15:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	9056	KOSE	*35:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	9124	IHL	*40:02	*56:02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	9035	JBUSH	*38:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	9049	IBW9	*14:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	9285	WT49	*58:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
27	9191	CH1007	*07:05	*51:01	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
28	9320	BEL5GB	*44:02	*44:03	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	9050	MOU	*44:03		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	9021	RSH	*42:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	9019	DUCAF	*18:01		-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
32	9297	HAG	*41:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	9098	MT14B	*40:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	9104	DHIF	*38:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	9302	SSTO	*44:02		-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	9024	KT17	*15:01	*35:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	9065	HHKB	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	9099	LZL	*15:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	9315	CML	*08:01	*27:05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	9134	WHONP199	*13:02	*46:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	9055	H0301	*14:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	9066	TAB089	*46:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	9076	T7526	*46:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	9057	TEM	*38:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	9239	SHJO	*42:01	*50:01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	9013	SCHU	*07:02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	9045	TUBO	*51:01		-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
48	9303	TER-ND	*35:01	*44:03	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CELL LINE VALIDATION SHEET																					
HLA-B*51 SSP subtyping kit																					
					Prod. No.:	Well															
						49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
						201073149	201073150	201073151	201073152	201073153	201073154	201073155	201073156	201073157	201073158	201073159	201073160	201073161	201073162	201073163	201073164
	IHWC cell line		B*																		
1	9001 SA		*07:02			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	9280 LK707		*52:01	*73:01		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	
3	9011 E4181324		*52:01			-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	
4	9275 GU373		*15:10	*53:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	9009 KAS011		*37:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	9353 SM		*39:01	*51:01		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	
7	9020 QBL		*18:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	9025 DEU		*35:01			+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9	9026 YAR		*38:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	9107 LKT3		*54:01			+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11	9051 PITOUT		*44:03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12	9052 DBB		*57:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
13	9004 JESTHOM		*27:05			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
14	9071 OLGA		*15:01	*15:20		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
15	9075 DKB		*40:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
16	9037 SWEIG007		*40:02			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	
17	9282 CTM3953540		*08:01	*55:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
18	9257 32367		*14:01	*56:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
19	9038 BM16		*18:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
20	9059 SLE005		*40:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
21	9064 AMALA		*15:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
22	9056 KOSE		*35:03			+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
23	9124 IHL		*40:02	*56:02		+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	
24	9035 JBUSH		*38:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
25	9049 IBW9		*14:02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
26	9285 WT49		*58:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
27	9191 CH1007		*07:05	*51:01		-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	
28	9320 BEL5GB		*44:02	*44:03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
29	9050 MOU		*44:03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
30	9021 RSH		*42:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
31	9019 DUCAF		*18:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
32	9297 HAG		*41:02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
33	9098 MT14B		*40:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
34	9104 DHIF		*38:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
35	9302 SSTO		*44:02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
36	9024 KT17		*15:01	*35:01		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
37	9065 HHKB		*07:02			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	
38	9099 LZL		*15:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
39	9315 CML		*08:01	*27:05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
40	9134 WHONP199		*13:02	*46:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
41	9055 H0301		*14:02			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
42	9066 TAB089		*46:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
43	9076 T7526		*46:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
44	9057 TEM		*38:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
45	9239 SHJO		*42:01	*50:01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
46	9013 SCHU		*07:02			-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	
47	9045 TUBO		*51:01			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
48	9303 TER-ND		*35:01	*44:03		+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	

CERTIFICATE OF ANALYSIS**Olerup SSP® HLA-B*51 SSP**

Product number:

101.561-24u/03u – without *Taq* pol.

Lot number:

48M

Expiry date:

2014-February-01

Number of tests:

24 tests – Product No. 101.561-24u**3 tests – Product No. 101.561-03u**

Number of wells per test:

64**Well specifications:**

Well No.	Production No.	Well No.	Production No.	Well No.	Production No.
1	2010-731-01	25	2010-731-25	49	2010-731-49
2	2010-731-02	26	2010-731-26	50	2010-731-50
3	2010-731-03	27	2010-731-27	51	2010-731-51
4	2010-731-04	28	2010-731-28	52	2010-731-52
5	2010-731-05	29	2010-731-29	53	2010-731-53
6	2010-731-06	30	2011-891-30	54	2010-731-54
7	2010-731-07	31	2010-731-31	55	2010-731-55
8	2010-731-08	32	2010-731-32	56	2010-731-56
9	2010-731-09	33	2010-731-33	57	2010-731-57
10	2010-731-10	34	2010-731-34	58	2010-731-58
11	2010-731-11	35	2010-731-35	59	2010-731-59
12	2010-731-12	36	2010-731-36	60	2010-731-60
13	2010-731-13	37	2010-731-37	61	2010-731-61
14	2010-731-14	38	2010-731-38	62	2010-731-62
15	2010-731-15	39	2010-731-39	63	2010-731-63
16	2010-731-16	40	2010-731-40	64	2010-731-64
17	2010-731-17	41	2010-731-41		
18	2010-731-18	42	2010-731-42		
19	2010-731-19	43	2010-731-43		
20	2010-731-20	44	2010-731-44		
21	2010-731-21	45	2010-731-45		
22	2010-731-22	46	2010-731-46		
23	2010-731-23	47	2010-731-47		
24	2010-731-24	48	2010-731-48		

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

No DNAs carrying the alleles to be amplified by primer solutions 5, 13, 17, 20, 21, 25, 27, 32, 33, 36, 37, 39, 42 to 46, 51 to 53, 55 and 57 to 64 were available. The specificities of the primers in primer solutions 5, 17, 27, 32, 37, 39, 42, 44, 46, 51, 57 and 61 were tested by separately adding one additional 5'-primer, respectively one additional 3'-primer. In primer solutions 13, 20, 21, 25, 33, 43, 45, 53, 55, 59, 60 and 62 it was only possible to test the 5'-primer, the 3'-primer was not possible to test. In primer solutions 36, 52, 58, 63 and 64

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Lot-specific Information

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it was only possible to test the 3'-primer, the 5'-primer was not possible to test. In primer solutions 9, 16, 25, 39, 41, 42 and 44 one or two of the 5'-primers were not possible to test. In primer solution 15, 18, 26 to 28, 37, 42, 51, 57 and 61 one or two of the 3'-primers were not possible to test. Additional primers in primer solutions 18, 26, 28, 31, 41, 47 and 48 were tested by separately adding one 5'-primer or one 3'-primer.

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

Date of approval: 2011-August-18

Approved by:

Quality Control, Supervisor

Declaration of Conformity

Product name: Olerup SSP® HLA-B*51

Product number: 101.561-24u/03u

Lot number: 48M

Intended use: HLA-B*51 histocompatibility testing

Manufacturer: Olerup SSP AB
Franzengatan 5
SE-112 51 Stockholm, 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 9001:2008 and ISO 13485:2003, following the provisions of the 98/79/EC Directive on *in vitro* diagnostic medical devices, Annex II List B, conformity assessed using Annex IV, as transposed into the national laws of the Member States of the European Union.

The Technical Documentation File is maintained at Olerup SSP AB, Franzengatan 5, SE-112 51 Stockholm, 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.)

Stockholm, Sweden
2011-August-18

Ann-Cathrin Jareman
Head of QA and Regulatory Affairs

Lot No.: **48M**

Lot-specific Information

www.olerup-ssp.com**ADDRESSES:****Manufacturer:****Olerup SSP AB**, Franzengatan 5, SE-112 51 Stockholm, Sweden.**Tel:** +46-8-717 88 27**Fax:** +46-8-717 88 18**E-mail:** info-ssp@olerup.com**Web page:** <http://www.olerup-ssp.com>**Distributed by:****Olerup GmbH**, Löwengasse 47 / 6, AT-1030 Vienna, Austria.**Tel:** +43-1-710 15 00**Fax:** +43-1-710 15 00 10**E-mail:** support-at@olerup.com**Web page:** <http://www.olerup.com>**Olerup Inc.**, 901 S. Bolmar St., Suite R, West Chester, PA 19382**Tel:** 1-877-OLERUP1**Fax:** 610-344-7989**E-mail:** info.us@olerup.com**Web page:** <http://www.olerup.com>For information on *Olerup* SSP distributors worldwide, contact **Olerup GmbH**.