

Olerup SSP® DRB1*11

Product number:	101.115-24/03 – including <i>Taq</i> pol.
Lot number:	55G
Expiry date:	2011-November-01
Number of tests:	24 tests – Product No. 101.115-24 3 tests – Product No. 101.115-03
Number of wells per test:	32
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. 55G.

**CHANGES COMPARED TO THE PREVIOUS *OLERUP SSP*®
DRB1*11 LOT**

The DRB1*11 specificity and interpretation tables have been updated for the DRB1 alleles described since the previous *Olerup SSP*® DRB1*11 lot was made (Lot No. 43F).

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

Well	5'-primer	3'-primer	rationale
4	-	Modified	Increased specificity of specific primer pair.
9	-	Added	Primer added for the DRB1*1177 allele.
10	-	Added	Primer added for the DRB1*1174 allele.
11	-	Added	Primer added for the DRB1*1175 allele.
16	-	Added	Primer added for the DRB1*1176 allele.
21	Added	-	Primer added for the DRB1*1172 allele.
22	-	Added	Primer added for the DRB1*1181 allele.
24	-	Added	Primer added for the DRB1*1181 allele.
26	Added	-	Primer added for the DRB1*1178 allele.

PRODUCT DESCRIPTION

DRB1*11 SSP subtyping

CONTENT

The primer set contains 5'- and 3'-primers for identifying the DRB1*1101 to DRB1*1184 alleles.

PLATE LAYOUT

Each test consists of 32 PCR reactions in a 32 well cut PCR plate.

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

The 32 well cut PCR plate is marked with 'DRB1*11', in silver/gray ink.

Well No. 1 is marked with the Lot No. '55G'.

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 heat-sealed with a PCR-compatible foil.

Please note: When removing each 32 well PCR plate, make sure that the remaining plates stay sealed. Use a scalpel or a similar instrument to carefully cut the foil between the plates.

INTERPRETATION

The interpretation of DRB1*11 PCR-SSP subtypings will be influenced by four DRB1*01 alleles, several DRB1*03 alleles, fourteen DRB1*04 alleles, most DRB1*07 alleles, most DRB1*08 alleles, all DRB1*12 alleles, most DRB1*13 and DRB1*14 alleles, seventeen DRB1*15 and five DRB1*16 alleles when present on the other haplotype. In addition, the DRB3*0114 allele is amplified by primer mixes 14 and 16, the DRB3*0211, DRB5*0107, DRB5*0111 and DRB5*0203 alleles are amplified by primer mix 29, the DRB3*0218 allele is amplified by primer mixes 7, 10, 12, 18 and 25 and the DRB5*0113 allele is amplified by primer mixes 3, 5 and 7.

UNIQUELY IDENTIFIED ALLELES

All the phenotypically different DRB1*11 alleles, i.e. **DRB1*1101 to DRB1*1184**, recognized by the HLA Nomenclature Committee in October 2009¹ will give rise to unique amplification patterns by the primers in the DRB1*11 subtyping kit.

The DRB1*11 subtyping kit cannot distinguish the DRB1*110101 to 110111 alleles, the DRB1*110201 and 110202 alleles, the DRB1*110401 to 110403 and 110405 alleles, the DRB1*110601 and 110602 alleles, the DRB1*110801 and 110802 alleles, the DRB1*111001 and 111002 alleles, the DRB1*111101 and 111102 alleles, the DRB1*111301 and 111302 alleles, the DRB1*111401 and 1111402 alleles, the DRB1*111901 and 111902 alleles, the DRB1*112701 and 112702 alleles, the DRB1*115401 and 115402 alleles and the DRB1*116501 and 116502 alleles.

Lot No.: **55G**

Lot-specific information

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¹DRB1 alleles listed on the IMGT/HLA web page 2009-October-19, release 2.27.0, www.ebi.ac.uk/imgt/hla.

RESOLUTION IN HOMO- AND HETEROZYGOTES

The 83 DRB1*11 alleles give rise to 86 different amplification patterns that can be combined in 3741 homozygous and heterozygous combinations. 1524 of these genotypes do not give rise to unique amplification patterns. (The different lengths of the specific PCR products in wells 9-13, 15, 19, 21, 22, 24 and 26 were not considered in these calculations.)

```

++++-++ +------ +-+----- ----+++- 1131,1167 = 1145,1167
+++-++- +++----- +----- ----+++- 1108,1167 = 1167,1175
+++-++- +------ +-+----- ----+++- 1105,1125 = 1123,1167 = 1132,1167
+++-++- +------ +-----+-- ----+++- 1133,1167 = 1167,1169
+++-++- +------ +-----+-- ----+++- 1101,1167 = 1126,1167 = 1153,1167
                                     = 1167,1174 = 1167,1179
++++-++- --+----- -----+ ----+++- 1105,1106 = 1105,1157
+++-++- -+----- -----+ ----+++- 1105,1126 = 1105,1174 = 1105,1179
+++-++- --+----- -----+ ----+++- 1105,1108 = 1105,1175
+++-++- -----+ ----+++- 1105,1133 = 1105,1169
+++-++- +++----- +-----+-- ----+++- 1106,1167 = 1157,1167
+++-++- +------ +-----+-- ----+++- 1107,1167 = 1167,1184
+++-++- +------ +-----+-- ----+++- 1104,1167 = 1134,1167 = 1154,1167
                                     = 1167,1177
++++++-++ +------ +-+----- ----+++- 1114,1155 = 1155,1173
++++++-++ +------ +-+----- ----+++- 1103,1145 = 1119,1155 = 1131,1155
                                     = 1145,1155
++++++-++ +------ +-+----- ----+++- 1102,1123 = 1123,1170
++++++-++ +-+----- --+----- ----+++- 1130,1170 = 1161,1170
++++++-++ +-+----- --+----- ++-+--+ 1109,1170 = 1116,1132
++++++-++ +-+----- --+----- ++-+--+ 1132,1165 = 1133,1170
++++++-++ +-+----- --+----- ++-+--+ 1101,1170 = 1102,1132 = 1132,1170
++++++-++ --+----- -----+ ----+++- 1121,1130 = 1121,1161
++++++-++ --+----- -----+ ----+++- 1121,1133 = 1121,1181
++++++-++ --+----- -----+ ----+++- 1101,1121 = 1121,1139 = 1121,1175
++++++-++ --+----- -----+ ++-+--+ 1116,1130 = 1116,1161
++++++-++ --+----- -----+ ----+++- 1130,1148 = 1148,1161
++++++-++ --+----- -----+ ----+++- 1130,1165 = 1161,1165
++++++-++ --+----- -----+ ----+++- 1102,1130 = 1102,1161
++++++-++ -----+ ----+++- 1114,1183 = 1120,1183
++++++-++ -----+ ----+++- ++-+--+ 1110,1116 = 11201,1116 =
                                     11202,1116
++++++-++ -----+ ----+++- ++-+--+ 1116,1122 = 1116,1172 = 1116,1180
++++++-++ -----+ ----+++- ++-+--+ 1109,1165 = 1116,1133
++++++-++ -----+ ----+++- ++-+--+ 1104,1120 = 110404,1120 =
                                     1120,1146 = 1120,1158 = 1120,1160
                                     = 1120,1178
++++++-++ -----+ ----+++- ++-+--+ 1101,1116 = 1102,1109 = 1109,1116
                                     = 1116,112801 = 1116,112802 =
                                     1116,1162
++++++-++ -----+ ----+++- ----+++- 1102,1137 = 1137,1148
++++++-++ -----+ ----+++- ----+++- 1102,1115 = 1115,1165 = 1124,1165
++++++-++ -----+ ----+++- ----+++- 1102,1181 = 1139,1165 = 1165,1181
++++++-++ -----+ ----+++- ----+++- 1101,1165 = 1102,1133 = 1133,1165
++++++-++ +------ +-+----- --+--+ 1111,1145 = 1114,1123
++++++-++ --+----- -----+ ++-+--+ 1120,1130 = 1120,1161

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Lot No.: **55G**

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++++++-	---+----	-----	--+--+-	1114,1130 = 1114,1161
++++++-	---+--+	---+----	+++--+-	1110,1120 = 111201,1120 = 111202,1120
++++++-	---+----	---+----	+++--+-	1120,1122 = 1120,1172 = 1120,1180
++++++-	---+----	-----	+++--+-	1101,1120 = 1109,1114 = 1109,1120 = 1120,112801 = 1120,112802 = 1120,1162
++++++-	-----	-----	--+--+-	1101,1114 = 1111,1119
++++++-	++-----	+-----	---+--+	1102,1125 = 1118,1155 = 1125,1170
++++++-	++-----	+-----	---+--+	1102,1155 = 1155,1170
++++++-	+-----	--+----	---+--+	1104,1170 = 1170,1177
++++++-	--+----	---+----	---+--+	1102,1147 = 1121,1147
++++++-	--+----	---+--+	---+--+	1106,1165 = 1121,1135
++++++-	--+----	-----	---+--+	1102,1106 = 1104,1121 = 1106,1121 = 1121,1143
++++++-	---+--+	---+----	++-+--+	1102,1183 = 1116,1183 = 1148,1183
++++++-	---+----	-----	++-+--+	1104,1116 = 110404,1116 = 1116,1146 = 1116,1158 = 1116,1160 = 1116,1178 = 1118,1140
++++++-	---+--+	---+--+	---+--+	1102,1150 = 1148,1150
++++++-	---+----	-----	---+--+	1102,1156 = 1118,1141 = 1148,1156
++++++-	-----	---+----	---+--+	1102,1135 = 1104,1165 = 1135,1165
++++++-	-----	-----	---+--+	1102,1104 = 1103,1118
++++++-	++-----	+-----	---+--+	1104,1145 = 1119,1125 = 1125,1131 = 1125,1145 = 1145,1154 = 1145,1177
++++++-	---+----	-----	---+--+	1118,1130 = 1118,1161
++++++-	++-+----	+-----	---+--+	1130,1145 = 1145,1161
++++++-	++-+----	+-----	---+--+	1101,1145 = 1119,1123 = 1123,1131 = 1123,1145 = 1132,1145 = 1145,1174
++++++-	+-----	--+----	---+--+	1119,1132 = 1131,1132
++++++-	---+----	--+----	---+--+	1130,1131 = 1131,1161
++++++-	---+----	-----	--+--+-	1130,1173 = 1161,1173
++++++-	---+----	-----	---+--+	1119,1130 = 1119,1161
++++++-	---+----	---+----	++++++-	1114,1159 = 1120,1159 = 1159,1173
++++++-	---+----	-----	++++++-	1103,1120 = 1114,1140 = 1120,1140 = 1140,1173
++++++-	---+--+	-----	---+--+	1114,1141 = 1141,1173
++++++-	-----	-----	---+--+	1114,1176 = 1173,1176
++++++-	-----	---+----	---+--+	1114,1163 = 1163,1173
++++++-	-----	-----	---+--+	1103,1114 = 1103,1173
++++++-	-----	-----	--+--+-	1111,1114 = 1111,1173
++++++-	---+----	---+----	++-+--+	1102,1159 = 1116,1159
++++++-	---+----	-----	++-+--+	1102,1140 = 1103,1116 = 1116,1140
++++++-	---+----	-----	---+--+	1102,1141 = 1141,1148
++++++-	+++-----	+-----	---+--+	1103,1164 = 1108,1155 = 1123,1136 = 1155,1164 = 1155,1175
++++++-	++-+----	+-----	---+--+	1130,1155 = 1155,1161
++++++-	++-+----	+-----	++-+--+	1109,1155 = 1123,1140
++++++-	++-+----	+-----	---+--+	1123,1141 = 1137,1155
++++++-	++-+----	+-----	---+--+	1123,1176 = 1124,1155
++++++-	++-+----	+-----	---+--+	1123,1163 = 1129,1155
++++++-	++-+----	+-----	---+--+	1133,1155 = 1155,1169
++++++-	++-+----	+-----	---+--+	1101,1155 = 1103,1123 = 1123,1155 = 1126,1155 = 1132,1155 = 1153,1155 = 1155,1174 = 1155,1179
++++++-	+-----	---+----	++-+--+	1126,1159 = 1159,1174
++++++-	+-----	-----	++-+--+	1126,1140 = 1140,1174

Lot No.: 55G

Lot-specific information

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+--+++++	-+-----+	-----	---+--+--	1126,1176 = 1174,1176
+--+++++	-+-----	---+-----	---+--+--	1126,1163 = 1163,1174
+--+++++	-+-----	-----	---+--+--	1103,1126 = 1103,1174
+--+++++	---+-----	-----	---+--+--	1130,1136 = 1136,1161
+--+++++	---+-----	---+-----	++-+--+--	1108,1159 = 1159,1175
+--+++++	---+-----	-----	++-+--+--	1108,1140 = 1109,1136 = 1140,1175
+--+++++	---+-----	-----	---+-----	1108,1141 = 1136,1137
+--+++++	---+-----+	-----	---+--+--	1108,1176 = 1124,1136 = 1175,1176
+--+++++	---+-----	---+-----	---+--+--	1111,1147 = 1147,1168
+--+++++	---+-----	---+-----	---+--+--	1108,1163 = 1129,1136 = 1163,1175
+--+++++	---+-----	-----+	---+--+--	1106,1111 = 1106,1168 = 1111,1157 = 1143,1168
+--+++++	---+-----	-----	---+--+--	1104,1168 = 1111,1142
+--+++++	---+-----	-----	---+--+--	1101,1136 = 1103,1108 = 1103,1175 = 1136,1175
+--+++++	---+-----	---+-----	++-+--+--	1130,1159 = 1159,1161
+--+++++	---+-----	-----	++-+--+--	1130,1140 = 1140,1161
+--+++++	---+-----	-----	---+--+--	1130,1141 = 1141,1161
+--+++++	---+-----+	-----	---+--+--	1130,1176 = 1161,1176
+--+++++	---+-----	---+-----	---+--+--	1130,1163 = 1161,1163
+--+++++	---+-----	-----	---+--+--	1103,1130 = 1103,1161
+--+++++	---+-----	-----	++-+--+--	1109,1141 = 1137,1140
+--+++++	---+-----	---+-----	++-+--+--	1110,1159 = 111201,1159 = 111202,1159
+--+++++	---+-----	---+-----	++-+--+--	1110,1140 = 111201,1140 = 111202,1140
+--+++++	---+-----+	-----	++-+--+--	1109,1176 = 1124,1140
+--+++++	---+-----	---+-----	++-+--+--	1109,1163 = 1129,1140
+--+++++	---+-----	---+-----	++-+--+--	1101,1159 = 1109,1159 = 1122,1140 = 1122,1159 = 112801,1159 = 112802,1159 = 1140,1172 = 1140,1180 = 1159,1162 = 1159,1172 = 1159,1180
+--+++++	---+-----	-----	++-+--+--	1101,1140 = 1103,1109 = 1109,1140 = 112801,1140 = 112802,1140 = 1140,1162
+--+++++	---+-----+	-----	---+--+--	1124,1141 = 1137,1176
+--+++++	---+-----	---+-----	---+--+--	1129,1141 = 1137,1163
+--+++++	---+-----	-----	---+--+--	1101,1141 = 1103,1137
+--+++++	---+-----	---+-----	++-+--+--	1103,1110 = 1110,1163
+--+++++	---+-----	---+-----	++-+--+--	1103,111202 = 111202,1163
+--+++++	---+-----	---+-----	---+--+--	1103,111201 = 111201,1163 = 1163,1166
+--+++++	---+-----+	---+-----	---+--+--	1103,1149 = 1124,1163 = 1129,1176 = 1149,1163 = 1149,1176
+--+++++	---+-----+	---+-----	---+--+--	1103,1115 = 1115,1176 = 1133,1176
+--+++++	---+-----+	-----	---+--+--	1101,1176 = 1103,1124 = 1124,1176
+--+++++	-----	---+-----	---+--+--	1101,1163 = 1103,1129 = 1129,1163
+--+++++	+++-----	+--+-----	---+--+--	1111,1164 = 1123,1168
+--+++++	+--+-----	-----	---+--+--	1111,1126 = 1111,1174
+--+++++	---+-----	-----	---+--+--	1130,1168 = 1161,1168
+--+++++	---+-----	-----	---+--+--	1101,1168 = 1108,1111 = 1111,1175 = 1168,1175
+--+++++	---+-----	-----	---+--+--	1111,1130 = 1111,1161
+--+++++	+++-----	+--+-----+	---+--+--	1106,1155 = 1155,1157
+--+++++	+++-----	+--+-----	---+--+--	1125,1136 = 1142,1155
+--+++++	+++-----+	+--+-----	++-+--+--	1117,1155 = 1152,1155
+--+++++	+++-----	+--+-----	---+--+--	1125,1141 = 1155,1156

Lot No.: **55G**

Lot-specific information

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+-+-++-	++-----	+-------	---+--+-	1103,1125 = 1104,1155 = 1125,1155 = 1154,1155 = 1155,1177
+-+-++-	++-----	+-------	---+--+-	1103,1155 = 1134,1155 = 1155,1155
+-+-++-	-+-----	+--++----	++-+--+-	1103,1152 = 1152,1163
+-+-++-	-+-----	+--++----	++-+--+-	1103,1117 = 1117,1163
+-+-++-	-+-----	---+--+-	++-+--+-	1103,1113 = 1113,1163
+-+-++-	---+--+-	---+--+-	++-+--+-	1106,1159 = 1157,1159
+-+-++-	---+--+-	---+--+-	++-+--+-	1106,1140 = 1140,1157
+-+-++-	---+--+-	---+--+-	---+--+-	1136,1156 = 1141,1142
+-+-++-	---+--+-	---+--+-	---+--+-	1106,1176 = 1157,1176
+-+-++-	---+--+-	---+--+-	---+--+-	1103,1147 = 1106,1163 = 1136,1147 = 1147,1163 = 1157,1163
+-+-++-	---+--+-	---+--+-	---+--+-	1103,1106 = 1103,1157 = 1106,1136 = 1136,1143
+-+-++-	---+--+-	---+--+-	---+--+-	1103,1142 = 1104,1136
+-+-++-	---+--+-	---+--+-	++-+--+-	1103,1183 = 1140,1183 = 1156,1159 = 1159,1183
+-+-++-	---+--+-	---+--+-	++-+--+-	1104,1159 = 110404,1159 = 1146,1159 = 1158,1159 = 1159,1160 = 1159,1178
+-+-++-	---+--+-	---+--+-	++-+--+-	1104,1140 = 110404,1140 = 1140,1146 = 1140,1158 = 1140,1160 = 1140,1178
+-+-++-	---+--+-	---+--+-	---+--+-	1103,1150 = 1150,1163 = 1150,1176
+-+-++-	---+--+-	---+--+-	---+--+-	1103,1156 = 1104,1141
+-+-++-	---+--+-	---+--+-	---+--+-	1103,1144 = 1144,1163 = 1144,1176
+-+-++-	++-----	+--++----	---+--+-	1123,1147 = 1147,1164
+-+-++-	++-----	+--++----	---+--+-	1106,1123 = 1106,1164 = 1123,1157 = 1143,1164
+-+-++-	++-----	+--++----	---+--+-	1104,1164 = 1108,1125 = 1123,1142 = 1125,1164 = 1125,1175 = 1154,1164 = 1164,1177
+-+-++-	++-+--+-	+--++----	---+--+-	1125,1130 = 1125,1161
+-+-++-	++-+--+-	-+-----	---+--+-	1107,1130 = 1107,1161
+-+-++-	++-+--+-	+--++----	+-----+	1123,1158 = 1125,112802
+-+-++-	++-+--+-	+--++----	---+--+-	1123,1160 = 1125,112801
+-+-++-	++-+--+-	+--++----	++-+--+-	1117,1123 = 1117,1132 = 1123,1152 = 1132,1152
+-+-++-	++-+--+-	+--++----	---+--+-	1123,1156 = 1125,1137
+-+-++-	++-+--+-	+--++----	---+--+-	1123,1144 = 1125,1149
+-+-++-	++-+--+-	++-----	---+--+-	1123,1184 = 1125,1127
+-+-++-	++-+--+-	+--+--+-	---+--+-	1123,1135 = 1125,1133 = 1125,1169
+-+-++-	++-+--+-	+--+--+-	---+--+-	1123,1143 = 1125,1139
+-+-++-	++-+--+-	+--+--+-	-+-----	1123,1178 = 1125,1162
+-+-++-	++-+--+-	+--+--+-	---+--+-	1101,1125 = 1104,1123 = 1123,1125 = 1123,1154 = 1123,1177 = 1125,1126 = 1125,1132 = 1125,1153 = 1125,1174 = 1125,1179
+-+-++-	++-+--+-	-+-----	---+--+-	1101,1107 = 1107,1127 = 1107,1174
+-+-++-	++-+--+-	---+--+-	---+--+-	1126,1177 = 1174,1177 = 1177,1179
+-+-++-	+--+--+-	---+--+-	---+--+-	1106,1132 = 1132,1157
+-+-++-	+--+--+-	---+--+-	---+--+-	1108,1177 = 1175,1177
+-+-++-	+--+--+-	---+--+-	---+--+-	1130,1177 = 1161,1177
+-+-++-	+--+--+-	---+--+-	---+--+-	1104,1132 = 1132,1177
+-+-++-	+--+--+-	---+--+-	---+--+-	1133,1177 = 1169,1177
+-+-++-	-+-----	---+--+-	---+--+-	1126,1147 = 1147,1174 = 1147,1179
+-+-++-	-+-----	---+--+-	---+--+-	1106,1126 = 1106,1174 = 1106,1179 = 1157,1174
+-+-++-	-+--+--	+--++----	++-+--	1130,1152 = 1152,1161

Lot No.: **55G**

Lot-specific information

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+-+-++	+-+-++	+-+-++	+-+-++	1117,1130 = 1117,1161
+-+-++	+-+-++	+-+-++	+-+-++	1113,1130 = 1113,1161
+-+-++	+-+-++	+-+-++	+-+-++	1130,1134 = 1134,1161
+-+-++	+-+-++	+-+-++	+-+-++	1109,1152 = 112801,1152 = 112802,1152
+-+-++	+-+-++	+-+-++	+-+-++	1109,1117 = 1117,112801 = 1117,112802
+-+-++	+-+-++	+-+-++	+-+-++	1126,1183 = 1179,1183
+-+-++	+-+-++	+-+-++	+-+-++	1109,1113 = 1113,112801 = 1113,112802
+-+-++	+-+-++	+-+-++	+-+-++	1126,1158 = 1158,1174 = 1158,1179
+-+-++	+-+-++	+-+-++	+-+-++	1126,1160 = 1160,1174 = 1160,1179
+-+-++	+-+-++	+-+-++	+-+-++	1124,1152 = 1149,1152
+-+-++	+-+-++	+-+-++	+-+-++	1117,1124 = 1117,1149
+-+-++	+-+-++	+-+-++	+-+-++	1122,1152 = 1152,1172 = 1152,1180
+-+-++	+-+-++	+-+-++	+-+-++	1101,1152 = 1110,1152 = 111201,1152 = 111202,1152 = 1129,1152 = 1151,1152 = 1152,1162 = 1152,1166 = 1152,1174
+-+-++	+-+-++	+-+-++	+-+-++	1117,1122 = 1117,1172 = 1117,1180
+-+-++	+-+-++	+-+-++	+-+-++	1101,1117 = 1110,1117 = 111201,1117 = 111202,1117 = 1117,1129 = 1117,1151 = 1117,1162 = 1117,1166 = 1117,1174
+-+-++	+-+-++	+-+-++	+-+-++	1126,1150 = 1150,1179
+-+-++	+-+-++	+-+-++	+-+-++	1126,1156 = 1156,1179
+-+-++	+-+-++	+-+-++	+-+-++	1113,1124 = 1113,1149
+-+-++	+-+-++	+-+-++	+-+-++	1113,1122 = 1113,1172 = 1113,1180
+-+-++	+-+-++	+-+-++	+-+-++	1101,1113 = 1110,1113 = 111201,1113 = 111202,1113 = 1113,1129 = 1113,1151 = 1113,1162 = 1113,1166 = 1113,1174
+-+-++	+-+-++	+-+-++	+-+-++	1126,1144 = 1144,1174 = 1144,1179
+-+-++	+-+-++	+-+-++	+-+-++	1126,1154 = 1154,1174 = 1154,1179
+-+-++	+-+-++	+-+-++	+-+-++	1126,1184 = 1174,1184 = 1179,1184
+-+-++	+-+-++	+-+-++	+-+-++	1126,1135 = 1135,1174 = 1135,1179
+-+-++	+-+-++	+-+-++	+-+-++	1126,1138 = 1138,1174 = 1138,1179
+-+-++	+-+-++	+-+-++	+-+-++	1126,1143 = 1143,1174 = 1143,1179
+-+-++	+-+-++	+-+-++	+-+-++	1126,1146 = 1146,1174 = 1146,1179
+-+-++	+-+-++	+-+-++	+-+-++	110404,1126 = 110404,1174 = 110404,1179
+-+-++	+-+-++	+-+-++	+-+-++	1126,1178 = 1174,1178 = 1178,1179
+-+-++	+-+-++	+-+-++	+-+-++	1104,1126 = 1104,1174 = 1104,1179
+-+-++	+-+-++	+-+-++	+-+-++	1101,1134 = 1134,1174
+-+-++	+-+-++	+-+-++	+-+-++	1130,1147 = 1147,1161
+-+-++	+-+-++	+-+-++	+-+-++	1106,1130 = 1106,1161 = 1130,1157 = 1157,1161
+-+-++	+-+-++	+-+-++	+-+-++	1130,1142 = 1142,1161
+-+-++	+-+-++	+-+-++	+-+-++	1106,1109 = 1109,1157
+-+-++	+-+-++	+-+-++	+-+-++	1106,112802 = 112802,1157
+-+-++	+-+-++	+-+-++	+-+-++	1106,112801 = 112801,1157
+-+-++	+-+-++	+-+-++	+-+-++	1108,1158 = 112802,1142 = 1158,1175
+-+-++	+-+-++	+-+-++	+-+-++	1108,1160 = 112801,1142 = 1160,1175
+-+-++	+-+-++	+-+-++	+-+-++	1108,1156 = 1137,1142
+-+-++	+-+-++	+-+-++	+-+-++	1106,1110 = 1110,1147 = 1110,1157
+-+-++	+-+-++	+-+-++	+-+-++	1106,111202 = 111202,1147 = 111202,1157

Lot No.: 55G

Lot-specific information

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+-+-++	---+---	-----+-	1106,111201 = 111201,1147 =
			111201,1157 = 1147,1166
+-+-++	---+---	-----+-	1106,1166 = 1157,1166
+-+-++	---+---	-----+-	1106,1149 = 1124,1147 = 1147,1149
			= 1149,1157
+-+-++	---+---	-----+-	1108,1144 = 1142,1149 = 1144,1175
+-+-++	---+---	-----+-	1106,1115 = 1115,1157
+-+-++	---+---	-----+-	1106,1124 = 1124,1157
+-+-++	---+---	-----+-	1108,1154 = 1154,1175
+-+-++	---+---	-----+-	1106,1127 = 1127,1157
+-+-++	---+---	-----+-	1108,1184 = 1127,1142 = 1175,1184
+-+-++	---+---	-----+-	1133,1147 = 1147,1169 = 1147,1181
+-+-++	---+---	-----+-	1101,1147 = 1106,1129 = 1108,1147
			= 1129,1147 = 1129,1157 =
			1139,1147 = 1147,1175
+-+-++	---+---	-----+-	1106,1122 = 1122,1157
+-+-++	---+---	-----+-	1106,1180 = 1157,1180
+-+-++	---+---	-----+-	1106,1172 = 1157,1172
+-+-++	---+---	-----+-	1106,1133 = 1106,1169 = 1106,1181
			= 1133,1157 = 1142,1181 =
			1157,1181
+-+-++	---+---	-----+-	1108,1135 = 1133,1142 = 1135,1175
+-+-++	---+---	-----+-	1108,1138 = 1138,1175
+-+-++	---+---	-----+-	1106,1162 = 1157,1162
+-+-++	---+---	-----+-	1106,1151 = 1151,1157
+-+-++	---+---	-----+-	1101,1106 = 1101,1157 = 1106,1108
			= 1106,1139 = 1106,1175 =
			1108,1143 = 1139,1142 = 1139,1157
			= 1143,1175 = 1157,1175
+-+-++	---+---	-----+-	1108,1146 = 1146,1175
+-+-++	---+---	-----+-	110404,1108 = 110404,1175
+-+-++	---+---	-----+-	1108,1178 = 1142,1162 = 1175,1178
+-+-++	---+---	-----+-	1101,1142 = 1104,1108 = 1104,1175
			= 1142,1175
+-+-++	---+---	-----+-	1130,1183 = 1161,1183
+-+-++	---+---	-----+-	1130,1158 = 1158,1161
+-+-++	---+---	-----+-	1130,1160 = 1160,1161
+-+-++	---+---	-----+-	1130,1150 = 1150,1161
+-+-++	---+---	-----+-	1130,1156 = 1156,1161
+-+-++	---+---	-----+-	1130,1144 = 1144,1161
+-+-++	---+---	-----+-	1130,1154 = 1154,1161
+-+-++	---+---	-----+-	1130,1184 = 1161,1184
+-+-++	---+---	-----+-	1130,1135 = 1135,1161
+-+-++	---+---	-----+-	1130,1138 = 1138,1161
+-+-++	---+---	-----+-	1130,1143 = 1143,1161
+-+-++	---+---	-----+-	1130,1146 = 1146,1161
+-+-++	---+---	-----+-	110404,1130 = 110404,1161
+-+-++	---+---	-----+-	1130,1178 = 1161,1178
+-+-++	---+---	-----+-	1104,1130 = 1104,1161
+-+-++	---+---	-----+-	1110,1183 = 111201,1183 =
			111202,1183
+-+-++	---+---	-----+-	1101,1183 = 1109,1183 = 1122,1183
			= 112801,1183 = 112802,1183 =
			1162,1183 = 1172,1183 = 1180,1183
+-+-++	---+---	-----+-	112802,1156 = 1137,1158
+-+-++	---+---	-----+-	112801,1156 = 1137,1160
+-+-++	---+---	-----+-	1110,1158 = 1110,1160
+-+-++	---+---	-----+-	111201,1158 = 111202,1158 =
			111202,1160

Lot No.: **55G**

Lot-specific information

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+-+-+--+	-----+--+	---+-----	+-----++-	112802,1144 = 1149,1158
+-+-+--+	-----+--+	---+-----	-----++-	112801,1144 = 1149,1160
+-+-+--+	-----+--+	+-----	+-----++-	112802,1154 = 1153,1158
+-+-+--+	-----+--+	+-----	-----++-	112801,1154 = 1153,1160
+-+-+--+	-----+--+	-+-----	+-----++-	1127,1158 = 112802,1184
+-+-+--+	-----+--+	-+-----	-----++-	1127,1160 = 112801,1184
+-+-+--+	-----+--+	-----+--	+-----++-	1122,1158 = 1122,1160 = 1158,1172
+-+-+--+	-----+--+	-----+--	+-----++-	112802,1135 = 1133,1158 = 1158,1169
+-+-+--+	-----+--+	-----+--	-----++-	112801,1135 = 1133,1160 = 1160,1169
+-+-+--+	-----+--+	-----+--	+-----++-	112802,1143 = 1139,1158
+-+-+--+	-----+--+	-----+--	-----++-	112801,1143 = 1139,1160
+-+-+--+	-----+--+	-----	++-----	1104,1109 = 110404,1109 = 1109,1146 = 1109,1158 = 1109,1160 = 1109,1178 = 112801,1146 = 112802,1146 = 112802,1178 = 1158,1162
+-+-+--+	-----+--+	-----	+-----++-	1101,1158 = 1104,112802 = 110404,112801 = 110404,112802 = 112801,1158 = 112802,1158 = 112802,1160
+-+-+--+	-----+--+	-----	-+-----	112801,1178 = 1160,1162
+-+-+--+	-----+--+	-----	-----++-	1101,1160 = 1104,112801 = 112801,1160
+-+-+--+	-----+++	---+-----	-----++-	111201,1150 = 1150,1166
+-+-+--+	-----+++	---+-----	-----++-	1115,1150 = 1133,1150 = 1150,1181
+-+-+--+	-----+++	---+-----	-----++-	1101,1150 = 1124,1150 = 1129,1150 = 1139,1150 = 1149,1150
+-+-+--+	-----+++	---+-----	-----++-	1137,1144 = 1149,1156
+-+-+--+	-----++	-+-----	-----++-	1127,1156 = 1137,1184
+-+-+--+	-----++	-----+--	-----++-	1133,1156 = 1135,1137
+-+-+--+	-----++	-----+--	-----++-	1137,1143 = 1139,1156
+-+-+--+	-----++	-----	-+-----	1137,1178 = 1156,1162
+-+-+--+	-----++	-----	-----++-	1101,1156 = 1104,1137
+-+-+--+	-----++	---+-----	-----++-	111201,1144 = 1144,1166
+-+-+--+	-----++	---+-----	++-----	1104,1110 = 110404,1110 = 1110,1146 = 1110,1178 = 111201,1146 = 111202,1146 = 111202,1178
+-+-+--+	-----++	---+-----	+-----++-	1104,111202 = 110404,111201 = 110404,111202
+-+-+--+	-----+--	+---+-----	-----++-	1144,1153 = 1149,1154
+-+-+--+	-----+--	-+---+-----	-----++-	1127,1144 = 1149,1184
+-+-+--+	-----+--	---+-----	-----++-	1115,1144 = 1133,1144 = 1135,1149 = 1144,1169
+-+-+--+	-----+--	---+-----	-----++-	1139,1144 = 1143,1149
+-+-+--+	-----+--	---+-----	-+-----	1144,1162 = 1149,1178
+-+-+--+	-----+--	---+-----	-----++-	1101,1144 = 1104,1149 = 1124,1144 = 1129,1144 = 1144,1149
+-+-+--+	-----+--	-----+--	-----++-	1104,1115 = 1115,1135 = 1124,1135
+-+-+--+	-----	++-----	-----++-	1127,1154 = 1153,1184
+-+-+--+	-----	+-----+--	-----++-	1133,1154 = 1135,1153 = 1154,1169
+-+-+--+	-----	+-----+--	-----++-	1139,1154 = 1143,1153
+-+-+--+	-----	+-----	-+-----	1153,1178 = 1154,1162
+-+-+--+	-----	+-----	-----++-	1101,1154 = 1104,1153 = 1153,1154
+-+-+--+	-----	-+-----+--	-----++-	1127,1135 = 1133,1184 = 1169,1184
+-+-+--+	-----	-+-----+--	-----++-	1127,1143 = 1139,1184
+-+-+--+	-----	-+-----	-+-----	1127,1178 = 1162,1184

Lot No.: **55G**

Lot-specific information

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+-+-++	-----	-+-----	-----+-	1101,1184 = 1104,1127 = 1127,1184
+-+-++	-----	-----+	++-----	110404,1180 = 1122,1146 =
				1122,1178 = 1146,1172 = 1146,1180
+-+-++	-----	-----+	+-----+	1104,1122 = 110404,1122 =
				110404,1172
+-+-++	-----	-----+	-+-----	1104,1180 = 1172,1178 = 1178,1180
+-+-++	-----	-----+	-----+	1133,1138 = 1138,1169
+-+-++	-----	-----+	-----+	1104,1181 = 1133,1143 = 1135,1139
				= 1135,1181 = 1143,1169 =
				1143,1181
+-+-++	-----	-----+	++-----	1133,1146 = 1146,1169
+-+-++	-----	-----+	+-----+	110404,1133 = 110404,1169
+-+-++	-----	-----+	-+-----	1133,1178 = 1135,1162 = 1169,1178
+-+-++	-----	-----+	-----+	1104,1182 = 1135,1182
+-+-++	-----	-----+	-----+	1101,1135 = 1104,1133 = 1104,1169
				= 1133,1135 = 1135,1169
+-+-++	-----	-----+	-+-----	1139,1178 = 1143,1162
+-+-++	-----	-----+	-----+	1101,1143 = 1104,1139 = 1139,1143
+-+-++	-----	-----	++-----	1101,1146 = 110404,1162 =
				1146,1162
+-+-++	-----	-----	-+-----	1101,1178 = 1104,1162 = 1162,1178
+-+-++	++++-----	+-----	-----+	1130,1164 = 1161,1164
+-+-++	++++-----	+-----	-----+	1101,1164 = 1108,1123 = 1123,1164
				= 1123,1175 = 1132,1164 =
				1164,1174 = 1164,1175
+-+-++	++-----	+-----	-----+	1123,1130 = 1123,1161
+-+-++	++-----	+-----	-----+	1123,1133 = 1123,1169
+-+-++	++-----	+-----	-----+	1101,1123 = 1123,1123 = 1123,1126
				= 1123,1132 = 1123,1153 =
				1123,1174 = 1123,1179
+-+-++	++-----	--+-----	-----+	1126,1132 = 1132,1174 = 1132,1179
+-+-++	+-----	--+-----	-----+	1108,1132 = 1132,1175
+-+-++	+-----	--+-----	-----+	1130,1132 = 1132,1161
+-+-++	+-----	--+-----	-----+	1132,1133 = 1132,1169
+-+-++	+-----	--+-----	-----+	1101,1132 = 1132,1132
+-+-++	-+-----	-----	-----+	1108,1174 = 1126,1175 = 1174,1175
				= 1175,1179
+-+-++	-+-----	-----	-----+	1126,1130 = 1126,1161 = 1130,1174
				= 1130,1179 = 1161,1174 =
				1161,1179
+-+-++	-+-----	-----	++-----	1109,1126 = 1109,1174 = 1109,1179
+-+-++	-+-----	-----	+-----	1126,112802 = 112802,1174 =
				112802,1179
+-+-++	-+-----	-----	-----+	1126,112801 = 112801,1174 =
				112801,1179
+-+-++	-+-----	-----	-----	1126,1137 = 1137,1179
+-+-++	-+-----	-----	++-----	1110,1126 = 1110,1174 = 1110,1179
+-+-++	-+-----	-----	+-----	111202,1126 = 111202,1174 =
				111202,1179
+-+-++	-+-----	-----	-----+	111201,1126 = 111201,1174 =
				111201,1179
+-+-++	-+-----	-----	-----+	1126,1166 = 1166,1174 = 1166,1179
+-+-++	-+-----	-----	-----+	1126,1149 = 1149,1174 = 1149,1179
+-+-++	-+-----	-----	-----+	1115,1126 = 1115,1174 = 1115,1179
+-+-++	-+-----	-----	-----+	1124,1126 = 1124,1174 = 1124,1179
+-+-++	-+-----	-+-----	-----+	1126,1127 = 1127,1174 = 1127,1179
+-+-++	-+-----	-----	-----+	1126,1129 = 1129,1174 = 1129,1179
+-+-++	-+-----	-----	-----+	1122,1126 = 1122,1174 = 1122,1179
+-+-++	-+-----	-----	-+-----	1126,1180 = 1174,1180 = 1179,1180

Lot No.: **55G**

Lot-specific information

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+-+-+-	-+-----	-----+	-----+	1126,1172 = 1172,1174 = 1172,1179
+-+-+-	-+-----	-----+	-----+	1126,1181 = 1174,1181 = 1179,1181
+-+-+-	-+-----	-----+	-----+	1126,1133 = 1133,1174 = 1133,1179 = 1169,1174
+-+-+-	-+-----	-----+	-----+	1126,1139 = 1139,1174 = 1139,1179
+-+-+-	-+-----	-----	-+-----	1126,1162 = 1162,1174 = 1162,1179
+-+-+-	-+-----	-----	-----+	1126,1151 = 1151,1174
+-+-+-	-+-----	-----	-----+	1101,1126 = 1101,1174 = 1101,1179 = 1126,1174 = 1174,1174 = 1174,1179
+-+-+-	---+-----	-----	-----+	1108,1130 = 1108,1161 = 1130,1175 = 1161,1175
+-+-+-	---+-----	-----	++-----	1108,1109 = 1109,1175
+-+-+-	---+-----	-----	++-----	1108,112802 = 112802,1175
+-+-+-	---+-----	-----	++-----	1108,112801 = 112801,1175
+-+-+-	---+-----	---+-----	++-----	1108,1110 = 1110,1175
+-+-+-	---+-----	---+-----	++-----	1108,111202 = 111202,1175
+-+-+-	---+-----	---+-----	++-----	1108,111201 = 111201,1175
+-+-+-	---+-----	-----	-----+	1108,1166 = 1166,1175
+-+-+-	---+-----	---+-----	-----+	1108,1149 = 1149,1175
+-+-+-	---+-----	---+-----	-----+	1108,1115 = 1115,1175
+-+-+-	---+-----	-----	-----+	1108,1124 = 1124,1175
+-+-+-	---+-----	-+-----	-----+	1108,1127 = 1127,1175
+-+-+-	---+-----	---+-----	-----+	1108,1129 = 1129,1175
+-+-+-	---+-----	---+-----	++-----	1108,1122 = 1122,1175
+-+-+-	---+-----	---+-----	-+-----	1108,1180 = 1175,1180
+-+-+-	---+-----	---+-----	-----+	1108,1172 = 1172,1175
+-+-+-	---+-----	-----+	-----+	1108,1181 = 1175,1181
+-+-+-	---+-----	-----+	-----+	1108,1133 = 1133,1175 = 1169,1175
+-+-+-	---+-----	-----+	-----+	1108,1139 = 1139,1175
+-+-+-	---+-----	-----	-+-----	1108,1162 = 1162,1175
+-+-+-	---+-----	-----	-----+	1108,1151 = 1151,1175
+-+-+-	---+-----	-----	-----+	1101,1108 = 1101,1175 = 1108,1175 = 1175,1175
+-+-+-	---+-----	-----	++-----	1109,1130 = 1109,1161
+-+-+-	---+-----	-----	++-----	112802,1130 = 112802,1161
+-+-+-	---+-----	-----	-----+	112801,1130 = 112801,1161
+-+-+-	---+-----	-----	-----+	1130,1137 = 1137,1161
+-+-+-	---+-----	---+-----	++-----	1110,1130 = 1110,1161
+-+-+-	---+-----	---+-----	++-----	111202,1130 = 111202,1161
+-+-+-	---+-----	---+-----	-----+	111201,1130 = 111201,1161
+-+-+-	---+-----	-----	-----+	1130,1166 = 1161,1166
+-+-+-	---+-----	---+-----	-----+	1130,1149 = 1149,1161
+-+-+-	---+-----	-----+	-----+	1115,1130 = 1115,1161
+-+-+-	---+-----	-----+	-----+	1124,1130 = 1124,1161
+-+-+-	---+-----	++-----	-----+	1130,1153 = 1153,1161
+-+-+-	---+-----	-+-----	-----+	1127,1130 = 1127,1161
+-+-+-	---+-----	---+-----	-----+	1129,1130 = 1129,1161
+-+-+-	---+-----	---+-----	-+-----	1130,1180 = 1161,1180
+-+-+-	---+-----	---+-----	-----+	1130,1172 = 1161,1172
+-+-+-	---+-----	-----+	-----+	1130,1181 = 1161,1181
+-+-+-	---+-----	-----+	-----+	1130,1182 = 1161,1182
+-+-+-	---+-----	-----+	-----+	1130,1133 = 1130,1169 = 1133,1161 = 1161,1169
+-+-+-	---+-----	-----+	-----+	1130,1139 = 1139,1161
+-+-+-	---+-----	-----	-+-----	1130,1162 = 1161,1162
+-+-+-	---+-----	-----	-----+	1130,1151 = 1151,1161
+-+-+-	---+-----	-----	-----+	1101,1130 = 1101,1161 = 1130,1161 = 1161,1161

Lot No.: **55G**

Lot-specific information

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+-+-+-	-----	---+---	+-+-+-	1109,1110 = 1109,111201 = 1109,111202 = 1110,112801 = 1110,112802
+-+-+-	-----	---+---	+-+-+-	111201,112802 = 111202,112801 = 111202,112802
+-+-+-	-----	---+---	+-+-+-	1109,1122 = 1109,1172 = 1109,1180 = 112802,1180
+-+-+-	-----	---+---	+-+-+-	1122,112801 = 1122,112802 = 112802,1172
+-+-+-	-----	---+---	+-+-+-	1109,1133 = 1109,1169
+-+-+-	-----	---+---	+-+-+-	112802,1133 = 112802,1169
+-+-+-	-----	---+---	+-+-+-	112801,1133 = 112801,1169
+-+-+-	-----	---+---	+-+-+-	1101,1109 = 1109,1109 = 1109,112801 = 1109,112802 = 1109,1162 = 112802,1162
+-+-+-	-----	---+---	+-+-+-	1101,112802 = 112801,112802 = 112802,112802
+-+-+-	-----	---+---	+-+-+-	1101,112801 = 112801,112801
+-+-+-	-----	---+---	+-+-+-	1110,1124 = 1110,1149
+-+-+-	-----	---+---	+-+-+-	111202,1124 = 111202,1149
+-+-+-	-----	---+---	+-+-+-	111201,1124 = 111201,1149 = 1149,1166
+-+-+-	-----	---+---	+-+-+-	1110,1122 = 1110,1172 = 1110,1180 = 111202,1180
+-+-+-	-----	---+---	+-+-+-	111201,1122 = 111202,1122 = 111202,1172
+-+-+-	-----	---+---	+-+-+-	1110,1133 = 1110,1169
+-+-+-	-----	---+---	+-+-+-	111202,1133 = 111202,1169
+-+-+-	-----	---+---	+-+-+-	111201,1133 = 111201,1169
+-+-+-	-----	---+---	+-+-+-	1101,1110 = 1110,1110 = 1110,111201 = 1110,111202 = 1110,1129 = 1110,1162 = 1110,1166 = 111202,1162
+-+-+-	-----	---+---	+-+-+-	1101,111202 = 111201,111202 = 111202,111202 = 111202,1129 = 111202,1166
+-+-+-	-----	---+---	+-+-+-	1101,111201 = 111201,111201 = 111201,1129 = 111201,1166 = 1129,1166
+-+-+-	-----	---+---	+-+-+-	1133,1166 = 1166,1169
+-+-+-	-----	---+---	+-+-+-	1101,1166 = 1166,1166
+-+-+-	-----	---+---	+-+-+-	1115,1129 = 1115,1149 = 1133,1149 = 1149,1169
+-+-+-	-----	---+---	+-+-+-	1101,1149 = 1124,1129 = 1124,1149 = 1129,1149 = 1149,1149
+-+-+-	-----	---+---	+-+-+-	1115,1139 = 1115,1181 = 1124,1181
+-+-+-	-----	---+---	+-+-+-	1115,1182 = 1124,1182
+-+-+-	-----	---+---	+-+-+-	1101,1115 = 1115,1115 = 1115,1124 = 1115,1133 = 1115,1169 = 1124,1133 = 1124,1169
+-+-+-	-----	---+---	+-+-+-	1101,1124 = 1124,1124
+-+-+-	-----	---+---	+-+-+-	1127,1133 = 1127,1169
+-+-+-	-----	---+---	+-+-+-	1101,1127 = 1127,1127
+-+-+-	-----	---+---	+-+-+-	1129,1133 = 1129,1169
+-+-+-	-----	---+---	+-+-+-	1101,1129 = 1129,1129
+-+-+-	-----	---+---	+-+-+-	1122,1133 = 1122,1169
+-+-+-	-----	---+---	+-+-+-	1133,1180 = 1169,1180
+-+-+-	-----	---+---	+-+-+-	1133,1172 = 1169,1172
+-+-+-	-----	---+---	+-+-+-	1122,1162 = 1122,1180

Lot No.: **55G**

Lot-specific information

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+-+-+-	-----	----+---	+----+--	1101,1122 = 1122,1172
+-+-+-	-----	----+---	-+----+--	1101,1180 = 1162,1172 = 1162,1180 = 1172,1180 = 1180,1180
+-+-+-	-----	----+---	-----+--	1101,1172 = 1172,1172
+-+-+-	-----	----+--+	-----+--	1139,1182 = 1181,1182
+-+-+-	-----	----+--+	-----+--	1101,1181 = 1133,1139 = 1133,1181 = 1139,1169 = 1139,1181 = 1169,1181 = 1181,1181
+-+-+-	-----	----+---	-+----+--	1133,1162 = 1162,1169
+-+-+-	-----	----+---	-----+--	1101,1182 = 1133,1182
+-+-+-	-----	----+---	-----+--	1101,1133 = 1101,1169 = 1133,1133 = 1133,1169
+-+-+-	-----	-----+	-----+--	1101,1139 = 1139,1139
+-+-+-	-----	-----	-+----+--	1101,1162 = 1162,1162
+-+-+-	+++-----	+--+-----	-----++	1106,1125 = 1125,1157
+-+-+-	+++-----	+--+-----	+++-----	1117,1125 = 1125,1152 = 1152,1177
+-+-+-	+++-----	+++-----	-----++	1107,1125 = 1125,1184
+-+-+-	+++-----	+--+-----	-----++	1104,1125 = 1125,1125 = 1125,1134 = 1125,1154 = 1125,1177
+-+-+-	+++-----	-+-----	-----++	1104,1107 = 1107,1177 = 1107,1184
+-+-+-	+++-----	-----+	-----++	1106,1177 = 1157,1177
+-+-+-	+++-----	-----	-----++	1104,1177 = 1177,1177
+-+-+-	-++-++-	+--+-----	+++-----	1106,1152 = 1147,1152
+-+-+-	-++-++-	+--+-----	+++-----	1106,1117 = 1117,1147
+-+-+-	-++-++-	-++-++-	+++-----	1106,1113 = 1113,1147
+-+-+-	-++-++-	+--+-----	+++-----	1152,1158 = 1152,1160
+-+-+-	-++-++-	+--+-----	+++-----	1117,1158 = 1117,1160
+-+-+-	-++-++-	-++-++-	+++-----	1113,1158 = 1113,1160
+-+-+-	-++-++-	+--+-----	+++-----	1104,1152 = 110404,1152 = 1146,1152 = 1152,1154 = 1152,1178
+-+-+-	-++-++-	+--+-----	+++-----	1104,1117 = 110404,1117 = 1117,1146 = 1117,1154 = 1117,1178
+-+-+-	-++-++-	---+-----	+++-----	1104,1113 = 110404,1113 = 1113,1146 = 1113,1178
+-+-+-	---+-----	-----+	+-----+	1106,1158 = 1157,1158
+-+-+-	---+-----	-----+	-----+	1106,1160 = 1157,1160
+-+-+-	---+-----	---+-----	-----+	1106,1150 = 1147,1150
+-+-+-	---+-----	---+-----	-----+	1142,1150 = 1150,1157
+-+-+-	---+-----	---+-----	-----+	1106,1144 = 1144,1147 = 1144,1157
+-+-+-	---+-----	+-----+	-----+	1106,1154 = 1154,1157
+-+-+-	---+-----	-+-----	-----+	1106,1184 = 1157,1184
+-+-+-	---+-----	---+-----	-----+	1104,1147 = 1106,1147 = 1142,1147 = 1143,1147 = 1147,1147 = 1147,1157
+-+-+-	---+-----	-----+	-----+	1106,1135 = 1135,1157
+-+-+-	---+-----	-----+	-----+	1106,1138 = 1138,1157
+-+-+-	---+-----	-----+	+++-----	1106,1146 = 1146,1157
+-+-+-	---+-----	-----+	+-----+	110404,1106 = 110404,1157
+-+-+-	---+-----	-----+	-+-----	1106,1178 = 1157,1178
+-+-+-	---+-----	-----+	-----+	1104,1106 = 1104,1157 = 1106,1106 = 1106,1142 = 1106,1143 = 1106,1157 = 1142,1143 = 1143,1157
+-+-+-	-----+	-----+	+++-----	1104,1183 = 110404,1183 = 1146,1183 = 1158,1183 = 1160,1183 = 1178,1183
+-+-+-	-----+	-----+	+++-----	1156,1183 = 1183,1183
+-+-+-	-----+	-----	+++-----	1146,1158 = 1146,1160 = 1158,1178

Lot No.: **55G**

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+-+-+--+	-----+---	-----	+-----++-	1104,1158 = 110404,1158 = 110404,1160 = 1158,1158 = 1158,1160
+-+-+--+	-----+---	-----	-----++-	1104,1160 = 1160,1160
+-+-+--+	-----+++	---+-----	-----++-	1104,1150 = 1143,1150 = 1144,1150
+-+-+--+	-----+++	---+-----	-----++-	1150,1150 = 1150,1156
+-+-+--+	-----++	---+-----	-----++-	1104,1144 = 1144,1144
+-+-+--+	-----	+-----	-----++-	1104,1154 = 1154,1154
+-+-+--+	-----	-+-----	-----++-	1104,1184 = 1184,1184
+-+-+--+	-----	-----++-	-----++-	1104,1135 = 1135,1135
+-+-+--+	-----	-----++-	-----++-	1104,1138 = 1138,1138
+-+-+--+	-----	-----++	-----++-	1104,1143 = 1143,1143
+-+-+--+	-----	-----	++-----	1104,1146 = 110404,1146 = 110404,1178 = 1146,1146 = 1146,1178
+-+-+--+	-----	-----	+-----++-	1104,110404 = 110404,110404
+-+-+--+	-----	-----	-+-----	1104,1178 = 1178,1178
+-+-+---	---+-----	-----	---++-+---	1103,1168 = 1111,1136
+-+-+--+	-----+---	-----+---	++-+--+---	1103,1159 = 1140,1159 = 1159,1159
+-+-+--+	-----+---	-----	++-+--+---	1103,1140 = 1140,1140
+-+-+--+	-----++	-----	---+--+---	1103,1176 = 1176,1176
+-+-+--+	-----	---+-----	---+--+---	1103,1163 = 1163,1163
+-+-+++++	+++-----	+-----	---+-----	1102,1164 = 1164,1170
+-+-+++++	++-----	+-----	---+-----	1102,1145 = 1145,1170
+-+-+++++	+-----	-+-----	---+-----	1119,1170 = 1131,1170
+-+-+++++	+++-----	+-----	---+-----	1114,1164 = 1145,1168
+-+-+++++	---+-----	-----	---+-----	1108,1114 = 1119,1168
+-+-+++++	++-----++	+-----	++-+--+---	1117,1170 = 1152,1170
+-+-+++++	-+-----++	+-----	++-+--+---	1102,1152 = 1148,1152
+-+-+++++	-+-----++	+-----	++-+--+---	1102,1117 = 1117,1148
+-+-+++++	---+-----	-----++	---+--+---	1102,1157 = 1118,1121 = 1121,1142 = 1121,1157
+-+-+++++	---+-----	-----	---+--+---	1102,1142 = 1118,1136
+-+-+++++	++-----++	+-----	++-+--+---	1117,1145 = 1145,1152
+-+-+++++	-+-----++	+-----	++-+--+---	1117,1131 = 1119,1152 = 1131,1152
+-+-+++++	-+-----	-----	-----++	1118,1126 = 1118,1179
+-+-+++++	+++-----	+-----	-----+---	1108,1145 = 1119,1164 = 1131,1164 = 1145,1164
+-+-+++++	++-----	+-----+---	-----+---	1145,1169 = 1145,1182
+-+-+++++	++-----	+-----	-----+---	1119,1145 = 1126,1145 = 1131,1145 = 1145,1145 = 1145,1153 = 1145,1179
+-+-+++++	-+-----	---+-----	-----+---	1126,1131 = 1131,1179
+-+-+++++	-+-----	-----	-----+---	1119,1126 = 1119,1179
+-+-+++++	-----	---+-----	-----+---	1131,1169 = 1131,1182
+-+-+++++	-----	---+-----	-----+---	1119,1131 = 1131,1131
+-+-+++++	-----	-----++-	-----+---	1119,1169 = 1119,1182
+-+-+++++	+-----	---+-----	-----+---	1114,1170 = 1170,1173
+-+-+++++	---+-----	-----++	-----+---	1114,1121 = 1121,1173
+-+-+++++	---+-----	-----	-----+---	1114,1136 = 1136,1173
+-+-+++++	-----+---	-----	+++++---	1102,1120 = 1114,1116 = 1116,1120 = 1116,1173
+-+-+++++	-----+---	-----	-----+---	1114,1148 = 1148,1173
+-+-+++++	-----	-----+---	-----+---	1114,1165 = 1165,1173
+-+-+++++	-----	-----+---	-----+---	1102,1182 = 1165,1182
+-+-+++++	-----	-----+---	-----+---	1102,1169 = 1165,1169
+-+-+++++	-----	-----	-----+---	1102,1114 = 1102,1173
+-+-+++++	---+-----	-----	---+-----	1114,1168 = 1168,1173
+-+-+++++	-----+---	-----+---	+++-----	1120,1169 = 1120,1182

Lot No.: **55G**

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+++--++-	-----+---	-----	+++--++-	1114,1120 = 1120,1120 = 1120,1173
+++--++-	-----	-----+--	+++--++-	1114,1169 = 1114,1182
+++--++-	-----	-----	+++--++-	1114,1114 = 1114,1173
+++--++-	+++-----	---+-----	+++--++-	1102,1170 = 1170,1170
+++--++-	---+-----	-----+	+++--++-	1102,1121 = 1121,1121 = 1121,1136
+++--++-	-----+---	-----	+++--++-	1102,1116 = 1116,1116
+++--++-	-----+--	-----	+++--++-	1102,1148 = 1148,1148
+++--++-	-----	-----+--	+++--++-	1102,1165 = 1165,1165
+++--++-	-----	-----+--	+++--++-	1169,1173 = 1173,1182
+++--++-	+++--++-	+++--++-	+++--++-	1117,1164 = 1152,1164
+++--++-	+++--++-	-----+	+++--++-	1126,1157 = 1157,1179
+++--++-	+++--++-	-----	+++--++-	1126,1142 = 1142,1179
+++--++-	+++--++-	+++--++-	+++--++-	1126,1152 = 1152,1153 = 1152,1179
+++--++-	+++--++-	+++--++-	+++--++-	1117,1126 = 1117,1153 = 1117,1179
+++--++-	+++--++-	+++--++-	+++--++-	1113,1126 = 1113,1179
+++--++-	+++--++-	-----	+++--++-	1126,1134 = 1134,1179
+++--++-	+++--++-	+++--++-	+++--++-	1108,1164 = 1126,1164 = 1153,1164
				= 1164,1164 = 1164,1179
+++--++-	+++--++-	-----	+++--++-	1108,1126 = 1108,1179
+++--++-	+++--++-	-----	+++--++-	1126,1126 = 1126,1179
+++--++-	+++--++-	+++--++-	+++--++-	1113,1152 = 1117,1152 = 1134,1152
				= 1152,1152
+++--++-	+++--++-	+++--++-	+++--++-	1113,1117 = 1117,1117 = 1117,1134
+++--++-	+++--++-	+++--++-	+++--++-	1113,1113 = 1113,1134
+++--++-	+++--++-	-----+	+++--++-	1142,1157 = 1157,1157
+++--++-	+++--++-	-----+--	+++--++-	1169,1182 = 1182,1182

1101 = 110101 - 110111

1102 = 110201 - 110202

1104 = 110401 - 110403, 110405

1106 = 110601 - 110602

1108 = 110801 - 110802**1110 = 111001 - 111002****1111 = 111101 - 111102****1113 = 111301 - 111302****1114 = 111401 - 111402****1119 = 111901 - 111902****1127 = 112701 - 112702****1154 = 115401 - 115402****1165 = 116501 - 116502**

SPECIFICITY TABLE

DRB1*11 SSP subtyping

Specificities and sizes of the PCR products of the 32 primer mixes used for DRB1*11 SSP subtyping

Primer Mix	Size of spec. PCR product ¹	Size of control band ²	Amplified DRB*11 alleles ³	Other amplified DRB alleles ^{3,4}
1	175 bp	515 bp	*110101-110405, 110601-1121, 1123- 1129, 1131-1166, 1168-1170, 1172- 1184	*0308
2	175 bp	430 bp	*1105, 1167	*0831, 1204, 1411
3⁵	65 bp	430 bp	*110101-110111, 1103-110602, 1109- 111202, 1115, 1122- 1125, 112701-1130, 1132, 1133, 1135, 1137-1141, 1143, 1144, 1146, 1147, 1149-1151, 115401- 1156, 1158-1163, 1166, 1167, 1172, 1174-1178, 1180, 1181, 1183, 1184	*0415, 0831, DRB5*0113
4⁶	200 bp	430 bp	*110201, 110202, 111401, 111402, 1116, 1118-1121, 1131, 1145, 1148, 116501, 116502, 1170, 1173	*130101-1304, 1306, 1308, 1310, 1312, 1313, 1315, 1316, 1319, 1322, 1323, 1327, 1328, 1330-1341, 1345, 1348, 1351-1353, 1357-1359, 1361, 1364-1366, 1368- 1370, 1372, 1373, 1376, 1377, 1379- 1385, 1387, 1389- 1394, 1416, 1463, 1467, 1478
5^{5,7}	85 bp	515 bp	*110101-110111, 110401-110602, 110801-111002, 111201-111302, 1115, 1117-111902,	*0415, 0461, 0831, 1204, 1411, DRB5*0113

Lot No.: **55G**

Lot-specific information

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			1122-1135, 1137-1139, 1142-1147, 1149, 1150, 1152, 115401-1158, 1160-1162, 1164, 1166, 1167, 1172, 1174, 1175, 1177, 1178, 1180, 1181, 1183, 1184	
6^{5,7}	80 bp	515 bp	*110201-1103, 111101, 111102, 111401, 111402, 1116, 1120, 1121, 1136, 1140, 1141, 1148, 1155, 1159, 1163, 116501, 116502, 1168, 1170, 1176	
7⁵	125 bp	430 bp	*110101-110111, 1105, 110801-111202, 111401-1115, 111901-1120, 1122-1124, 1126-1133, 1137, 1139, 1145, 1149, 1151, 1153, 1161, 1162, 1164, 1166, 1168, 1169, 1172-1175, 1179-1182	*0461, DRB3*0218 , DRB5*0113
8⁵	125 bp	430 bp	*110201-110405, 110601-1107, 111301, 111302, 1116-1118, 1121, 1125, 1134-1136, 1138, 1140-1144, 1146-1148, 1150, 1152, 115401-1160, 1163, 116501, 116502, 1167, 1170, 1176-1178, 1183, 1184	*0308, 0415, 0831, 1204, 1411
9^{5,7,10}	85 bp, 115 bp	430 bp	*1107, 1123, 1125, 1132, 1145, 1155, 1164, 1167, 1170, 1177	*0308
10^{5,11}	65 bp, 85 bp, 120 bp	430 bp	*1107, 111301, 111302, 1117, 1123,	*0308, 0461, 1411, DRB3*0218

Lot No.: **55G**

Lot-specific information

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			1125, 1126, 1134, 1145, 1152, 1155, 1164, 1167, 1174, 1179	
11 ^{7,12}	155 bp, 200 bp, 255 bp	515 bp	*110601, 110602, 110801, 110802, 1121, 1136, 1142, 1147, 1157, 1164, 1168, 1175	*0320, 1320, 1325, 1329, 1343, 1356, 1358, 1360, 1371, 1378, 1381, 1388, 140301, 140302, 1412, 1429, 1440, 1469, 1474, 1477, 1484, 1485
12 ^{5,13}	95 bp, 185 bp	430 bp	*1130, 1161	DRB3*0218
13 ^{5,7,14}	70 bp, 105 bp	430 bp	*1109, 1116, 1120, 112801, 112802, 1140, 1158-1160, 1183	*0308
14 ^{5,7}	145 bp	430 bp	*1117, 1137, 1141, 1148, 1150, 1152, 1156, 1183	*030201-0303, 0306, 0317, 0326, 0327, 0331, 0335, 0338, 0341, 0820, 130301-130303, 130701-1308, 1312, 1313, 1319, 1326, 1332-133303, 1336- 1338, 1340, 1347- 1349, 1353, 1355, 1358, 1360, 1365, 1370, 1372, 1376, 1381, 1384, 1385, 1388-1390, 1394, 140101-140301, 140501-1409, 1412- 1414, 1416, 1418- 1420, 1422-1427, 1429, 143201, 143202, 1434, 1436- 1441, 1443-1445, 1447-1449, 1451, 1454-1456, 1458- 1460, 1462, 1463, 1467, 1469, 1470, 1474, 1475, 1477, 1478, 1480-1492N, DRB3*0114
15 ^{5,15}	60 bp, 105 bp	430 bp	*111001, 111002, 111201-111302,	*1411

Lot No.: **55G**

Lot-specific information

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16⁵	110 bp	430 bp	1117, 1152, 1166 *1115, 1124, 1144, 1149, 1150, 1176	*0326, 0333, 0343, 0344, 1334, 1362, 1364, 1368, 1441, 1477, DRB3*0114
17^{5,8}	90 bp	430 bp	*1117, 1123, 1125, 1145, 1152-1155, 1164, 1167	*1411
18^{5,7}	95 bp	515 bp	*1107, 112701, 112702, 1184	*0308, DRB3*0218
19^{7,16}	180 bp, 225 bp	430 bp	*1123, 1125, 1131, 1132, 1145, 1152, 1155, 1164, 1170	*0310, 0820, 1313, 1318, 1343, 1345, 1347, 1355, 140101- 140103, 140301, 140302, 140701- 1408, 1412, 1416, 1422, 1425-1427, 143201, 143202, 1434, 1435, 1438- 1440, 1449, 1453- 1455, 1458, 1460, 1462, 1463, 1467, 1469, 1470, 1472, 1474, 1475, 1477, 1478, 1482, 1484- 1490, 1492N
20^{5,7}	115 bp	515 bp	*111001, 111002, 111201-111302, 1117, 1129, 1144, 1147, 1149, 1150, 1152, 1163	*0304, 0321, 0326, 0330, 0333, 0335, 0344, 1308, 1319, 1357, 1360, 1372, 1376, 1383, 1384, 1387, 140101- 140103, 140501- 140503, 140701- 1408, 1414, 1416, 1420, 1422-142303, 1426, 143201, 143202, 1434-1440, 1443-1445, 1449, 1454-1456, 1460, 1462, 1465, 1470, 1472, 1474, 1475, 1482, 1484, 1486- 1488, 1490-1492N
21¹⁷	135 bp, 175 bp	430 bp	*1122, 1159, 1172, 1180, 1183	*0308, 0415, 0461

Lot No.: **55G**

Lot-specific information

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22^{5,17}	115 bp, 180 bp, 215 bp, 245 bp	430 bp	*1115, 1133, 1135, 116501, 116502, 1169, 1181, 1182	*1309, 1362, 1424, 1437
23⁵	120 bp	430 bp	*1138	
24¹⁹	155 bp, 250 bp	430 bp	*110601, 110602, 1121, 1139, 1143, 1147, 1150, 1157, 1181	*0317, 0320, 0337, 1358, 1381, 1429, 1459, 1486
25⁵	110 bp	515 bp	*110404, 1109- 111002, 111202- 111302, 1116, 1117, 1120, 1122, 112802, 1140, 1146, 1152, 1158, 1159, 1183	*0308, 1204, 1411, DRB3*0218
26^{5,7,20}	120 bp, 160 bp	430 bp	*1109-111002, 111301, 111302, 1116, 1117, 1120, 1140, 1146, 1152, 1159, 1162, 1178, 1180, 1183	*0308, 1411
27⁵	85 bp	430 bp	*111101, 111102, 111401, 111402, 1120, 1168, 1173	*0103, 0414, 130201-130303, 1323, 1329, 1331, 1333, 1334, 1336- 1339, 1341, 1345, 1363, 1365-1367, 1373, 1374, 1385
28⁵	85 bp	430 bp	*110201-1103, 1116, 1121, 1136, 1140, 1141, 1148, 1155, 1159, 1163, 116501, 116502, 1170, 1176	*0402, 0437, 130101-130105, 1304, 1308, 1310, 1315, 1317, 1319, 1320, 1322, 1324, 1327, 1328, 1332, 1335, 1340, 1343, 1348, 1351-1354, 1357, 1359, 1361, 1364, 1368-1372, 1375, 1376, 1378- 1381, 1383, 1384, 1387, 1391-1393, 1416, 1457, 1510
29⁵	100 bp	515 bp	*111401, 111402, 111901-1120, 1131, 1145, 1173, 1182	*0103, 0115, 0124, 0414, 0438, 0482, 0486, 07010101- 070103, 0703, 0704, 0706-0717, 080302,

				0814, 0815, 0818, 0819, 0823, 0825, 0827, 0829-083002, 0832-0838, 130201- 130303, 1312, 1313, 1323, 1330, 1331, 133301-1334, 1336- 1339, 1341, 1345, 1365-1367, 1373, 1374, 1382, 1385, 1390, 1424, 1463, 1467, 150201- 150207, 1511, 1514, 1519, 1526, 1529, 1530, 1538, 1539, 160501, 160502, 1607, DRB3*0211, DRB5*0107, 0111, DRB5*0203
30⁵	100 bp	515 bp	*110101-110111, 1103-110602, 1109- 111202, 1115, 1122- 1125, 112701-1130, 1132, 1133, 1135, 1138-1140, 1143, 1144, 1146, 1147, 1149, 1151, 115401- 1155, 1158-1163, 1166, 1167, 1172, 1174-1178, 1180, 1181, 1184	*0817, 0828, 120201-120204, 1213, 1215, 1216, 1218-1220, 130501, 130502, 131101, 131102, 131401- 131403, 1318, 1321, 1324, 1342, 1346, 135001, 135002, 1354, 1362, 1363, 1375, 1453, 1609
31⁵	85 bp	515 bp	*110401-110405, 110601, 110602, 1118, 1125, 1135, 1138, 1142-1144, 1146, 1147, 1150, 115401, 115402, 1156-1158, 1160, 1167, 1177, 1178, 1183, 1184	*0123, 0412, 0415, 0418, 0425, 0436, 0453, 0458, 080401, 080404, 0806, 0810, 0812, 0820, 0822, 0828, 0831, 120101- 1215, 1217-1220, 1306, 131101, 131102, 1318, 1342, 1358, 1377, 1412, 1415, 1473, 1474, 1478, 1484, 1521, 1615
32^{5,9}	75 bp	430 bp	*111301, 111302, 1117, 1151, 1152	*1411

Lot No.: 55G

Lot-specific information

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¹Alleles are assigned by the presence of specific PCR product(s). However, the sizes of the specific PCR products may be helpful in the interpretation of DRB1*11 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 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 430 base pairs, for most wells, or a band of 515 base pairs, for some wells.

Well number 1 contains the primer pair giving rise to the longer, 515 bp, internal positive control band in order to help in the correct orientation of the DRB1*11 subtyping.

In addition, wells number 5, 6, 11, 18, 20, 25 and 29 to 31 contain the primer pair giving rise to the longer, 515 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 DRB alleles only partial second exon nucleotide sequences are 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 first hyperpolymorphic region of the second exon of DRB alleles are conserved within allelic groups and that unknown sequences of codons 87 to 92 are identical with the DRB1*0101 consensus sequence.

⁴Due to the sharing of sequence motifs within the DR52 group of DRB1 alleles, other DRB1 alleles are amplified by primer mixes 1 to 5, 7 to 11, 13 to 22 and 24 to 32. The DRB3*0114 allele is amplified by primer mixes 14 and 16, the DRB3*0211, DRB5*0107, DRB5*0111 and DRB5*0203 alleles are amplified by primer mix 29, the DRB3*0218 allele is amplified by primer mixes 7, 10, 12 and 18 and 25 and the DRB5*0113 allele is amplified by primer mixes 3, 5 and 7.

⁵Specific PCR fragments shorter than 125 base pairs have a lower intensity than longer PCR bands. In order to have as little co-amplification as possible of non-DRB1*11 alleles by the primer pairs of the DRB1*11 subtyping kit, the DRB1*11 characteristic sequence motif in codon 58, 'Ag', has been used in either the 5'-primer or the 3'-primer in many of the DRB1*11 primer mixes and consequently many of the specific PCR products are shorter than 100 base pairs.

⁶Primer mix 4 may faintly amplify the DRB1*1329 allele.

⁷Primer mixes 5, 6, 9, 11, 13, 14, 18 to 20 and 26 may give rise to nonspecific amplification and/or a primer oligomer artifact.

⁸In primer mix 17, the yield of specific PCR product may be lower than for the other DRB1*11 primer mixes.

⁹Primer mix 32 might generate a long unspecific PCR product. This band should be disregarded when interpreting the DRB1*11 typings.

¹⁰Primer mix 9: Specific PCR fragment of 85 bp in the DRB1*1107, 1123, 1125, 1132, 1145, 1155, 1164, 1167 and 1170 and the DRB1*0308 alleles. Specific PCR fragment of 115 bp in the DRB1*1177 allele.

¹¹Primer mix 10: Specific PCR fragment of 65 bp in the DRB1*111301, 111302, 1117, 1126, 1134, 1152 and 1179, the DRB1*0308, 0461, 1411 and the DRB3*0218 alleles. Specific PCR fragment of 85 bp in the DRB1*1107, 1123, 1125, 1145, 1155, 1164 and 1167 alleles. Specific PCR fragment of 120 bp in the DRB1*1174 allele.

Lot No.: 55G

Lot-specific information

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¹²Primer mix 11: Specific PCR fragment of 155 bp in the DRB1*1175 allele. Specific PCR fragment of 200 bp in the DRB1*110801, 110802, 1136, 1142, 1157, 1164 and 1168 and the DRB1*1320, 1325, 1329, 1343, 1356, 1360, 1371, 1378, 1388, 140301, 140302, 1412, 1440, 1469, 1474, 1477, 1484 and 1485 alleles. Specific PCR fragment of 255 bp in the DRB1*110601, 110602, 1121, 1147 and 1157 and the DRB1*0320, 1358, 1381 and 1429 alleles.

¹³Primer mix 12: Specific PCR fragment of 95 bp in the DRB1*1161 allele. Specific PCR fragment of 185 bp in the DRB1*1130 and the DRB3*0218 alleles.

¹⁴Primer mix 13: Specific PCR fragment of 70 bp in the DRB1*1160 allele. Specific PCR fragment of 105 bp in the DRB1*1109, 1116, 1120, 112801, 112802, 1140, 1158, 1159, 1183 and the DRB1*0308 alleles.

¹⁵Primer mix 15: Specific PCR fragment of 60 bp in the DRB1*1166 allele. Specific PCR fragment of 105 bp in the DRB1*111001, 111002, 111201-111302, 1117 and 1152 and the DRB1*1411 alleles.

¹⁶Primer mix 19: Specific PCR fragment of 180 bp in the DRB1*1131, 1152 and the 0310, 1343, 1345, 140101-140103, 140701-1408, 1416, 1422, 1425, 1426, 143201-143202, 1434, 1435, 1438, 1439, 1449, 1453-1455, 1458, 1460, 1462, 1469, 1470, 1472, 1474, 1475, 1482, 1486-1488, 1490 and 1492N alleles.

Specific PCR fragment of 225 bp in the DRB1*1123, 1125, 1132, 1145, 1155, 1164, 1170 and the 0820, 1313, 1318, 1347, 1355, 140301, 140302, 1412, 1427, 1440, 1455, 1463, 1467, 1477, 1478, 1484, 1485, 1489 alleles.

¹⁷Primer mix 21: Specific PCR fragment of 135 bp in the DRB1*1159, 1172, 1180, 1183 and the DRB1*0308 alleles. Specific PCR fragment of 175 bp in the DRB1*1122 and the 0415 and 0461 alleles.

¹⁸Primer mix 22: Specific PCR fragment of 115 bp in the DRB1*1115 and the 1362 alleles. Specific PCR fragment of 180 bp in the DRB1*1133, 1135 and 116501-116502 alleles. Specific PCR fragment of 215 bp in DRB1*1169, 1182 and DRB1*1309, 1424 and 1437 alleles. Specific PCR fragment of 245 bp in DRB1*1181 allele.

¹⁹Primer mix 24: Specific PCR fragment of 155 bp in the DRB1*1139, 1143, 1150 and the DRB1*0317, 0337, 1459 and 1486 alleles. Specific PCR fragment of 250 bp in the DRB1*110601-110602, 1121, 1147, 1157 and 1181 and the DRB1*0320, 1358, 1381 and 1429 alleles.

²⁰Primer mix 26: Specific PCR fragment of 120 bp in the DRB1*1109-111002, 111301, 111302, 1116, 1117, 1120, 1140, 1146, 1152, 1159, 1162, 1180 and 1183 and the DRB1*0308 and 1411 alleles. Specific PCR fragment of 160 bp in the DRB1*1178 allele.

INTERPRETATION TABLE																
DRB1*11 SSP subtyping																
Amplification patterns of the DRB1*1101 to DRB1*1184 alleles																
	Well ⁵															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Length of spec. PCR product	175	175	65	200	85	80	125	125	85	65	155	95	70	145	60	110
									115	85	200	185	105		105	
										120	255					
Length of int. pos. control ¹	515	430	430	430	515	515	430	430	430	430	515	430	430	430	430	430
5'-primer(s) ²	5'-gTC [*]	5'-ggg [*]	5'-gAg [*]	5'-gTC [*]	5'-TgA [*]	5'-gAg [*]	5'-gAg [*]	5'-gAg [*]	5'-gAg [*]	5'-gAg [*]	5'-gTC [*]	5'-gCT [*]	5'-AgA [*]	5'-gTC [*]	5'-gTT [*]	5'-gTC [*]
												5'-TCA [*]	5'-AgA [*]		5'-gAT [*]	
													5'-ggA [*]			
3'-primer(s) ³	5'-CCT [*]	5'-CCT [*]	5'-gAA [*]	5'-gAT [*]	5'-CCT [*]	5'-CTC [*]	5'-CAC [*]	5'-CCA [*]	5'-ggC [*]	5'-ggC [*]	5'-gAg [*]	5'-CgC [*]	5'-CCT [*]	5'-CCT [*]	5'-ggT [*]	5'-CCT [*]
	58(260)	58(260)	67(286)	67(286)	72(303)				74(308)	73(305)	73(305)	67(286)		58(260)	47(227)	58(260)
					74(307)					83(334)	74(307)	67(286)				38(199)
					5'-CAg [*]				5'-gTg [*]		5'-CAg [*]	5'-CAg [*]				38(200)
											85(341)					5'-gCg [*]

INTERPRETATION TABLE**DRB1*11 SSP subtyping****Amplification patterns of the DRB1*1101 to DRB1*1184 alleles**

Well ⁵																
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
90	95	180	115	135	115	120	155	110	120	85	85	100	100	85	75	Length of spec. PCR product
		225		175	180		250		160							
					215											
					245											Length of int. pos. control ¹
430	515	430	515	430	430	430	430	515	430	430	430	515	515	515	430	
58(260)	58(261)	13(125)	13(125)	13(125)	13(125)	59(263)	13(125)	34(189)	19(143)	71(299)	71(299)	67(286)	47(227)	71(299)	58(261)	5'-primer(s) ²
5'-TgA	5'-gAg	5'-gTC	5'-gTC	5'-ACA	5'-gTC	5'-ggg	5'-gTC	5'-CAg	5'-CAg	5'-CAg	5'-CAg	5'-ACA	5'-gTT	5'-CAg	5'-gAg	
				26(164)					32(181)	71(299)	71(299)					3'-primer(s) ³
				5'-gTA					5'-TCC	5'-CAA	5'-CAA					
				26(165)												3'-primer(s) ³
				5'-TTg												
74(307)	77(317)	74(308)	60(265)	58(260)	59(264)	86(344)	51(239)	58(260)	58(260)	86(344)	86(344)	86(344)	67(286)	86(344)	70(296)	3'-primer(s) ³
5'-CCT	5'-AgT	5'-CCA	5'-gTg	5'-CCT	5'-TAg	5'-CCA	5'-CCT	5'-CCT	5'-CCT	5'-CAC	5'-CCA	5'-CAC	5'-gAA	5'-CCA	5'-TCC	
			38(200)		71(299)		81(330)									3'-primer(s) ³
			5'-gCg		5'-gCg		5'-TTT									
					81(330)											3'-primer(s) ³
					5'-TTT											
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.

Length of spec.	175	175	65	200	85	80	125	125	85	65	155	95	70	145	60	110
PCR product									115	85	200	185	105		105	
										120	255					
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DRB1 allele ⁴																
*110101-110111	1		3		5		7									
*110201, 110202	1			4		6		8								
*1103	1		3			6		8								
*110401-110403, 110405	1		3		5			8								
*110404	1		3		5			8								
*1105		2	3		5		7									
*110601, 110602	1		3		5			8			11					
*1107	1							8	9	10						
*110801, 110802	1				5		7				11					
*1109	1		3		5		7						13			
*111001, 111002	1		3		5		7								15	
*111101, 111102	1		3			6	7									
*111201	1		3		5		7								15	
*111202	1		3		5		7								15	
*111301, 111302	1				5			8		10					15	
*111401, 111402	1			4		6	7									
*1115	1		3		5		7									16
*1116	1			4		6		8					13			
*1117	1				5			8		10				14	15	
*1118	1			4	5			8								
*111901, 111902	1			4	5		7									
*1120	1			4		6	7						13			
*1121	1			4		6		8			11					
*1122			3		5		7									
*1123	1		3		5		7		9	10						
*1124	1		3		5		7									16
*1125	1		3		5			8	9	10						
*1126	1				5		7			10						
*112701, 112702	1		3		5		7									
*112801	1		3		5		7						13			
*112802	1		3		5		7						13			
*1129	1		3		5		7									
*1130			3		5		7					12				
*1131	1			4	5		7									
*1132	1		3		5		7		9							
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Lot No.: **55G**

Lot-specific information

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90	95	180	115	135	115	120	155	110	120	85	85	100	100	85	75	Length of spec. PCR product
		225		175	180		250		160							
					215											
					245											
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.
																DRB1 allele ⁴
													30			*110101-110111
											28					*110201, 110202
											28		30			*1103
													30	31		*110401-110403, 110405
								25					30	31		*110404
													30			*1105
							24						30	31		*110601, 110602
18																*1107
																*110801, 110802
								25	26				30			*1109
			20					25	26				30			*111001, 111002
										27			30			*111101, 111102
			20										30			*111201
			20					25					30			*111202
			20					25	26						32	*111301, 111302
										27		29				*111401, 111402
					22								30			*1115
								25	26		28					*1116
17			20					25	26						32	*1117
														31		*1118
												29				*111901, 111902
								25	26	27		29				*1120
							24				28					*1121
				21				25					30			*1122
17		19											30			*1123
													30			*1124
17		19											30	31		*1125
																*1126
	18												30			*112701, 112702
													30			*112801
								25					30			*112802
			20										30			*1129
													30			*1130
		19										29				*1131
		19											30			*1132
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.

Length of spec.	175	175	65	200	85	80	125	125	85	65	155	95	70	145	60	110
PCR product									115	85	200	185	105		105	
										120	255					
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*1133	1		3		5		7									
*1134	1				5			8		10						
*1135	1		3		5			8								
*1136	1					6		8			11					
*1137	1		3		5		7							14		
*1138	1		3		5			8								
*1139	1		3		5		7									
*1140	1		3			6		8					13			
*1141	1		3			6		8						14		
*1142	1				5			8			11					
*1143	1		3		5			8								
*1144	1		3		5			8								16
*1145	1			4	5		7		9	10						
*1146	1		3		5			8								
*1147	1		3		5			8			11					
*1148	1			4		6		8						14		
*1149	1		3		5		7									16
*1150	1		3		5			8						14		16
*1151	1		3				7									
*1152	1				5			8		10				14	15	
*1153	1						7									
*115401, 115402	1		3		5			8								
*1155	1		3		5	6		8	9	10						
*1156	1		3		5			8						14		
*1157	1				5			8			11					
*1158	1		3		5			8						13		
*1159	1		3			6		8						13		
*1160	1		3		5			8						13		
*1161	1		3		5		7					12				
*1162	1		3		5		7									
*1163	1		3			6		8								
*1164	1				5		7		9	10	11					
*116501, 116502	1			4		6		8								
*1166	1		3		5		7								15	
*1167		2	3		5			8	9	10						
*1168	1					6	7				11					
*1169	1						7									
*1170	1			4		6		8	9							
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Lot No.: **55G**

Lot-specific information

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90	95	180	115	135	115	120	155	110	120	85	85	100	100	85	75	Length of spec. PCR product
		225		175	180		250		160							
					215											
					245											
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.
					22								30			*1133
																*1134
					22								30	31		*1135
											28					*1136
																*1137
						23							30	31		*1138
							24						30			*1139
								25	26		28		30			*1140
											28					*1141
														31		*1142
							24						30	31		*1143
			20										30	31		*1144
17		19										29				*1145
								25	26				30	31		*1146
			20				24						30	31		*1147
											28					*1148
			20										30			*1149
			20				24							31		*1150
													30		32	*1151
17		19	20					25	26						32	*1152
17																*1153
17													30	31		*115401, 115402
17		19									28		30			*1155
														31		*1156
							24							31		*1157
								25					30	31		*1158
				21				25	26		28		30			*1159
													30	31		*1160
													30			*1161
									26				30			*1162
			20								28		30			*1163
17		19														*1164
					22						28					*116501, 116502
													30			*1166
17													30	31		*1167
											27					*1168
					22											*1169
			19								28					*1170
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.

Length of spec.	175	175	65	200	85	80	125	125	85	65	155	95	70	145	60	110
PCR product									115	85	200	185	105		105	
										120	255					
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*1172	1		3		5		7									
*1173	1			4			7									
*1174	1		3		5		7			10						
*1175	1		3		5		7				11					
*1176	1		3			6		8								16
*1177	1		3		5			8	9							
*1178	1		3		5			8								
*1179	1						7			10						
*1180	1		3		5		7									
*1181	1		3		5		7									
*1182	1						7									
*1183	1		3		5			8					13	14		
*1184	1		3		5			8								
*0103, 0414, 1367, 1374																
*0115, 0124, 0438, 0482, 0486, 07010101-070103, 0703, 0704, 0706- 0717, 080302, 0814, 0815, 0818, 0819, 0823, 0825, 0827, 0829-083002, 0832-0838, 150201- 150207, 1511, 1514, 1519, 1526, 1529, 1530, 1538, 1539, 160501, 160502, 1607, <i>DRB3*0211</i> , <i>DRB5*0107</i> , <i>DRB5*0111</i> , <i>DRB5*0203</i>																
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Lot No.: **55G**

Lot-specific information

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90	95	180	115	135	115	120	155	110	120	85	85	100	100	85	75	Length of spec. PCR product
		225		175	180		250		160							
					215											
					245											
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.
				21									30			*1172
										27		29				*1173
													30			*1174
													30			*1175
											28		30			*1176
													30	31		*1177
									26				30	31		*1178
																*1179
				21					26				30			*1180
					22		24						30			*1181
					22							29				*1182
				21				25	26					31		*1183
	18												30	31		*1184
										27		29				*0103, 0414, 1367, 1374
												29				*0115, 0124, 0438, 0482, 0486, 07010101-070103, 0703, 0704, 0706- 0717, 080302, 0814, 0815, 0818, 0819, 0823, 0825, 0827, 0829-083002, 0832-0838, 150201- 150207, 1511, 1514, 1519, 1526, 1529, 1530, 1538, 1539, 160501, 160502, 1607, DRB3*0211, DRB5*0107, DRB5*0111, DRB5*0203
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.

Lot No.: **55G**

Lot-specific information

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Length of spec.	175	175	65	200	85	80	125	125	85	65	155	95	70	145	60	110
PCR product									115	85	200	185	105		105	
										120	255					
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*0123, 0412, 0418, 0425, 0436, 0453, 0458, 080401, 080404, 0806, 0810, 0812, 0822, 120101-120103, 120302, 1205-1212, 1214, 1217, 1415, 1473, 1521, 1615																
*030201-0303, 0306, 0327, 0331, 0338, 0341, 130701, 130702, 1326, 1349, 1402, 140601, 140602, 1409, 1413, 1418, 1419, 1447, 1448, 1451, 1480, 1481, 1483														14		
*0304, 0321, 0330, 1465																
*0308	1							8	9	10			13			
*0310																
*0317, 1459														14		
*0320											11					
*0326														14		16
*0333, 0344																16
*0335, 140501- 140503, 1414, 1420, 142301- 142303, 1436, 1443- 1445, 1456, 1491														14		
*0337																
*0343																16
*0402, 0437, 1317, 1457, 1510																
*0415			3		5			8								
*0461					5		7			10						
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Lot No.: **55G**

Lot-specific information

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90	95	180	115	135	115	120	155	110	120	85	85	100	100	85	75	Length of spec. PCR product
		225		175	180		250		160							
					215											
					245											
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.
														31		*0123, 0412, 0418, 0425, 0436, 0453, 0458, 080401, 080404, 0806, 0810, 0812, 0822, 120101-120103, 120302, 1205-1212, 1214, 1217, 1415, 1473, 1521, 1615
																*030201-0303, 0306, 0327, 0331, 0338, 0341, 130701, 130702, 1326, 1349, 1402, 140601, 140602, 1409, 1413, 1418, 1419, 1447, 1448, 1451, 1480, 1481, 1483
			20													*0304, 0321, 0330, 1465
	18			21				25	26							*0308
		19														*0310
							24									*0317, 1459
							24									*0320
			20													*0326
			20													*0333, 0344
			20													*0335, 140501- 140503, 1414, 1420, 142301- 142303, 1436, 1443- 1445, 1456, 1491
							24									*0337
																*0343
										28						*0402, 0437, 1317, 1457, 1510
				21										31		*0415
				21												*0461
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.

Lot No.: **55G**

Lot-specific information

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Length of spec.	175	175	65	200	85	80	125	125	85	65	155	95	70	145	60	110
PCR product									115	85	200	185	105		105	
										120	255					
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*0817, 1216, 130501, 130502, 131401-131403, 1321, 1346, 135001, 135002, 1609																
*0820														14		
*0828, 120201- 120204, 1213, 1215, 1218-1220, 131101, 131102, 1342																
*0831		2	3		5			8								
*1204		2			5			8								
*130101-130105, 1304, 1310, 1315, 1322, 1327, 1328, 1335, 1351, 1352, 1359, 1361, 1369, 1379, 1380, 1391- 1393				4												
*130201-130203, 1323, 1331, 1339, 1341, 1366, 1373				4												
*130301-130303, 133301, 1336-1338, 1365, 1385				4										14		
*1306, 1377				4												
*1308, 1319, 1372, 1376, 1384				4										14		
*1309																
*1312, 133302, 133303, 1390				4										14		
*1313, 1463, 1467				4										14		
*1316				4												
*1318																
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Lot No.: **55G**

Lot-specific information

www.olerup.com

90	95	180	115	135	115	120	155	110	120	85	85	100	100	85	75	Length of spec. PCR product
		225		175	180		250		160							
					215											
					245											
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.
													30			*0817, 1216, 130501, 130502, 131401-131403, 1321, 1346, 135001, 135002, 1609
		19												31		*0820
													30	31		*0828, 120201- 120204, 1213, 1215, 1218-1220, 131101, 131102, 1342
														31		*0831
								25						31		*1204
											28					*130101-130105, 1304, 1310, 1315, 1322, 1327, 1328, 1335, 1351, 1352, 1359, 1361, 1369, 1379, 1380, 1391- 1393
										27		29				*130201-130203, 1323, 1331, 1339, 1341, 1366, 1373
										27		29				*130301-130303, 133301, 1336-1338, 1365, 1385
														31		*1306, 1377
			20								28					*1308, 1319, 1372, 1376, 1384
					22											*1309
												29				*1312, 133302, 133303, 1390
		19										29				*1313, 1463, 1467
																*1316
		19											30	31		*1318
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.

Lot No.: **55G**

Lot-specific information

www.olerup.com

Length of spec.	175	175	65	200	85	80	125	125	85	65	155	95	70	145	60	110
PCR product									115	85	200	185	105		105	
										120	255					
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*1320, 1371, 1378											11					
*1324, 1354, 1375																
*1325, 1356											11					
*1329											11					
*1330, 1382				4												
*1332, 1340, 1348, 1353, 1370				4										14		
*1334				4												16
*1343											11					
*1345				4												
*1347, 1355, 1425, 1427, 1458, 1489														14		
*1357, 1383, 1387				4												
*1358				4							11			14		
*1360											11			14		
*1362																16
*1363																
*1364, 1368				4												16
*1381				4							11			14		
*1388											11			14		
*1389, 1394				4										14		
*140101-140103, 140701-1408, 1422, 1426, 143201, 143202, 1434, 1438, 1439, 1449, 1454, 1455, 1460, 1462, 1470, 1475, 1482, 1487, 1488, 1490, 1492N														14		
*140301, 1469, 1485											11			14		
*140302											11					
*1411		2			5			8		10					15	
*1412											11			14		
*1416				4										14		
*1424														14		
*1429											11			14		
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Lot No.: **55G**

Lot-specific information

www.olerup.com

90	95	180	115	135	115	120	155	110	120	85	85	100	100	85	75	Length of spec. PCR product
		225		175	180		250		160							
					215											
					245											
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.
											28					*1320, 1371, 1378
											28		30			*1324, 1354, 1375
																*1325, 1356
										27						*1329
												29				*1330, 1382
											28					*1332, 1340, 1348, 1353, 1370
										27		29				*1334
		19									28					*1343
		19								27		29				*1345
		19														*1347, 1355, 1425, 1427, 1458, 1489
			20								28					*1357, 1383, 1387
							24							31		*1358
			20													*1360
					22								30			*1362
										27			30			*1363
											28					*1364, 1368
							24				28					*1381
																*1388
																*1389, 1394
		19	20													*140101-140103, 140701-1408, 1422, 1426, 143201, 143202, 1434, 1438, 1439, 1449, 1454, 1455, 1460, 1462, 1470, 1475, 1482, 1487, 1488, 1490, 1492N
		19														*140301, 1469, 1485
		19														*140302
17								25	26						32	*1411
		19												31		*1412
		19	20								28					*1416
					22							29				*1424
							24									*1429
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.

Length of spec.	175	175	65	200	85	80	125	125	85	65	155	95	70	145	60	110
PCR product									115	85	200	185	105		105	
										120	255					
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
*1435, 1472																
*1437														14		
*1440											11			14		
*1441, DRB3*0114														14		16
*1453																
*1474, 1484											11			14		
*1477											11			14		16
*1478				4										14		
*1486														14		
DRB3*0218							7			10		12				
DRB5*0113			3		5		7									
DRB1 allele ⁴																
Well No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

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 430 base pairs, for most wells, or a band of 515 base pairs, for some wells.

Well number 1 contains the primer pair giving rise to the longer, 515 bp, internal positive control band in order to help in the correct orientation of the DRB1*11 subtyping.

In addition, wells number 5, 6, 11, 18, 20, 25, 29, 30 and 31 contain the primer pair giving rise to the longer, 515 bp, internal positive control band in order to allow kit identification.

²The codon, and in parenthesis the nucleotide, position, in the 1st, 2nd or 3rd exons, matching the specificity-determining 3'-end of the primer is given. Codon and 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.

³The codon, and in parenthesis the nucleotide, position, in the 2nd or 3rd exons, matching the specificity-determining 3'-end of the primer is given in the anti-sense direction. Codon and 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.

⁴The DRB1*1171 has been shown to be in error.

⁵Primer mix 9: Specific PCR fragment of 85 bp in the DRB1*1107, 1123, 1125, 1132, 1145, 1155, 1164, 1167 and 1170 and the DRB1*0308 alleles. Specific PCR fragment of 115 bp in the DRB1*1177 allele.

Primer mix 10: Specific PCR fragment of 65 bp in the DRB1*111301, 111302, 1117, 1126, 1134, 1152 and 1179, the DRB1*0308, 0461, 1411 and the DRB3*0218 alleles. Specific PCR fragment of 85 bp in the DRB1*1107, 1123, 1125, 1145, 1155, 1164 and 1167 alleles. Specific PCR fragment of 120 bp in the DRB1*1174 allele.

Primer mix 11: Specific PCR fragment of 155 bp in the DRB1*1175 allele. Specific PCR fragment of 200 bp in the DRB1*110801, 110802, 1136, 1142, 1157, 1164 and 1168 and the DRB1*1320, 1325, 1329, 1343, 1356, 1360, 1371, 1378, 1388, 140301, 140302, 1412, 1440, 1469, 1474, 1477, 1484 and 1485 alleles. Specific PCR fragment of 255 bp in the DRB1*110601, 110602, 1121, 1147 and 1157 and the DRB1*0320, 1358, 1381 and 1429 alleles.

Primer mix 12: Specific PCR fragment of 95 bp in the DRB1*1161 allele. Specific PCR fragment of 185 bp in the DRB1*1130 and the DRB3*0218 alleles.

90	95	180	115	135	115	120	155	110	120	85	85	100	100	85	75	Length of spec. PCR product
		225		175	180		250		160							
					215											
					245											
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.
		19	20													*1435, 1472
			20		22											*1437
		19	20													*1440
																*1441, DRB3*0114
		19											30			*1453
		19	20											31		*1474, 1484
		19														*1477
		19												31		*1478
		19	20				24									*1486
	18							25								DRB3*0218
																DRB5*0113
																DRB1 allele ⁴
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	Well No.

Primer mix 13: Specific PCR fragment of 70 bp in the DRB1*1160 allele. Specific PCR fragment of 105 bp in the DRB1*1109, 1116, 1120, 112801, 112802, 1140, 1158, 1159, 1183 and the DRB1*0308 alleles.

Primer mix 15: Specific PCR fragment of 60 bp in the DRB1*1166 allele. Specific PCR fragment of 105 bp in the DRB1*111001, 111002, 111201-111302, 1117 and 1152 and the DRB1*1411 alleles.

Primer mix 19: Specific PCR fragment of 180 bp in the DRB1*1131, 1152 and the 0310, 1343, 1345, 140101-140103, 140701-1408, 1416, 1422, 1425, 1426, 143201-143202, 1434, 1435, 1438, 1439, 1449, 1453-1455, 1458, 1460, 1462, 1469, 1470, 1472, 1474, 1475, 1482, 1486-1488, 1490 and 1492N alleles.

Specific PCR fragment of 225 bp in the DRB1*1123, 1125, 1132, 1145, 1155, 1164, 1170 and the 0820, 1313, 1318, 1347, 1355, 140301, 140302, 1412, 1427, 1440, 1455, 1463, 1467, 1477, 1478, 1484, 1485, 1489 alleles.

Primer mix 21: Specific PCR fragment of 135 bp in the DRB1*1159, 1172, 1180, 1183 and the DRB1*0308 alleles. Specific PCR fragment of 175 bp in the DRB1*1122 and the 0415 and 0461 alleles.

Primer mix 22: Specific PCR fragment of 115 bp in the DRB1*1115 and the 1362 alleles. Specific PCR fragment of 180 bp in the DRB1*1133, 1135 and 116501-116502 alleles. Specific PCR fragment of 215 bp in DRB1*1169, 1182 and DRB1*1309, 1424 and 1437 alleles. Specific PCR fragment of 245 bp in DRB1*1181 allele.

Primer mix 24: Specific PCR fragment of 155 bp in the DRB1*1139, 1143, 1150 and the DRB1*0317, 0337, 1459 and 1486 alleles. Specific PCR fragment of 250 bp in the DRB1*110601-110602, 1121, 1147, 1157 and 1181 and the DRB1*0320, 1358, 1381 and 1429 alleles.

Primer mix 26: Specific PCR fragment of 120 bp in the DRB1*1109-111002, 111301, 111302, 1116, 1117, 1120, 1140, 1146, 1152, 1159, 1162, 1180 and 1183 and the DRB1*0308 and 1411 alleles. Specific PCR fragment of 160 bp in the DRB1*1178 allele.

CERTIFICATE OF ANALYSIS

Olerup SSP® DRB1*11 SSP

Product number: 101.115-24/03 – including *Taq* pol.
Lot number: 55G
Expiry date: 2011-November-01
Number of tests: 24 tests – Product No. 101.115-24
 3 tests – Product No. 101.115-03
Number of wells per test: 32

Well specifications:

Well No.	Production No.	Well No.	Production No.	Well No.	Production No.
1	2008-546-01	13	2007-400-13	25	2008-546-25
2	2005-140-02	14	2008-546-14	26	2009-663-26
3	2005-140-03	15	2007-400-15	27	2005-140-27
4	2009-663-04	16	2009-663-16	28	2005-140-28
5	2005-140-05	17	2005-140-17	29	2008-546-29
6	2006-273-06	18	2007-400-18	30	2005-140-30
7	2005-140-07	19	2005-140-19	31	2008-546-31
8	2005-140-08	20	2009-663-20	32	2007-400-32
9	2009-663-09	21	2009-663-21		
10	2009-663-10	22	2009-663-22		
11	2009-663-11	23	2005-140-23		
12	2007-400-12	24	2009-663-24		

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

No DNAs carrying the alleles to be amplified by primer solutions 12, 16 and 21 to 24 were available. The specificities of the primers in primer solutions 12, 16, 21, 22 and 24 were tested by separately adding one or several additional 5'-primer(s), respectively, one or several additional 3'-primer(s).

In primer solution 23 the 3'-primer was tested by separately adding one 5'-primer, the 5'-primer was not possible test.

In primer solutions 9 to 11, 16, 22, 24 and 32 one or two of the 3'-primers were not possible to test, and in primer solutions 12, 13, 15 and 26 one or two of the 5'-primers were not possible to test. Additional 3'-primers in primer solutions 5, 9 to 11 and 17 to 20 were tested by separately adding one or two 5'-primers.

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

Date of approval: 2009-December-09

Approved by:

Quality Control, Supervisor

Declaration of Conformity

Product name: *Olerup SSP*[®] DRB1*11
Product number: 101.115-24/03
Lot number: 55G

Intended use: DRB1*11 high resolution histocompatibility testing

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

We, *Olerup SSP AB*, hereby declare that this product, to which this Declaration of Conformity relates is in conformity with the following Standard(s) and other normative document(s) ISO 9001:2008 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*, Hasselstigen 1, SE-133 33 Saltsjöbaden, Sweden.

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

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

Saltsjöbaden, Sweden
2009-December-09

Olle Olerup
Managing Director

Lot No.: **55G**

Lot-specific information

www.olerup.com**ADDRESSES:****Manufacturer:****Olerup SSP AB**, Hasselstigen 1, SE-133 33 Saltsjöbaden, Sweden.**Tel:** +46-8-717 88 27**Fax:** +46-8-717 88 18**E-mail:** info-ssp@olerup.com**Web page:** <http://www.olerup.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**.