DQB1 high resolution for frequent alleles

(101.221-12/12u) Lot No: 7R9 Expiry Date: 2027-02-01

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sample ID:\_\_\_\_\_\_\_\_\_\_\_\_\_\_

DNA Conc.(ng/ul):\_\_\_\_\_\_\_\_\_

Test Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Tested By:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Review Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Reviewed By:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Interpretation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Failed lanes*: \_\_\_\_\_\_\_\_\_\_\_\_ *Comments:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**Gel Picture**

|  |
| --- |
| PHOTO DOCUMENT |



Abbreviations

ICB: Internal Control Band

AmpS: Amplicon Size

**Notes:**

Product sizes are approximate. For detailed information, see the lot-specific Specificity Table and Interpretation Table.

This table is intended as a guide. For interpretation always use the Interpretation Table and/or Specificity Table.

HLA-specific PCR products shorter than 125 base pairs have a lower intensity and are less sharp than longer PCR products.

Primer mixes 21, 26, 30, 37, 47, 55, 57, 59, 62, 72 and 81 may give rise to a lower yield of HLA-specific PCR product than the other DQB1 primer mixes, most pronounced for primer mix 55.

Primer mixes 3, 8, 13, 17, 18, 30, 35, 38, 41, 42, 43, 49, 64 and 71 have a tendency to giving rise to primer oligomer formation.

Primer mixes 2, 10, 12, 18, 20, 21, 31, 33, 35, 36, 39, 40, 42, 43, 51, 61, 64, 75, 79, 80 and 94 may have tendencies of unspecific amplifications, most pronounced for primer mix 75.

Primer mix 20 may give rise to a long unspecific amplification product. This band should be disregarded when interpreting the typing results.

Primer mix 96 contains a negative control, which will amplify the majority of HLA amplicons as well as the amplicons generated by the control primer pairs matching the human growth hormone gene. HLA-specific PCR product sizes range from 75 to 200 base pairs and the PCR product generated by the HGH positive control primer pair is 200 base pairs.









































**1**DQB1 alleles in bold lettering are listed as confirmed alleles on the IMGT/HLA web page [www.ebi.ac.uk/imgt/hla](http://www.ebi.ac.uk/imgt/hla), release 3.27.0, January 2017.

**2**Alleles that have been deleted from or renamed in the official WHO HLA Nomenclature up to and including the last IMGT/HLA database release can be retrieved from web page <http://hla.alleles.org/alleles/deleted.html>.

**3**The following DQB1 high primer mixes have two or more product sizes:

|  |  |  |
| --- | --- | --- |
| Primer Mix | Size of spec. PCR product | Amplified DQB1alleles |
| **4** | 140 bp  185 bp | \*02:02:01:01-02:02:23, 02:05?, 02:06, 02:10-02:12, 02:13?, 02:15?-02:19?, 02:20:01:01N-02:20:01:02N, 02:21?-02:25?, 02:26, 02:28?-02:47?, 02:49?, 02:50, 02:51?-02:52?, 02:54?-02:56?, 02:58N?, 02:60?-02:61?, 02:62, 02:64-02:65, 02:66?-02:70?, 02:71, 02:73?-02:78?, 02:80, 02:84, 02:89:01-02:89:02, 02:95, 02:97, 02:110, 02:113, 02:116-02:117, 02:120-02:122, 02:124, 02:126-02:127, 02:131, 02:137-02:138, 02:141-02:147, 02:150, 02:153, 02:156, 02:161-02:162N, 02:165, 02:167N, 02:169, 02:171Q-02:172, 02:175-02:176N, 02:179-02:180, 02:183N, 02:187, 02:194N, 02:199-02:201, 02:203-02:204N, 02:206N-02:207, 02:210-02:211  \*03:28, 03:50 |
| **5** | 155 bp  180 bp  210 bp  260 bp | \*02:04, 02:108, 02:144, 03:22:01:01-03:22:02, 03:96, 03:251, 04:23, 05:103w, 05:226, 05:231w, 06:04:01:01w-06:04:15w, 06:04:17w-06:05:02w, 06:06?, 06:07:01w-06:07:02w, 06:08:02?-06:08:03?, 06:09:01:01w-06:09:12w, 06:11:02?-06:11:03?, 06:12w, 06:13:02?-06:13:03?, 06:15:01?, 06:17?-06:18:01?, 06:18:02w, 06:19:01?, 06:21w, 06:22:01?-06:25?, 06:27:02?, 06:29?-06:32:02?, 06:34w, 06:35?, 06:36w, 06:38w, 06:40?, 06:41:01:01w-06:42w, 06:45?, 06:50?, 06:51:02?, 06:52w, 06:53:01?-06:54N?, 06:56?-06:57:01?, 06:58w, 06:59?-06:61?, 06:63?-06:67?, 06:69:01?-06:72?, 06:76?, 06:79:02?-06:83?, 06:84:01:01w-06:84:01:02w, 06:85?, 06:89?, 06:91?, 06:93?-06:97?, 06:118:01w, 06:118:02?-06:118:03?, 06:118:04w, 06:119?-06:121?, 06:123?-06:124?, 06:126?, 06:128?, 06:129w, 06:131?-06:141?, 06:142w, 06:143?-06:145:01?, 06:146:01?-06:147?, 06:149?-06:153:01?, 06:154?-06:163?, 06:164w, 06:165?-06:170?, 06:171w, 06:172?-06:184?, 06:186w, 06:189w, 06:190:01?-06:199?, 06:201?-06:204?, 06:206:01?, 06:206:02w, 06:207?-06:208:01?, 06:210?-06:215?, 06:217w, 06:229?-06:236?, 06:238?, 06:241?, 06:244?, 06:246?-06:247?, 06:249?, 06:252N?, 06:254w, 06:260?, 06:261w, 06:263?, 06:265w-06:267w, 06:268?, 06:275w, 06:277?, 06:280w-06:283w, 06:287w-06:288w, 06:291w-06:292w, 06:299w, 06:301w, 06:303Nw, 06:313w, 06:318w-06:319:02w, 06:320?, 06:325w, 06:332w, 06:339w, 06:343w, 06:348w-06:349w, 06:351w, 06:353w, 06:358w, 06:361w, 06:369w, 06:371?, 06:374?, 06:375w, 06:378?-06:379N?, 06:381w, 06:385w-06:386w, 06:389?, 06:393?, 06:398w, 06:407w, 06:414Nw, 06:420w-06:421w, 06:423N?, 06:426w, 06:429w, 06:432w, 06:434w, 06:439Qw-06:441w, 06:444w, 06:449w, 06:452Nw, 06:458Nw, 06:462?-06:464?, 06:465w  \*05:06:01-05:06:02, 05:07, 05:50  \*05:106  \*05:03:02, 05:51, 05:119, 05:125, 06:06?, 06:129, 06:146:01, 06:241 |
| **8** | 135 bp  225 bp | \*02:01:01:01-02:01:09, 02:01:11-02:01:13, 02:01:15-02:01:27, 02:01:29-02:01:37, 02:01:39-02:02:10, 02:02:12-02:02:23, 02:04-02:16, 02:18N-02:36, 02:38-02:76, 02:78-02:94, 02:96N-02:115, 02:117-02:146, 02:148-02:171Q, 02:173-02:179, 02:182-02:187, 02:189-02:211, 03:02:01:01-03:02:37, 03:07-03:08, 03:11, 03:18, 03:32, 03:37, 03:45:01-03:45:02, 03:62-03:64, 03:66N-03:68, 03:70, 03:81, 03:85, 03:106-03:107, 03:125, 03:146, 03:153, 03:161, 03:174-03:175, 03:178-03:179, 03:184-03:185, 03:189-03:190, 03:199, 03:203-03:205, 03:210-03:211, 03:213N-03:215, 03:220-03:221, 03:223-03:225, 03:228-03:229, 03:233, 03:237N, 03:240, 03:245, 03:247, 03:251, 03:261, 03:263:01:01-03:263:01:02, 03:265, 03:269N, 03:273-03:274, 03:277-03:279, 03:287, 03:289, 03:295-03:296, 03:298-03:301, 03:308, 03:310N, 03:315, 03:320-03:324, 03:333-03:334N, 03:339N, 03:343-03:345, 03:348-03:349, 03:352, 03:362, 03:364, 03:367-03:369, 03:371, 03:379, 03:383, 03:386, 03:388, 03:392, 03:403N, 03:409-03:410, 03:412-03:413, 03:415-03:416, 03:422N, 03:429, 03:433, 03:437, 03:440N-03:442, 03:444, 03:446-03:447, 03:450, 03:452, 03:456-03:457, 03:459, 03:462-03:464, 03:466, 03:471, 03:479, 03:481, 03:484, 03:490, 03:493, 03:495, 03:498, 03:500-03:502, 03:504, 06:03:13, 06:29, 06:63, 06:123, 06:139, 06:320, 06:337  \*06:171 |
| **9** | 175 bp  220 bp | \*03:02:01:01-03:02:33, 03:02:35-03:03:29, 03:05:01-03:05:05, 03:06?-03:07?, 03:08, 03:11, 03:14:01?-03:15?, 03:17:01?-03:18?, 03:19:01:01-03:19:06, 03:20?, 03:23:01?, 03:23:02, 03:23:03?, 03:25:01, 03:25:02?-03:26?, 03:30-03:32, 03:33?-03:34?, 03:37-03:41, 03:43, 03:45:01-03:45:02, 03:48?, 03:52?-03:54?, 03:56?-03:67?, 03:68, 03:69?-03:70?, 03:71-03:72, 03:74?-03:78?, 03:79, 03:81?-03:82?, 03:85-03:91Q, 03:95N-03:100, 03:101?-03:104?, 03:105, 03:106?-03:112?, 03:117, 03:118N?, 03:120?-03:125?, 03:126, 03:127?-03:131?, 03:132, 03:133?-03:135?, 03:136, 03:137?, 03:138, 03:140?-03:149?, 03:150, 03:152?-03:163?, 03:165?-03:167?, 03:168, 03:170?-03:171?, 03:173?-03:179?, 03:180-03:181, 03:183?, 03:184, 03:185?, 03:187, 03:188?-03:189?, 03:190, 03:192?-03:194?, 03:195, 03:199-03:200, 03:201?-03:205?, 03:207?-03:210?, 03:211, 03:212?-03:214?, 03:215, 03:216?-03:221?, 03:222, 03:223?-03:228?, 03:229, 03:230?, 03:232?-03:238?, 03:239, 03:240?, 03:244?, 03:245, 03:247-03:248, 03:250-03:251, 03:255?-03:262?, 03:263:01:01-03:263:01:02, 03:265, 03:267?-03:270?, 03:272, 03:273?-03:275?, 03:277, 03:278?, 03:279-03:280, 03:282N-03:283, 03:286-03:287, 03:289, 03:295-03:296, 03:298-03:301, 03:304, 03:308, 03:310N, 03:313, 03:315-03:316, 03:319-03:324, 03:332-03:337, 03:339N, 03:343-03:346, 03:348-03:349, 03:351?-03:353?, 03:356N?, 03:357N, 03:359?, 03:362-03:365, 03:367-03:369, 03:371, 03:374-03:376N, 03:379, 03:381-03:384, 03:386, 03:387?, 03:388, 03:392-03:395, 03:398, 03:401-03:403N, 03:405-03:406, 03:409-03:416, 03:422N, 03:425?, 03:429, 03:433, 03:437?-03:438?, 03:440N, 03:441?, 03:442, 03:444-03:447, 03:449?-03:450?, 03:452-03:453, 03:455?-03:456?, 03:457, 03:459, 03:461-03:464, 03:466, 03:471, 03:474, 03:477-03:479, 03:484-03:485, 03:487, 03:489-03:490, 03:492?, 03:493-03:495, 03:498, 03:500-03:502, 03:504-03:505, 03:507, 03:509N, 04:01:01:01-04:02:01:01, 04:02:01:04-04:44, 04:46N-04:95  \*02:01:01:01-02:01:09, 02:01:11-02:01:13, 02:01:15-02:01:27, 02:01:29-02:36, 02:38-02:94, 02:96N-02:115, 02:117-02:146, 02:148-02:171Q, 02:173-02:180, 02:182-02:211, 03:02:01:01-03:03:15, 03:03:17-03:03:29, 03:06-03:08, 03:11-03:12, 03:15, 03:18, 03:20, 03:23:01-03:23:03, 03:25:01-03:26, 03:30-03:34, 03:37-03:41, 03:43, 03:45:01-03:45:02, 03:62-03:68, 03:70, 03:74, 03:79, 03:81, 03:85-03:91Q, 03:95N-03:99Q, 03:106-03:107, 03:110-03:113, 03:117, 03:123-03:126, 03:136-03:137, 03:141, 03:145-03:146, 03:149, 03:153, 03:155-03:156, 03:161, 03:168, 03:174-03:179, 03:184-03:185, 03:190, 03:199-03:200, 03:203-03:205, 03:209-03:215, 03:217, 03:220-03:225, 03:227-03:230, 03:233-03:234, 03:237N-03:240, 03:245, 03:247-03:249, 03:251, 03:259, 03:261, 03:263:01:01-03:263:01:02, 03:265, 03:269N-03:270, 03:273-03:274, 03:277-03:280, 03:282N-03:283, 03:287, 03:289, 03:295-03:296, 03:298-03:301, 03:304, 03:308, 03:310N, 03:313, 03:315-03:316, 03:319-03:324, 03:332-03:334N, 03:336-03:337, 03:339N, 03:343-03:345, 03:348-03:349, 03:351-03:352, 03:356N-03:357N, 03:359, 03:362-03:365, 03:367-03:369, 03:371, 03:374-03:375N, 03:379, 03:382-03:384, 03:386, 03:388, 03:392-03:393, 03:395, 03:397-03:398, 03:402-03:403N, 03:405-03:406, 03:409-03:416, 03:422N, 03:429, 03:433, 03:437, 03:440N-03:442, 03:444-03:447, 03:450, 03:452-03:453, 03:456-03:457, 03:459, 03:461-03:464, 03:466, 03:471, 03:477-03:479, 03:481, 03:484, 03:487, 03:489-03:490, 03:493-03:495, 03:498, 03:500-03:502, 03:504-03:505, 03:507, 03:509N, 04:03:01-04:03:03 |
| **10** | 120 bp  145 bp  175 bp | \*02:11, 02:25  \*02:26, 03:04:01:01-03:04:04, 03:14:01-03:14:02, 03:80, 03:138, 03:318, 03:327, 03:443, 03:474, 06:246  \*03:58 |
| **11** | 95 bp  130 bp | \*03:20  \*03:05:01-03:05:05, 03:17:01-03:17:02, 03:53, 03:61-03:62, 03:72, 03:100, 03:132, 03:181, 03:226, 03:244, 03:250, 03:262, 03:272, 03:346, 04:09, 04:63, 04:75, 05:131, 05:276 |
| **12** | 65 bp  105 bp  140 bp  195 bp | \*03:40, 03:353  \*03:03:06, 03:06, 03:25:01-03:25:02, 03:234, 03:239, 04:01:03, 04:02:16, 04:03:03  \*03:08, 03:119, 03:137, 03:194, 06:02:02, 06:03:02, 06:03:34, 06:145:02, 06:208:02, 06:210  \*03:57 |
| **13** | 110 bp  145 bp  190 bp | \*03:15  \*02:62, 03:07, 03:16, 03:438  \*02:196, 03:54, 03:162, 03:183, 03:204, 03:223, 03:233, 03:351, 04:35 |
| **14** | 135 bp  175 bp  260 bp | \*03:09, 05:56  \*03:55, 03:250  \*03:11, 03:26, 03:244 |
| **15** | 140 bp  195 bp  245 bp | \*03:10:01-03:10:02:02, 03:12, 03:14:01-03:14:02, 03:70, 03:179, 03:183, 03:195, 03:474, 06:01:01:01-06:01:31, 06:01:33-06:01:34, 06:06?, 06:43, 06:54N-06:58, 06:98, 06:99:02-06:105, 06:108, 06:120, 06:132, 06:140, 06:153:01-06:153:02, 06:157, 06:167-06:168, 06:177, 06:181, 06:194, 06:205, 06:209, 06:214, 06:229, 06:239, 06:243, 06:245-06:247, 06:251, 06:257-06:258, 06:260, 06:263, 06:268, 06:274, 06:277, 06:285, 06:302, 06:305, 06:307, 06:309-06:310, 06:312, 06:321, 06:323, 06:330N, 06:342, 06:359, 06:377, 06:382, 06:415, 06:418-06:419, 06:421, 06:427, 06:435, 06:462-06:464, 06:466  \*02:42, 02:78  \*03:27, 03:82 |
| **17** | 110 bp  155 bp  175 bp  215 bp  300 bp | \*05:03:12, 05:43:02, 06:23, 06:82, 06:99:01, 06:156, 06:162, 06:169, 06:233, 06:340, 06:389  \*02:10, 02:81, 03:13, 03:49:01:01-03:49:01:02, 03:286, 03:402, 03:471, 04:32, 05:152, 05:314, 06:359, 06:381, 06:396  \*03:28, 03:232  \*03:47  \*02:154, 03:458, 04:66, 05:250, 05:280, 05:307, 06:34 |
| **18** | 80 bp  135 bp  185 bp  220 bp  260 bp | \*03:188  \*03:24, 03:79, 03:282N, 03:447, 04:81  \*03:60, 03:73, 03:112, 03:118N, 03:226, 03:237N, 03:371, 04:30, 05:73, 05:98, 05:116, 06:28, 06:56, 06:79:01-06:79:02, 06:144N, 06:451  \*03:18, 06:393  \*02:36, 03:479 |
| **21** | 125 bp  205 bp | \*04:11  \*04:01:01:01-04:01:06, 04:05-04:08, 04:14-04:17, 04:27, 04:38, 04:42, 04:61-04:62, 04:69, 04:71, 04:73N-04:74, 04:90, 04:92-04:95 |
| **22** | 140 bp  205 bp | \*04:14  \*03:132, 04:02:01:01, 04:02:01:04-04:02:07, 04:02:09-04:02:21, 04:02:23-04:03:01, 04:04, 04:09-04:13, 04:18-04:19, 04:21-04:37, 04:39-04:41N, 04:43-04:47, 04:49-04:60, 04:63-04:68N, 04:70, 04:72, 04:75-04:89, 04:91 |
| **24** | 115 bp  215 bp | \*05:02:01:01-05:02:26, 05:05:01-05:05:02, 05:14, 05:17, 05:19, 05:26, 05:33-05:37, 05:46-05:47, 05:53, 05:57, 05:59, 05:65, 05:79, 05:83, 05:86-05:88, 05:90N, 05:94, 05:100, 05:102, 05:106, 05:113, 05:116-05:118, 05:123, 05:125, 05:135-05:136, 05:142, 05:145, 05:153, 05:165, 05:170, 05:172, 05:174-05:175, 05:178-05:179, 05:181, 05:186, 05:189, 05:192, 05:196, 05:198-05:199, 05:222, 05:227, 05:229, 05:231, 05:238-05:239, 05:241, 05:247, 05:250-05:251, 05:253-05:254, 05:257, 05:274, 05:278, 05:284, 05:287, 05:309, 05:311  \*05:72 |
| **25** | 100 bp  125 bp  220 bp | \*03:226, 03:272, 04:28, 05:01:09-05:01:10, 05:02:02, 05:02:18, 05:03:01:01-05:03:11, 05:03:13, 05:03:15-05:03:19, 05:03:21-05:03:23, 05:03:25-05:03:29, 05:06:01-05:06:02, 05:08-05:10, 05:13, 05:15-05:16, 05:24, 05:28, 05:38-05:42, 05:50, 05:56, 05:58, 05:60, 05:64, 05:66:01-05:67, 05:78, 05:85, 05:91, 05:96, 05:98, 05:101, 05:108-05:109, 05:119, 05:121, 05:129-05:130, 05:140, 05:143, 05:147, 05:149, 05:161, 05:191, 05:200-05:206N, 05:208N-05:214, 05:218, 05:220-05:221, 05:224N, 05:233, 05:235N-05:236N, 05:240, 05:243, 05:245, 05:259-05:260, 05:264-05:265N, 05:273N, 05:280-05:282, 05:289, 05:292-05:294, 05:296, 05:305-05:306, 05:312, 05:314, 05:318  \*03:272, 05:03:01:01-05:03:01:09, 05:03:03-05:03:23, 05:03:25-05:03:30, 05:06:01-05:06:02, 05:08-05:10, 05:13, 05:15-05:16, 05:23-05:24, 05:28, 05:38-05:43:01, 05:50, 05:56, 05:58, 05:60, 05:64, 05:66:01-05:67, 05:78, 05:85, 05:91, 05:96, 05:98, 05:101, 05:108-05:109, 05:119, 05:121, 05:129-05:131, 05:134, 05:140, 05:147, 05:149, 05:161, 05:191, 05:200-05:206N, 05:208N-05:214, 05:218, 05:220-05:221, 05:224N, 05:233, 05:235N-05:236N, 05:243, 05:245, 05:259-05:260, 05:264-05:265N, 05:273N, 05:276, 05:280-05:282, 05:289, 05:293:01-05:294, 05:296, 05:305-05:306, 05:312, 05:314, 05:318  \*05:72, 05:128N |
| **27** | 170 bp  210 bp | \*03:67, 03:311, 06:457  \*06:01:01:01-06:02:59, 06:05:02?-06:06?, 06:10-06:11:04, 06:13:01-06:13:03, 06:16, 06:18:01-06:20, 06:24, 06:29, 06:33, 06:35, 06:37, 06:43, 06:45, 06:47-06:51:02, 06:53:01-06:57:02, 06:68, 06:70-06:84:01:02, 06:95-06:109, 06:111-06:117, 06:120, 06:122-06:127, 06:130-06:132, 06:136-06:140, 06:147, 06:150-06:153:02, 06:157, 06:159, 06:161, 06:163, 06:166-06:167, 06:173-06:179N, 06:181-06:183, 06:188, 06:192, 06:197-06:198, 06:200-06:201, 06:205, 06:208:01-06:209, 06:211, 06:213-06:216N, 06:219, 06:224-06:229, 06:232-06:233, 06:235-06:237, 06:240, 06:242-06:243, 06:245-06:247, 06:249, 06:251, 06:255-06:258, 06:260, 06:262-06:264, 06:268, 06:270:01-06:271, 06:273-06:274, 06:277, 06:284-06:286, 06:289-06:290, 06:293-06:298, 06:300, 06:302, 06:304N, 06:306N-06:312, 06:314-06:315, 06:317N, 06:319:01-06:319:02, 06:321-06:324, 06:326, 06:330N, 06:333, 06:335, 06:337-06:338, 06:340-06:341N, 06:344, 06:347, 06:354-06:357, 06:359, 06:363-06:364, 06:366, 06:370, 06:372, 06:374, 06:376-06:377, 06:379N-06:380, 06:382, 06:384, 06:388, 06:390, 06:395, 06:397N, 06:401-06:402, 06:404-06:406, 06:408-06:409, 06:411-06:413, 06:416Q-06:419, 06:421-06:422N, 06:427, 06:430-06:431, 06:435-06:438, 06:442, 06:445-06:448, 06:457, 06:461-06:464, 06:466 |
| **30** | 65 bp  105 bp  150 bp  205 bp  235 bp | \*02:67N  \*04:15-04:16  \*03:23:01, 05:03:12, 05:43:02, 06:03:01:01-06:03:03, 06:03:05-06:03:07, 06:03:11-06:03:25, 06:03:27-06:03:33, 06:03:35-06:03:46, 06:04:02, 06:07:01, 06:08:01, 06:09:02, 06:11:01:01-06:11:03, 06:26N, 06:28, 06:30-06:32:01, 06:40-06:41:01:03, 06:44, 06:59-06:62, 06:64-06:65, 06:67, 06:90-06:92:02, 06:94, 06:110, 06:118:01, 06:118:03, 06:128, 06:133-06:134, 06:141, 06:143-06:145:02, 06:148, 06:154, 06:161, 06:165, 06:169-06:170, 06:184-06:185, 06:187, 06:191, 06:195-06:196, 06:199, 06:203, 06:210, 06:218, 06:221-06:223, 06:230, 06:234, 06:238, 06:248, 06:250, 06:253, 06:259, 06:272, 06:276, 06:279, 06:316, 06:327-06:329, 06:331, 06:334, 06:336, 06:345N-06:346, 06:350, 06:352, 06:360, 06:362, 06:365, 06:367, 06:371, 06:385, 06:391-06:394N, 06:396, 06:399-06:400, 06:403, 06:410, 06:423N-06:425, 06:428, 06:433, 06:440, 06:442-06:443, 06:450, 06:454N-06:455, 06:459-06:460  \*04:20, 04:27  \*03:06, 03:25:01, 04:04-04:05, 04:18 |
| **33** | 110 bp  170 bp | \*03:133, 03:199-03:200, 03:462  \*06:04:01:01-06:05:02, 06:06w, 06:07:01-06:07:02, 06:09:01:01-06:09:03, 06:09:05-06:09:12, 06:18:01-06:18:02, 06:22:02, 06:25, 06:27:01-06:27:02, 06:32:01-06:32:02, 06:34, 06:36, 06:38-06:39, 06:52, 06:58, 06:66, 06:69:01, 06:85-06:86, 06:88:01:01-06:89, 06:93-06:94, 06:118:01-06:118:02, 06:118:04, 06:121, 06:129, 06:135, 06:142, 06:155, 06:158N, 06:160, 06:164, 06:168, 06:171-06:172, 06:180, 06:186, 06:189, 06:193N, 06:202, 06:204, 06:207, 06:217, 06:241, 06:252N, 06:254, 06:261, 06:265-06:267, 06:280-06:283, 06:287-06:288, 06:291-06:292, 06:299, 06:303N, 06:313, 06:318, 06:320, 06:339, 06:343, 06:348-06:349, 06:351, 06:353, 06:358, 06:361, 06:368-06:369, 06:375, 06:381, 06:387, 06:398, 06:407, 06:414N, 06:420, 06:426, 06:429, 06:432, 06:434, 06:439Q, 06:444, 06:449, 06:452N, 06:458N, 06:465 |
| **34** | 95 bp  120 bp  180 bp | \*05:07  \*03:259, 05:25, 05:75, 06:04:01:01-06:05:01, 06:06, 06:08:01-06:09:12, 06:12-06:13:03, 06:17-06:18:02, 06:21-06:22:03, 06:27:01-06:27:02, 06:34, 06:36, 06:38-06:39, 06:42, 06:52, 06:58, 06:69:01-06:69:02, 06:85-06:86, 06:88:01:01-06:89, 06:93, 06:119, 06:121, 06:129, 06:135, 06:142, 06:149, 06:155, 06:158N, 06:160, 06:164, 06:171, 06:180, 06:186, 06:189, 06:193N, 06:202, 06:204, 06:206:01-06:207, 06:217, 06:231, 06:241, 06:252N, 06:254, 06:261, 06:265-06:267, 06:280-06:283, 06:287-06:288, 06:291-06:292, 06:299, 06:301, 06:313, 06:318-06:319:02, 06:339, 06:343, 06:348-06:349, 06:351, 06:353, 06:358, 06:361, 06:368-06:369, 06:375, 06:381, 06:387, 06:398, 06:407, 06:414N, 06:417, 06:420, 06:426, 06:432, 06:434, 06:439Q, 06:441, 06:444, 06:449, 06:452N, 06:455, 06:458N, 06:465  \*05:112 |
| **35** | 85 bp  155 bp  215 bp  255 bp | \*05:103, 05:231  \*03:27, 03:48, 03:87, 06:35, 06:53:01-06:53:02, 06:145:01-06:145:02, 06:208:01-06:208:02  \*05:101, 05:145, 06:151, 06:212, 06:260  \*03:31, 05:73, 05:80, 05:98, 05:116, 06:05:01, 06:05:02?-06:06?, 06:20, 06:31, 06:45, 06:156, 06:442 |
| **36** | 95 bp  155 bp  180 bp  210 bp | \*03:90N  \*06:164  \*03:68  \*06:05:01, 06:05:02?-06:06?, 06:09:01:01-06:09:12, 06:12, 06:15:01-06:15:02, 06:22:01-06:22:03, 06:42, 06:46, 06:66, 06:88:01:01-06:88:01:02, 06:94, 06:118:01-06:119, 06:121, 06:142, 06:189, 06:207, 06:212w, 06:275, 06:281-06:282, 06:287, 06:299, 06:339, 06:348, 06:353, 06:358, 06:386, 06:420, 06:429, 06:432, 06:441 |
| **37** | 130 bp  165 bp  185 bp | \*02:152, 05:63  \*05:39  \*05:21, 06:06, 06:149, 06:276 |
| **38** | 100 bp  130 bp  185 bp  235 bp | \*04:28, 05:38, 05:62, 05:79, 05:119-05:121, 05:156, 06:14:01-06:14:03, 06:69:01-06:69:02, 06:156, 06:162, 06:168, 06:194, 06:206:01-06:206:02, 06:244, 06:269, 06:278, 06:368, 06:451, 06:453  \*05:04, 05:08, 05:18:01-05:18:02, 05:26, 05:52, 05:77, 05:132Q, 05:146, 05:262, 06:221, 06:254w, 06:273  \*04:33, 05:79, 06:10, 06:130, 06:188, 06:214  \*04:33 |
| **39** | 115 bp  140 bp  180 bp | \*03:88, 05:111  \*03:24, 03:79, 03:165, 03:447, 04:81  \*03:29-03:30, 03:52, 03:72, 03:100, 03:132, 03:179, 03:191, 03:215, 03:270, 03:474, 04:09, 04:13, 04:63, 04:75, 05:62, 05:120, 06:13:01-06:13:03, 06:16, 06:22:01-06:22:03, 06:29, 06:55, 06:69:01-06:69:02, 06:96:01-06:96:02, 06:119, 06:139, 06:202, 06:206:01-06:206:02, 06:209, 06:247, 06:322:01-06:322:03, 06:337, 06:368, 06:389, 06:417 |
| **40** | 110 bp  150 bp  205 bp | \*03:245, 05:45, 05:201, 06:40  \*02:64, 02:79, 02:108, 02:144, 03:21-03:22:02, 03:96, 03:251, 03:452, 04:23, 05:35, 05:103w, 05:182, 05:226, 05:231w, 05:259, 06:04:01:01w-06:04:15w, 06:04:17w-06:05:02w, 06:06?, 06:07:01w-06:07:02w, 06:08:02?-06:08:03?, 06:09:01:01w-06:09:12w, 06:11:02?-06:11:03?, 06:12w, 06:13:02?-06:13:03?, 06:15:01?, 06:17?-06:18:01?, 06:18:02w, 06:19:01?, 06:21w, 06:22:01?-06:25?, 06:27:02?, 06:29?-06:32:02?, 06:34w, 06:35?, 06:36w, 06:38w, 06:40, 06:41:01:01w-06:42w, 06:45?, 06:50?, 06:51:02?, 06:52w, 06:53:01?-06:54N?, 06:56?-06:57:01?, 06:58w, 06:59?-06:61?, 06:63?-06:67?, 06:69:01?-06:72?, 06:76?, 06:79:02?-06:83?, 06:84:01:01w-06:84:01:02w, 06:85?, 06:89?, 06:91?, 06:93?-06:97?, 06:118:01w, 06:118:02?-06:118:03?, 06:118:04w, 06:119?-06:121?, 06:123?-06:124?, 06:126?, 06:128?, 06:129w, 06:131?-06:141?, 06:142w, 06:143?-06:145:01?, 06:146:01?-06:147?, 06:149?-06:153:01?, 06:154?-06:163?, 06:164w, 06:165?-06:170?, 06:171w, 06:172?-06:184?, 06:186w, 06:189w, 06:190:01?-06:199?, 06:201?-06:204?, 06:206:01?, 06:206:02w, 06:207?-06:208:01?, 06:210?-06:215?, 06:217w, 06:229?-06:236?, 06:238?, 06:241?, 06:243, 06:244?, 06:246?-06:247?, 06:249?, 06:252N?, 06:254w, 06:255, 06:260?, 06:261w, 06:263?, 06:265w-06:267w, 06:268?, 06:275w, 06:277?, 06:280w-06:283w, 06:287w-06:288w, 06:291w-06:292w, 06:299w, 06:301w, 06:303Nw, 06:313w, 06:318w-06:319:02w, 06:320?, 06:325w, 06:332w, 06:339w, 06:343w, 06:348w-06:349w, 06:351w, 06:353w, 06:358w, 06:361w, 06:369w, 06:371?, 06:374?, 06:375w, 06:378?-06:379N?, 06:381w, 06:385w-06:386w, 06:389?, 06:393?, 06:398w, 06:407w, 06:414Nw, 06:420w-06:421w, 06:423N?, 06:426w, 06:429w, 06:432w, 06:434w, 06:439Qw-06:441w, 06:444w, 06:449w, 06:452Nw, 06:458Nw, 06:462?-06:464?, 06:465w  \*02:96N, 05:41N, 05:90N, 05:133 |
| **41** | 165 bp  190 bp  230 bp  265 bp  300 bp | \*03:213N, 03:228, 06:17, 06:24, 06:30, 06:42  \*03:45:01, 03:420, 05:27, 06:38  \*02:47, 03:212  \*06:127  \*06:52 |
| **42** | 105 bp  135 bp  160 bp  190 bp  230 bp | \*03:41, 03:224, 04:06, 04:12, 04:16  \*03:25:01-03:25:02, 03:66N, 03:234, 03:239, 04:03:01-04:03:03, 06:10, 06:25, 06:130, 06:193N, 06:429  \*03:213N, 04:18  \*02:08, 03:06, 03:25:01, 03:230, 04:03:01-04:03:03, 05:79  \*04:18 |
| **43** | 85 bp  110 bp  155 bp  185 bp  215 bp  240 bp  270 bp | \*03:59, 06:37, 06:374  \*06:37, 06:374  \*02:05, 03:204, 06:100  \*06:26N, 06:100  \*06:26N  \*03:71, 06:33, 06:143, 06:351  \*06:33, 06:143 |
| **44** | 120 bp  165 bp | \*03:42, 03:89, 03:164, 04:44  \*03:94, 03:191, 04:02:07, 04:09, 05:62, 06:02:01:01-06:02:04, 06:02:06-06:02:59, 06:10, 06:13:01-06:16, 06:20, 06:22:01-06:24, 06:29, 06:33, 06:37, 06:46-06:51:02, 06:68-06:84:01:02, 06:96:01-06:97, 06:106-06:107, 06:109, 06:111-06:117, 06:119, 06:122, 06:124-06:127, 06:130, 06:136-06:138, 06:146:01-06:147, 06:150-06:151, 06:156, 06:159, 06:161-06:162, 06:166, 06:173-06:175, 06:178-06:179N, 06:182-06:183, 06:188, 06:192, 06:198, 06:200-06:201, 06:206:01-06:206:02, 06:208:01-06:208:02, 06:211, 06:213, 06:215-06:216N, 06:219, 06:224-06:228, 06:232, 06:235-06:237, 06:240, 06:242, 06:249, 06:255-06:256, 06:262, 06:264, 06:270:02-06:271, 06:273, 06:284, 06:286, 06:289-06:290, 06:293-06:298, 06:300, 06:304N, 06:306N, 06:308N, 06:311, 06:314-06:315, 06:317N, 06:324, 06:326, 06:333, 06:335, 06:338, 06:341N, 06:344, 06:347, 06:355-06:357, 06:363-06:364, 06:366, 06:368, 06:370, 06:374, 06:376, 06:379N-06:380, 06:383N-06:384, 06:386,  06:388-06:390, 06:395, 06:397N, 06:401-06:402, 06:404-06:406, 06:408-06:409, 06:411-06:413, 06:416Q-06:417, 06:422N, 06:430-06:431, 06:436-06:438, 06:445-06:448, 06:451, 06:456N-06:457, 06:461 |
| **45** | 130 bp  155 bp  225 bp  260 bp | \*06:07:01-06:07:02, 06:15:01-06:15:02, 06:36, 06:46, 06:66, 06:92:02, 06:118:01-06:118:04, 06:172, 06:216N, 06:224, 06:275, 06:385-06:386  \*06:164  \*06:212  \*06:85 |
| **46** | 160 bp  210 bp | \*06:03:01:01-06:03:14, 06:03:16-06:03:18, 06:03:20-06:03:46, 06:08:01-06:08:03, 06:14:01-06:14:03, 06:21, 06:28, 06:31, 06:40-06:41:01:03, 06:44, 06:59, 06:61, 06:63-06:65, 06:67, 06:87, 06:90-06:92:02, 06:110, 06:128, 06:133-06:134, 06:141, 06:143-06:145:02, 06:148, 06:154, 06:170, 06:184-06:185, 06:187, 06:190:01-06:191, 06:195-06:196, 06:199, 06:203, 06:206:01-06:206:02, 06:210, 06:218, 06:221-06:223, 06:230, 06:234, 06:238, 06:244, 06:248, 06:250, 06:253, 06:259, 06:269, 06:272, 06:278-06:279, 06:316, 06:327-06:329, 06:331, 06:334, 06:336, 06:345N-06:346, 06:350, 06:352, 06:360, 06:362, 06:365, 06:367, 06:371, 06:373, 06:378, 06:385, 06:391-06:394N, 06:396, 06:399-06:400, 06:403, 06:410, 06:423N-06:425, 06:428, 06:433, 06:440, 06:443, 06:450-06:451, 06:453-06:455, 06:459-06:460  \*06:03:01:01-06:03:10, 06:03:12-06:03:46, 06:08:01-06:08:03, 06:14:01-06:14:03, 06:27:01-06:28, 06:30-06:32:02, 06:40-06:41:01:03, 06:44, 06:59-06:65, 06:67, 06:87, 06:90-06:91, 06:110, 06:128, 06:133-06:134, 06:141, 06:143-06:145:02, 06:148, 06:154, 06:168, 06:170, 06:184-06:185, 06:187, 06:190:01-06:191, 06:195-06:196, 06:206:01-06:206:02, 06:210, 06:218, 06:221-06:223, 06:230, 06:234, 06:238, 06:244, 06:248, 06:250, 06:253, 06:259, 06:269, 06:272, 06:276, 06:278-06:279, 06:316, 06:327-06:329, 06:331, 06:334, 06:336, 06:345N-06:346, 06:350, 06:352, 06:360, 06:362, 06:365, 06:367-06:368, 06:371, 06:373, 06:378, 06:391-06:394N, 06:396, 06:399-06:400, 06:403, 06:410, 06:423N-06:425, 06:428, 06:433, 06:440, 06:443, 06:450-06:451, 06:453-06:455, 06:459-06:460 |
| **47** | 110 bp  155 bp | \*03:42  \*03:30, 03:72, 03:84N, 03:98, 03:100, 03:132, 03:215, 04:01:01:01-04:02:01:01, 04:02:01:04-04:03:03, 04:06-04:10, 04:12-04:14, 04:16-04:36N, 04:38-04:72, 04:74-04:95, 05:38, 05:119, 06:02:05, 06:02:16, 06:13:02, 06:14:03, 06:19:01-06:19:02, 06:22:01-06:22:02, 06:69:01-06:69:02, 06:95, 06:119, 06:123w, 06:139, 06:152, 06:206:02, 06:322:01-06:322:03, 06:337, 06:368 |
| **48** | 170 bp  225 bp | \*03:32, 03:43, 04:07  \*03:85 |
| **49** | 105 bp  140 bp  165 bp  240 bp | \*03:33, 03:328, 04:56, 05:32, 05:42, 05:45, 05:201, 05:281, 06:228, 06:304N  \*02:169, 03:319, 03:347, 04:70, 05:14, 05:84, 05:87Q, 05:132Q, 05:211, 06:103, 06:284, 06:350  \*02:33, 02:41, 03:35, 03:315, 03:322  \*03:246, 06:310 |
| **50** | 130 bp  155 bp  190 bp  210 bp  240 bp | \*03:130, 03:271, 03:282N  \*03:80, 03:139, 03:257  \*03:37, 03:162, 03:183, 03:223, 03:233, 03:252, 03:351  \*03:38:01-03:38:02, 03:46, 03:201, 03:277, 03:500  \*02:14:01:01-02:14:02, 03:34, 03:143, 04:67 |
| **51** | 125 bp  160 bp  185 bp  245 bp  270 bp | \*03:36, 03:39, 03:53, 03:62, 03:149  \*02:10, 02:81, 03:49:01:01-03:49:01:02, 03:286, 03:402, 03:471, 05:152, 05:314, 06:359, 06:381, 06:396  \*03:51, 03:287  \*03:447  \*02:09, 03:330 |
| **52** | 95 bp  220 bp | \*03:06?-03:07?, 03:14:01?-03:15?, 03:17:01?-03:18?, 03:19:01:01-03:19:06, 03:20?, 03:23:01?, 03:23:03?, 03:25:02?-03:26?, 03:48?, 03:52?-03:54?, 03:56?-03:67?, 03:69?-03:70?, 03:71, 03:74?-03:78?, 03:81?-03:82?, 03:101?-03:104?, 03:106?-03:112?, 03:118N?, 03:120?-03:125?, 03:127?-03:131?, 03:133?-03:135?, 03:137?, 03:140?-03:149?, 03:150, 03:152?-03:163?, 03:165?-03:167?, 03:170?-03:171?, 03:173?-03:179?, 03:183?, 03:185?, 03:187, 03:188?-03:189?, 03:192?-03:194?, 03:201?-03:205?, 03:207?-03:210?, 03:212?-03:214?, 03:216?-03:221?, 03:223?-03:228?, 03:230?, 03:232?-03:238?, 03:240?, 03:244?, 03:255?-03:262?, 03:263:01:01-03:263:01:02, 03:267?-03:270?, 03:273?-03:275?, 03:278?, 03:286, 03:335, 03:351?-03:353?, 03:356N?, 03:359?, 03:360, 03:376N, 03:381, 03:387?, 03:394, 03:401, 03:425?, 03:437?-03:438?, 03:441?, 03:449?-03:450?, 03:455?-03:456?, 03:485, 03:492?, 04:08  \*06:98, 06:126 |
| **53** | 130 bp  160 bp  195 bp | \*03:162, 03:183, 03:223, 03:233, 03:351, 06:153:01-06:153:02, 06:247, 06:340, 06:436  \*02:51  \*02:07:02, 05:09, 05:29-05:30, 06:252N |
| **54** | 110 bp  150 bp  190 bp  245 bp | \*05:17, 05:23, 05:242  \*02:106, 03:115, 03:368, 04:43, 05:246, 05:287, 06:109-06:110, 06:269  \*02:99, 03:249, 03:309:01, 03:312, 03:481, 05:10, 05:12, 05:47, 05:71, 05:159, 05:312, 06:105, 06:185, 06:225, 06:407, 06:432  \*04:36N |
| **56** | 100 bp  140 bp  185 bp  220 bp  265 bp | \*06:44, 06:47  \*03:177, 06:224  \*03:114, 03:197Q  \*06:43  \*03:83 |
| **57** | 150 bp  185 bp | \*02:54  \*02:07:01, 03:01:01:01-03:01:01:12, 03:01:01:14-03:01:35, 03:01:37-03:01:58, 03:04:01:01-03:04:04, 03:06?-03:07?, 03:09-03:10:03, 03:12-03:13, 03:14:01?-03:15?, 03:16, 03:17:01?-03:18?, 03:20?, 03:21-03:22:02, 03:23:01?, 03:23:03?, 03:24, 03:25:02?-03:26?, 03:27-03:29, 03:33?-03:34?, 03:35-03:36, 03:42, 03:44, 03:46-03:47, 03:48?, 03:49:01:01-03:51, 03:52?-03:54?, 03:55, 03:56?-03:67?, 03:69?-03:70?, 03:73, 03:74?-03:78?, 03:80, 03:81?-03:82?, 03:83-03:84N, 03:92-03:94, 03:101?-03:104?, 03:106?-03:112?, 03:113-03:116, 03:118N?, 03:119, 03:120?-03:125?, 03:127?-03:131?, 03:133?-03:135?, 03:137?, 03:139, 03:140?-03:149?, 03:151, 03:152?-03:163?, 03:164, 03:165?-03:167?, 03:169, 03:170?-03:171?, 03:172, 03:173?-03:179?, 03:182, 03:183?, 03:185?, 03:186, 03:188?-03:189?, 03:191, 03:192?-03:194?, 03:196-03:198:02, 03:201?-03:205?, 03:206, 03:207?-03:210?, 03:212?-03:214?, 03:216?-03:221?, 03:223?-03:228?, 03:230?, 03:231, 03:232?-03:238?, 03:240?, 03:241-03:243, 03:244?, 03:246, 03:252-03:254, 03:255?-03:262?, 03:264, 03:266, 03:267?-03:270?, 03:271, 03:273?-03:275?, 03:276N, 03:278?, 03:281, 03:284-03:285, 03:288, 03:290-03:294, 03:297, 03:302-03:303N, 03:305-03:307, 03:309:01-03:309:02, 03:311, 03:314, 03:317:01-03:318, 03:326-03:331, 03:338N, 03:340N-03:342, 03:347, 03:350, 03:351?-03:353?, 03:354N-03:355, 03:356N?, 03:359?, 03:361, 03:366, 03:372-03:373, 03:377-03:378, 03:380, 03:385N, 03:387?, 03:389-03:391, 03:396, 03:399N-03:400N, 03:404, 03:407N-03:408, 03:417-03:421, 03:423-03:424, 03:425?, 03:426-03:428, 03:430-03:432, 03:434-03:436, 03:437?-03:438?, 03:439, 03:441?, 03:443, 03:448, 03:449?-03:450?, 03:451, 03:454, 03:455?-03:456?, 03:458, 03:460, 03:465, 03:467-03:470, 03:472-03:473N, 03:475-03:476, 03:480Q, 03:482-03:483, 03:486, 03:488N, 03:491, 03:492?, 03:496?-03:497?, 03:499N?, 03:503?, 03:506?, 03:508?, 05:27 |
| **58** | 145 bp  180 bp  215 bp  250 bp | \*03:119, 03:228, 06:17, 06:24, 06:30, 06:42  \*03:56, 05:05:01-05:05:02, 05:11:01-05:11:02, 05:28, 05:66:01-05:66:02, 05:240, 06:06?, 06:129, 06:146:01, 06:241  \*03:119, 03:228, 05:30, 06:17, 06:24, 06:30, 06:42  \*03:56, 05:03:02, 05:20:02, 05:51-05:52, 05:119, 05:125, 06:06?, 06:129, 06:146:01, 06:241 |
| **59** | 100 bp  190 bp  220 bp | \*03:44, 05:13, 05:117, 05:169  \*03:114, 06:54N  \*05:24, 05:101, 05:145 |
| **60** | 110 bp  150 bp  180 bp | \*05:88  \*05:40, 05:69, 05:153  \*05:15, 05:33, 05:49 |
| **61** | 110 bp  150 bp  215 bp | \*05:88  \*05:40, 05:69, 05:153  \*05:16, 05:34, 05:44, 05:73, 05:98, 05:116, 05:128N, 05:130, 06:156, 06:162, 06:169 |
| **62** | 90 bp  140 bp  165 bp  225 bp | \*03:205, 03:214, 05:110N  \*03:75, 06:97, 06:158N, 06:465  \*05:62, 06:02:19, 06:13:03, 06:79:02, 06:95  \*03:30, 03:72, 03:100, 03:215, 06:15:01-06:15:02, 06:22:01-06:22:03, 06:37, 06:48:01-06:48:02, 06:51:01-06:51:02, 06:69:01-06:69:02, 06:139, 06:368, 06:417 |
| **63** | 95 bp  180 bp  220 bp | \*03:240  \*06:50  \*03:86 |
| **64** | 100 bp  160 bp  230 bp | \*02:16, 02:21  \*02:51, 03:276N, 03:395, 04:17  \*02:20:01:01N-02:20:01:02N |
| **65** | 115 bp  220 bp | \*02:21, 02:32, 05:36, 06:326  \*02:46 |
| **66** | 110 bp  125 bp  165 bp  205 bp  255 bp | \*03:116, 03:432, 05:57  \*02:17-02:18N, 03:317:01-03:317:02, 05:31, 05:46, 05:108, 06:111, 06:265, 06:455  \*02:19  \*02:96N, 05:41N, 05:90N, 05:133  \*02:126, 03:243 |
| **67** | 100 bp  155 bp | \*02:15, 02:27, 02:58N  \*02:26, 02:30 |
| **68** | 100 bp  175 bp | \*02:23-02:24, 02:27  \*02:28 |
| **69** | 105 bp  140 bp  185 bp | \*02:24, 02:31, 02:58N  \*03:225  \*02:29 |
| **71** | 55 bp  135 bp  160 bp  235 bp | \*03:188  \*03:63, 03:76, 03:139, 03:168, 03:211  \*03:118N, 03:237N, 06:144N  \*03:146, 03:207, 06:195 |
| **72** | 145 bp  180 bp  210 bp  270 bp | \*03:64, 05:37, 05:104, 06:218, 06:250  \*02:50, 03:77, 03:118N, 03:237N  \*03:99Q, 03:201, 03:269N  \*03:150, 03:490 |
| **73** | 90 bp  125 bp  160 bp  200 bp  225 bp  270 bp | \*02:53Q, 03:65  \*03:23:01-03:23:02, 03:217, 03:355, 04:10  \*03:211  \*03:269N  \*02:116, 03:78, 03:81, 03:159  \*03:150, 03:490 |
| **74** | 115 bp  140 bp  185 bp | \*05:19, 05:22  \*04:25N, 05:97, 05:143  \*05:71 |
| **75** | 115 bp  155 bp  175 bp  205 bp | \*05:75  \*03:102, 05:20:01  \*03:197Q, 05:122, 06:06?, 06:55, 06:58, 06:202, 06:247  \*03:194, 06:122, 06:148, 06:161, 06:278, 06:302, 06:412 |
| **76** | 150 bp  185 bp | \*03:01:38, 03:04:02, 03:10:01, 03:12, 03:14:02, 03:70, 03:179, 03:195, 03:474, 06:01:01:01-06:01:06, 06:01:08-06:01:34, 06:43, 06:53:01-06:57:02, 06:98-06:105, 06:108, 06:120, 06:132, 06:140, 06:153:01-06:153:02, 06:157, 06:167-06:168, 06:177, 06:181, 06:194, 06:205, 06:209, 06:214, 06:229, 06:239, 06:243, 06:245-06:247, 06:251, 06:257-06:258, 06:260, 06:263, 06:268, 06:274, 06:277, 06:285, 06:302, 06:305, 06:307, 06:309-06:310, 06:312, 06:321, 06:323, 06:330N, 06:342, 06:359, 06:377, 06:382, 06:415, 06:418-06:419, 06:421, 06:427, 06:435, 06:462-06:464, 06:466  \*06:54N |
| **77** | 95 bp  120 bp  190 bp | \*06:155  \*06:190:01-06:190:02  \*06:60-06:61 |
| **78** | 95 bp  130 bp  170 bp | \*03:217, 03:275, 06:64  \*03:232, 03:283, 06:94, 06:170, 06:190:01-06:190:02  \*06:62 |
| **79** | 90 bp  125 bp  200 bp | \*06:65  \*06:93  \*06:116, 06:187 |
| **80** | 105 bp  175 bp  290 bp | \*06:70  \*06:76, 06:163  \*06:02:04, 06:72 |
| **81** | 120 bp  170 bp | \*03:95N, 03:210  \*03:30, 03:72, 03:100, 03:132, 03:158, 03:170, 03:215, 04:09, 04:63, 04:75, 06:29, 06:71, 06:96:01-06:96:02, 06:139, 06:163, 06:322:01-06:322:03, 06:337 |
| **82** | 170 bp  230 bp  280 bp | \*06:77N  \*03:132, 06:107  \*06:73 |
| **83** | 115 bp  165 bp  235 bp  260 bp  290 bp | \*04:46N, 05:185N  \*06:78  \*06:107  \*06:74  \*06:02:04, 06:72 |
| **84** | 115 bp  195 bp | \*06:80, 06:217  \*06:75N, 06:106 |
| **85** | 135 bp  180 bp  215 bp  265 bp | \*06:184  \*06:67, 06:174, 06:191  \*06:68, 06:112N  \*06:127 |
| **86** | 95 bp  130 bp  180 bp  220 bp | \*06:59, 06:90, 06:150, 06:191  \*06:99:01-06:99:03, 06:112N, 06:210, 06:233, 06:244, 06:252N, 06:269-06:270:01, 06:278  \*06:90, 06:191  \*06:112N, 06:233, 06:244, 06:269-06:270:01, 06:278, 06:302 |
| **87** | 105 bp  140 bp | \*03:08, 03:137, 03:194, 06:29, 06:59, 06:63, 06:87, 06:91, 06:96:01-06:96:02, 06:150, 06:322:01-06:322:03, 06:337  \*06:179N, 06:184 |
| **88** | 110 bp  215 bp | \*06:125  \*06:57:01, 06:81 |
| **89** | 110 bp  150 bp  185 bp  260 bp | \*06:125  \*06:101  \*06:144N  \*06:83 |
| **90** | 105 bp  130 bp  175 bp  240 bp | \*04:41N  \*06:102N  \*03:247, 03:285  \*03:97, 03:117, 03:329, 03:349, 03:381, 06:86, 06:104, 06:117, 06:343, 06:366 |
| **91** | 70 bp  100 bp  185 bp | \*03:03:28, 03:10:02:01-03:10:03, 03:38:02, 03:183, 04:02:07w, 05:03:14, 05:03:20, 05:03:30, 05:43:01, 05:131, 05:276, 06:01:12, 06:02:43, 06:03:33, 06:51:01, 06:66, 06:96:01, 06:99:01, 06:118:04, 06:172, 06:322:01  \*06:01:12, 06:51:01-06:51:02, 06:99:01, 06:142  \*03:158 |
| **92** | 105 bp  120 bp  155 bp  190 bp  230 bp | \*02:22  \*02:32  \*02:19, 02:54  \*02:78  \*02:12 |
| **93** | 95 bp  170 bp  225 bp | \*03:91Q  \*02:13, 02:41, 03:322  \*03:85 |
| **95** | 95 bp  120 bp | \*03:105-03:106, 03:109, 03:120  \*05:04, 05:52, 05:77, 05:132Q, 05:146, 05:262 |

**4**The following DQB1 alleles can be distinguished by the different sizes of the specific PCR product:

|  |  |  |  |
| --- | --- | --- | --- |
| Alleles | Primer mix | Alleles | Primer mix |
| DQB1\*02:15, 02:30 | 67 | DQB1\*05:10, 05:23, 05:312 | 54 |
| DQB1\*02:23, 02:28 | 68 | DQB1\*05:11:01-05:11:02, 05:20:02 | 58 |
| DQB1\*02:29, 02:31 | 69 | DQB1\*05:12, 05:159, 05:242, 05:246 | 54 |
| DQB1\*02:99, 02:106 | 54 | DQB1\*05:13, 05:24 | 59 |
| DQB1\*03:03:06, 03:40 | 12 | DQB1\*05:17, 05:47, 05:287 | 54 |
| DQB1\*03:13, 03:47, 03:458 | 17 | DQB1\*05:25, 05:112 | 34 |
| DQB1\*03:31, 03:87 | 35 | DQB1\*06:02:19, 06:48:01-06:48:02 | 62 |
| DQB1\*03:35, 03:246, 03:328 | 49 | DQB1\*06:31, 06:145:01 | 35 |
| DQB1\*03:36, 03:51, 03:330 | 51 | DQB1\*06:35, 06:45 | 35 |
| DQB1\*03:46, 03:252, 03:271 | 50 | DQB1\*06:70, 06:76 | 80 |
| DQB1\*03:54, 03:438 | 13 | DQB1\*06:73, 06:77N | 82 |
| DQB1\*03:57, 03:353 | 12 | DQB1\*06:74, 06:78 | 83 |
| DQB1\*03:115, 03:309:01 | 54 | DQB1\*06:102N, 06:104 | 90 |
| DQB1\*03:116, 03:243, 03:317:01-03:317:02, 03:432 | 66 | DQB1\*06:109, 06:225 | 54 |
| DQB1\*03:143, 03:257 | 50 | DQB1\*06:110, 06:185 | 54 |
| DQB1\*04:05, 04:15 | 30 | DQB1\*06:151, 06:208:01 | 35 |
| DQB1\*04:32, 04:66 | 17 | DQB1\*06:188, 06:273 | 38 |
| DQB1\*04:36N, 04:43 | 54 |  |  |

**5**The DQB1 high primer set cannot separate the following alleles. These alleles can be distinguished by the DQB1\*05 kit.

|  |
| --- |
| Alleles |
| DQB1\*05:03:14, 05:03:20, 05:43:01 |

**6**This lot of the DQB1 high primer set cannot separate the DQB1\*03:01:01:01-03:01:01:12, 03:01:01:14-03:01:02, 03:01:04:01-03:01:07, 03:01:09-03:01:12, 03:01:14, 03:01:16-03:01:24, 03:01:26-03:01:33, 03:01:35, 03:01:39-03:01:58 and DQB1\*03:196 alleles; or the DQB1\*06:02:01:01-06:02:01:13, 06:02:03, 06:02:06, 06:02:08-06:02:15, 06:02:17-06:02:18, 06:02:20-06:02:27, 06:02:29-06:02:42, 06:02:44-06:02:46, 06:02:48-06:02:52 and the DQB1\*06:49 alleles.

Abbreviations

?: nucleotide sequence information not available for the primer matching sequence.

w: might be weakly amplified.