

| Variety                | Aroma Characteristics           | Country   | Alpha        | Beta         | Cohumulone<br>(of Alpha Acids) | Oils ml/100g | Myrcene<br>(of total oil) | Caryophyllene<br>(of total oil) | Humulene<br>(of total oil) | Farnesene<br>(of total oil) |
|------------------------|---------------------------------|-----------|--------------|--------------|--------------------------------|--------------|---------------------------|---------------------------------|----------------------------|-----------------------------|
| Admiral                | Light, Fresh & Sappy            | UK        | 13.0 - 16.0% | 4.8 - 6.1%   | 37 - 45%                       | 1.0 - 1.7    | 39 - 48%                  | 6.8 - 7.2%                      | 23 - 26%                   | 1.8 - 2.2%                  |
| Ahtanum                | Floral & Citrusy                | US        | 5.7 - 6.3%   | 5.0 - 6.5%   | 30 - 35%                       | 0.8 - 1.2    | 50 - 55%                  | 9.0 - 12%                       | 16 - 20%                   | 0.0%                        |
| Amarillo®              | Floral & Citrusy                | US        | 8.0 - 11.0%  | 6.0 - 7.0%   | 21 - 24%                       | 1.5 - 1.9    | 68 - 70%                  | 2.0 - 4.0%                      | 9 - 11%                    | 2.0 - 4.0%                  |
| Aramis                 | Herbal, Spicy & Citrus          | France    | 7.0 - 8.5%   | 3.8 - 4.5%   | 21.5 - 21.7%                   | 1.2 - 1.6    | 40%                       | 8%                              | 21%                        | 2%                          |
| Bramling Cross         | Spicy & Fruity                  | UK        | 5.0 - 7.0%   | 2.3 - 3.2%   | 34%                            | 0.7 - 1.0    | 36%                       | 15%                             | 30%                        | <1%                         |
| Cascade                | Floral & Citrusy                | US        | 4.5 - 7.0%   | 4.8 - 7.0%   | 33 - 40%                       | 0.7 - 1.4    | 45 - 60%                  | 3.5 - 5.5%                      | 8 - 13%                    | 3.0 - 7.0%                  |
| Celeia                 | Spicy & Citrusy                 | Slovenia  | 4.5 - 6.0%   | 2.5 - 3.5%   | 25 - 30%                       | 0.5 - 1.0    | 27 - 33%                  | 7 - 10%                         | 20 - 35%                   | 3 - 5%                      |
| Centennial             | Floral & Citrusy                | US        | 9.5 - 11.5%  | 3.5 - 4.5%   | 29 - 30%                       | 1.5 - 2.5    | 45 - 55%                  | 5.0 - 8.0%                      | 10 - 18%                   | <1%                         |
| Challenger             | Mild & Spicy                    | UK        | 6.5 - 8.5%   | 4.0 - 4.5%   | 20 - 25%                       | 1.0 - 1.7    | 30 - 42%                  | 8 - 10%                         | 25 - 32%                   | 1 - 3%                      |
| Chinook                | Spicy & Citrusy                 | US        | 12.0 - 14.0% | 3.0 - 4.0%   | 29 - 35%                       | 1.7 - 2.7    | 35 - 40%                  | 9.0 - 11.0%                     | 18 - 23%                   | <1%                         |
| Citra®                 | Citrusy & Fruity                | US        | 11.0 - 13.0% | 3.5 - 4.5%   | 22 - 24%                       | 2.2 - 2.8    | 60 - 65%                  | 6.0 - 8.0%                      | 11 - 13%                   | 0.0%                        |
| Cluster                | Floral & Spicy                  | US        | 5.5 - 8.5%   | 4.5 - 5.5%   | 37 - 43%                       | 0.4 - 0.8    | 45 - 55%                  | 6.0 - 7.0%                      | 15 - 18%                   | <1%                         |
| Columbus               | Aromatic & Pungent              | US        | 14.5 - 16.5% | 4.0 - 5.0%   | 28 - 32%                       | 2.0 - 3.0    | 40 - 50%                  | 9.0 - 11.0%                     | 12 - 18%                   | <1%                         |
| Crystal                | Spicy & Floral                  | US        | 3.5 - 5.5%   | 4.5 - 6.5%   | 20 - 26%                       | 1.0 - 1.5    | 40 - 65%                  | 4.0 - 8.0%                      | 18 - 24%                   | <1%                         |
| Delta                  | Spicy & Citrusy                 | US        | 5.5 - 7.0%   | 5.5 - 7.0%   | 22 - 24%                       | 0.5 - 1.1    | 25 - 40%                  | 9.0 - 15.0%                     | 16 - 20%                   | <1%                         |
| East Kent Goldings     | Spicy & Citrusy                 | UK        | 4.5 - 6.5%   | 1.9 - 2.8%   | 28 - 32%                       | 0.4 - 0.8    | 20 - 30%                  | 12 - 16%                        | 38 - 44%                   | <1%                         |
| El Dorado®             | Fruity & Tropical               | US        | 14.0 - 16.0% | 7.0 - 8.0%   | 28 - 33%                       | 2.5 - 2.8    | 55 - 60%                  | 6.0 - 8.0%                      | 10 - 15%                   | 0.1%                        |
| Ella (formally Stella) | Grapefruit & Tropical           | Australia | 14.0 - 16.0% | 4.0 - 4.5%   | 36%                            | 2.9          | 33%                       | 15%                             | 12%                        | 13%                         |
| First Gold             | Spicy & Fruity                  | UK        | 5.6 - 9.3%   | 2.3 - 4.1%   | 32 - 34%                       | 0.7 - 1.5    | 24 - 27%                  | 6 - 7%                          | 20 - 24%                   | 2 - 4%                      |
| Fuggles                | Mild, Minty & Earthy            | UK        | 3.0 - 5.6%   | 2.0 - 3.0%   | 25 - 30%                       | 0.7 - 1.4    | 24 - 28%                  | 9 - 13%                         | 33 - 38%                   | 5 - 7%                      |
| Galaxy                 | Citrus & Passion Fruit          | Australia | 13.5 - 14.8% | 5.8 - 6.0%   | 35%                            | 2.4 - 2.7    | 33 - 42%                  | 9 - 12%                         | 1 - 2%                     | 4 - 6%                      |
| Goldings               | Citrus & Floral                 | UK        | 4.0 - 6.0%   | 2.0 - 3.0%   | 23 - 28%                       | 0.7 - 1.0    | 25 - 35%                  | 13 - 16%                        | 35 - 45%                   | <1%                         |
| Hallertau Hersbrucker  | Fragrant, Floral & Minty        | Germany   | 1.5 - 4.0%   | 2.5 - 6.0%   | 17 - 25%                       | 0.5 - 1.0    | 15 - 30%                  | 8 - 13%                         | 20 - 30%                   | <1%                         |
| Hallertau Tradition    | Herbal, Fruity & Spicy          | Germany   | 4.0 - 7.0%   | 3.0 - 6.0%   | 24 - 30%                       | 0.5 - 1.0    | 17 - 32%                  | 10 - 15%                        | 35 - 50%                   | <1%                         |
| Helga                  | Delicate Floral & Subtle Herbal | Australia | 4.9 - 6.3%   | 3.8 - 5.4%   | 22.2 - 26.0%                   | 0.6 - 0.7    | 2 - 12%                   | 10 - 14%                        | 35 - 47%                   | <1%                         |
| Liberty                | Mild & Spicy                    | US        | 3.0 - 5.0%   | 3.0 - 4.0%   | 24 - 30%                       | 0.6 - 1.2    | 20 - 40%                  | 9.0 - 12.0%                     | 35 - 40%                   | <1%                         |
| Magnum                 | Clean Bitterness & Citrusy      | Germany   | 11.0 - 16.0% | 5.0 - 7.0%   | 21 - 29%                       | 1.6 - 2.6    | 30 - 45%                  | 8 - 12%                         | 30 - 45%                   | <1%                         |
| Marynka                | Strong & Hoppy                  | Poland    | 6.0 - 12.0%  | 10.2 - 13.0% | 26 - 33%                       | 1.8 - 2.2    | 28 - 31%                  | 11 - 12%                        | 26 - 33%                   | 1.8 - 2.2%                  |
| Mount Hood             | Mild & Herbal                   | US        | 4.0 - 7.0%   | 5.0 - 8.0%   | 21 - 23%                       | 1.2 - 1.7    | 30 - 40%                  | 13.0 - 16.0%                    | 30 - 38%                   | <1%                         |
| Mount Rainier          | Floral & Citrusy                | US        | 5.0 - 8.1%   | 5.0 - 7.0%   | 21 - 24%                       | 0.2 - 0.5    | TBC                       | TBC                             | TBC                        | TBC                         |
| Northdown              | Floral, Mint & Earthy Notes     | UK        | 7.5 - 9.5%   | 5.0 - 5.5%   | 24 - 30%                       | 1.5 - 2.5    | 23 - 29%                  | 13 - 17%                        | 40 - 45%                   | <1%                         |
| Perle                  | Intense & Pleasant              | Germany   | 4.0 - 9.0%   | 2.5 - 4.5%   | 29 - 35%                       | 0.5 - 1.5    | 20 - 35%                  | 10 - 20%                        | 35 - 55%                   | <1%                         |
| Phoenix                | Crisp & Pleasant                | UK        | 12.0 - 15.0% | 3.3 - 5.3%   | 24 - 28%                       | 1.2 - 2.5    | 24%                       | 11%                             | 30%                        | 1.4%                        |
| Pilgrim                | Strong & Fruity                 | UK        | 9.0 - 13.0%  | 4.3 - 5.0%   | 36 - 38%                       | 1.2 - 2.4    | 30%                       | 7 - 8%                          | ~17%                       | 0.3%                        |
| Pride of Ringwood      | Spicy & Herbal                  | Australia | 9.0 - 10.5%  | 5.5 - 6.0%   | 32%                            | 0.9 - 1.1    | 16 - 31%                  | 9 - 13%                         | 2 - 3%                     | 0%                          |
| Progress               | Floral, Mint & Earthy Notes     | UK        | 5.0 - 7.0%   | 2.0 - 2.5%   | 25 - 30%                       | 0.6 - 1.2    | 30 - 35%                  | 12 - 15%                        | 40 - 47%                   | <1%                         |
| Saaz                   | Intense & Pleasant              | Czech Rep | 3.0 - 6.0%   | 4.5 - 8.0%   | 23 - 26%                       | 0.4 - 1.0    | 25 - 40%                  | 10 - 12%                        | 15 - 25%                   | 14 - 20%                    |
| Saphir                 | Spicy, Fruity & Floral          | Germany   | 2.0 - 4.5%   | 4.0 - 7.0%   | 12 - 17%                       | 0.8 - 1.4    | 25 - 40%                  | 9 - 14%                         | 20 - 30%                   | <1%                         |
| Simcoe                 | Unique & Pine-Like              |           | 12.0 - 14.0% | 4.0 - 5.0%   | 15 - 20%                       | 2.0 - 2.5    | 60 - 65%                  | 5.0 - 8.0%                      | 10 - 15%                   | 0.0%                        |
| Sorachi Ace            | Unique & Citrusy                | US        | 10.0 - 16.0% | 6.0 - 7.0%   | ~23.0%                         | 2.0 - 2.8    | TBC                       | TBC                             | TBC                        | TBC                         |
| Sovereign              | Intense, Fruity & Pleasant      | UK        | 4.5 - 6.5%   | 2.1 - 3.1%   | 26 - 30%                       | 0.6 - 1.0    | TBC                       | ~8.0%                           | TBC                        | ~3.6%                       |
| Spalter Select         | Spalt-like, Spicy & Floral      | Germany   | 3.0 - 6.5%   | 2.5 - 5.0%   | 21 - 27%                       | 0.6 - 0.9    | 20 - 40%                  | 4 - 10%                         | 10 - 22%                   | 15 - 22%                    |
| Summer                 | Subtle Apricot & Melon          | Australia | 4.0 - 7.0%   | 4.8 - 6.1%   | 22.5 - 25%                     | 0.9 - 1.3    | 5 - 13%                   | 14 - 15%                        | 42 - 46%                   | 10%                         |
| Summit                 | Citrusy                         | US        | 16.0 - 18.0% | 4.0 - 6.0%   | 26 - 33%                       | 1.5 - 2.5    | 30 - 50%                  | 10.0 - 15.0%                    | 15 - 25%                   | <1%                         |
| Sylva                  | Spicy & Herbal                  | Australia | 4.6 - 7.0%   | 3.0 - 4.6%   | 24 - 28%                       | 0.5 - 1.1    | 17 - 23%                  | 6 - 9%                          | 19 - 26%                   | 23 - 25%                    |
| Target                 | Spicy & Citrusy                 | UK        | 9.5 - 12.5%  | 4.3 - 5.7%   | 35 - 40%                       | 1.2 - 1.4    | 45 - 55%                  | 8 - 10%                         | 17 - 22%                   | <1%                         |
| Tettnang Tettnanger    | Mild & Slightly Spicy           | Germany   | 2.5 - 5.5%   | 3.0 - 5.0%   | 22 - 28%                       | 0.5 - 0.9    | 20 - 35%                  | 6 - 11%                         | 22 - 32%                   | 16 - 24%                    |
| Topaz                  | Earthy, Fruity & Lychee         | Australia | 15.5 - 18.0% | 6.0 - 7.0%   | 47 - 50%                       | 0.8 - 1.7    | 25 - 43%                  | 10 - 11%                        | 11 - 13%                   | 0%                          |
| WGV                    | Sweet & Slightly Fruity         | UK        | 5.4 - 7.7%   | 2.0 - 3.3%   | 32 - 43%                       | 0.8 - 1.2    | 27%                       | 13%                             | 42%                        | 2.1%                        |
| Willamette             | Mild & Spicy                    | US        | 4.0 - 6.0%   | 3.5 - 4.5%   | 30 - 35%                       | 1.0 - 1.5    | 30 - 40%                  | 6.5 - 8.2%                      | 20 - 27%                   | 5.0 - 6.0%                  |