

# KSE2 series

## Miniature Aluminum Electrolytic Capacitors

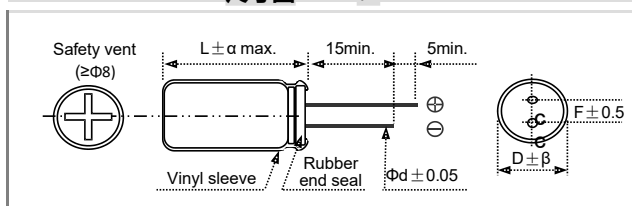
- Load life: 105°C 8,000~12,000 hours.
- 105°C high-temperature resistance, high ripple current and long life.
- Suitable for LED lighting driver and the electronic ballast.
- RoHS Compliant.



### SPECIFICATIONS 規格表

|                                                                                                        |                                                                                                                                                                                                                                              |                                                                                                               |             |              |                                                                                       |                                                                                   |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------|--------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|------|---|---|---|---|---|--|--|--|
| Item 項目                                                                                                | Performance Characteristics 特性參數                                                                                                                                                                                                             |                                                                                                               |             |              |                                                                                       |                                                                                   |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
| Operation Temperature Range 工作溫度範圍                                                                     | -40 to +105℃                                                                                                                                                                                                                                 |                                                                                                               |             |              | -25to +105℃                                                                           |                                                                                   |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
| Rated Working Voltage Range 額定電壓範圍                                                                     | 6.3 to 100V                                                                                                                                                                                                                                  |                                                                                                               |             |              | 160V to 450V                                                                          |                                                                                   |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
| Capacitance Tolerance 靜電容量允許偏差                                                                         | ±20%(120Hz, +20℃)                                                                                                                                                                                                                            |                                                                                                               |             |              |                                                                                       |                                                                                   |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
| Leakage Current 漏電流                                                                                    | LC≤0.01CV or 3(μA)    Whichever is greater measured after 2 minutes application of rated working voltage at +20℃<br>施加額定工作電壓充電 2分鐘後讀數，二者取大值。    [C: 靜電容量 (uF), V: 額定電壓 (V)]                                                                  |                                                                                                               |             |              | LC≤0.02CV+10 or 3(μA)    after 2 minutes application of rated working voltage at +20℃ |                                                                                   |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
| Dissipaiom Factor (tan δ) 損失角正切值 (120Hz, +20℃)                                                         | Working Voltage(v)                                                                                                                                                                                                                           | 6.3                                                                                                           | 10          | 16           | 25                                                                                    | 35                                                                                | 50                                                | 63                                                | 100  |   |   |   |   |   |  |  |  |
|                                                                                                        | tan δ(max)                                                                                                                                                                                                                                   | 0.22                                                                                                          | 0.19        | 0.16         | 0.14                                                                                  | 0.12                                                                              | 0.10                                              | 0.09                                              | 0.08 |   |   |   |   |   |  |  |  |
|                                                                                                        | Working Voltage(v)                                                                                                                                                                                                                           | 160                                                                                                           | 250         | 300          | 400                                                                                   | 450                                                                               |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
|                                                                                                        | tan δ(max)                                                                                                                                                                                                                                   | 0.15                                                                                                          | 0.15        | 0.20         | 0.20                                                                                  | 0.20                                                                              |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
| For capacitance value >1000μF, add 0.02 per another 1000μF    標稱容量值超過 1000uF，則每增加 1000uF，損失角正切值增加 0.02 |                                                                                                                                                                                                                                              |                                                                                                               |             |              |                                                                                       |                                                                                   |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
| Low Temperature characteristics 溫度特性(阻抗比)                                                              | Impedance ratio max. at 120 Hz    阻抗比最大值                                                                                                                                                                                                     |                                                                                                               |             |              |                                                                                       |                                                                                   |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
|                                                                                                        | Working Voltage(V)                                                                                                                                                                                                                           | 6.3                                                                                                           | 10          | 16           | 25                                                                                    | 35                                                                                | 50                                                | 63                                                | 100  |   |   |   |   |   |  |  |  |
|                                                                                                        | Z(-40℃)/ Z(+20℃)                                                                                                                                                                                                                             | 3                                                                                                             | 3           | 3            | 3                                                                                     | 3                                                                                 | 3                                                 | 3                                                 | 3    |   |   |   |   |   |  |  |  |
|                                                                                                        | Working Voltage(V)                                                                                                                                                                                                                           | 160                                                                                                           | 250         | 300          | 400                                                                                   | 450                                                                               |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
| Z(-25℃)/ Z(+20℃)                                                                                       |                                                                                                                                                                                                                                              |                                                                                                               |             |              |                                                                                       |                                                                                   |                                                   |                                                   |      | 3 | 3 | 5 | 5 | 6 |  |  |  |
| High Temperature Loading (Endurance) 高溫負荷壽命(耐久性)                                                       | Test conditions    試驗條件(+105℃)                                                                                                                                                                                                               |                                                                                                               |             |              | Post test requirements at +20℃    試驗後特性應滿足如下要求                                        |                                                                                   |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
|                                                                                                        | Case Size                                                                                                                                                                                                                                    |                                                                                                               | ΦD ≤ 6.3    | ΦD=8,10      | ΦD ≥ 13                                                                               | Leakage current 漏電流                                                               |                                                   | ≡ Initial specified value 初始規格值                   |      |   |   |   |   |   |  |  |  |
|                                                                                                        | Duration 持續時間                                                                                                                                                                                                                                | 6.3~35V                                                                                                       | 8,000 hours | 8,000 hours  | 8,000 hours                                                                           | Cap. Change 靜電容量變化率                                                               |                                                   | within ±25% of initial measured value 初始測試值的±25%內 |      |   |   |   |   |   |  |  |  |
|                                                                                                        |                                                                                                                                                                                                                                              | 50~100V                                                                                                       | 8,000 hours | 8,000 hours  | 8,000~10,000 hours                                                                    | D.F.(tan δ) 損失角正切值                                                                |                                                   | ≤200% of initial specified value 2倍初始規格值          |      |   |   |   |   |   |  |  |  |
|                                                                                                        |                                                                                                                                                                                                                                              | 160~450V                                                                                                      | 8,000 hours | 10,000 hours | 10,000~12,000 hours                                                                   | Before test requirement: Resumed 16 hours at normal temperature 測試前將電容在常溫中放置 16小時 |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
|                                                                                                        | Applied voltage 施加電壓                                                                                                                                                                                                                         | DC voltage with maximum permissible ripple current specified at +105℃ 施加直流電壓與額定紋波電流（所加電壓峰值 [DC+AC] 不超過額定工作電壓） |             |              |                                                                                       |                                                                                   |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
| Shelf Life 高溫儲存壽命                                                                                      | Test conditions    試驗條件                                                                                                                                                                                                                      |                                                                                                               |             |              | Post test requirements at +20℃    試驗後特性應滿足如下要求                                        |                                                                                   |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
|                                                                                                        | Duration 持續時間                                                                                                                                                                                                                                | 1,000 hours                                                                                                   |             |              | Leakage current 漏電流                                                                   |                                                                                   | ≡ Initial specified value 初始規格值                   |                                                   |      |   |   |   |   |   |  |  |  |
|                                                                                                        | Ambient temp. 環境溫度                                                                                                                                                                                                                           | +105℃                                                                                                         |             |              | Cap. Change 靜電容量變化率                                                                   |                                                                                   | within ±25% of initial measured value 初始測試值的±25%內 |                                                   |      |   |   |   |   |   |  |  |  |
|                                                                                                        | Applied voltage 施加電壓                                                                                                                                                                                                                         | (None) 無                                                                                                      |             |              | D.F.(tan δ) 損失角正切值                                                                    |                                                                                   | ≤200% of initial specified value 2倍初始規格值          |                                                   |      |   |   |   |   |   |  |  |  |
|                                                                                                        | ◆(Before the measurements, the capacitor shall be pretreated by applying DC working voltage for 30min, after discharged and then stored under standard atmospheric conditions for 24-48 hours)    測試前應將電容在常溫中施加工作電壓 30分鐘，放電後在標準氣壓下放置 24~48小時 |                                                                                                               |             |              |                                                                                       |                                                                                   |                                                   |                                                   |      |   |   |   |   |   |  |  |  |
| Other 其他                                                                                               | JIS C-5101 (IEC 60384)                                                                                                                                                                                                                       |                                                                                                               |             |              |                                                                                       |                                                                                   |                                                   |                                                   |      |   |   |   |   |   |  |  |  |

### CASE SIZE TABLE 尺寸圖 (Unit: mm)



|    |              |     |     |     |              |     |     |     |
|----|--------------|-----|-----|-----|--------------|-----|-----|-----|
| ΦD | 5            | 6.3 | 8   | 10  | 13           | 16  | 18  | 22  |
| F  | 2.0          | 2.5 | 3.5 | 5.0 | 5.0          | 7.5 | 7.5 | 10  |
| Φd | 0.5          | 0.5 | 0.5 | 0.6 | 0.6          | 0.8 | 0.8 | 0.8 |
| α  | (L < 20) 1.5 |     |     |     | (L ≥ 20) 2.0 |     |     |     |
| β  | (D < 20) 0.5 |     |     |     | (D ≥ 20) 1.0 |     |     |     |

### Multiplier for Ripple Current vs. Frequency 紋波電流頻率修正係數

Frequency Coefficient 頻率係數

| Cap (µF)   | Frequency (HZ) |      |       |         | Frequency (HZ) | 50HZ | 120HZ |
|------------|----------------|------|-------|---------|----------------|------|-------|
|            | 120HZ          | 1KHZ | 10KHZ | K100KHZ | Coefficient    |      |       |
| 5.6-180    | 0.40           | 0.70 | 0.90  | 1.00    |                | 0.45 | 0.55  |
| 220-560    | 0.40           | 0.85 | 0.94  | 1.00    |                |      |       |
| 680-1800   | 0.60           | 0.87 | 0.95  | 1.00    |                | 1KHZ | 10KHZ |
| 2200-3900  | 0.75           | 0.90 | 0.95  | 1.00    |                | 0.75 | 0.90  |
| 4700-18000 | 0.85           | 0.95 | 0.98  | 1.00    |                |      |       |

## ●STANDARD RATINGS

Dimension:ΦDXL(mm)  
 Ripple Current: (mA/rms)at 105 ℃,100KHz; IMP: (Ωmax) at 20 ℃ 100KHz.

| UR(S V)<br>Code |                 | 6.3(7.2)<br>(0J)  |                   | 10(12.5)<br>(1A) |                   |                   | 16(19.2)<br>(1C) |                   |                   |
|-----------------|-----------------|-------------------|-------------------|------------------|-------------------|-------------------|------------------|-------------------|-------------------|
| Item<br>μF      | SIZE<br>DXL(mm) | Impedance<br>Ωmax | Ripple<br>Current | SIZE<br>DXL(mm)  | Impedance<br>Ωmax | Ripple<br>Current | SIZE<br>DXL(mm)  | Impedance<br>Ωmax | Ripple<br>Current |
| 47              |                 |                   |                   |                  |                   |                   | 5*11             | 0.570             | 160               |
| 100             |                 |                   |                   | 5*11             | 0.570             | 180               | 5*11             | 0.400             | 280               |
| 150             |                 |                   |                   | 5*11             | 0.450             | 250               | 6.3*12           | 0.300             | 320               |
| 220             | 6.3*12          | 0.350             | 260               | 6.3*12           | 0.340             | 320               | 6.3*12           | 0.180             | 355               |
| 330             | 6.3*12          | 0.220             | 360               | 6.3*12           | 0.280             | 540               | 8*12             | 0.130             | 650               |
| 470             | 8*12            | 0.180             | 380               | 8*12             | 0.250             | 580               | 8*12             | 0.100             | 750               |
| 560             | 8*12            | 0.170             | 830               | 8*12             | 0.150             | 1210              | 8*16             | 0.100             | 1610              |
| 680             | 8*12            | 0.120             | 900               | 8*16             | 0.095             | 1610              | 10*13            | 0.080             | 1690              |
| 1000            | 10*13           | 0.095             | 1291              | 10*16            | 0.085             | 2073              | 10*16            | 0.055             | 1990              |
| 1500            | 10*17           | 0.053             | 1589              | 10*17            | 0.059             | 2560              | 10*20            | 0.040             | 2520              |
| 2200            | 10*25           | 0.045             | 2800              | 10*25            | 0.036             | 2910              | 13*21            | 0.034             | 2610              |
| 3300            | 13*21           | 0.039             | 2419              | 13*25            | 0.032             | 3060              | 16*25            | 0.028             | 3615              |
| 4700            | 13*25           | 0.028             | 2910              | 13*25            | 0.023             | 3490              | 16*25            | 0.022             | 3650              |
| 5600            | 13*25           | 0.027             | 3091              | 13*25            | 0.027             | 3247              | 16*25            | 0.015             | 3560              |
| 6800            | 16*22           | 0.025             | 3245              | 16*25            | 0.022             | 3526              | 16*36            | 0.012             | 3720              |
|                 |                 |                   |                   |                  |                   |                   | 18*32            | 0.017             | 3920              |
| 8200            | 16*25           | 0.020             | 3640              | 18*32            | 0.019             | 4331              | 18*35            | 0.016             | 4510              |
| 10000           | 18*25           | 0.020             | 4700              | 22*30            | 0.017             | 4823              | 18*40            | 0.015             | 4900              |
| WV(V)<br>(Code) |                 | 25(31.25)<br>(1E) |                   | 35(42)<br>(1V)   |                   |                   | 50(62.5)<br>(1H) |                   |                   |
| Item<br>μF      | SIZE<br>DXL(mm) | Impedance<br>Ωmax | Ripple<br>Current | SIZE<br>DXL(mm)  | Impedance<br>Ωmax | Ripple<br>Current | SIZE<br>DXL(mm)  | Impedance<br>Ωmax | Ripple<br>Current |
| 4.7             | 5*11            | 1.100             | 70                | 5*11             | 1.600             | 82                | 5*11             | 2.000             | 90                |
| 10              | 5*11            | 1.100             | 90                | 5*11             | 1.600             | 100               | 5*11             | 1.800             | 95                |
| 15              | 5*11            | 1.100             | 110               | 5*11             | 1.100             | 120               | 5*11             | 1.600             | 114               |
| 22              | 5*11            | 1.100             | 120               | 5*11             | 1.100             | 160               | 5*12             | 1.400             | 200               |
| 33              | 5*11            | 0.570             | 150               | 5*11             | 0.570             | 180               | 5*11             | 0.400             | 204               |
| 47              | 5*11            | 0.570             | 180               | 5*11             | 0.400             | 295               | 6.3*12           | 0.380             | 240               |
| 68              | 5*11            | 0.420             | 300               | 6.3*12           | 0.390             | 460               | 6.3*12           | 0.360             | 470               |
| 100             | 6.3*12          | 0.350             | 320               | 6.3*12           | 0.220             | 690               | 8*12             | 0.250             | 940               |
| 150             | 8*12            | 0.250             | 690               | 8*12             | 0.150             | 700               | 10*13            | 0.150             | 1270              |
| 220             | 8*12            | 0.150             | 720               | 8*16             | 0.130             | 1610              | 10*13            | 0.120             | 1505              |
|                 |                 |                   |                   | 10*13            | 0.100             | 1670              | 10*17            | 0.120             | 1645              |
| 330             | 10*13           | 0.100             | 1210              | 10*17            | 0.072             | 2073              | 10*20            | 0.081             | 2065              |
| 470             | 10*13           | 0.100             | 1690              | 10*17            | 0.054             | 1900              | 10*20            | 0.070             | 2167              |
|                 | 10*17           | 0.070             | 1895              | 10*20            | 0.051             | 2040              | 13*21            | 0.058             | 2210              |
| 680             | 10*20           | 0.055             | 2194              | 10*20            | 0.042             | 2632              | 13*21            | 0.050             | 2325              |
|                 |                 |                   |                   | 13*21            | 0.042             | 3115              |                  |                   |                   |
| 1000            | 10*20           | 0.051             | 2520              | 13*25            | 0.033             | 3000              | 16*25            | 0.035             | 3000              |
|                 | 13*21           | 0.040             | 2982              |                  |                   |                   |                  |                   |                   |
| 2200            | 16*25           | 0.027             | 3250              | 16*21            | 0.022             | 3330              | 18*36            | 0.029             | 3426              |
| 3300            | 16*32           | 0.023             | 3650              | 18*25            | 0.020             | 3789              | 22*30            | 0.020             | 4002              |
|                 | 18*25           | 0.024             | 3762              | 18*36            | 0.019             | 3890              |                  |                   |                   |
| 4700            | 18*36           | 0.019             | 4110              | 22*30            | 0.019             | 4300              |                  |                   |                   |
| 6800            | 18*36           | 0.011             | 4200              |                  |                   |                   |                  |                   |                   |
| 8200            | 18*40           | 0.010             | 4326              |                  |                   |                   |                  |                   |                   |

Specifications are subject to change without notice. Should a safety or technical concern arise regarding the product please be sure to contact our sales offices or agents immediately

## ●STANDARD RATINGS

Dimension:ΦDXL(mm)

Ripple Current: (mA/rms)at 105 ℃,100KHz; IMP: (Ωmax) at 20 ℃ 100KHz.

| WV(V)<br>(Code) | 63(78.75)<br>(1J)  |                   |                   | 100(115)<br>(2A)  |                   |                   | 160(200)<br>(2C) |                   | 200(250)<br>(2D) |                   |
|-----------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|-------------------|------------------|-------------------|
| Item<br>μF      | SIZE<br>DXL(mm)    | Impedance<br>Ωmax | Ripple<br>Current | SIZE<br>DXL(mm)   | Impedance<br>Ωmax | Ripple<br>Current | SIZE<br>DXL(mm)  | Ripple<br>Current | SIZE<br>DXL(mm)  | Ripple<br>Current |
| 0.47            | 5*11               | 3.000             | 22                | 5*11              | 3.000             | 23                | 5*11             | 75                | 5*11             | 70                |
| 1               | 5*11               | 3.000             | 33                | 5*11              | 3.000             | 34                | 6.3*12           | 80                | 6.3*12           | 90                |
| 2.2             | 5*11               | 3.000             | 44                | 5*11              | 3.000             | 46                | 8*12             | 80                | 8*12             | 95                |
| 3.3             | 5*11               | 3.000             | 58                | 5*11              | 1.500             | 61                | 8*12             | 90                | 8*12             | 97                |
| 4.7             | 5*11               | 3.000             | 97                | 5*11              | 1.500             | 100               | 8*12             | 98                | 8*12             | 102               |
| 6.8             | 5*11               | 1.500             | 102               | 5*11              | 1.500             | 110               | 8*12             | 100               | 8*12             | 115               |
| 10              | 5*11               | 1.500             | 110               | 6.3*12            | 1.500             | 120               | 10*13            | 230               | 10*13            | 237               |
| 15              | 6.3*12             | 1.200             | 250               | 8*12              | 0.900             | 360               | 10*17            | 430               | 10*17            | 389               |
| 22              | 6.3*12             | 1.000             | 260               | 8*12              | 0.640             | 390               | 10*17            | 510               | 10*17            | 400               |
| 47              | 6.3*12             | 0.500             | 430               | 10*17             | 0.400             | 560               | 13*17            | 620               | 13*17            | 550               |
| 100             | 10*13              | 0.255             | 1027              | 10*20             | 0.200             | 740               | 16*26            | 900               | 16*26            | 620               |
| 150             | 10*17              | 0.220             | 1200              | 13*21             | 0.150             | 790               | 16*32            | 1050              | 16*32            | 620               |
| 220             | 10*20              | 0.120             | 1689              | 13*25             | 0.130             | 880               | 18*35            | 1190              | 18*35            | 673               |
| 330             | 13*17              | 0.081             | 1947              | 16*30             | 0.066             | 1410              | 18*35            | 1250              | 22*40            | 1030              |
|                 | 13*21              | 0.090             | 2130              | 18*22             | 0.060             | 1510              |                  |                   |                  |                   |
| 470             | 13*25              | 0.070             | 2450              | 18*22             | 0.050             | 1650              | 22*40            | 1450              |                  |                   |
| 680             | 16*25              | 0.060             | 2946              | 18*36             | 0.049             | 1720              |                  |                   |                  |                   |
| 1000            | 16*30              | 0.039             | 3150              | 18*40             | 0.047             | 2000              |                  |                   |                  |                   |
|                 | 18*22              | 0.043             | 2866              | 22*36             | 0.040             | 3120              |                  |                   |                  |                   |
| 1500            | 18*25              | 0.035             | 2930              |                   |                   |                   |                  |                   |                  |                   |
| 2200            | 18*36              | 0.034             | 3477              |                   |                   |                   |                  |                   |                  |                   |
| 3300            | 22*40              | 0.020             | 3862              |                   |                   |                   |                  |                   |                  |                   |
| WV(V)<br>(Code) | 250(312.5)<br>(2E) |                   | 300(350)<br>(2X)  |                   | 350(400)<br>(2V)  |                   | 400(450)<br>(2G) |                   | 450(500)<br>(2W) |                   |
| Item<br>μF      | SIZE<br>DXL(mm)    | Ripple<br>Current | SIZE<br>DXL(mm)   | Ripple<br>Current | SIZE<br>DXL(mm)   | Ripple<br>Current | SIZE<br>DXL(mm)  | Ripple<br>Current | SIZE<br>DXL(mm)  | Ripple<br>Current |
| 1               | 6.3*12             | 70                | 6.3*12            | 71                | 6.3*12            | 64                | 6.3*12           | 68                | 6.3*12           | 77                |
| 2.2             | 8*12               | 80                | 8*12              | 83                | 8*12              | 66                | 8*12             | 85                | 8*12             | 90                |
| 3.3             | 8*12               | 86                | 8*12              | 88                | 8*12              | 85                | 8*12             | 89                | 8*12             | 95                |
| 4.7             | 8*12               | 93                | 10*13             | 110               | 10*13             | 120               | 10*13            | 122               | 10*13            | 130               |
|                 |                    |                   |                   |                   |                   |                   |                  |                   | 10*17            | 139               |
| 6.8             | 8*12               | 101               | 10*13             | 122               | 10*13             | 140               | 10*13            | 161               | 10*17            | 205               |
| 10              | 10*17              | 190               | 10*17             | 205               | 10*17             | 228               | 10*17            | 270               | 13*21            | 330               |
|                 |                    |                   |                   |                   |                   |                   | 13*17            | 290               |                  |                   |
| 15              | 10*17              | 290               | 10*20             | 295               | 10*20             | 295               | 13*17            | 330               | 13*21            | 395               |
| 22              | 10*17              | 470               | 13*17             | 480               | 13*17             | 480               | 13*21            | 405               | 16*22            | 410               |
| 33              | 13*21              | 500               | 16*22             | 505               | 16*22             | 510               | 16*22            | 552               | 16*25            | 604               |
| 47              | 13*21              | 560               | 16*25             | 565               | 16*25             | 580               | 16*25            | 781               | 18*25            | 809               |
| 56              | 13*25              | 620               | 16*25             | 630               | 16*25             | 633               | 18*25            | 783               | 18*30            | 815               |
| 68              | 16*25              | 834               | 18*25             | 840               | 18*25             | 850               | 18*25            | 871               | 18*32            | 1000              |
|                 | 16*30              | 903               |                   |                   |                   |                   | 18*32            | 960               | 18*35            | 1150              |
| 100             | 18*25              | 1087              | 18*30             | 1068              | 18*30             | 1068              | 18*35            | 1319              | 18*40            | 1400              |
| 150             | 18*30              | 1277              | 18*40             | 1424              | 18*40             | 1400              | 22*35            | 1476              | 22*40            | 1565              |
| 220             | 18*40              | 1214              | 18*40             | 1900              | 18*40             | 1900              |                  |                   |                  |                   |
|                 | 22*35              | 1432              |                   |                   |                   |                   |                  |                   |                  |                   |

Specifications are subject to change without notice. Should a safety or technical concern arise regarding the product please be sure to contact our sales offices or agents immediately