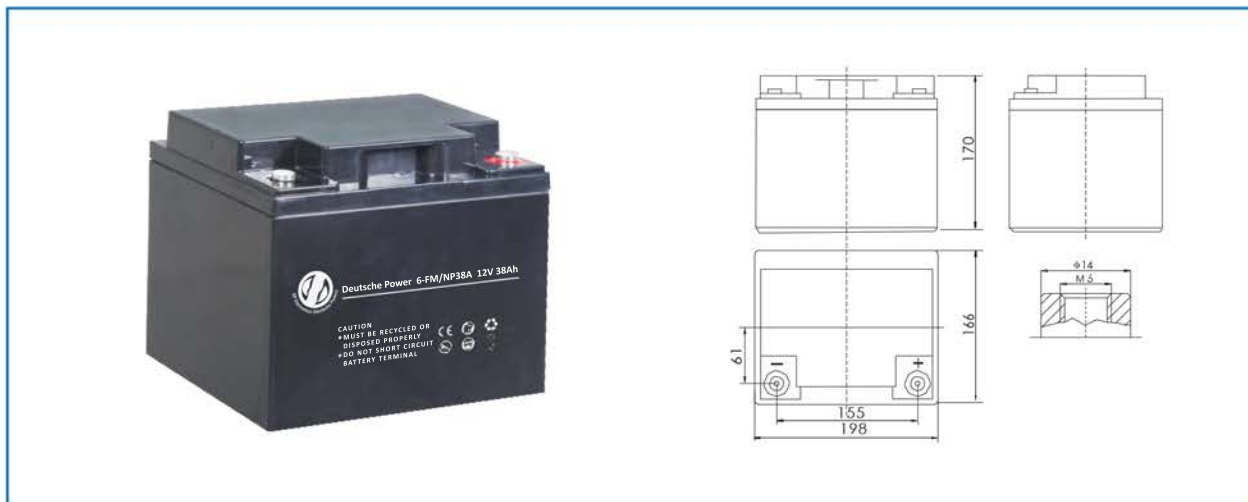


# 6-FM/NP38A

FM/NP Battery Series (General Use Battery)



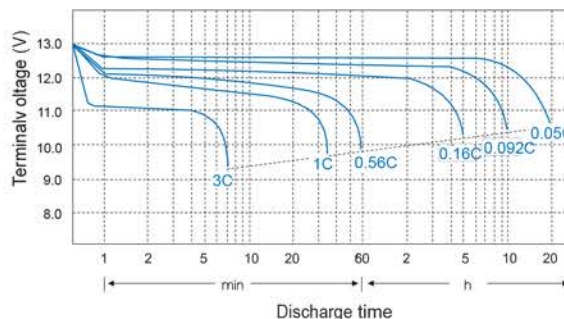
## Specifications

|                               |                               |                    |
|-------------------------------|-------------------------------|--------------------|
| Nominal Voltage               | 12V                           |                    |
| Rated Capacity (20 hour rate) | 38Ah                          |                    |
| Dimensions                    | Total Height (with terminals) | 6.70 inches(170mm) |
|                               | Height                        | 6.70 inches(170mm) |
|                               | length                        | 7.80 inches(198mm) |
|                               | width                         | 6.54 inches(166mm) |
| Weight                        | Approx.26.4 Pound(12.0kg)     |                    |

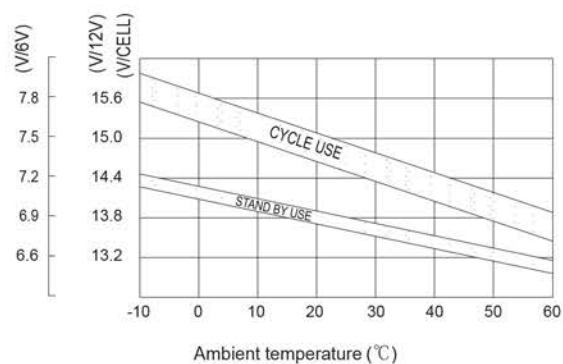
## Characteristics

|   |                                    |  |
|---|------------------------------------|--|
| Capacity<br>77°F(25°C)                            | 20 hour rate (1.90A)               | 38.0 Ah  |
|   | 10 hour rate (3.42A)               | 34.2 Ah  |
|   | 5 hour rate (6.08A)                | 30.4 Ah  |
|   | 1hour rate (22.8A)                 | 22.8 Ah  |
|   | 15Minute Rate (62.7A)              | 15.7 Ah  |
| Internal Resistance                               | Full charged Battery<br>77°F(25°C) | 8 MΩ   |
|   | 104°F(40°C)                        | 102%   |
| Capacity affected by<br>Temperature (20hour rate) | 77°F(25°C)                         | 100%   |
|   | °F(0°C)                            | 85%  |
|   | 5°F(-15°C)                         | 65%  |
| Self-Discharge<br>77°F(25°C)                      | Capacity after 3 month storage     | 91%  |
|   | Capacity after 6 month storage     | 81%  |
|   | Capacity after 12 month storage    | 60%  |
| Max. Discharge Current<br>77°F(25°C)              | 380A(5S)                           |  |
| Terminal  | M1                                 |  |
| Charge<br>(Constant Voltage)                      | Cycle                              | Initial Charging Current less than 11.4A<br>Voltage 14.4~14.7 V / 77°F(25°C) |
|   | Float                              | Voltage 13.5~13.8V / 77°F(25°C)  |

## Discharge Curves 77°F(25°C)



## Relationship between charge voltage and temperature



## Constant Current Discharge (AMPERES @25°C)

| F.V/Time | 5Min | 10Min | 15Min | 30Min | 60Min | 2H   | 3H   | 4H   | 5H   | 10H  | 20H  |
|----------|------|-------|-------|-------|-------|------|------|------|------|------|------|
| 1.65     | 108  | 77.6  | 60.8  | 38.3  | 28.7  | 22.3 | 13.4 | 9.79 | 6.47 | 3.86 | 1.76 |
| 1.70     | 103  | 73.1  | 57.3  | 36.2  | 26.9  | 21.3 | 13.0 | 9.50 | 6.21 | 3.72 | 1.69 |
| 1.80     | 81.0 | 61.2  | 48.9  | 33.3  | 24.8  | 20.7 | 12.5 | 9.03 | 5.92 | 3.50 | 1.59 |

## Constant Power Discharge (WATTS PER CELL@25°C)

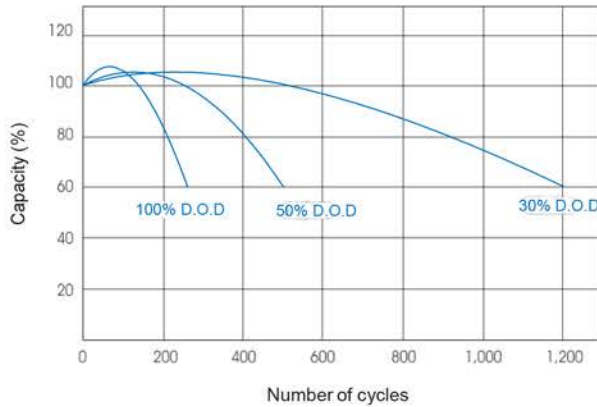
| Cut off voltage V/cell | 5min | 10min | 15min | 30min | 45min | 1h   | 2h   | 3h   | 5h    | 10h  | 24h  |
|------------------------|------|-------|-------|-------|-------|------|------|------|-------|------|------|
| 1.6                    | 198  | 143   | 113.0 | 70.2  | 52.7  | 44.6 | 25.3 | 18.0 | 12.1  | 6.76 | 2.92 |
| 1.65                   | 189  | 139   | 110.0 | 69.7  | 52.3  | 43.2 | 24.5 | 17.8 | 11.9  | 6.70 | 2.90 |
| 1.67                   | 186  | 137   | 108.0 | 68.8  | 51.3  | 42.6 | 24.4 | 17.7 | 11.8  | 6.62 | 2.87 |
| 1.7                    | 184  | 135   | 106.0 | 67.6  | 50.4  | 41.9 | 24.2 | 17.5 | 11.6  | 6.56 | 2.81 |
| 1.75                   | 171  | 127   | 102.0 | 67.4  | 49.6  | 41.6 | 24.0 | 17.4 | 11.5  | 6.50 | 2.76 |
| 1.8                    | 151  | 117   | 94.1  | 64.1  | 47.8  | 40.9 | 23.6 | 17.0 | 11.3  | 6.28 | 2.68 |
| 1.85                   | 121  | 96.9  | 82.7  | 58.3  | 45.4  | 38   | 22.7 | 16.5 | 10.70 | 6.00 | 2.60 |

# 6-FM/NP38A

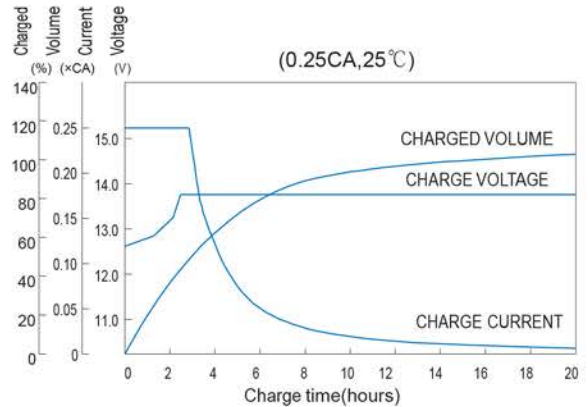
FM/NP Battery Series (General Use Battery)

The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, Deutsche Power battery should be fully charged before storage.

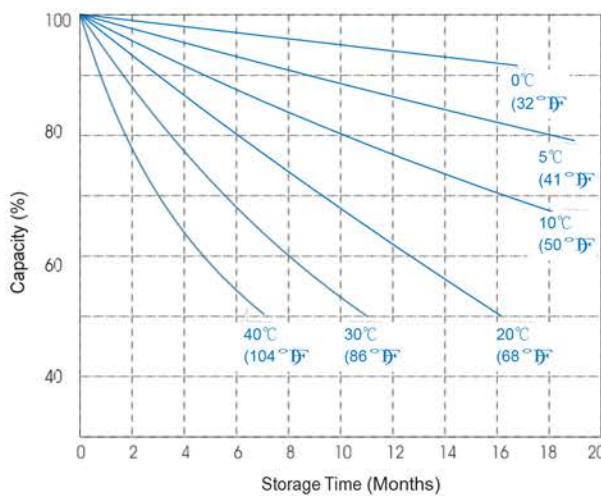
## Cycle service life in relation to depth of discharge



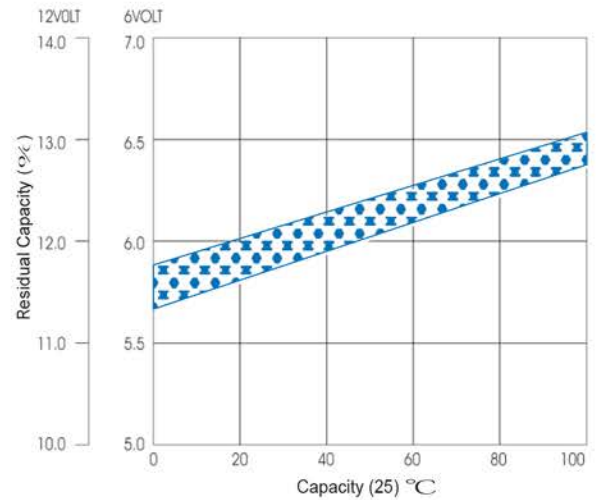
## Constant voltage charge characteristic



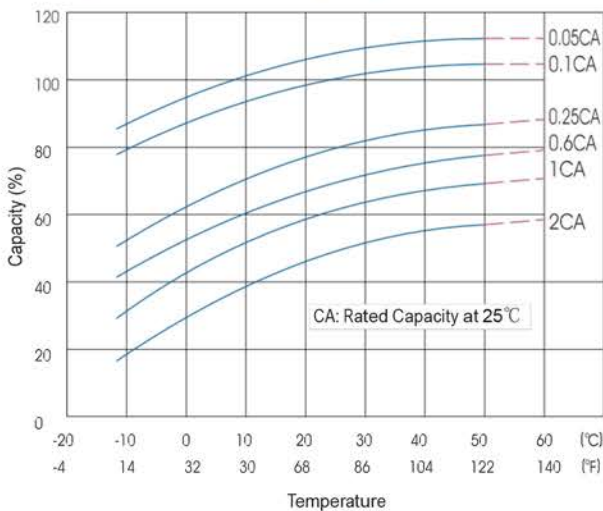
## Self-Discharge Characteristics



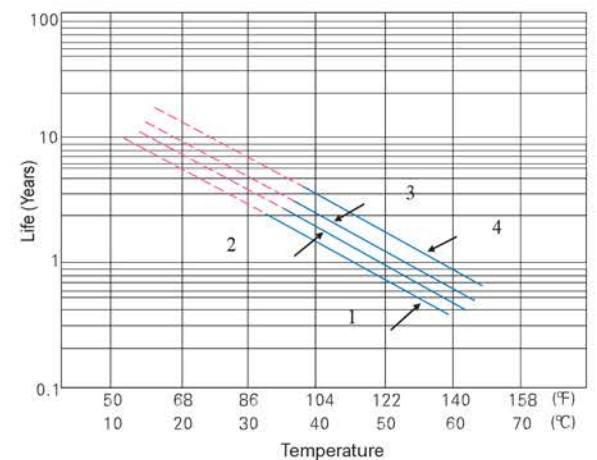
## Relationship of OCV and Residual Capacity % (25°C)



## Temperature effects on capacity



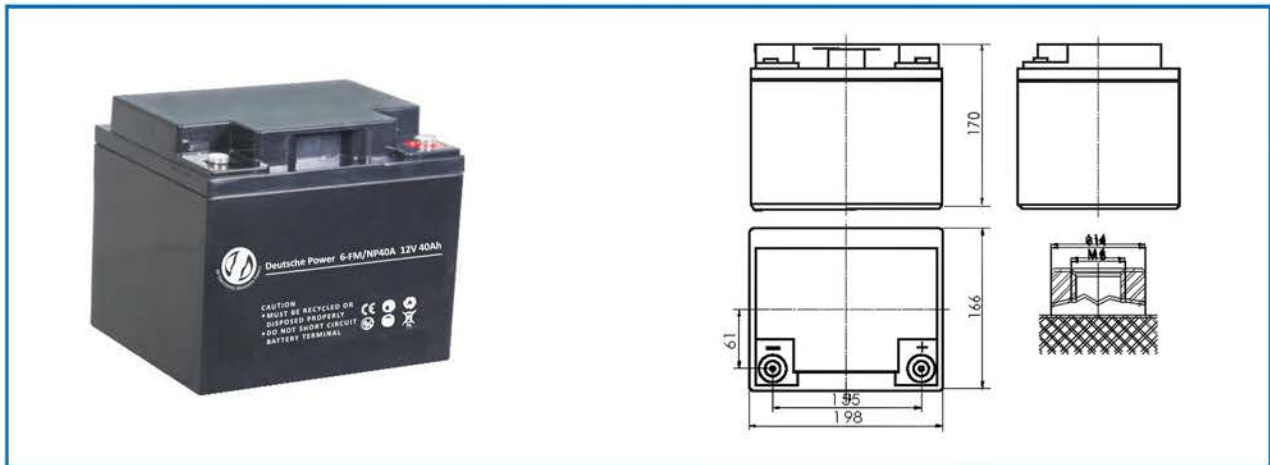
## Temperature effects float life





# 6-FM/NP40A

FM/NP Battery Series (General Use Battery)



## Specifications

|                              |                               |                            |
|------------------------------|-------------------------------|----------------------------|
| Nominal Voltage              |                               | 12V                        |
| Rated Capacity(20 hour rate) |                               | 40Ah                       |
| Dimensions                   | Total Height (with terminals) | 6.70inches (170mm)         |
|                              | Height                        | 6.70inches (170mm)         |
|                              | Length                        | 7.80inches (198mm)         |
|                              | Width                         | 6.54inches (166mm)         |
| Weight                       |                               | Approx. 30.18pound(13.7kg) |

## Characteristics

|  |                                 |  |
|--|---------------------------------|--|
| Capacity<br>77°F(25°C)                             |                                 | 40.0Ah                                   |
|  |                                 | 36.0Ah                                   |
|  |                                 | 32.0Ah                                   |
|  |                                 | 24.0Ah                                   |
|  |                                 | 16.5Ah                                   |
| Internal Resistance                                | Full charged Battery 77°F(25°C) | 7mΩ                                      |
| Capacity affected by<br>Temperature (20 hour rate) | 104°F(40°C)                     | 102%                                     |
|  | 77°F(25°C)                      | 100%                                     |
|  | 32°F(0°C)                       | 85%                                      |
|  | 5°F(-15°C)                      | 65%                                      |
| Self-Discharge<br>77°F(20°C)                       | Capacity after 3 month storage  | 91%                                      |
|  | Capacity after 6 month storage  | 81%                                      |
|  | Capacity after 12 month storage | 60%                                      |
| Max. Discharge<br>Current 77°F(25°C)               | 400A(5S)                        |  |
| Terminal   | M1                              |  |
| Charge<br>(Constant Voltage)                       | Cycle                           | Initial Charging Current less than 12.0A |
|  |                                 | Voltage 14.4~14.7V/77°F(25°C)            |
|  | Float                           | Voltage 13.5~13.8V/77°F(25°C)            |

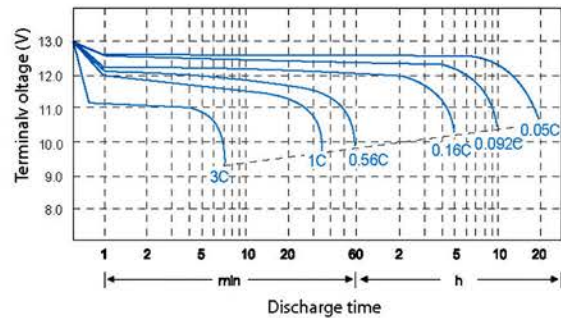
## Constant Current Discharge (AMPERES @25°C)

| F.V/Time | 10Min | 15Min | 30Min | 45Min | 1Hour | 2Hour | 3Hour | 5Hour | 8Hour | 10Hour | 12Hour | 24Hour |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| 1.65     | 81.7  | 64.0  | 40.3  | 30.2  | 23.5  | 14.1  | 10.3  | 6.81  | 4.53  | 4.06   | 3.24   | 1.86   |
| 1.70     | 77.0  | 60.3  | 38.1  | 28.3  | 22.5  | 13.7  | 10.0  | 6.54  | 4.36  | 3.91   | 3.11   | 1.78   |
| 1.80     | 64.4  | 51.5  | 35.1  | 26.1  | 21.8  | 13.2  | 9.51  | 6.23  | 4.08  | 3.68   | 2.92   | 1.68   |

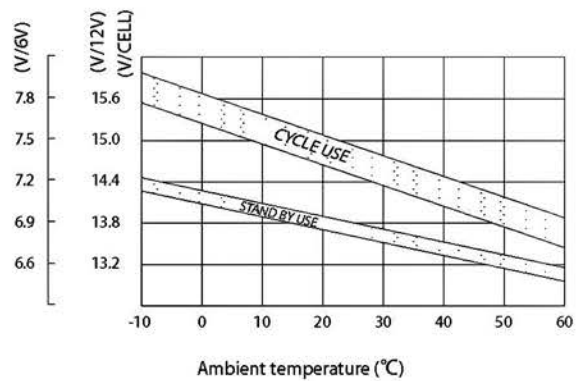
## Constant Power Discharge (WATTS PER CELL@25°C)

| F.V/Time | 10Min | 15Min | 30Min | 45Min | 1Hour | 2Hour | 3Hour | 5Hour | 8Hour | 10Hour | 12Hour | 24Hour |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| 1.60     | 150   | 119   | 73.9  | 55.5  | 46.9  | 26.6  | 18.9  | 12.7  | 8.42  | 7.12   | 6.09   | 3.07   |
| 1.65     | 146   | 116   | 73.4  | 55.0  | 45.5  | 25.8  | 18.7  | 12.5  | 8.36  | 7.05   | 6.00   | 3.05   |
| 1.67     | 144   | 114   | 72.4  | 54.0  | 44.8  | 25.7  | 18.6  | 12.4  | 8.27  | 6.97   | 5.94   | 3.02   |
| 1.70     | 142   | 112   | 71.2  | 53.1  | 44.1  | 25.5  | 18.4  | 12.2  | 8.16  | 6.91   | 5.86   | 2.96   |
| 1.75     | 134   | 107   | 70.9  | 52.2  | 43.8  | 25.3  | 18.3  | 12.1  | 8.08  | 6.84   | 5.71   | 2.91   |
| 1.80     | 123   | 99.0  | 67.5  | 50.3  | 43.0  | 24.8  | 17.9  | 11.9  | 7.81  | 6.61   | 5.60   | 2.82   |
| 1.85     | 102   | 87.0  | 61.4  | 47.8  | 40.0  | 23.9  | 17.4  | 11.3  | 7.59  | 6.32   | 5.39   | 2.74   |

## Discharge Curves 77°F(25°C)



## Relationship between charge voltage and temperature

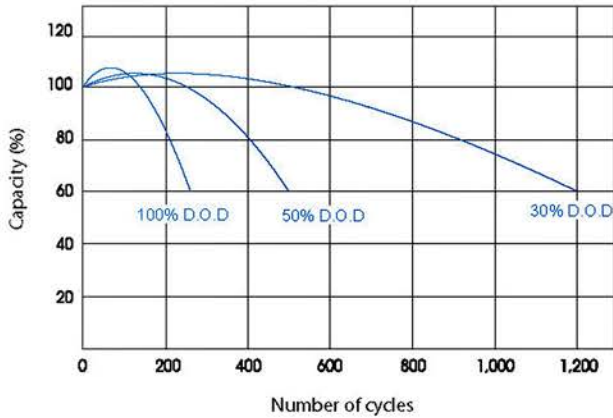


# 6-FM/NP40A

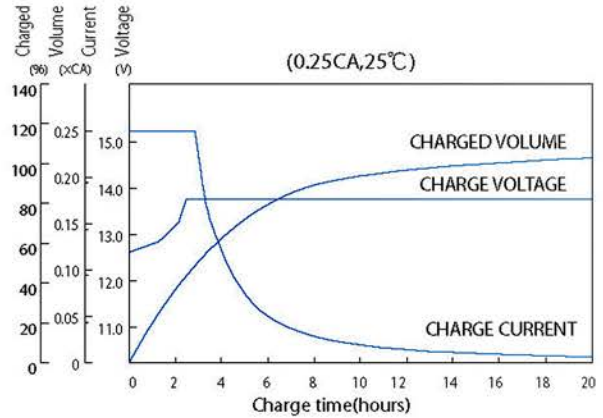
FM/NP Battery Series (General Use Battery)

The operating environment temperature above 40°C should be avoided, after long term storage. The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, Deutsche Power battery should be fully charged before storage.

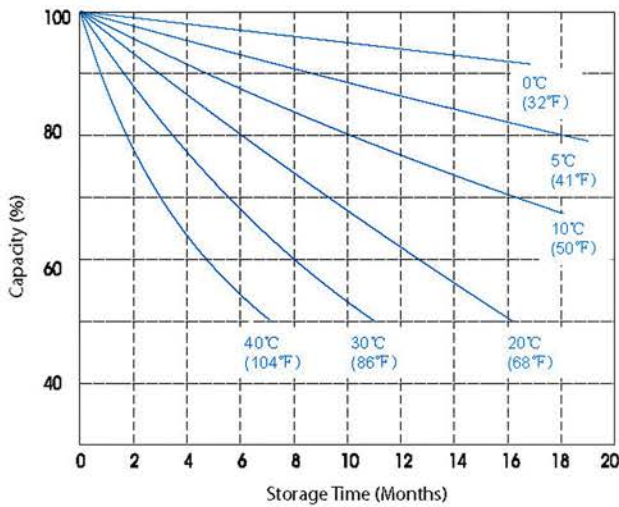
## Cycle service life in relation to depth of discharge



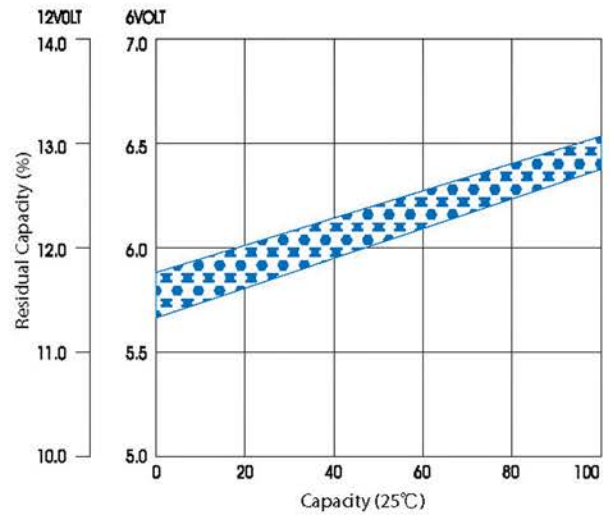
## Constant voltage charge characteristic



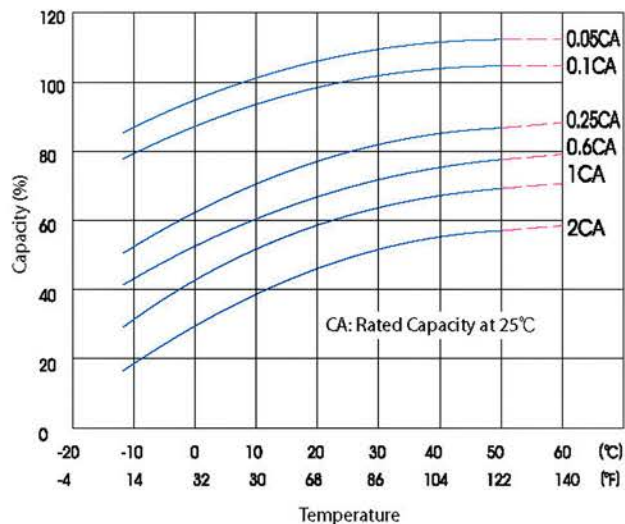
## Self-Discharge Characteristics



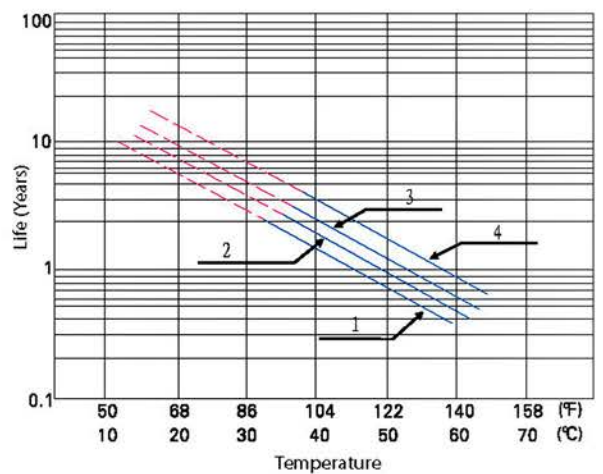
## Relationship of OCV and Residual Capacity % (25°C)



## Temperature effects on capacity



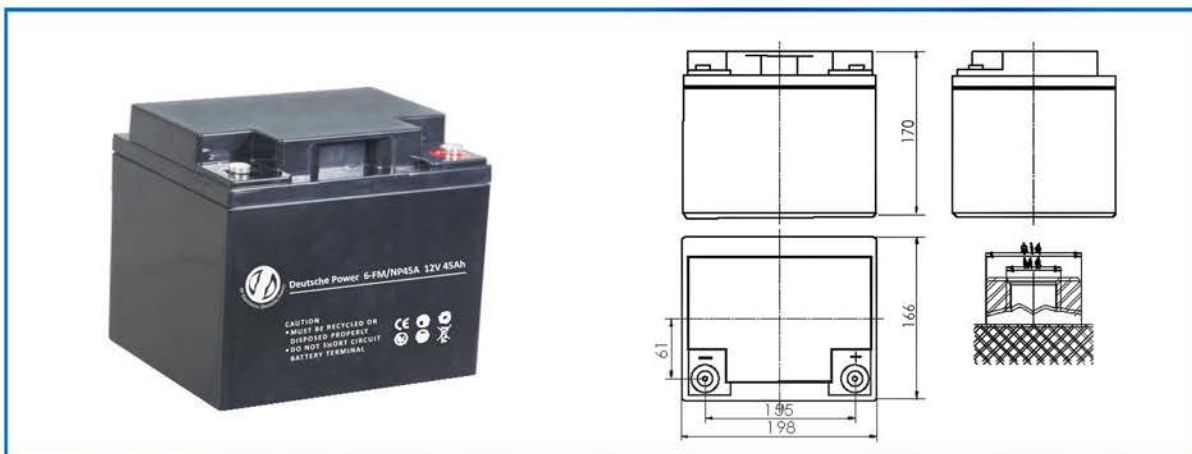
## Temperature effects float life





# 6-FM/NP45A

FM/NP Battery Series (General Use Battery)



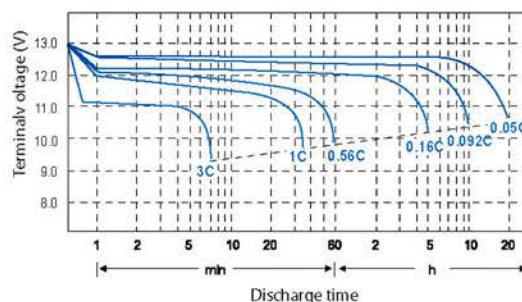
## Specifications

|                              |                               |                            |
|------------------------------|-------------------------------|----------------------------|
| Nominal Voltage              |                               | 12V                        |
| Rated Capacity(20 hour rate) |                               | 45Ah                       |
| Dimensions                   | Total Height (with terminals) | 6.70inches (170mm)         |
|                              | Height                        | 6.70inches (170mm)         |
|                              | Length                        | 7.80inches (198mm)         |
|                              | Width                         | 6.54inches (166mm)         |
| Weight                       |                               | Approx. 30.36pound(13.8kg) |

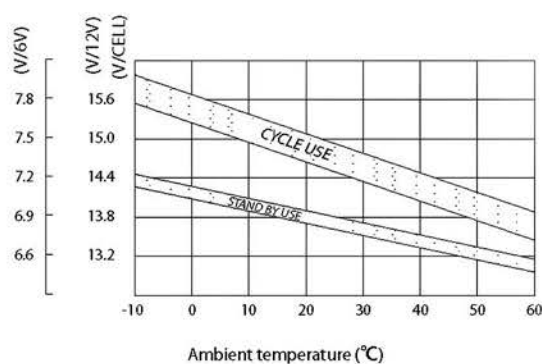
## Characteristics

|  |                                 |  |
|--|---------------------------------|--|
| Capacity<br>77°F(25°C)                             | 20 hour rate (2.25A)            | 45.0Ah                                   |
|  | 10 hour rate (4.05A)            | 40.5Ah                                   |
|  | 5 hour rate (7.20A)             | 36.0Ah                                   |
|  | 1 hour rate (27.0A)             | 27.0Ah                                   |
|  | 15 minute Rate (74.4A)          | 18.6Ah                                   |
| Internal Resistance                                | Full charged Battery 77°F(25°C) | 6.5mΩ                                    |
| Capacity affected by<br>Temperature (20 hour rate) | 104°F(40°C)                     | 102%                                     |
|  | 77°F(25°C)                      | 100%                                     |
|  | 32°F(0°C)                       | 85%                                      |
|  | 5°F(-15°C)                      | 65%                                      |
| Self-Discharge<br>77°F(20°C)                       | Capacity after 3 month storage  | 91%                                      |
|  | Capacity after 6 month storage  | 81%                                      |
|  | Capacity after 12 month storage | 60%                                      |
| Max. Discharge<br>Current 77°F(25°C)               | 450A(5S)                        |  |
| Terminal   | M1                              |  |
| Charge<br>(Constant Voltage)                       | Cycle                           | Initial Charging Current less than 13.5A |
|  |                                 | Voltage 14.4~14.7V/77°F(25°C)            |
|  | Float                           | Voltage 13.5~13.8V/77°F(25°C)            |

## Discharge Curves 77°F (25 °C)



## Relationship between charge voltage and temperature



## Constant Current Discharge (AMPERES @25 °C)

| F.V/Time | 10Min | 15Min | 30Min | 45Min | 1Hour | 2Hour | 3Hour | 5Hour | 8Hour | 10Hour | 12Hour | 24Hour |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| 1.65     | 97.7  | 75.6  | 45.9  | 36.0  | 24.39 | 17.01 | 11.75 | 7.88  | 5.58  | 4.41   | 3.78   | 1.95   |
| 1.70     | 92.3  | 70.7  | 39.1  | 34.1  | 23.36 | 16.61 | 11.25 | 7.61  | 5.36  | 4.32   | 3.67   | 1.91   |
| 1.80     | 77.9  | 61.7  | 35.3  | 32.2  | 22.23 | 15.89 | 10.62 | 7.20  | 5.04  | 4.14   | 3.57   | 1.88   |

## Constant Power Discharge (WATTS PER CELL@25°C)

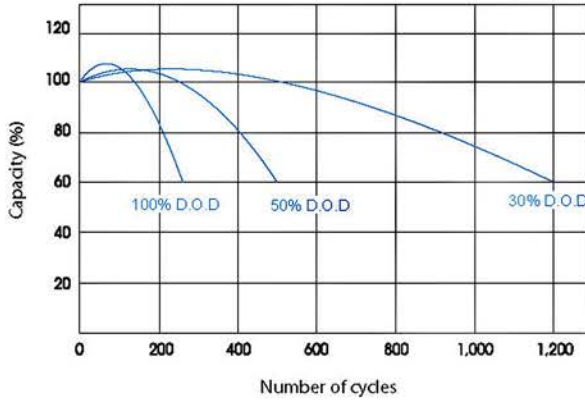
| F.V/Time | 10Min | 15Min | 30Min | 45Min | 1Hour | 2Hour | 3Hour | 5Hour | 8Hour | 10Hour | 12Hour | 24Hour |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| 1-60     | 169   | 134   | 83.1  | 62.4  | 52.8  | 29.9  | 21.3  | 14.3  | 9.47  | 8.01   | 6.85   | 3.45   |
| 1-65     | 164   | 131   | 82.6  | 61.9  | 51.2  | 29.0  | 21.0  | 14.1  | 9.41  | 7.93   | 6.75   | 3.43   |
| 1-67     | 162   | 128   | 81.5  | 60.8  | 50.4  | 28.9  | 20.9  | 14.0  | 9.30  | 7.84   | 6.68   | 3.40   |
| 1-70     | 160   | 126   | 80.1  | 59.7  | 49.6  | 28.7  | 20.7  | 13.7  | 9.18  | 7.77   | 6.59   | 3.33   |
| 1-75     | 151   | 120   | 79.8  | 58.7  | 49.3  | 28.5  | 20.6  | 13.6  | 9.09  | 7.70   | 6.42   | 3.27   |
| 1-80     | 138   | 111   | 75.9  | 56.6  | 48.4  | 27.9  | 20.1  | 13.4  | 8.79  | 7.44   | 6.30   | 3.17   |
| 1-85     | 115   | 99.0  | 69.1  | 53.8  | 45.0  | 26.9  | 19.6  | 12.7  | 8.54  | 7.11   | 6.06   | 3.08   |

# 6-FM/NP45A

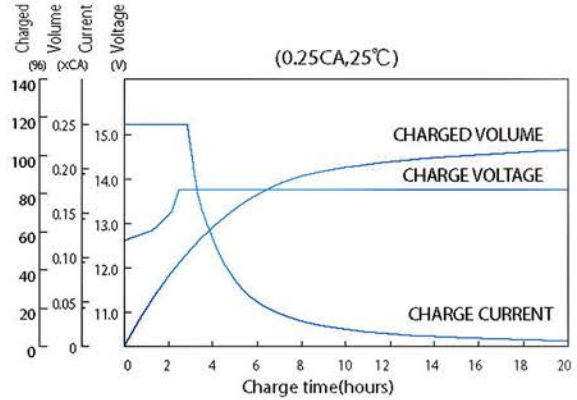
FM/NP Battery Series (General Use Battery)

The operating environment temperature above 40°C should be avoided, after long term storage. The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, Deutsche Power battery should be fully charged before storage.

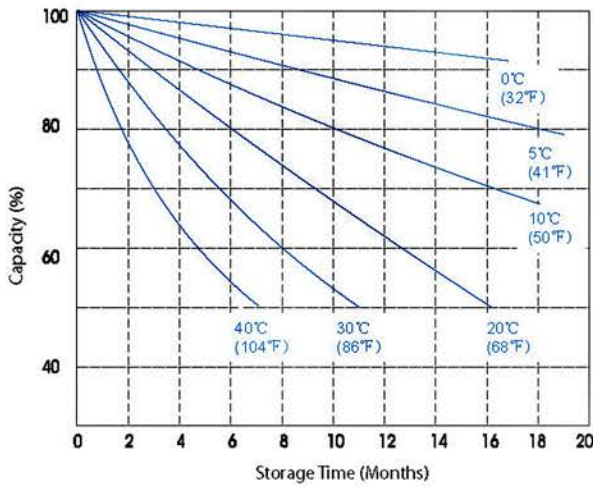
## Cycle service life in relation to depth of discharge



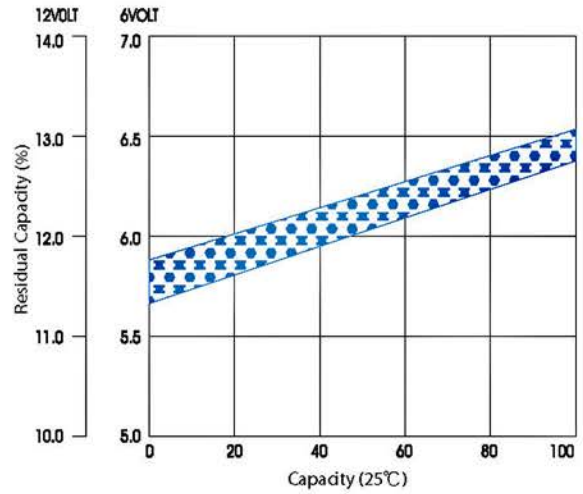
## Constant voltage charge characteristic



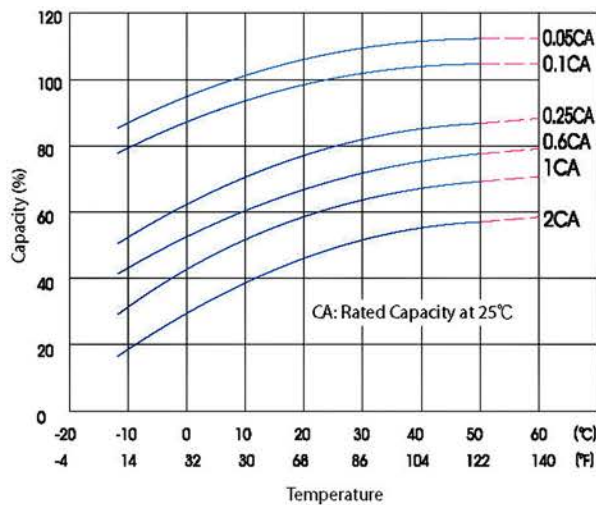
## Self-Discharge Characteristics



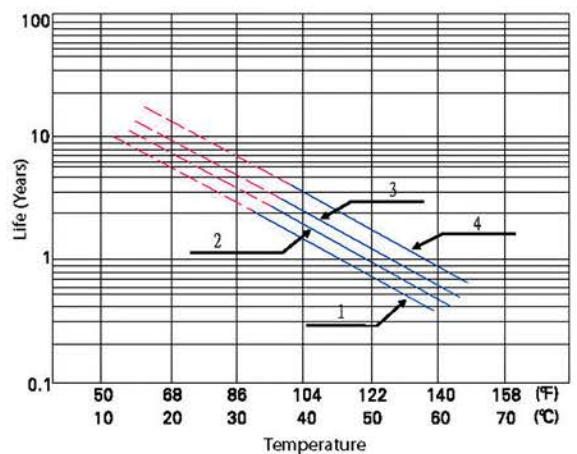
## Relationship of OCV and Residual Capacity % (25°C)



## Temperature effects on capacity



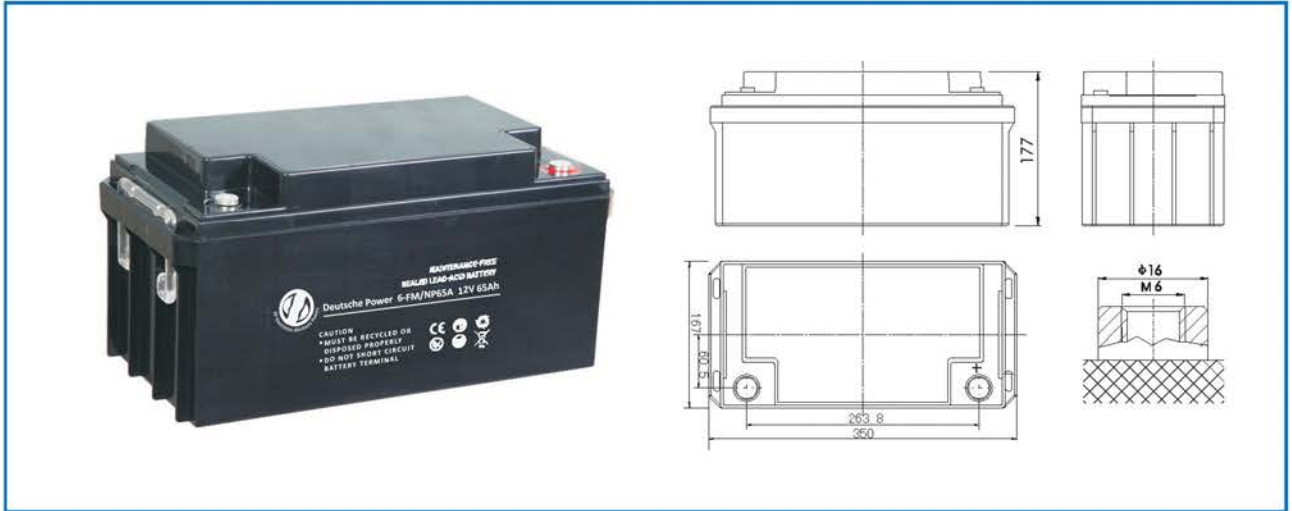
## Temperature effects float life





# 6-FM/NP65A

FM/NP Battery Series (General Use Battery)



## Specifications

|                               |                               |                    |
|-------------------------------|-------------------------------|--------------------|
| Nominal Voltage               | 12V                           |                    |
| Rated Capacity (20 hour rate) | 65Ah                          |                    |
| Dimensions                    | Total Height (with terminals) | 6.97 inches(177mm) |
|                               | Height                        | 6.97 inches(177mm) |
|                               | length                        | 13.8 inches(350mm) |
|                               | width                         | 6.57 inches(167mm) |
| Weight                        | Approx.44.0 Pound(20.0kg)     |                    |

## Characteristics

|   |                                     |  |
|---|-------------------------------------|--|
| Capacity<br>77°F (25°C)                           | 20 hour rate (3.25A)                | 65 Ah  |
|   | 10 hour rate (6.10A)                | 61 Ah  |
|   | 5 hour rate (10.4A)                 | 52 Ah  |
|   | 1 hour rate (39.0A)                 | 39 Ah  |
|   | 15Minute Rate (107A)                | 26.8 Ah  |
| Internal Resistance                               | Full charged Battery<br>77°F (25°C) | 7.5 MΩ   |
|   | 104°F (40°C)                        | 102%   |
| Capacity affected by<br>Temperature (20hour rate) | 77°F (25°C)                         | 100%   |
|   | °F (0°C)                            | 85%  |
| Self-Discharge<br>77°F (25°C)                     | 5°F (-15°C)                         | 65%  |
|   | Capacity after 3 month storage      | 91%  |
|   | Capacity after 6 month storage      | 81%  |
| Capacity after 12 month storage                   | 60%                                 |  |
| Max. Discharge Current<br>77°F (25°C)             | 650A(5S)                            |  |
| Terminal  | M2 / B5 / B11                       |  |
| Charge<br>(Constant Voltage)                      | Cycle                               | Initial Charging Current less than 19.5A<br>Voltage 14.4~14.7V / 77°F (25°C) |
|   | Float                               | Voltage 13.5~13.8V / 77°F (25°C)   |

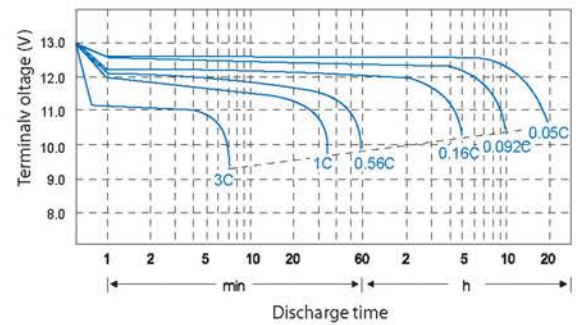
## Constant Current Discharge (AMPERES @25°C)

| F.V/Time | 5Min | 10Min | 15Min | 30Min | 60Min | 2H   | 3H   | 4H   | 5H   | 10H  | 20H  |
|----------|------|-------|-------|-------|-------|------|------|------|------|------|------|
| 1.65     | 197  | 140   | 106   | 68.2  | 51.7  | 35.0 | 24.4 | 16.6 | 11.3 | 6.53 | 2.85 |
| 1.70     | 184  | 133   | 101   | 64.8  | 48.8  | 34.1 | 23.5 | 16.3 | 10.9 | 6.26 | 2.78 |
| 1.80     | 146  | 112   | 88.4  | 54    | 46.1  | 33.6 | 22.5 | 15.3 | 10.5 | 5.98 | 2.72 |

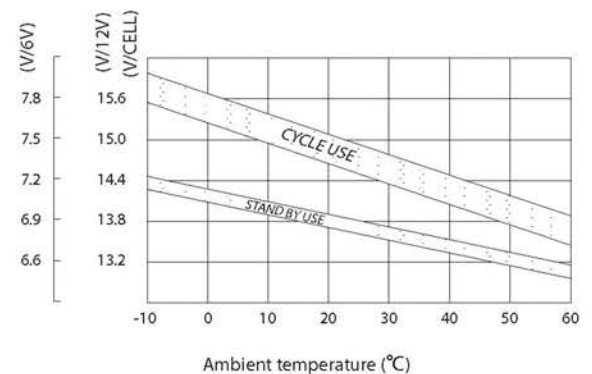
## Constant Power Discharge (WATTS PER CELL@25°C)

| Cut off voltage V/cell | 5min | 10min | 15min | 30min | 45min | 1h   | 2h   | 3h   | 5h   | 10h   | 24h  |
|------------------------|------|-------|-------|-------|-------|------|------|------|------|-------|------|
| 1.60                   | 359  | 254   | 194   | 127   | 95.2  | 77.2 | 45.3 | 31.8 | 20.9 | 11.8  | 5.35 |
| 1.65                   | 343  | 251   | 192   | 124   | 94.3  | 76.4 | 44.7 | 31.5 | 20.7 | 11.6  | 5.33 |
| 1.67                   | 341  | 250   | 190   | 123   | 92.9  | 75.6 | 44.2 | 31.4 | 20.6 | 11.5  | 5.31 |
| 1.70                   | 328  | 246   | 187   | 121   | 91.5  | 75.0 | 43.6 | 31.2 | 20.3 | 11.3  | 5.29 |
| 1.75                   | 305  | 230   | 182   | 111   | 90.0  | 74.8 | 43.1 | 30.8 | 20.1 | 11.20 | 5.27 |
| 1.80                   | 273  | 214   | 170   | 104   | 89.0  | 74.4 | 42.4 | 30.1 | 20.0 | 11.00 | 5.25 |
| 1.85                   | 219  | 177   | 149   | 96.0  | 82.1  | 69.2 | 41.4 | 29.7 | 19.1 | 10.90 | 4.95 |

## Discharge Curves 77°F (25°C)



## Relationship between charge voltage and temperature

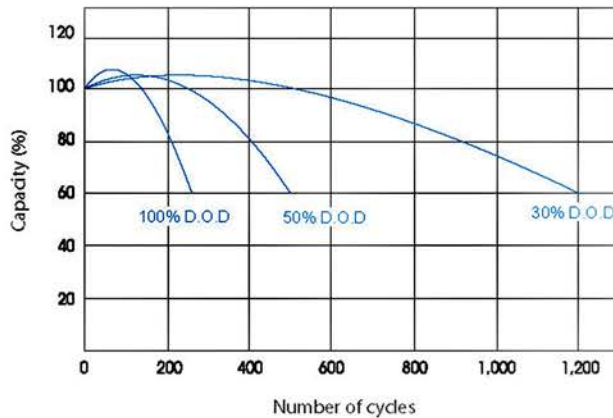


# 6-FM/NP65A

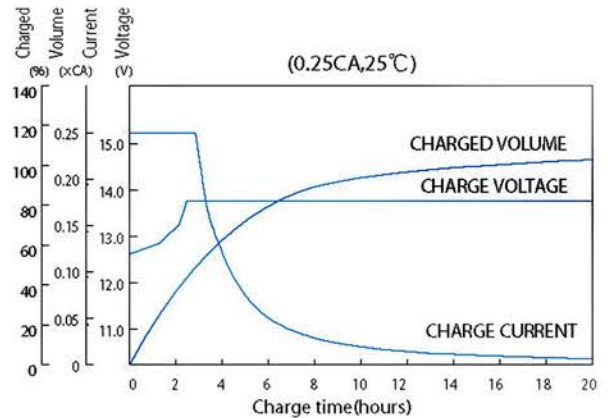
FM/NP Battery Series (General Use Battery)

The operating environment temperature above 40°C should be avoided, after long term storage. The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, Deutsche Power battery should be fully charged before storage.

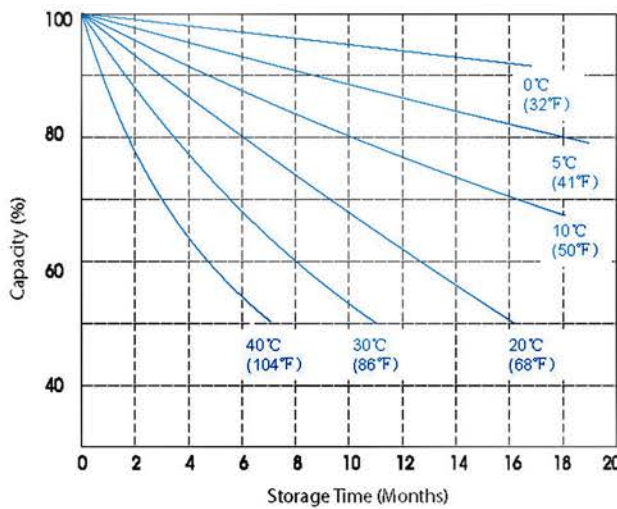
## Cycle service life in relation to depth of discharge



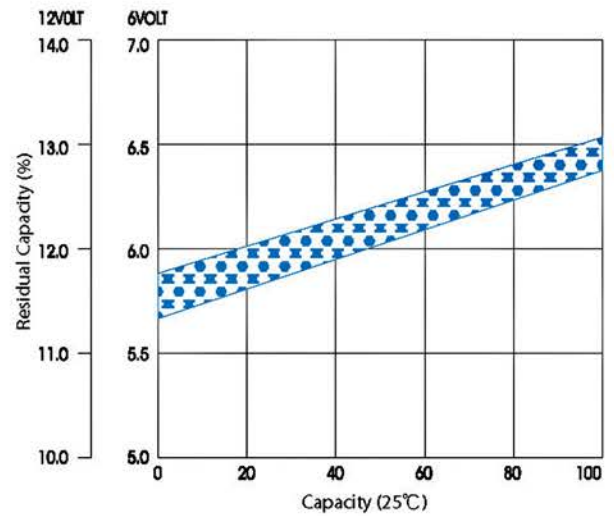
## Constant voltage charge characteristic



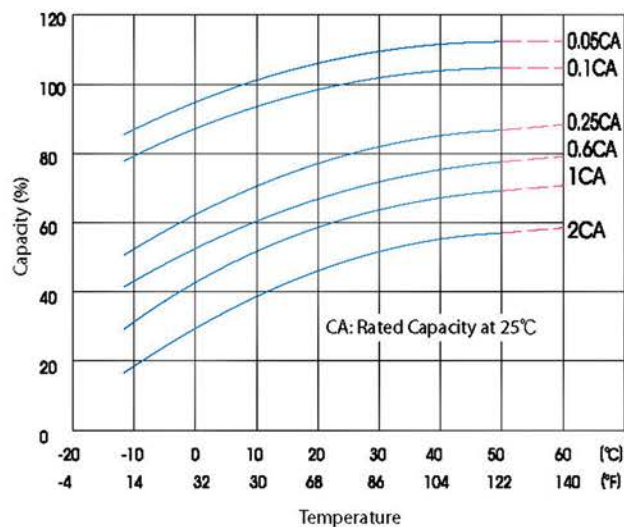
## Self-Discharge Characteristics



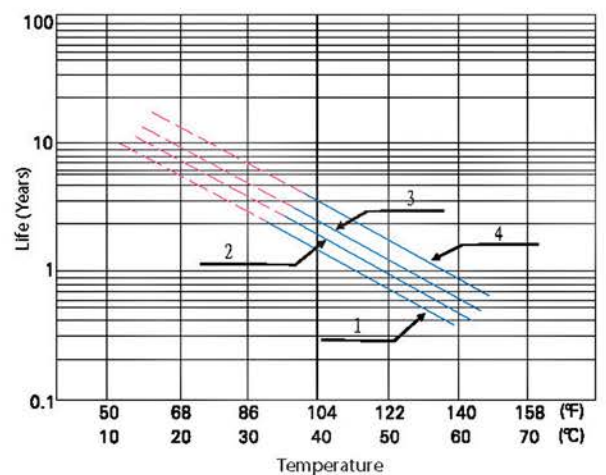
## Relationship of OCV and Residual Capacity % (25°C)



## Temperature effects on capacity



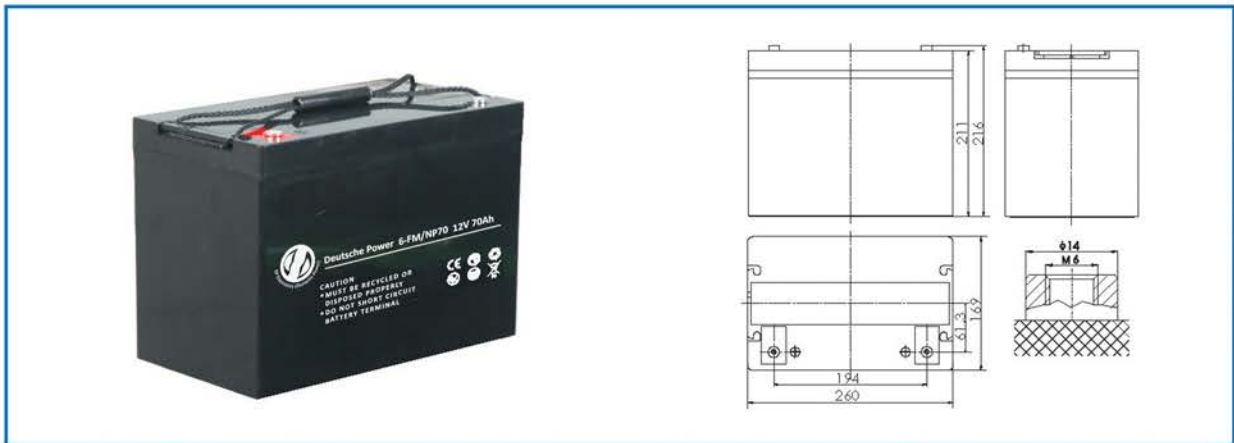
## Temperature effects float life





# 6-FM/NP70

FM/NP Battery Series (General Use Battery)



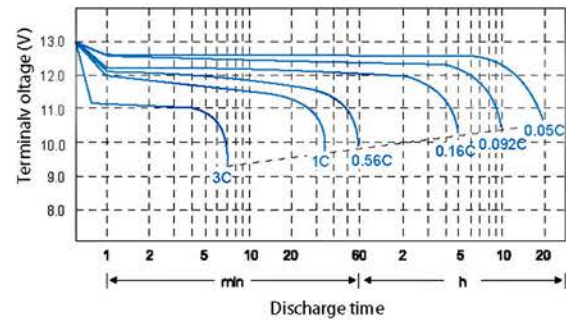
## Specifications

|                              |                               |                            |
|------------------------------|-------------------------------|----------------------------|
| Nominal Voltage              |                               | 12V                        |
| Rated Capacity(20 hour rate) |                               | 70Ah                       |
| Dimensions                   | Total Height (with terminals) | 8.51 inches(216mm)         |
|                              | Height                        | 8.31 inches(211 mm)        |
|                              | Length                        | 10.24inches(260mm)         |
|                              | Width                         | 6.65inches(169mm)          |
| Weight                       |                               | Approx. 47.08pound(21.4kg) |

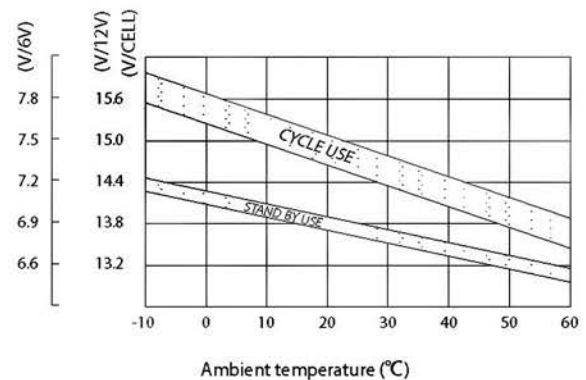
## Characteristics

|  |                                 |   |
|--|---------------------------------|---|
| Capacity<br>77°F(25°C)                             | 20 hour rate (3.5A)             | 70.0Ah                                  |
|  | 10 hour rate (6.44A)            | 64.4Ah                                  |
|  | 5 hour rate (11.2A)             | 56.0Ah                                  |
|  | 1 hour rate (42A)               | 42.0Ah                                  |
|  | Full charged Battery 77°F(25°C) | 28.5Ah                                  |
| Internal Resistance                                | 15 minute Rate (114A)           | 75mΩ                                    |
| Capacity affected by<br>Temperature (20 hour rate) | 104°F(40°C)                     | 102%                                    |
|  | 77°F(25°C)                      | 100%                                    |
|  | 32°F(0°C)                       | 85%                                     |
|  | 5°F(-15°C)                      | 65%                                     |
| Self-Discharge<br>77°F(20°C)                       | Capacity after 3 month storage  | 91%                                     |
|  | Capacity after 6 month storage  | 81%                                     |
|  | Capacity after 12 month storage | 60%                                     |
| Max. Discharge<br>Current 77°F(25°C)               | 665A(5S)                        |   |
| Terminal   | M1                              |   |
| Charge<br>(Constant Voltage)                       | Cycle                           | Initial Charging Current less than 21 A |
|  |                                 | Voltage 14.4~14.7V/77°F(25°C)           |
|  | Float                           | Voltage 13.5~13.8V/77°F(25°C)           |

## Discharge Curves 77°F(25°C)



## Relationship between charge voltage and temperature



## Constant Current Discharge (AMPERES @25°C)

| F.V/Time    | 10Min | 15Min | 30Min | 45Min | 1Hour | 2Hour | 3Hour | 5Hour | 8Hour | 10Hour | 12Hour | 24Hour |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| <b>1.65</b> | 151.9 | 117.6 | 71.4  | 56.1  | 37.9  | 26.46 | 18.27 | 12.25 | 8.68  | 6.86   | 5.89   | 3.03   |
| <b>1.70</b> | 143.5 | 109.9 | 60.8  | 53.0  | 36.3  | 25.83 | 17.50 | 11.83 | 8.33  | 6.71   | 5.71   | 2.98   |
| <b>1.80</b> | 121.1 | 95.9  | 54.9  | 50.1  | 34.6  | 24.71 | 16.52 | 11.20 | 7.84  | 6.44   | 5.55   | 2.93   |

## Constant Power Discharge (WATTS PER CELL@25°C)

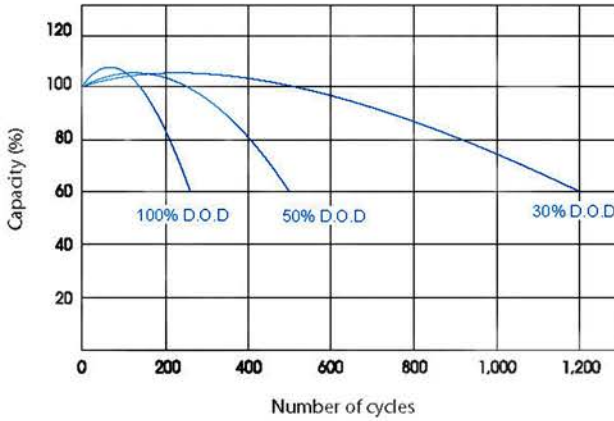
| F.V/Time    | 10Min | 15Min | 30Min | 45Min | 1Hour | 2Hour | 3Hour | 5Hour | 8Hour | 10Hour | 12Hour | 24Hour |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| <b>1.60</b> | 273   | 209   | 137   | 103   | 83.2  | 48.8  | 34.3  | 22.5  | 15.3  | 12.7   | 11.0   | 5.76   |
| <b>1.65</b> | 271   | 207   | 133   | 102   | 82.3  | 48.2  | 33.9  | 22.3  | 15.2  | 12.5   | 10.9   | 5.74   |
| <b>1.67</b> | 269   | 204   | 132   | 100   | 81.2  | 47.6  | 33.8  | 22.2  | 15.1  | 12.4   | 10.7   | 5.72   |
| <b>1.70</b> | 265   | 202   | 130   | 98.9  | 80.7  | 46.9  | 33.6  | 21.8  | 14.9  | 12.1   | 10.7   | 5.69   |
| <b>1.75</b> | 247   | 196   | 119   | 97.1  | 80.5  | 46.4  | 33.1  | 21.7  | 14.8  | 12.0   | 10.7   | 5.67   |
| <b>1.80</b> | 231   | 183   | 112   | 96.1  | 80.1  | 45.6  | 32.4  | 21.6  | 14.6  | 11.9   | 10.4   | 5.66   |
| <b>1.85</b> | 190   | 161   | 104   | 88.4  | 74.5  | 44.6  | 32.0  | 20.5  | 14.0  | 11.8   | 10.2   | 5.33   |

# 6-FM/NP70A

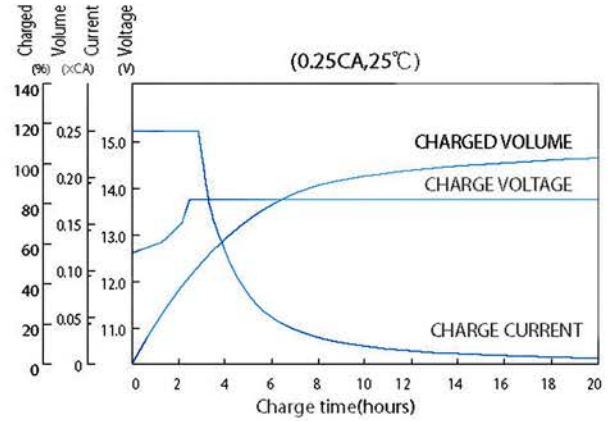
FM/NP Battery Series (General Use Battery)

The operating environment temperature above 40°C should be avoided, after long term storage. The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, Deutsche Power battery should be fully charged before storage.

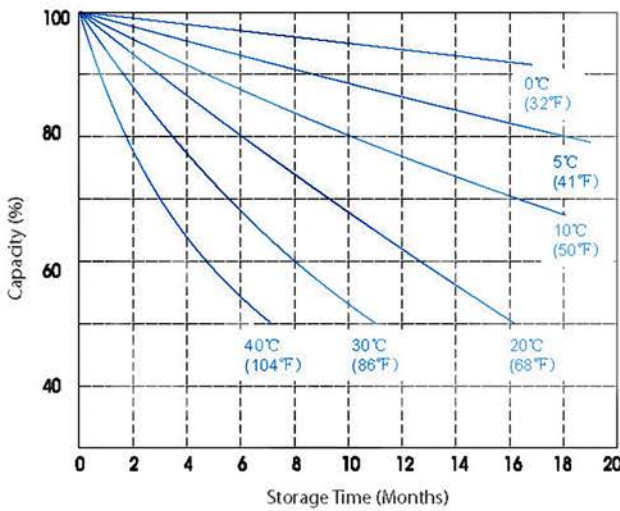
## Cycle service life in relation to depth of discharge



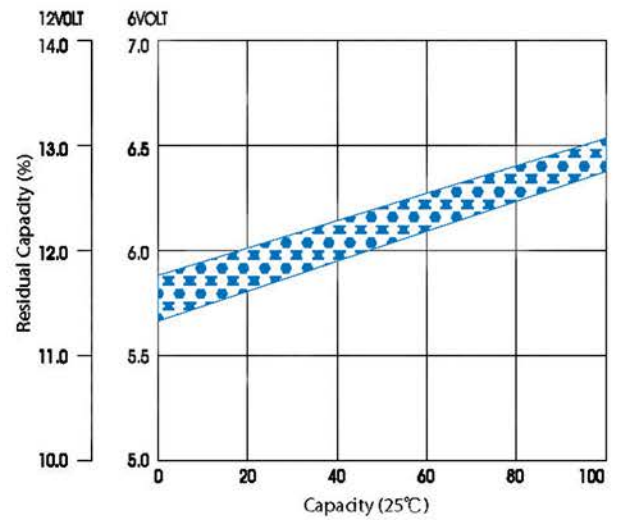
## Constant voltage charge characteristic



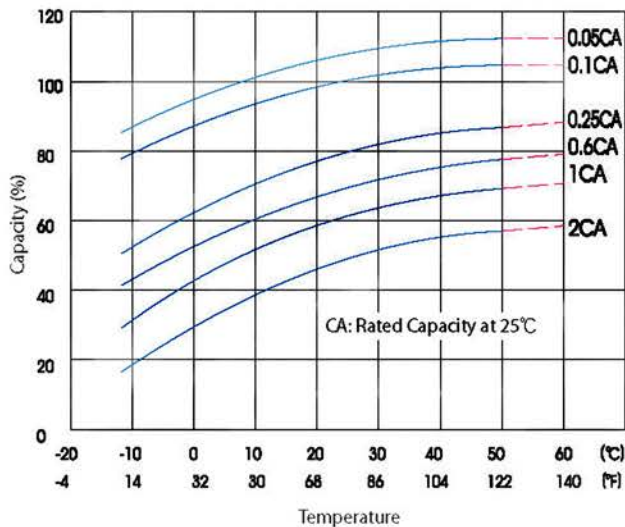
## Self-Discharge Characteristics



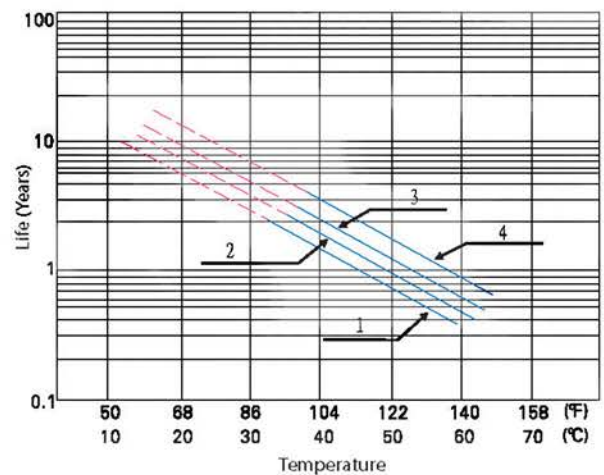
## Relationship of OCV and Residual Capacity % (25°C)



## Temperature effects on capacity



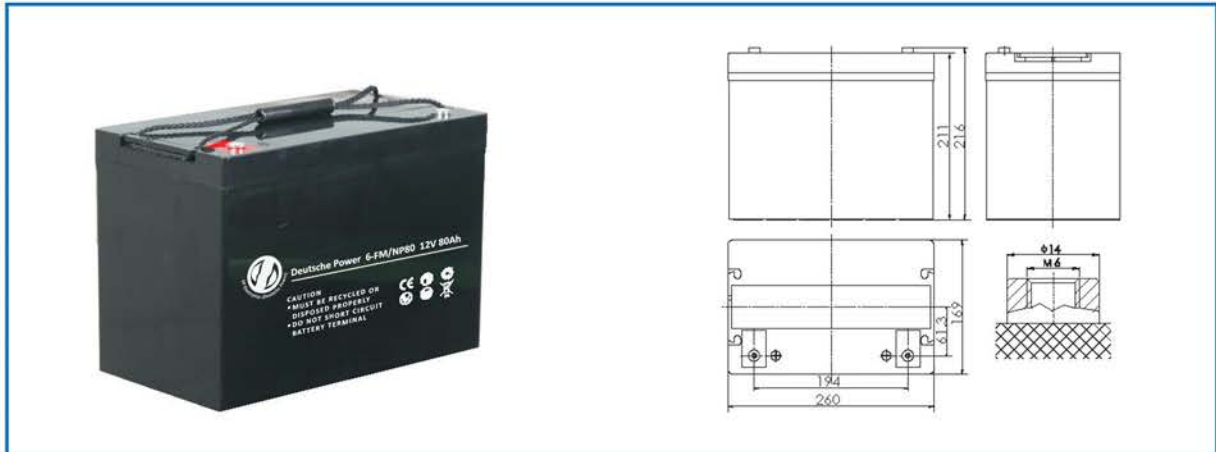
## Temperature effects float life





# 6-FM/NP80

FM/NP Battery Series (General Use Battery)



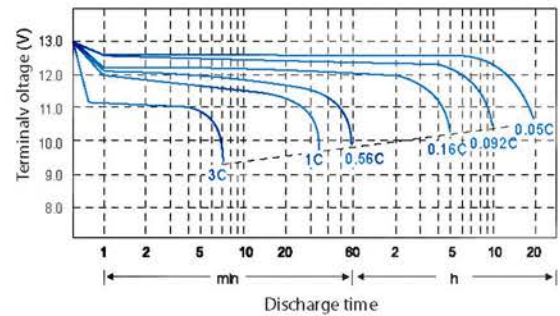
## Specifications

|                              |                               |                            |
|------------------------------|-------------------------------|----------------------------|
| Nominal Voltage              |                               | 12V                        |
| Rated Capacity(20 hour rate) |                               | 80Ah                       |
| Dimensions                   | Total Height (with terminals) | 8.51inches (216mm)         |
|                              | Height                        | 8.31inches (211mm)         |
|                              | Length                        | 10.24inches(260mm)         |
|                              | Width                         | 6.65inches (169mm)         |
| Weight                       |                               | Approx. 49.50pound(22.5kg) |

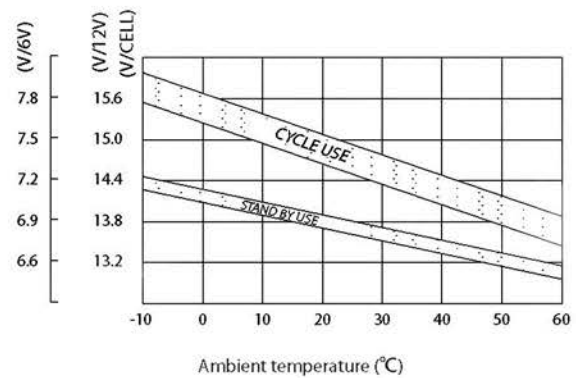
## Characteristics

|  |                                 |   |
|--|---------------------------------|---|
| Capacity<br>77°F(25°C)                             | 20 hourrate (4.0A)              | 80Ah  |
|  | 10 hourrate (7.2A)              | 72Ah  |
|  | 5 hourrate (12.8A)              | 64Ah  |
|  | 1 hourrate (48A)                | 48Ah  |
|  | 15 minute Rate (130A)           | 32.5Ah  |
| Internal Resistance                                | Full charged Battery 77°F(25°C) | 7.5mΩ   |
| Capacity affected by<br>Temperature (20 hour rate) | 104°F(40°C)                     | 102%  |
|  | 77°F(25°C)                      | 100%  |
|  | 32°F(0°C)                       | 85%   |
|  | 5°F(-15°C)                      | 65%   |
| Self-Discharge<br>77°F(20°C)                       | Capacity after 3 month storage  | 91%   |
|  | Capacity after 6 month storage  | 81%   |
|  | Capacity after 12 month storage | 60%   |
| Max. Discharge<br>Current 77°F(28°C)               | 680A(5S)                        |   |
| Terminal   | M1                              |   |
| Charge<br>(Constant Voltage)                       | Cycle                           | Initial Charging Current less than 24A<br>Voltage 14.4~14.7V/77°F(25°C) |
|  | Float                           | Voltage 13.5~13.8V/77°F(25°C)   |

## Discharge Curves 77°F (25°C)



## Relationship between charge voltage and temperature



## Constant Current Discharge (AMPERES @25°C)

| F.V/Time | 10Min | 15Min | 30Min | 45Min | 1Hour | 2Hour | 3Hour | 5Hour | 8Hour | 10Hour | 12Hour | 24Hour |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| 1.65     | 173.6 | 134.4 | 81.6  | 64.1  | 43.36 | 30.24 | 20.88 | 14.00 | 9.92  | 7.84   | 6.73   | 3.46   |
| 1.70     | 164.0 | 125.6 | 69.4  | 60.6  | 41.52 | 29.52 | 20.00 | 13.52 | 9.52  | 7.67   | 6.53   | 3.40   |
| 1.80     | 138.4 | 109.6 | 62.7  | 57.2  | 39.52 | 28.24 | 18.88 | 12.80 | 8.96  | 7.36   | 6.34   | 3.34   |

## Constant Power Discharge (WATTS PER CELL@25°C)

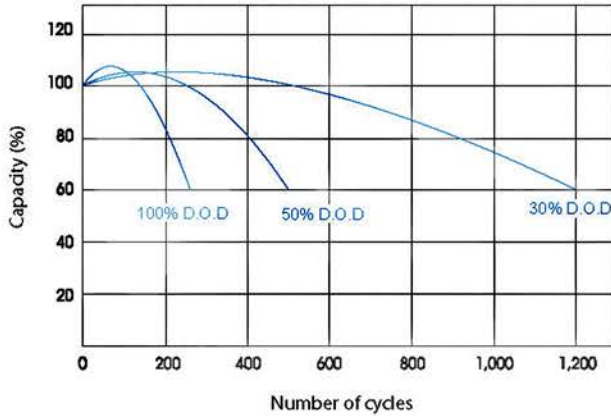
| F.V/Time | 10Min | 15Min | 30Min | 45Min | 1Hour | 2Hour | 3Hour | 5Hour | 8Hour | 10Hour | 12Hour | 24Hour |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| 1.60     | 313   | 239   | 157   | 117   | 95.0  | 55.8  | 39.1  | 25.7  | 17.5  | 14.5   | 12.6   | 6.58   |
| 1.65     | 309   | 237   | 153   | 116   | 94.1  | 55.0  | 38.7  | 25.5  | 17.4  | 14.3   | 12.5   | 6.56   |
| 1.67     | 307   | 234   | 151   | 114   | 92.8  | 54.4  | 38.6  | 25.4  | 17.3  | 14.2   | 12.4   | 6.54   |
| 1.70     | 303   | 230   | 149   | 113   | 92.3  | 53.7  | 38.4  | 25.0  | 17.1  | 13.9   | 12.4   | 6.51   |
| 1.75     | 283   | 224   | 137   | 111   | 92.1  | 53.0  | 37.9  | 24.7  | 17.0  | 13.8   | 12.4   | 6.49   |
| 1.80     | 263   | 209   | 128   | 110   | 91.5  | 52.2  | 37.0  | 24.6  | 16.6  | 13.5   | 11.8   | 6.46   |
| 1.85     | 218   | 183   | 118   | 101   | 85.1  | 51.0  | 36.6  | 23.5  | 16.0  | 13.4   | 11.6   | 6.09   |

# 6-FM/NP80

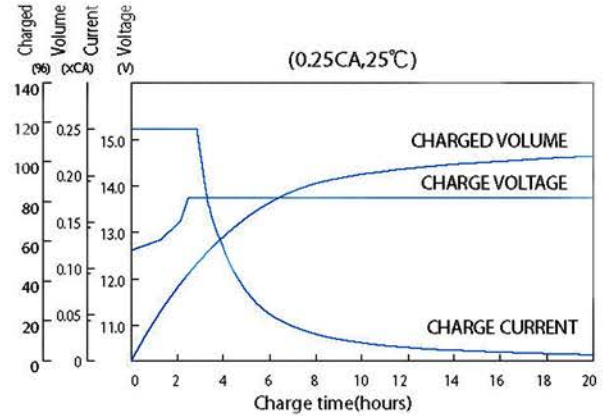
FM/NP Battery Series (General Use Battery)

The operating environment temperature above 40°C should be avoided, after long term storage. The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, Deutsche Power battery should be fully charged before storage.

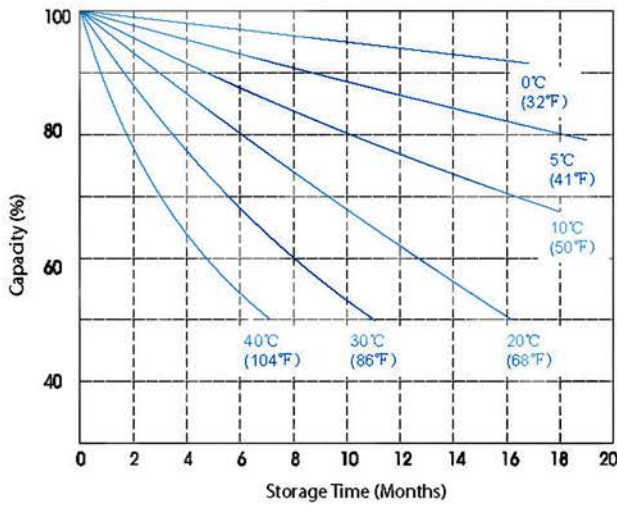
## Cycle service life in relation to depth of discharge



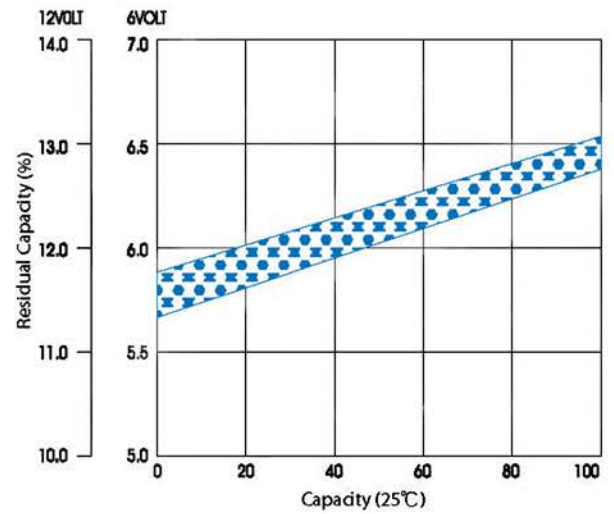
## Constant voltage charge characteristic



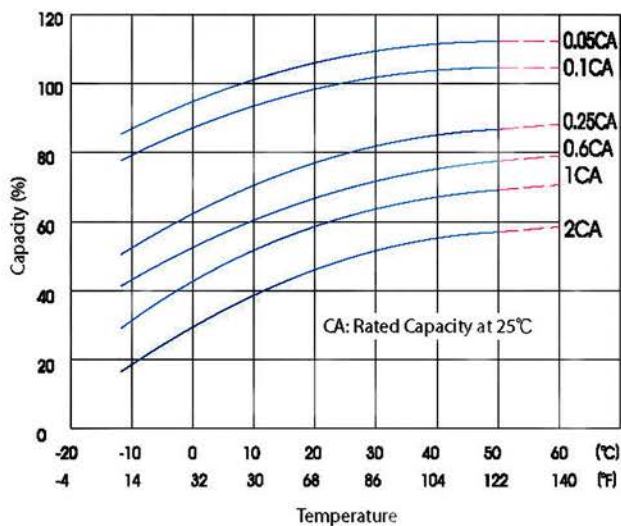
## Self-Discharge Characteristics



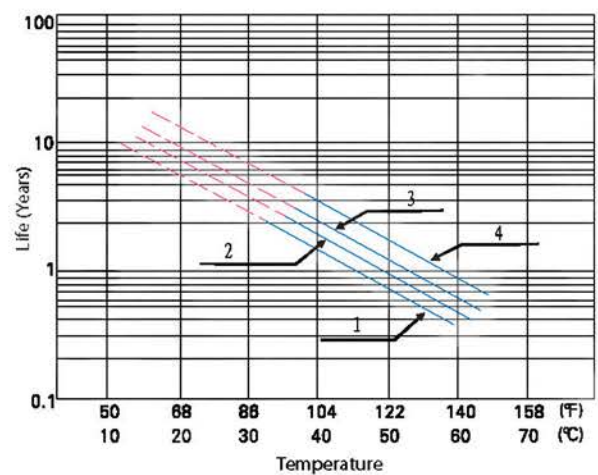
## Relationship of OCV and Residual Capacity % (25°C)



## Temperature effects on capacity



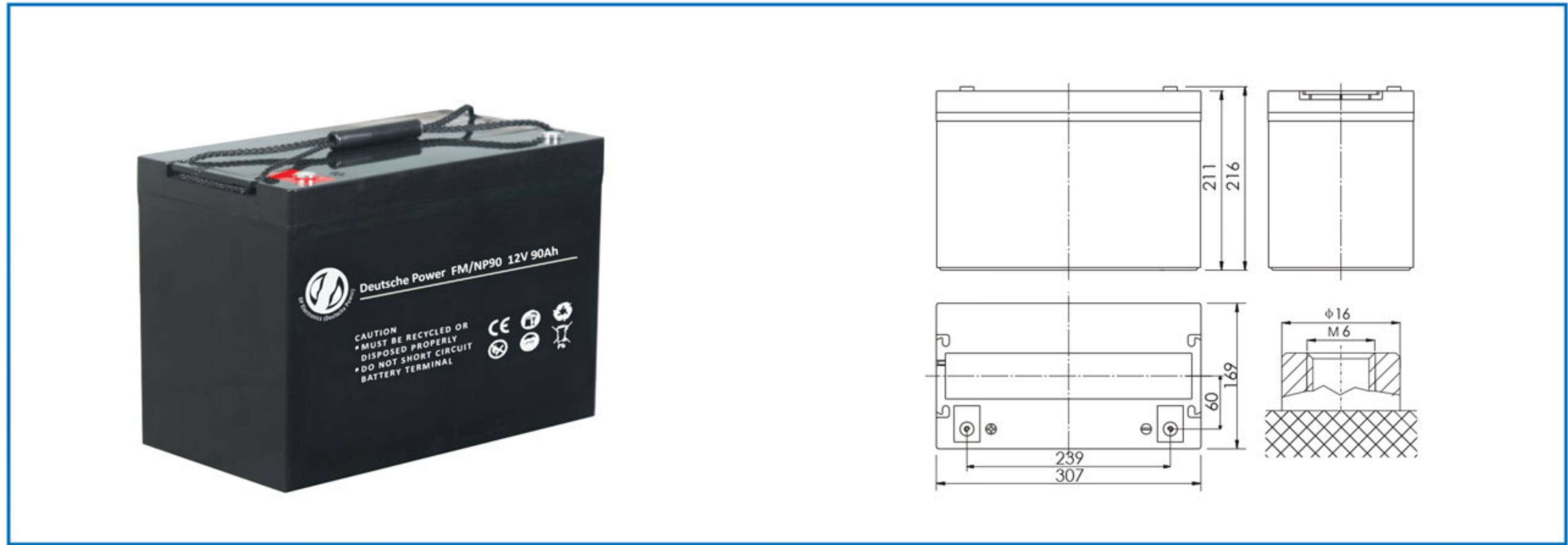
## Temperature effects float life





# 6-FM/NP90

FM/NP Battery Series (General Use Battery)



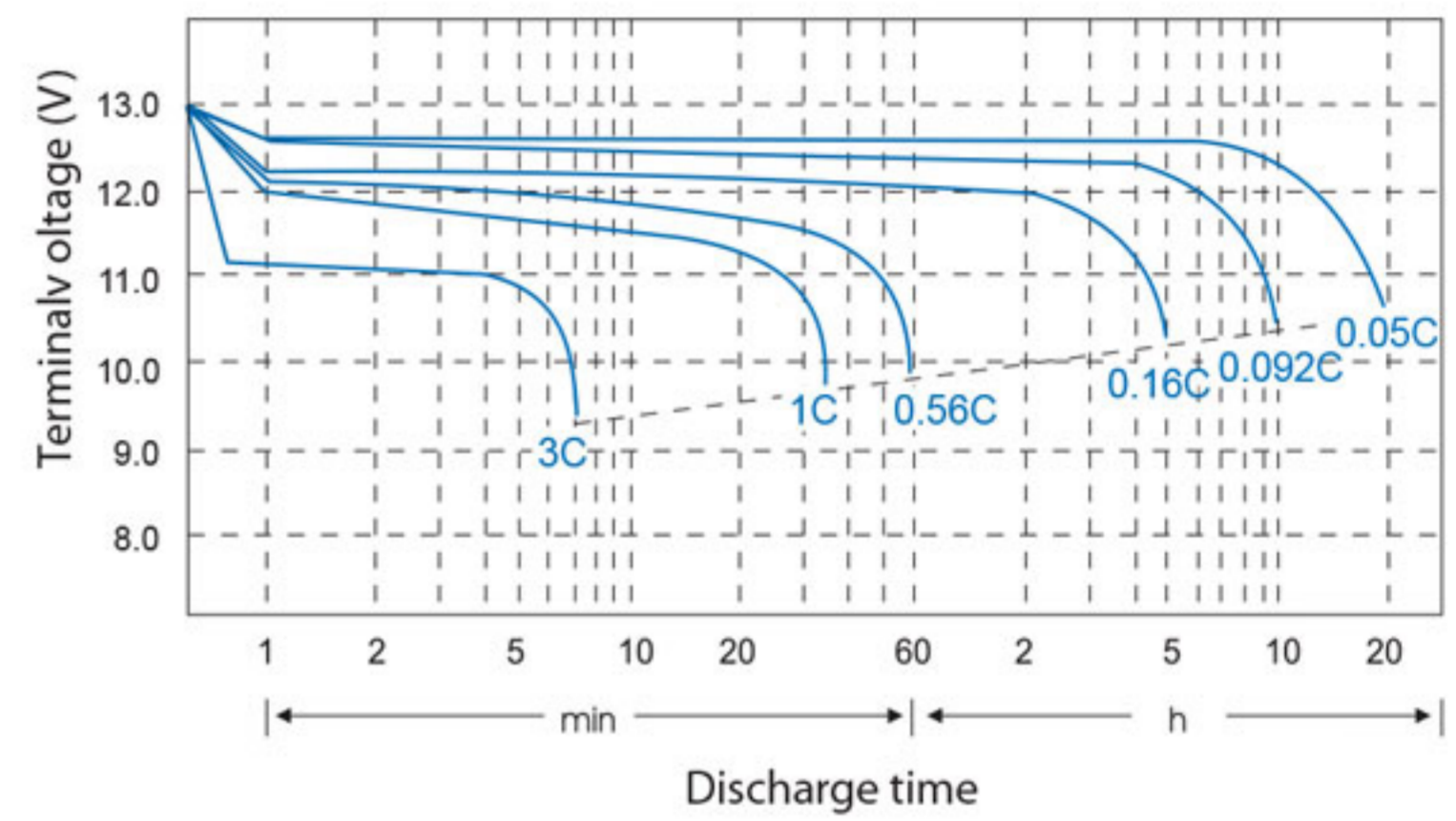
## Specifications

|                              |                               |                    |
|------------------------------|-------------------------------|--------------------|
| Nominal Voltage              | 12V                           |                    |
| Rated Capacity(20 hour rate) | 90Ah                          |                    |
| Dimensions                   | Total Height (with terminals) | 8.50inches (216mm) |
|                              | Height                        | 8.31inches (211mm) |
|                              | Length                        | 12.1inches (307mm) |
|                              | Width                         | 6.65inches (169mm) |
| Weight                       | Approx. 58.52pound(26.6kg)    |                    |

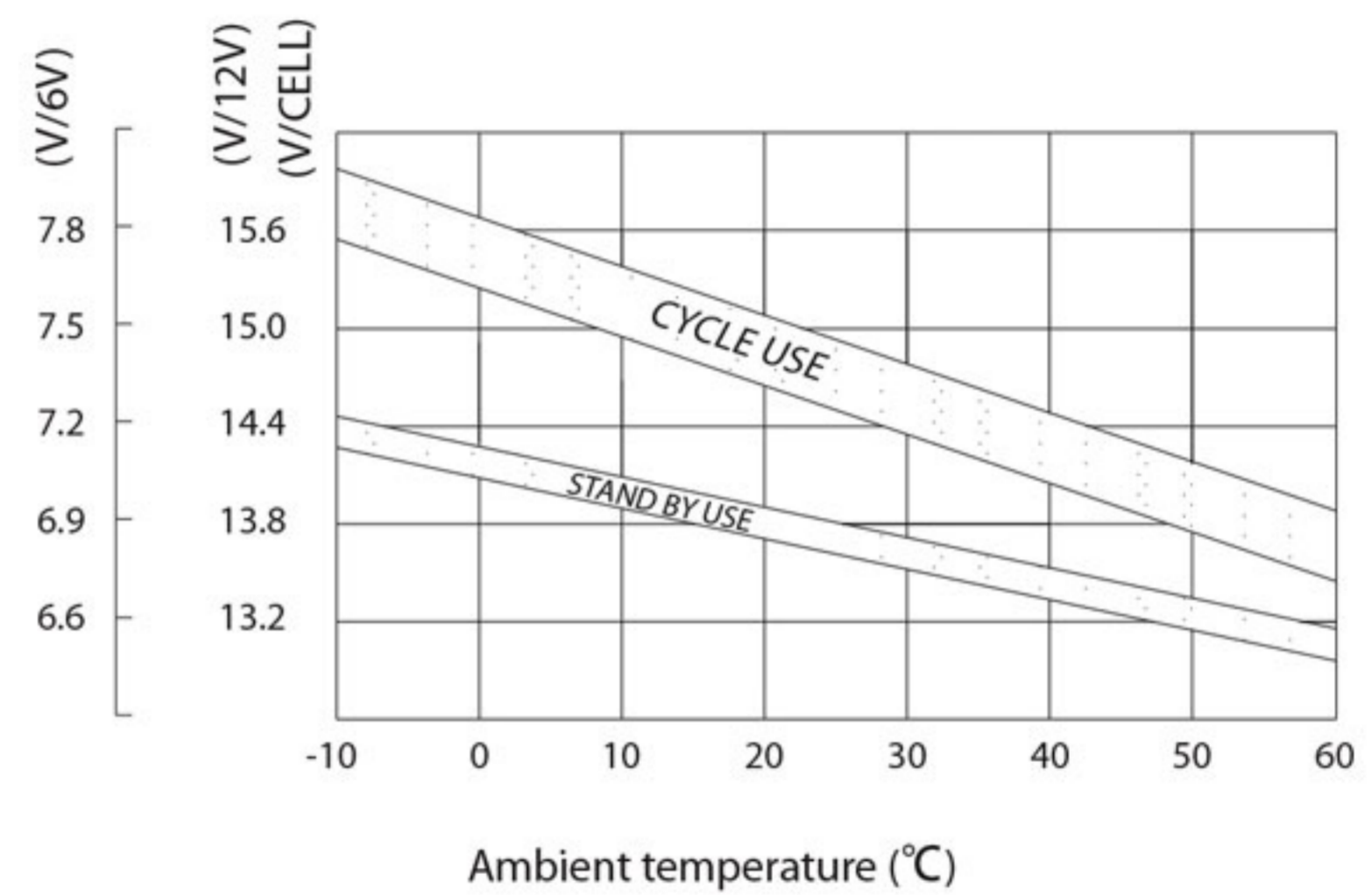
## Characteristics

|  |                                 |  |
|--|---------------------------------|--|
| Capacity<br>77°F(25°C)                             | 20 hourrate (4.50A)             | 90.0Ah                                 |
|  | 10 hourrate (8.28A)             | 82.8Ah                                 |
|  | 5 hourrate (14.4A)              | 72.0Ah                                 |
|  | 1 hourrate (54.0A)              | 54.0Ah                                 |
|  | 15 minute Rate(148A)            | 37.0Ah                                 |
| Internal Resistance                                | Full charged Battery 77°F(25°C) | 5mΩ                                    |
| Capacity affected by<br>Temperature (20 hour rate) | 104°F(40°C)                     | 102%                                   |
|  | 77°F(25°C)                      | 100%                                   |
|  | 32°F(0°C)                       | 85%                                    |
|  | 5°F(-15°C)                      | 65%                                    |
| Self-Discharge<br>77°F(20°C)                       | Capacityafter 3 month storage   | 91%                                    |
|  | Capacityafter 6 month storage   | 81%                                    |
|  | Capacityafter 12 month storage  | 60%                                    |
| Max. Discharge<br>Current 77°F(25°C)               | 720A(5S)                        |  |
| Terminal   | M2                              |  |
| Charge<br>(ConstantVoltage)                        | Cycle                           | Initial Charging Current less than 27A |
|  |                                 | Voltage 14.4~14.7V/77°F(25°C)          |
|  | Float                           | Voltage 13.5~13.8V/77°F(25°C)          |

## Discharge Curves 77°F (25°C)



## Relationship between charge voltage and temperature



## Constant Current Discharge (AMPERES @25°C)

| F.V/Time | 10Min | 15Min | 30Min | 45Min | 1Hour | 2Hour | 3Hour | 5Hour | 8Hour | 10Hour | 12Hour | 24Hour |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| 1.65     | 195   | 151   | 94.0  | 71.9  | 48.7  | 34.2  | 23.0  | 15.7  | 10.6  | 8.90   | 7.55   | 3.92   |
| 1.70     | 185   | 144   | 89.4  | 68.3  | 48.3  | 33.1  | 22.5  | 15.4  | 10.3  | 8.65   | 7.31   | 3.84   |
| 1.80     | 155   | 123   | 80.5  | 63.8  | 46.0  | 31.7  | 21.6  | 14.8  | 9.93  | 8.28   | 7.05   | 3.77   |

## Constant Power Discharge (WATTS PER CELL@25°C)

| F.V/Time | 10Min | 15Min | 30Min | 45Min | 1Hour | 2Hour | 3Hour | 5Hour | 8Hour | 10Hour | 12Hour | 24Hour |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| 1.60     | 354   | 275   | 175   | 132   | 109   | 63.6  | 44.1  | 29.1  | 19.6  | 16.3   | 14.1   | 7.22   |
| 1.65     | 350   | 273   | 171   | 131   | 107   | 62.5  | 43.9  | 28.9  | 19.5  | 16.2   | 14.0   | 7.20   |
| 1.67     | 345   | 272   | 169   | 129   | 107   | 61.5  | 43.8  | 28.8  | 19.4  | 16.2   | 13.9   | 7.19   |
| 1.70     | 341   | 267   | 167   | 128   | 107   | 61.4  | 43.6  | 28.7  | 19.3  | 16.0   | 13.8   | 7.17   |
| 1.75     | 317   | 252   | 158   | 127   | 106   | 60.8  | 43.4  | 28.6  | 19.2  | 15.9   | 13.7   | 7.14   |
| 1.80     | 296   | 236   | 155   | 123   | 103   | 59.7  | 42.7  | 28.3  | 19.0  | 15.6   | 13.5   | 7.10   |
| 1.85     | 245   | 206   | 145   | 113   | 96.1  | 57.5  | 41.4  | 26.4  | 18.0  | 15.1   | 13.0   | 6.88   |



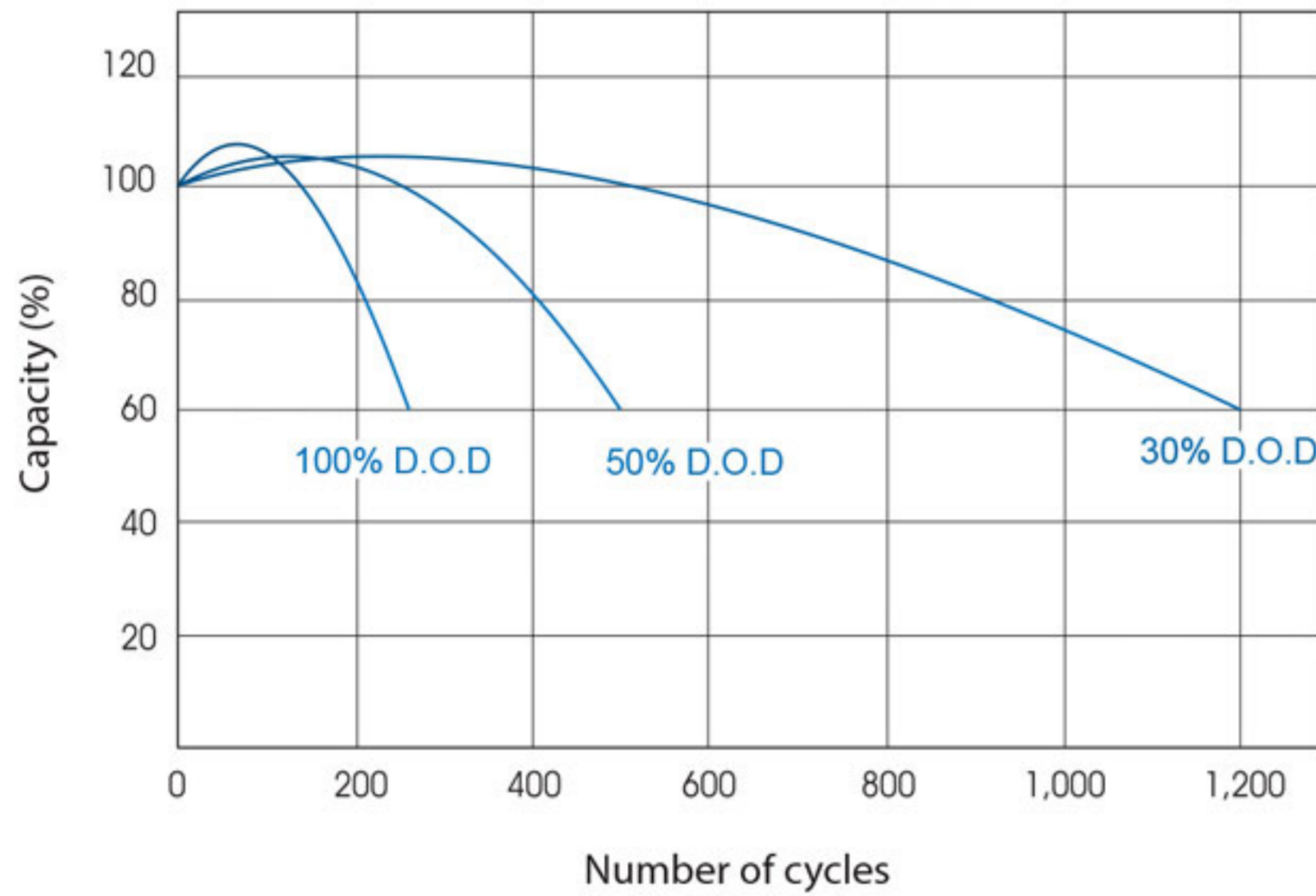
# 6-FM/NP90

FM/NP Battery Series (General Use Battery)

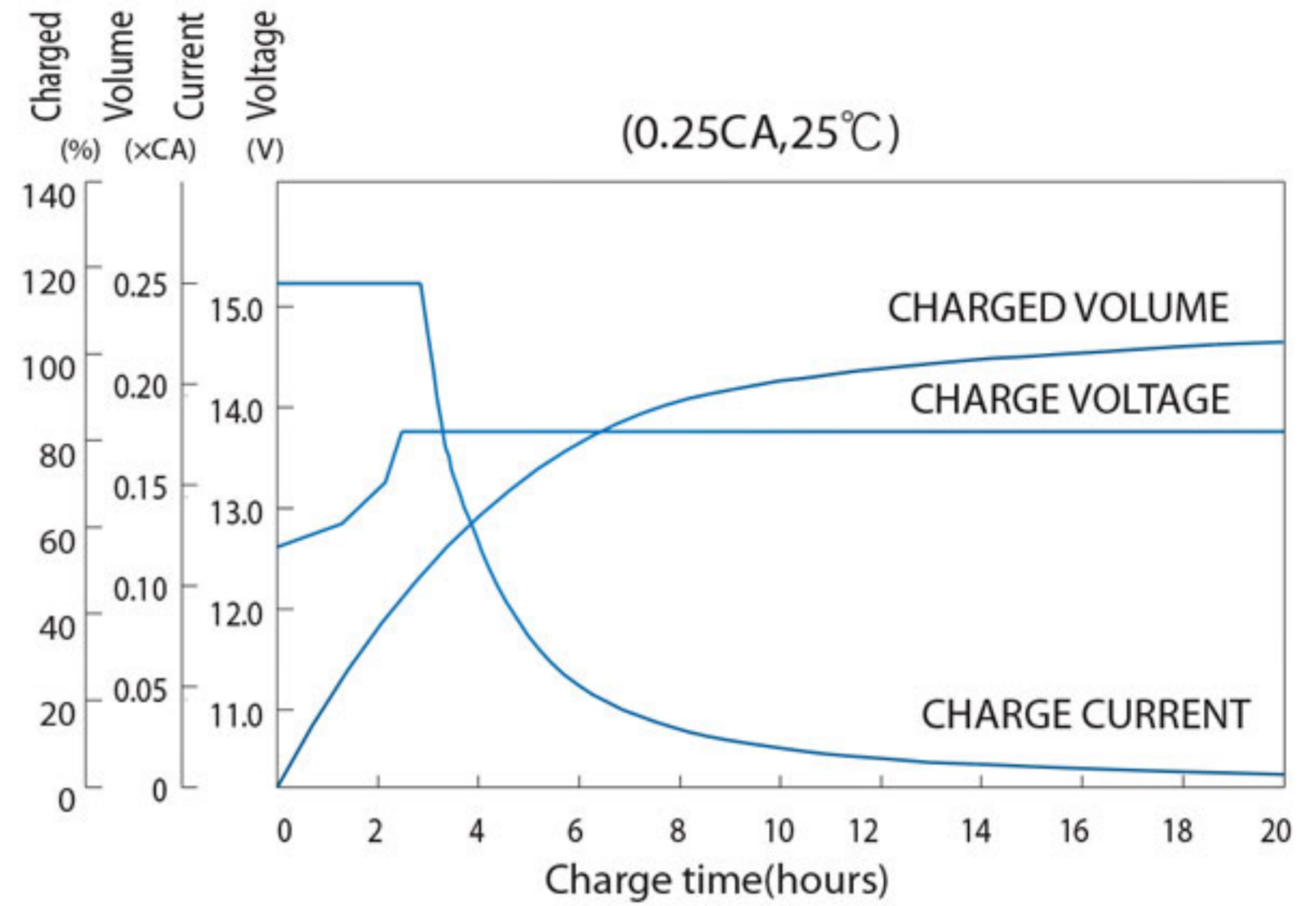
The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles.

To get the longest life, Deutsche Power battery should be fully charged before storage

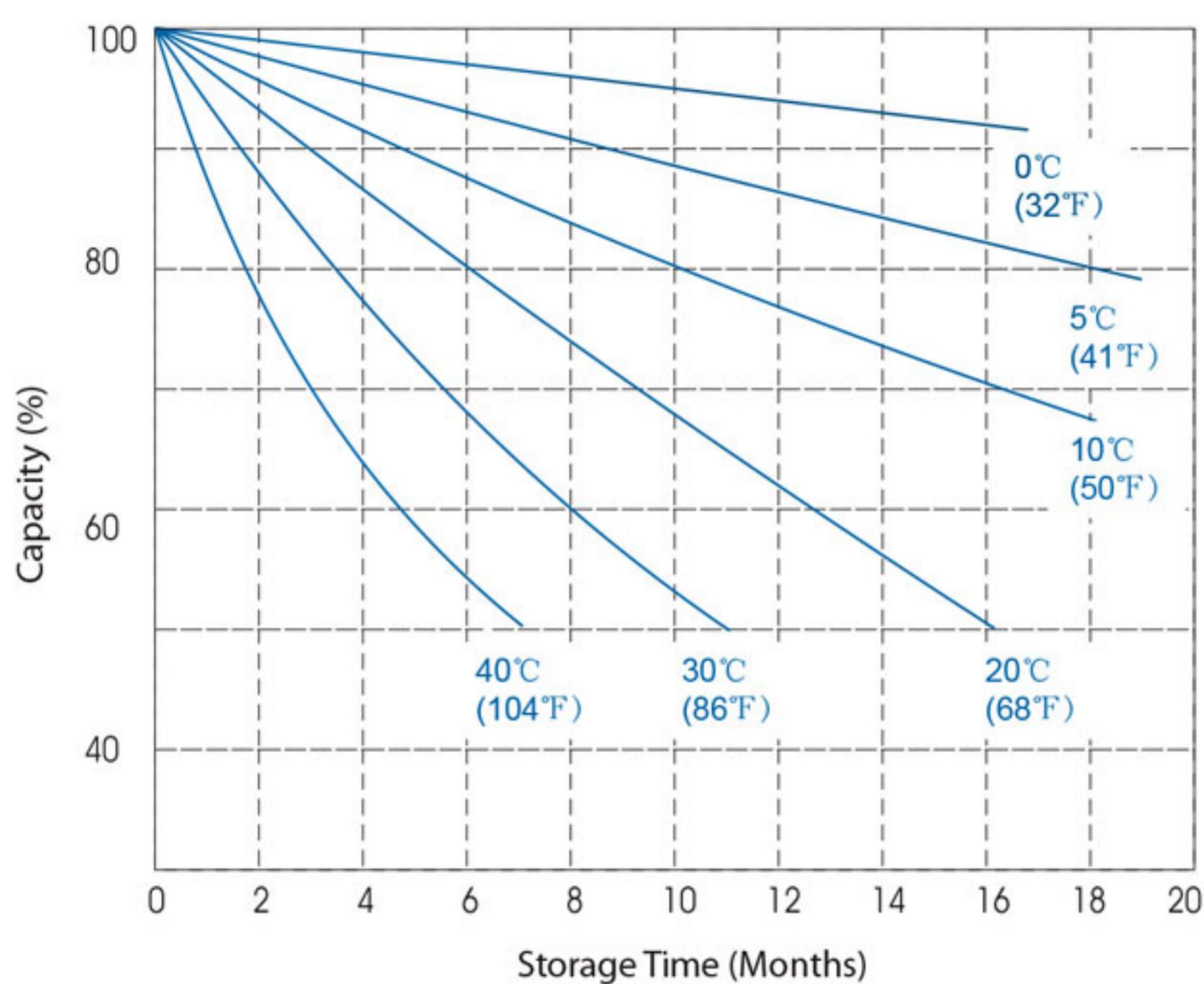
## Cycle service life in relation to depth of discharge



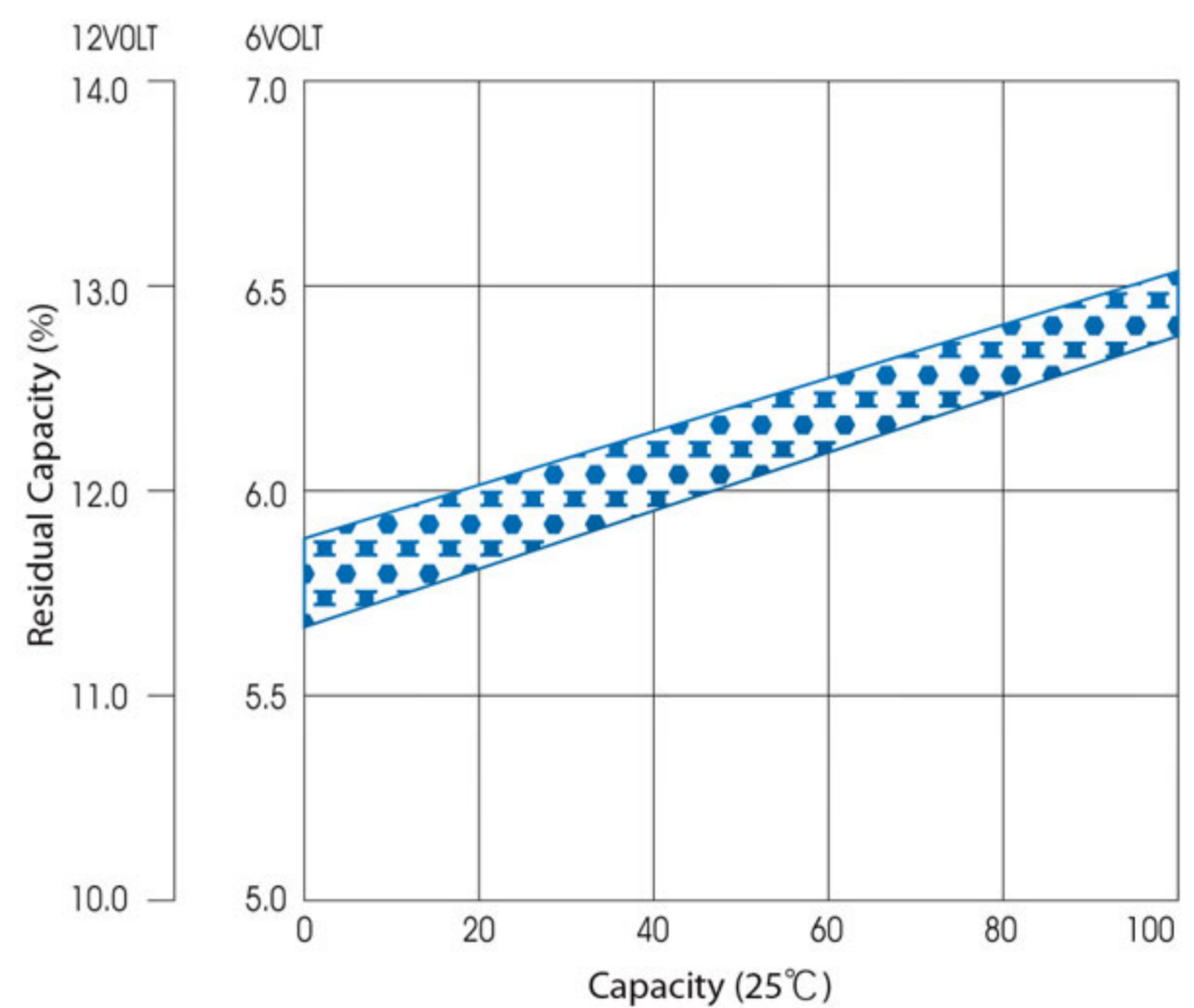
## Constant voltage charge characteristic



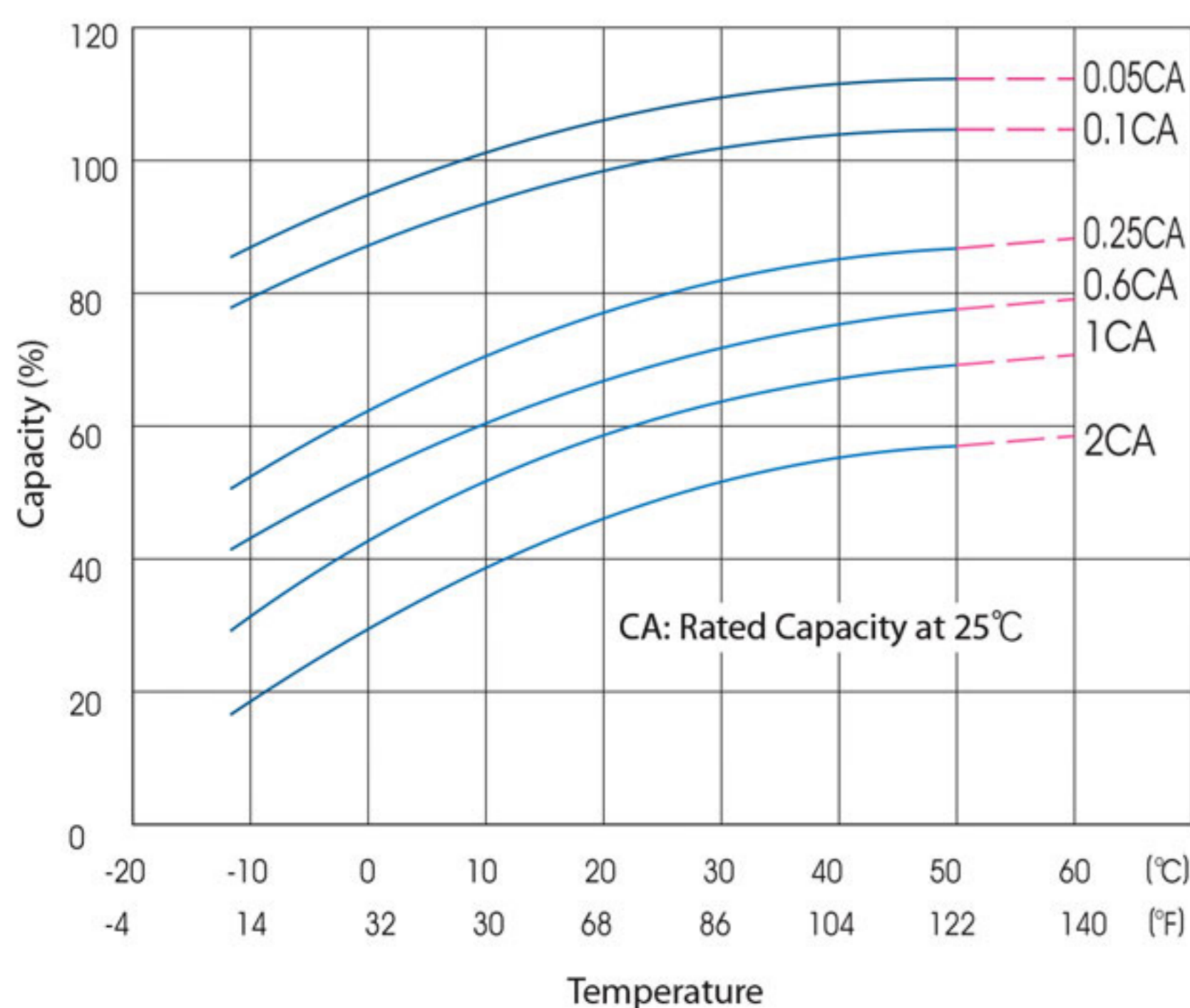
## Self-Discharge Characteristics



## Relationship of OCV and Residual Capacity % (25°C)



## Temperature effects on capacity



## Temperature effects float life

