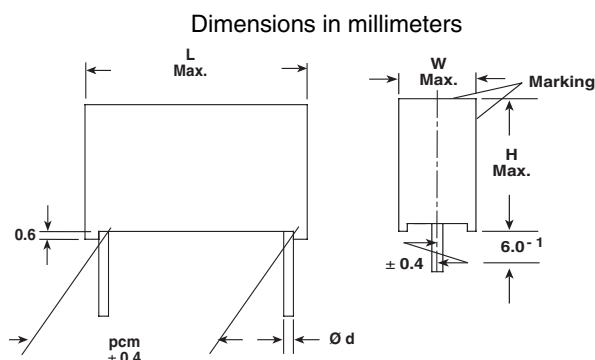


# Polypropylene Film Capacitors

## Related Document: IEC 60384-17 Grade 1.2



| W      | Ø d |
|--------|-----|
| ≥ 16   | 1.0 |
| < 16.0 | 0.8 |

### MAIN APPLICATIONS

High voltage, very high current and high pulse operations, deflection circuits in TV sets (fly-back tuning). Electronic ballasts, protection circuits in SMPS's. Snubber and SCR commutating circuits.

### MARKING

Manufacturer's logo/type/C-value/rated voltage/tolerance/data of manufacture

### DIELECTRIC

Polypropylene film

### ELECTRODES

Aluminum foil

### COATING

Flame retardant plastic case (UL-class 94 V-0), blue, epoxy resin sealed. Flame class B according to IEC 60065 available on request

### CONSTRUCTION

Extended aluminum foil, internal series connection, double-sided metallized, polyester carrier film (refer to general information)

### INSULATION RESISTANCE

Measured at 500 VDC after one minute  
100 000 MΩ minimum value, (1000 GΩ typical value)

### MAXIMUM PULSE RISE TIME

| PCM (mm) | Maximum Pulse Rise Time $d_v/d_t$ [V/μs] |          |          |          |          |
|----------|------------------------------------------|----------|----------|----------|----------|
|          | 630 VDC                                  | 1000 VDC | 1250 VDC | 1600 VDC | 2000 VDC |
| 15       | 6500                                     | 8200     | 11 100   | 13 900   | 13 900   |
| 22.5     | 2600                                     | 3200     | 4600     | 6000     | 9800     |
| 27.5     | 1800                                     | 2300     | 3100     | 4000     | 6000     |
| 37.5     | 1200                                     | 1500     | 1900     | 2400     | 3500     |

If the maximum pulse voltage is less than the rated voltage higher  $d_v/d_t$  values can be permitted.

### DISSIPATION FACTOR $\tan \delta$

| MEASURED AT    | C ≤ 0.1 μF           | C > 1.0 μF           |
|----------------|----------------------|----------------------|
| 1 kHz          | $0.3 \times 10^{-3}$ | $0.3 \times 10^{-3}$ |
| 10 kHz         | $0.4 \times 10^{-3}$ | $0.4 \times 10^{-3}$ |
| 100 kHz        | $1 \times 10^{-3}$   | -                    |
| Maximum values |                      |                      |

### FEATURES

Product is completely lead (Pb)-free  
Product is RoHS-compliant

### LEADS

Tinned wire

### IEC TEST CLASSIFICATION

55/100/56 according to IEC 60068

### OPERATING TEMPERATURE RANGE

- 55 °C to + 100 °C

### CAPACITANCE RANGE

100 pF to 0.22 μF

### CAPACITANCE TOLERANCES

± 10 % (K), ± 5 % (J)

### RATED VOLTAGES ( $U_R$ ):

630 VDC, 1000 VDC, 1250 VDC, 1600 VDC, 2000 VDC

### PERMISSIBLE AC VOLTAGES (RMS) UP TO 60 Hz

300 VAC, 350 VAC, 400 VAC, 500 VAC, 600 VAC

### TEST VOLTAGE (ELECTRODE/ELECTRODE)

2 x  $U_R$  for 2 s

### TEMPERATURE COEFFICIENT

-  $250 \times 10^{-6}/^{\circ}\text{C}$  (typical value)

### CAPACITANCE DRIFT

Up to + 40 °C, ± 0.5 % for a period of two years

### DERATING FOR DC AND AC CATEGORY VOLTAGE $U_C$

At + 85 °C:  $U_C = 1.0 U_R$

At + 100 °C:  $U_C = 0.7 U_R$

### SELF INDUCTANCE

~ 6 nH measured with 2 mm long leads

### PULL TEST ON LEADS

≥ 30 N in direction of leads according to IEC 60068-2-21

### RELIABILITY

Operational life > 300 000 h

Failure rate < 1 FIT (0.5 x  $U_R$  and 40 °C)

For further details, please refer to the general information available at [www.vishay.com/doc?26033](http://www.vishay.com/doc?26033).



**RoHS**  
COMPLIANT

| CAPACITANCE | CAPACITANCE CODE | VOLTAGE CODE 63<br>630 VDC/300 VAC |      |      |      | VOLTAGE CODE 10<br>1000 VDC/350 VAC |      |      |      | VOLTAGE CODE 12<br>1250 VDC/400 VAC |      |      |      |
|-------------|------------------|------------------------------------|------|------|------|-------------------------------------|------|------|------|-------------------------------------|------|------|------|
|             |                  | W                                  | H    | L    | PCM  | W                                   | H    | L    | PCM  | W                                   | H    | L    | PCM  |
| 100 pF      | - 110            | -                                  | -    | -    | -    | -                                   | -    | -    | -    | -                                   | -    | -    | -    |
| 150 pF      | - 115            | -                                  | -    | -    | -    | -                                   | -    | -    | -    | -                                   | -    | -    | -    |
| 220 pF      | - 122            | -                                  | -    | -    | -    | -                                   | -    | -    | -    | -                                   | -    | -    | -    |
| 330 pF      | - 133            | -                                  | -    | -    | -    | -                                   | -    | -    | -    | -                                   | -    | -    | -    |
| 470 pF      | - 147            | -                                  | -    | -    | -    | -                                   | -    | -    | -    | -                                   | -    | -    | -    |
| 680 pF      | - 168            | -                                  | -    | -    | -    | -                                   | -    | -    | -    | -                                   | -    | -    | -    |
| 1000 pF     | - 210            | -                                  | -    | -    | -    | -                                   | -    | -    | -    | -                                   | -    | -    | -    |
| 1200 pF     | - 212            | -                                  | -    | -    | -    | -                                   | -    | -    | -    | 5.5                                 | 10.5 | 18.0 | 15   |
| 1500 pF     | - 215            | -                                  | -    | -    | -    | -                                   | -    | -    | -    | 5.5                                 | 10.5 | 18.0 | 15   |
| 1800 pF     | - 218            | -                                  | -    | -    | -    | 5.5                                 | 10.5 | 18.0 | 15   | 6.5                                 | 12.5 | 18.0 | 15   |
| 2200 pF     | - 222            | -                                  | -    | -    | -    | 5.5                                 | 10.5 | 18.0 | 15   | 6.5                                 | 12.5 | 18.0 | 15   |
| 2700 pF     | - 227            | 5.5                                | 10.5 | 18.0 | 15   | 6.5                                 | 12.5 | 18.0 | 15   | 7.5                                 | 13.5 | 18.0 | 15   |
| 3300 pF     | - 233            | 5.5                                | 10.5 | 18.0 | 15   | 6.5                                 | 12.5 | 18.0 | 15   | 7.5                                 | 13.5 | 18.0 | 15   |
| 3900 pF     | - 239            | 6.5                                | 12.5 | 18.0 | 15   | 7.5                                 | 13.5 | 18.0 | 15   | 6.5                                 | 14.5 | 26.5 | 22.5 |
| 4700 pF     | - 247            | 6.5                                | 12.5 | 18.0 | 15   | 7.5                                 | 13.5 | 18.0 | 15   | 6.5                                 | 14.5 | 26.5 | 22.5 |
| 5600 pF     | - 256            | 7.5                                | 13.5 | 18.0 | 15   | 8.5                                 | 14.5 | 18.0 | 15   | 6.5                                 | 14.5 | 26.5 | 22.5 |
| 6800 pF     | - 268            | 7.5                                | 13.5 | 18.0 | 15   | 8.5                                 | 14.5 | 18.0 | 15   | 6.5                                 | 14.5 | 26.5 | 22.5 |
| 8200 pF     | - 282            | 8.5                                | 14.5 | 18.0 | 15   | 6.5                                 | 14.5 | 26.5 | 22.5 | 57.5                                | 15.5 | 26.5 | 22.5 |
| 0.01 µF     | - 310            | 8.5                                | 14.5 | 18.0 | 15   | 6.5                                 | 14.5 | 26.5 | 22.5 | 7.5                                 | 15.5 | 26.5 | 22.5 |
| 0.012 µF    | - 312            | 8.5                                | 17.5 | 18.0 | 15   | 7.5                                 | 15.5 | 26.5 | 22.5 | 10.5                                | 18.5 | 26.5 | 22.5 |
| 0.015 µF    | - 315            | 10.5                               | 17.5 | 18.0 | 15   | 7.5                                 | 15.5 | 26.5 | 22.5 | 10.5                                | 18.5 | 26.5 | 22.5 |
| 0.018 µF    | - 318            | 7.5                                | 15.5 | 26.5 | 22.5 | 8.5                                 | 16.5 | 26.5 | 22.5 | 11.0                                | 21.0 | 26.5 | 22.5 |
| 0.022 µF    | - 322            | 7.5                                | 15.5 | 26.5 | 22.5 | 8.5                                 | 16.5 | 26.5 | 22.5 | 11.0                                | 21.0 | 26.5 | 22.5 |
| 0.027 µF    | - 327            | 8.5                                | 16.5 | 26.5 | 22.5 | 10.5                                | 18.5 | 26.5 | 22.5 | 11.5                                | 20.5 | 31.5 | 27.5 |
| 0.033 µF    | - 333            | 10.5                               | 18.5 | 26.5 | 22.5 | 11.5                                | 20.5 | 31.5 | 27.5 | 11.5                                | 20.5 | 31.5 | 27.5 |
| 0.039 µF    | - 339            | 10.5                               | 18.5 | 26.5 | 22.5 | 11.5                                | 20.5 | 31.5 | 27.5 | 13.5                                | 23.5 | 31.5 | 27.5 |
| 0.047 µF    | - 347            | 10.5                               | 18.5 | 26.5 | 22.5 | 11.5                                | 20.5 | 31.5 | 27.5 | 13.5                                | 23.5 | 31.5 | 27.5 |
| 0.056 µF    | - 356            | 11.5                               | 20.5 | 31.5 | 27.5 | 12.5                                | 22.5 | 41.5 | 37.5 | 12.5                                | 23.5 | 41.5 | 37.5 |
| 0.068 µF    | - 368            | 11.5                               | 20.5 | 31.5 | 27.5 | 12.5                                | 22.5 | 41.5 | 37.5 | 12.5                                | 22.5 | 41.5 | 37.5 |
| 0.082 µF    | - 382            | 11.5                               | 20.5 | 31.5 | 27.5 | 12.5                                | 22.5 | 41.5 | 37.5 | 14.5                                | 24.5 | 41.5 | 37.5 |
| 0.1 µF      | - 410            | 13.5                               | 23.5 | 31.5 | 27.5 | 14.5                                | 24.5 | 41.5 | 37.5 | 14.5                                | 24.5 | 41.5 | 37.5 |
| 0.12 µF     | - 412            | 12.5                               | 22.5 | 41.5 | 37.5 | 14.5                                | 24.5 | 41.5 | 37.5 | 16.0                                | 28.5 | 41.5 | 37.5 |
| 0.15 µF     | - 415            | 12.5                               | 22.5 | 41.5 | 37.5 | 16.0                                | 28.5 | 41.5 | 37.5 | 16.0                                | 28.5 | 41.5 | 37.5 |
| 0.18 µF     | - 418            | 14.5                               | 24.5 | 41.5 | 37.5 | 16.0                                | 28.5 | 41.5 | 37.5 | 20.0                                | 40.0 | 42.5 | 37.5 |
| 0.22 µF     | - 422            | 14.5                               | 24.5 | 41.5 | 37.5 | 18.0                                | 32.5 | 41.5 | 37.5 | 20.0                                | 40.0 | 42.5 | 37.5 |

Further C-values upon request.

**RECOMMENDED PACKAGING**

| LETTER CODE | TYPE OF PACKAGING | HEIGHT (H)<br>(mm) | REEL DIAMETER<br>(mm) | ORDERING CODE<br>EXAMPLES | PCM<br>15 | PCM<br>22.5 - 27.5 | PCM<br>37.5 |
|-------------|-------------------|--------------------|-----------------------|---------------------------|-----------|--------------------|-------------|
| D           | AMMO              | 16.5               | S*                    | KP 1836-168/205-D         | X         | -                  | -           |
| G           | AMMO              | 18.5               | S*                    | KP 1836-168/205-G         | X         | -                  | -           |
| F           | REEL              | 16.5               | 350                   | KP 1836-168/205-F         | X         | -                  | -           |
| W           | REEL              | 18.5               | 350                   | KP 1836-168/205-W         | X         | -                  | -           |
| V           | REEL              | 18.5               | 500                   | KP 1836-310/134-V         | X         | X                  | -           |
| G           | AMMO              | 18.5               | L*                    | KP 1836-310/134-G         | -         | X                  | -           |
| -           | BULK              | -                  | -                     | KP 1836-310/134           | X         | X                  | X           |

\* S = box size 55 x 210 x 340 mm (W x H x L)

\* L = box size 60 x 360 x 510 mm (W x H x L)

Polypropylene Film Capacitors  
Related Document: IEC 60384-17 Grade 1.2

Vishay Roederstein

| CAPACITANCE   | CAPACITANCE CODE | VOLTAGE CODE 13<br>1600 VDC/500 VAC |      |      |      | VOLTAGE CODE 20<br>2000 VDC/600 VAC |      |      |      |
|---------------|------------------|-------------------------------------|------|------|------|-------------------------------------|------|------|------|
|               |                  | W                                   | H    | L    | PCM  | W                                   | H    | L    | PCM  |
| 100 pF        | - 110            | -                                   | -    | -    | -    | 5.5                                 | 10.5 | 18.0 | 15   |
| 150 pF        | - 115            | -                                   | -    | -    | -    | 5.5                                 | 10.5 | 18.0 | 15   |
| 220 pF        | - 122            | -                                   | -    | -    | -    | 5.5                                 | 10.5 | 18.0 | 15   |
| 330 pF        | - 133            | -                                   | -    | -    | -    | 5.5                                 | 10.5 | 18.0 | 15   |
| 470 pF        | - 147            | -                                   | -    | -    | -    | 5.5                                 | 10.5 | 18.0 | 15   |
| 680 pF        | - 168            | 5.5                                 | 10.5 | 18.0 | 15   | 5.5                                 | 10.5 | 18.0 | 15   |
| 1000 pF       | - 210            | 5.5                                 | 10.5 | 18.0 | 15   | 6.5                                 | 14.5 | 26.5 | 22.5 |
| 1200 pF       | - 212            | 6.5                                 | 12.5 | 18.0 | 15   | 6.5                                 | 14.5 | 26.5 | 22.5 |
| 1500 pF       | - 215            | 6.5                                 | 12.5 | 18.0 | 15   | 6.5                                 | 14.5 | 26.5 | 22.5 |
| 1800 pF       | - 218            | 6.5                                 | 14.5 | 26.5 | 22.5 | 6.5                                 | 14.5 | 26.5 | 22.5 |
| 2200 pF       | - 222            | 6.5                                 | 14.5 | 26.5 | 22.5 | 6.5                                 | 14.5 | 26.5 | 22.5 |
| 2700 pF       | - 227            | 6.5                                 | 14.5 | 26.5 | 22.5 | 7.5                                 | 15.5 | 26.5 | 22.5 |
| 3300 pF       | - 233            | 6.5                                 | 14.5 | 26.5 | 22.5 | 7.5                                 | 15.5 | 26.5 | 22.5 |
| 3900 pF       | - 239            | 7.5                                 | 15.5 | 26.5 | 22.5 | 10.5                                | 18.5 | 26.5 | 22.5 |
| 4700 pF       | - 247            | 7.5                                 | 15.5 | 26.5 | 22.5 | 10.5                                | 18.5 | 26.5 | 22.5 |
| 5600 pF       | - 256            | 8.5                                 | 16.5 | 26.5 | 22.5 | 10.5                                | 18.5 | 26.5 | 22.5 |
| 6800 pF       | - 268            | 8.5                                 | 16.5 | 26.5 | 22.5 | 11.5                                | 20.5 | 31.5 | 27.5 |
| 8200 pF       | - 282            | 10.5                                | 18.5 | 26.5 | 22.5 | 11.5                                | 20.5 | 31.5 | 27.5 |
| 0.01 $\mu$ F  | - 310            | 10.5                                | 18.5 | 26.5 | 22.5 | 11.5                                | 20.5 | 31.5 | 27.5 |
| 0.012 $\mu$ F | - 312            | 11.5                                | 20.5 | 31.5 | 27.5 | 13.5                                | 23.5 | 31.5 | 27.5 |
| 0.015 $\mu$ F | - 315            | 11.5                                | 20.5 | 31.5 | 27.5 | 13.5                                | 23.5 | 31.5 | 27.5 |
| 0.018 $\mu$ F | - 318            | 11.5                                | 20.5 | 31.5 | 27.5 | 15.0                                | 24.5 | 31.5 | 27.5 |
| 0.022 $\mu$ F | - 322            | 11.5                                | 20.5 | 31.5 | 27.5 | 15.0                                | 24.5 | 31.5 | 27.5 |
| 0.027 $\mu$ F | - 327            | 13.5                                | 23.5 | 31.5 | 27.5 | 14.5                                | 24.5 | 41.5 | 37.5 |
| 0.033 $\mu$ F | - 333            | 13.5                                | 23.5 | 31.5 | 27.5 | 14.5                                | 24.5 | 41.5 | 37.5 |
| 0.039 $\mu$ F | - 339            | 12.5                                | 22.5 | 41.5 | 37.5 | 16.0                                | 28.5 | 41.5 | 37.5 |
| 0.047 $\mu$ F | - 347            | 12.5                                | 22.5 | 41.5 | 37.5 | 16.0                                | 28.5 | 41.5 | 37.5 |
| 0.056 $\mu$ F | - 356            | 14.5                                | 24.5 | 41.5 | 37.5 | -                                   | -    | -    | -    |
| 0.068 $\mu$ F | - 368            | 14.5                                | 24.5 | 41.5 | 37.5 | -                                   | -    | -    | -    |
| 0.082 $\mu$ F | - 382            | 16.0                                | 28.5 | 41.5 | 37.5 | -                                   | -    | -    | -    |
| 0.1 $\mu$ F   | - 410            | 16.0                                | 28.5 | 41.5 | 37.5 | -                                   | -    | -    | -    |
| 0.12 $\mu$ F  | - 412            | -                                   | -    | -    | -    | -                                   | -    | -    | -    |
| 0.15 $\mu$ F  | - 415            | -                                   | -    | -    | -    | -                                   | -    | -    | -    |
| 0.18 $\mu$ F  | - 418            | -                                   | -    | -    | -    | -                                   | -    | -    | -    |
| 0.22 $\mu$ F  | - 422            | -                                   | -    | -    | -    | -                                   | -    | -    | -    |

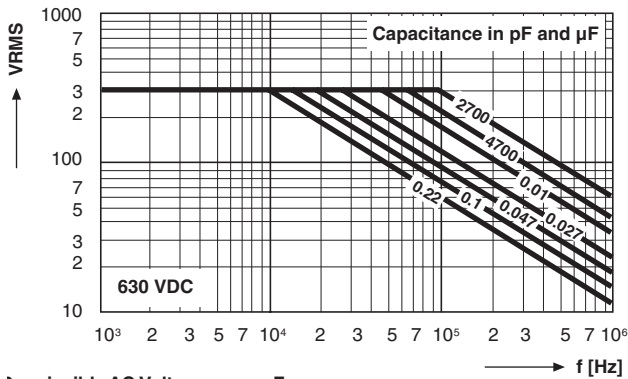
Further C-values upon request.

## RECOMMENDED PACKAGING

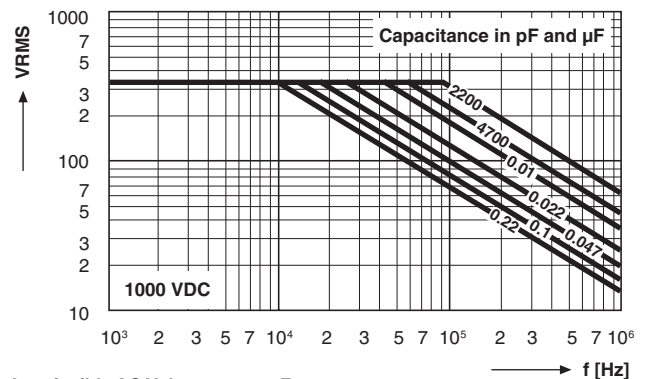
| LETTER CODE | TYPE OF PACKAGING | HEIGHT (H) (mm) | REEL DIAMETER (mm) | ORDERING CODE EXAMPLES | PCM 15 | PCM 22.5 - 27.5 | PCM 37.5 |
|-------------|-------------------|-----------------|--------------------|------------------------|--------|-----------------|----------|
| D           | AMMO              | 16.5            | S*                 | KP 1836-168/205-D      | X      | -               | -        |
| G           | AMMO              | 18.5            | S*                 | KP 1836-168/205-G      | X      | -               | -        |
| F           | REEL              | 16.5            | 350                | KP 1836-168/205-F      | X      | -               | -        |
| W           | REEL              | 18.5            | 350                | KP 1836-168/205-W      | X      | -               | -        |
| V           | REEL              | 18.5            | 500                | KP 1836-310/134-V      | X      | X               | -        |
| G           | AMMO              | 18.5            | L*                 | KP 1836-310/134-G      | -      | X               | -        |
| -           | BULK              | -               | -                  | KP 1836-310/134        | X      | X               | X        |

\* S = box size 55 x 210 x 340 mm (W x H x L)

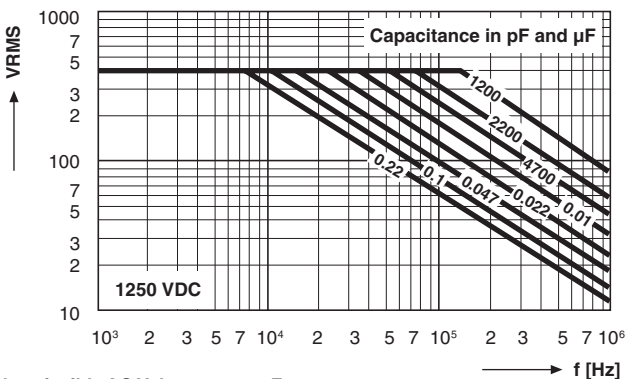
\* L = box size 60 x 360 x 510 mm (W x H x L)



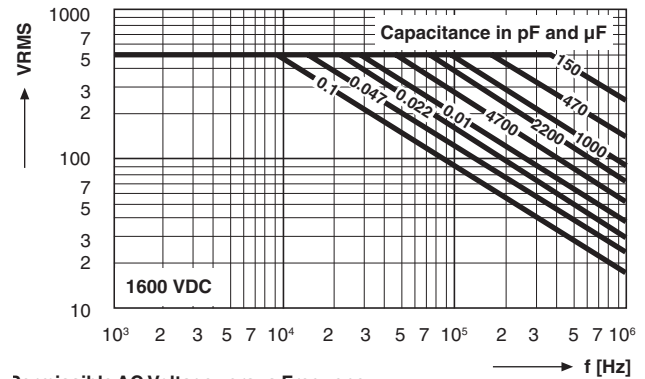
Permissible AC Voltage versus Frequency



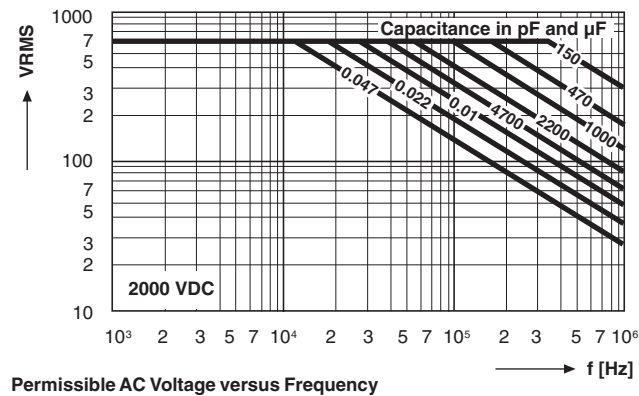
Permissible AC Voltage versus Frequency



Permissible AC Voltage versus Frequency



Permissible AC Voltage versus Frequency



Permissible AC Voltage versus Frequency



### Disclaimer

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