



信陽師範大學

XINYI NORMAL UNIVERSITY

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1.6	.....	8
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1.

2.

3.

4.

4. q

## 1.1

GB/T 2542-2012

1. .
2. 5 g
3. 1 mm
4. 0.5 mm

1. 5

2.

0.2

2 h

*m*

3.

0.5 mm

*V* m<sup>3</sup>

4

1.  $\rho$  (1.1)

$$\rho = \frac{m}{V}$$

(0.1)

2.

## 1.2

GB/T 50081-2019

[

]

1. . . . .
2. 5 kg 0.1 g
3. 0.5 mm

1. 3
2. 0.1g
3. m

- 1
- 1 6 0.5mm 6 1
- 2  $V$   $m^3$  4
- 2 4 4 4
- 2  $V$   $m^3$  4

1.  $\rho$  (1.1)
- 2.

**1.3**

JGJ52-2006 GB/T  
14684-2022

1. 1 L 108 mm 109  
mm 2 mm
2. 5 kg 0.1 g
- 3.

4. 0.5 mm

5.

1. 5.00 mm 4.75 mm  
3L

2. 0.1g  $m_1$

3. 50 mm) (

$m_2$

1.  $\rho_{os}$  (1.2)

$$\rho_{os} = \frac{m_2 - m_1}{V_o} \quad (0.2)$$

$V_o$

2.

### 1.4

JGJ52-2006

GB/T

14684-2022

1. 500 mL

2. 1 kg 1 g

3.

4.

1. 5.00 mm 4.75 mm  
650 g

2. 300 g  $m_0$



3. 24 h

$m_1$

4. 2

$m_2$

1.  $\rho'$  (1.3)

$$\rho = \frac{m_0}{m_0 + m_2 - m_1} \times \rho \quad (0.3)$$

2.

3. 1.3

$V_c$

(1.4)

$$V_c = 1 - \frac{\rho_{os}}{\rho} \times 100\% \quad (0.4)$$

### 1.5

JGJ52-2006

GB/T

14685-2022

1. 0.1%

2. 1

3. mm 600mm

4.

5.

1

/mm	/L			
		/mm	/mm	/mm
9.5,16.0,19.0,26.5	10	208	294	2

31.5,37.5	20	294	294	3
53.0,63.0,75.0	30	360	294	4

1. 40 80 120kg

2. 0.1g  $m_1$

3.

50mm

$m_2$

1.  $\rho_{os}$  (1.2)

2.

## 1.6

JGJ52-2006

GB/T

14685-2022

1. 1000ml

2. 5 kg 1 g

3.

4. 5mm 4.75mm

1. 5mm 2kg

2.

3.

$m_1$

4.

$m_0$

5.

2

.

$m_2$

1.

$\rho'$  (1.3)

2.

3. 1.5

$V_c$

(1.4)

## 2.1

GB/T1345-2005

1. m GB/T6005 GB/T6003.1
2. 5 g
3. 100g 0.01g

1. 4000 6000Pa
2. 25.00g  $m_c$

3. 2min

4.  $m_s$  g 0.01g

1. 25g  $m_c$  0.01g

2. 120 40 60°  
0.03g

$m_s$

1. 0.1%

$$F = \frac{m_s}{m_c} \times 100\% \quad (0.5)$$

## 2.2

GB/T1345-2005

1.					
2.					
3.					
1.		500g		120	
150ml					
2.					
3.			120s	15s	120s
4.					
			1	2s	
				30s	
	<i>S</i>		6±1mm		
<i>S</i>					
	<i>P</i>				
	1.5min				

## 2.3

GB/T1345-2005





9.  
 24h±15min 48h±30min 72h±45min 7d±2h 28d±8h  
 15min

10.

11. 50±10N/s

$F_f$  N

12.

2.4±0.2kN/s

$F_c$  N

1.

$$R_f = \frac{1.5F_f L}{2bh^2} \quad (0.6)$$

$L$   
40mm

$L$  100mm  $b$   $h$

±10

2.

$$f_c = \frac{F_c}{A} \quad (0.7)$$

$A$

40mm×40mm=1600mm<sup>2</sup>

±10

±10

1.

2.

3.

4.



### 3.1

JGJ52-2006 GB/T  
14684-2022

1. JGJ52 0.160 0.315 0.630 1.25mm  
2.50 5.00 10.00mm GB/T14684 0.150  
0.300 0.600 1.18 2.36 4.75 9.50mm

GB/T6003.1

GB/T6003.2

2. 1kg 1g  
3. 0.5±0.1mm 50±3Hz  
4.

1. 10.0 mm(9.5 mm ) 4.75 mm(  
) ( )  
550g

2. 500 g 10 min  
10 min

3. 0.1

4. 200 g

(1 3) h

5 0.08 mm

1. 0.1
- 2.
3. 3-1

3-1

mm			
	1	2	3
10.0	0	0	0
5.0	10 0	10 0	10 0
2.5	35 5	25 0	15 0
1.25	65 35	50 10	25 0
0.630	85 71	70 41	40 16
0.315	95 80	92 70	85 55
0.160	100 90	100 90	100 90

4.  $M_x(0.1)$

$$M_x = \frac{A_2 + A_3 + A_4 + A_5 + A_6 - 5A_1}{100 - A_1} \quad (0.8)$$

$A_1$   $A_2$ ..... $A_6$       5.00mm 2.50mm.....0.160mm

5. 1

6. (Mx)

5.00mm 0.630mm

5

### 3.2

14684-2022

- 1. 1kg 1g
- 2.

- 1. 20mm

- 2. 500g  $m_1$  g  
 $m_2(\text{g})$

- 3.  $m_3(\text{g})$

- 1. 0.1%

$$\omega_{wc} = \frac{m_2 - m_3}{m_3 - m_1} \times 100\% \quad (0.9)$$

- 2.

### 3.3

JGJ52-2006

GB/T

14685-2022

1.	JGJ52	2.50	5.00	10.0	16.0	20.0	25.0		
31.5	40.0	50.0	63.0	80.0	mm	GB/T14685	2.36		
4.75	9.50	16.0	19.0	26.5	31.5	37.5	53.0	90.0	mm

GB/T6003.1

GB/T6003.2

- 2.

3.  $0.5 \pm 0.1 \text{mm}$   $50 \pm 3 \text{Hz}$

1.

2. 3-2( 3-3)

3-2

JGJ52

mm	10	16	20	25	31.5	40	63	80
kg	2	4	4	10	10	15	20	30

3-3

GB/T14685

mm	10	16	20	25	31.5	40	63	80
kg	2	4	4	10	10	15	20	30

3. 10min

1

4. 0.1%

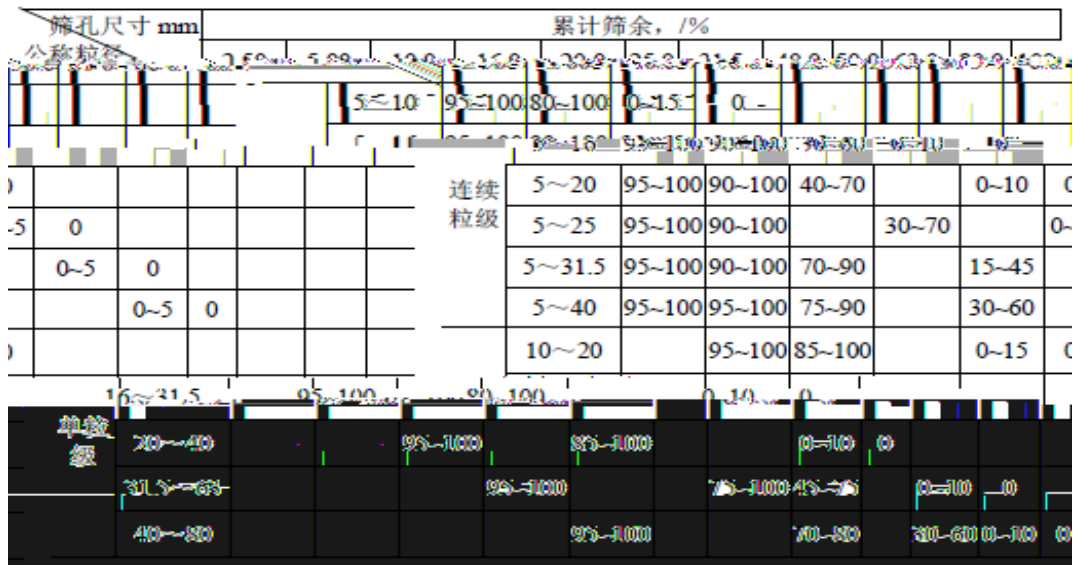
1. 0.1

2.

0.1

3. 3-4

3-4



4.

10

## 4.1

GB/T 50080-2016

- 1.
  - 2.
  - 3.
- 1.
  - 2.

1

1.

2.

25

1

3.

3~7 s

150 s

1 mm

5 mm

220 mm

50 mm

50 mm

4.

2

40 mm

5~30 s

50 mm

30 s

1.

2.

3.

25

4.

5.

6.

7.

1s

(30~ 21s)

(20~11s)

(10~5s)

## 4.2

GB/T 50080-2016

1. : 40 mm 5 L

40 mm

4

2. : 100 kg 50 g

3. : 50±3 Hz

4. : 16 mm 600mm

1.  $m_1$  10 g

2.

90 mm

90 mm



5 L

25

5L

100 mm,

100 cm<sup>2</sup>

12

5~ 10

3.

$m_2$

10 g

10kg/m<sup>3</sup>:

$$\rho_{0c} = \frac{m_2 - m_1}{V} \times 1000$$

$\rho_{0c}$ —

(kg/m<sup>3</sup>);

$m_1$ —

(kg);

$m_2$ —

(kg);

$V$ —

(L)

### 4.3

GB/T 50080-2016

JGJ55-2011

GB 50164-2011

1.

1.

C0 S0 g0 W0

$m_{c0}:m_{s0}:m_{g0}:m_{w0}=1:1.33:3.10:0.48$

2.

1.5m×2m

**4.1**

5 10

30min

W/C

**4.4**

GB/T 50080-2016

1.

1mm

1mm

100 mm

0.05 mm

±1%

2.

3.

0.3~0.5 MPa;

0.5~0.8 MPa.

C30

C30

C60

4.

$$f_{cu} = \frac{P}{A}$$

$f_{cu}$ —

MPa

P—

(N)

A—

mm<sup>2</sup>

## 5.1

GB/T 494-2010

JTG E20-2011

1.					
2.					
3.		200	55 mm	35 mm	200~350
	70 mm	45 mm		350	
	60 mm		125 mL		
4.		10 L			
5.					
6.					
7.		0.1s			
8.			0.1 mm		
9.					
10.					
11.					
1.					
2.					
3.				10 mm	
		1~2 h			
4.					

10 mm

5.

0

6.

5s

0.1 mm

7.

3

10 mm

200

1. 3 3

$y = \lg P, x = T,$

$A_{\lg Pen}$

$$\lg P = K + A_{\lg Pen} \times T$$

$\lg P$ —

$T$ —

$K$ —

$A_{\lg Pen}$ —

2.

PI

$$PI = \frac{20 - 500A_{\lg Pen}}{1 + 50A_{\lg Pen}}$$

## 5.2

GB/T 494-2010

JTG E20-2011

1.

2.

3.

4.

100 mm

50 mm

5.

6.

1.

2.

3.

30 min

30

min

1~1.5 h

4.

5.

25 mm

6.

7.

“cm”

1.

5%

5%

## 6.1

GB/T 228.1-2010

1

GB/T 42901-2023

1.

2.

3.

1.

$L_0$   $L_0=5a$  10a 100a

a

2.

3.

4.

5.

6.

7.

8.

$$L_0/3$$

$L_1$

$$L_0/3$$

$L_1$

O

B

( )

C

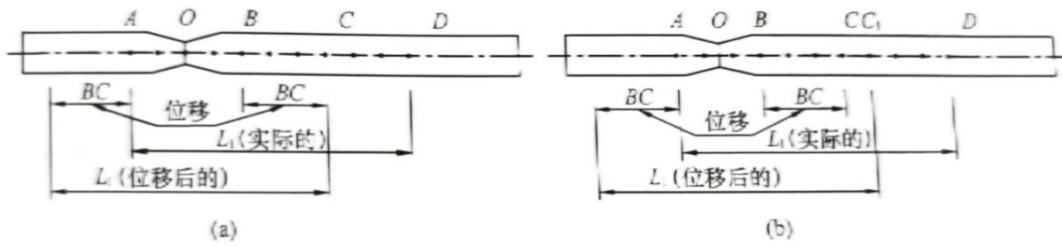
( ) 1

1

C C

$$L_1=AB+2BC$$

$$L_1=AB+BC+BC$$



(a)

(b)

a

b

1.

$\delta_s$

$\delta_b$

$$\delta_s = \frac{F_s}{A}, \delta_b = \frac{F_b}{A}$$

$\delta_s$   $\delta_b$  —

(MPa)

$F_s$   $F_b$  —

(N)

$A$  —

(mm<sup>2</sup>)

$\delta_s$   $\delta_b$

1000MPa

10MPa

$\delta_s$   $\delta_b$

200~1000MPa

5MPa

$\delta_s$   $\delta_b$

200MPa

1MPa

2.

$\delta_5$   $\delta_{10}$

$\delta_5$  ( $\delta_{10}$ )

1%

$$\delta_5 \quad \delta_{10} = \frac{L_1 - L_0}{L_0} \times 100\%$$

$\delta_5$   $\delta_{10}$  —

$L_0=5a$   $L_0=10a$

(%)



$L_1$ — (mm)

$L_0$ — (mm)

## 6.2

GB/T 232-2010

1.

2.

1.

2-11

2-6(a)

$L_1$

$$L_1=(d+3a)\pm 0.5a$$

$d$ — (mm)

$a$ — (mm)

2.

3. (180° 90°)

4.

(180° 90°)

5.

6.

1.

- |    |      |        |        |
|----|------|--------|--------|
| 2. |      | 2 mm   | 0.2 mm |
| 3. | 2 mm | 5 mm   | 0.2 mm |
| 4. | 5 mm | 0.5 mm |        |
| 5. |      |        |        |