

105°C LEAD FREE REFLOW SOLDERING.

ALUMINUM ELECTROLYTIC CAPACITOR, POLARIZED

FEATURES

G RoHS COMPLIANT

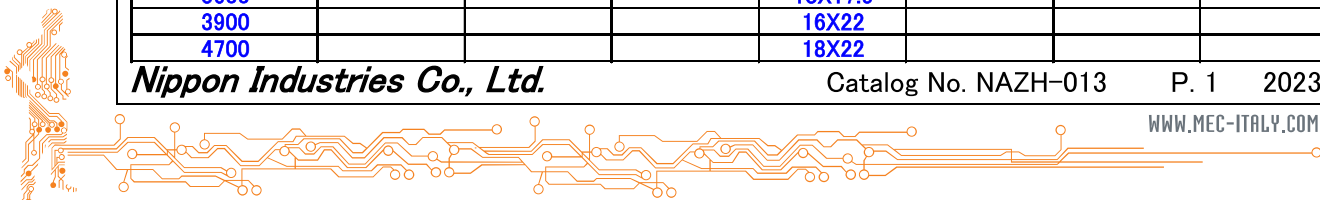
- LOAD LIFE : 105°C 2000~5000 HOURS .
- CYLINDRIAL LEADLESS TYPE FOR SURFACE MOUNTING
- LEAD FREE REFLOW SOLDERING IS AVAILABLE.
- SOLVENT PROOF (WITHIN 2 MINUTES).

CHARACTERISTICS

Rated Voltage Range		6.3 ~ 63 Vdc						
Capacitance Range		10 ~ 4700 μF						
Operating Temperature Range		-55 ~ +105 °C						
Capacitance Tolerance		±20%(M)						
Max. Leakage Current After 2 minutes @20°C		0.01CV or 3 μA, whichever is greater						
Surge Voltage	R.V. (Vdc)	6.3	10	16	25	35	50	63
	S.V. (Vdc)	8	13	20	32	44	63	79
Max. Tan δ at 120Hz & 20°C	Tan δ	0.26	0.19	0.16	0.14	0.12	0.10	0.08
	When rated capacitance exceeds 1000 μ F, add 0.02 to the value above for each 1000μF increase.							
Low Temperature Stability Impedance Ratio @ 120Hz	R.V. (Vdc)	6.3	10	16	25	35	50	63
	Z-25°C/Z+20°C	2	2	2	2	2	2	2
	Z-40°C/Z+20°C	3	3	3	3	3	3	3
	Z-55°C/Z+20°C	4	4	4	3	3	3	3
Load Life Test 105°C With Rated Voltage	Test	Φ6.3 to Φ10X10.5: 2000 Hrs, Φ10X14: 3000 Hrs, Φ16 to Φ18: 5000 Hrs						
	Capacitance Change	Within ±30% of initial measured value						
	Tan δ	Less than 200% of specified value						
	Leakage Current	Less than specified value						
Resistance to soldering heat	After reflow soldering (Page 5), the capacitor shall be left at room temperature before measurement.							
	Capacitance Change	Within ±10% of initial measured value						
	Tan δ	Less than the initial limit						
	Leakage Current	Less than the initial limit						
	Appearance	No significant change can be observed.						

STANDARD PRODUCT TABLE (ΦD x L mm)

R.V.(Vdc) Cap.(μF)	6.3	10	16	25	35	50	63
10						4X6.1	
22				4X6.1	4X6.1	5X6.1	
33				4X6.1	5X6.1		
47			4X6.1	5X6.1	5X6.1	6.3X6.1	
68		4X6.1	5X6.1	5X6.1	6.3X6.1		
100	4X6.1		5X6.1	6.3X6.1	6.3X6.1	6.3X8	
150		5X6.1	6.3X6.1	6.3X8	6.3X8		
220	5X6.1	6.3X6.1	6.3X6.1	6.3X8		8X10.5	10X14
330	6.3X6.1	6.3X8	6.3X8			8X10.5	10X10.5
390					8X10.5		
470	6.3X8	6.3X8		8X10.5	10X10.5	10X14	
560				8X10.5	10X10.5		
680	6.3X8		8X10.5		10X10.5		
820			8X10.5	10X10.5	10X14		
1000		8X10.5	10X10.5	10X10.5			
1200	8X10.5		10X10.5	10X14			
1500	8X10.5	10X10.5					
1800					16X17		
2200	10X10.5						
2400					18X17.5		
2700				16X17	16X22		
3000					18X22		
3600				18X17.5			
3900				16X22			
4700				18X22			



MAX. ESR (Ω) at 100kHz, 20°C

R.V.(Vdc) Cap.(μ F)	6.3	10	16	25	35	50	63
10						2.30 0.88	
22				0.85	0.85	0.88	
33				0.85	0.36		
47			0.85	0.36	0.36	0.68	
68		0.85	0.36	0.36	0.26		
100	0.85		0.36	0.26	0.26	0.34	
150		0.36	0.26	0.16	0.16		
220	0.36	0.26	0.26	0.16		0.18	0.14
330	0.26	0.16	0.16		0.08	0.12	
390					0.08		
470	0.16	0.16		0.08	0.06	0.12	
560				0.08	0.06		
680	0.16		0.08		0.06		
820			0.08	0.06	0.06		
1000		0.08	0.06	0.06			
1200	0.08		0.06	0.06			
1500	0.08	0.06					
1800					0.035		
2200	0.06						
2400					0.033		
2700				0.035	0.034		
3000					0.025		
3600				0.033			
3900				0.034			
4700				0.025			

MAXIMUM PERMISSIBLE RIPPLE CURRENT (mA rms at 100kHz & 105°C)

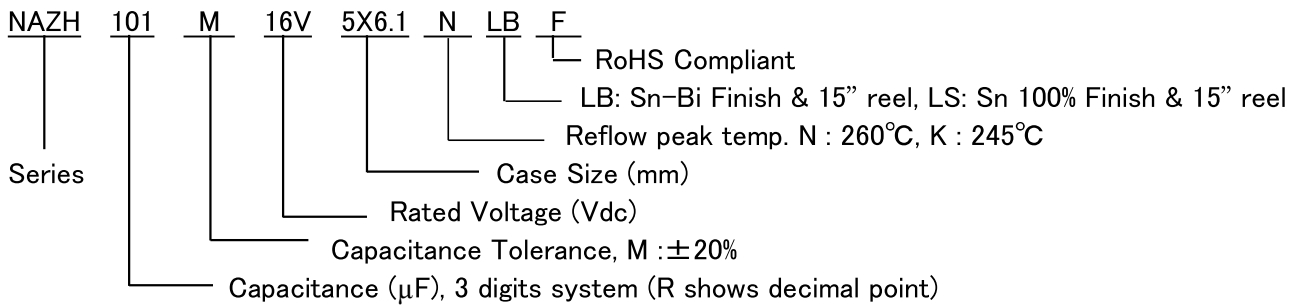
R.V.(Vdc) Cap.(μ F)	6.3	10	16	25	35	50	63
10						85 165	
22				160	160	165	
33				160	240		
47			160	240	240	195	
68		160	240	240	300		
100	160		240	300	300	350	
150		240	300	600	600		
220	240	300	300	600		670	600
330	300	600	600		850	900	
390					850		
470	600	600		850	1190	750	
560				850	1190		
680	600		850		1190		
820			850	1190	1500		
1000		850	1190	1190			
1200	850		1190	1500			
1500	850	1190					
1800					1800		
2200	1190						
2400					2060		
2700				1800	2540		
3000					2640		
3600				2060			
3900				2540			
4700				2640			



STANDARD PRODUCTS AND SPECIFICATIONS

Part number	R.V. (V.DC)	Capacitance (μ F)	$\tan \delta$	E.S.R. (Ω) (100kHz, 20°C)	Rated Ripple Current mA(100kHz,105°C)	
NAZH101M6.3V4X6.1NLBF	6.3V	100	0.26	0.85	160	
NAZH221M6.3V5X6.1NLBF		220	0.26	0.36	240	
NAZH331M6.3V6.3X6.1NLBF		330	0.26	0.26	300	
NAZH471M6.3V6.3X8NLBF		470	0.26	0.16	600	
NAZH681M6.3V6.3X8NLBF		680	0.26	0.16	600	
NAZH122M6.3V8X10.5NLBF		1200	0.26	0.08	850	
NAZH152M6.3V8X10.5NLBF		1500	0.26	0.08	850	
NAZH222M6.3V10X10.5NLBF		2200	0.28	0.06	1190	
NAZH680M10V4X6.1NLBF	10V	68	0.19	0.85	160	
NAZH151M10V5X6.1NLBF		150	0.19	0.36	240	
NAZH221M10V6.3X6.1NLBF		220	0.19	0.26	300	
NAZH331M10V6.3X8NLBF		330	0.19	0.16	600	
NAZH471M10V6.3X8NLBF		470	0.19	0.16	600	
NAZH102M10V8X10.5NLBF		1000	0.19	0.08	850	
NAZH152M10V10X10.5NLBF		1500	0.19	0.06	1190	
NAZH470M16V4X6.1NLBF		16V	47	0.16	0.85	160
NAZH680M16V5X6.1NLBF	68		0.16	0.36	240	
NAZH101M16V5X6.1NLBF	100		0.16	0.36	240	
NAZH151M16V6.3X6.1NLBF	150		0.16	0.26	300	
NAZH221M16V6.3X6.1NLBF	220		0.16	0.26	300	
NAZH331M16V6.3X8NLBF	330		0.16	0.16	600	
NAZH681M16V8X10.5NLBF	680		0.16	0.08	850	
NAZH821M16V8X10.5NLBF	820		0.16	0.08	850	
NAZH102M16V10X10.5NLBF	1000		0.16	0.06	1190	
NAZH122M16V10X10.5NLBF	1200		0.16	0.06	1190	
NAZH220M25V4X6.1NLBF	25V		22	0.14	0.85	160
NAZH330M25V4X6.1NLBF			33	0.14	0.85	160
NAZH470M25V5X6.1NLBF		47	0.14	0.36	240	
NAZH680M25V5X6.1NLBF		68	0.14	0.36	240	
NAZH101M25V6.3X6.1NLBF		100	0.14	0.26	300	
NAZH151M25V6.3X8NLBF		150	0.14	0.16	600	
NAZH221M25V6.3X8NLBF		220	0.14	0.16	600	
NAZH471M25V8X10.5NLBF		470	0.14	0.08	850	
NAZH561M25V8X10.5NLBF		560	0.14	0.08	850	
NAZH821M25V10X10.5NLBF		820	0.14	0.06	1190	
NAZH102M25V10X10.5NLBF		1000	0.14	0.06	1190	
NAZH122M25V10X14NLBF		1200	0.14	0.06	1500	
NAZH272M25V16X17KLSF		2700	0.16	0.035	1800	
NAZH362M25V18X17.5KLSF		3600	0.18	0.033	2060	
NAZH392M25V16X22KLSF		3900	0.18	0.034	2540	
NAZH472M25V18X22KLSF		4700	0.20	0.025	2640	
NAZH220M35V4X6.1NLBF		35V	22	0.12	0.85	160
NAZH330M35V5X6.1NLBF			33	0.12	0.36	240
NAZH470M35V5X6.1NLBF	47		0.12	0.36	240	
NAZH680M35V6.3X6.1NLBF	68		0.12	0.26	300	
NAZH101M35V6.3X6.1NLBF	100		0.12	0.26	300	
NAZH151M35V6.3X8NLBF	150		0.12	0.16	600	
NAZH331M35V8X10.5NLBF	330		0.12	0.08	850	
NAZH391M35V8X10.5NLBF	390		0.12	0.08	850	
NAZH471M35V10X10.5NLBF	470		0.12	0.06	1190	
NAZH561M35V10X10.5NLBF	560		0.12	0.06	1190	
NAZH681M35V10X10.5NLBF	680		0.12	0.06	1190	
NAZH821M35V10X14NLBF	820		0.12	0.06	1500	
NAZH182M35V16X17KLSF	1800		0.12	0.035	1800	
NAZH242M35V18X17.5KLSF	2400		0.14	0.033	2060	
NAZH272M35V16X22KLSF	2700		0.14	0.034	2540	
NAZH302M35V18X22KLSF	3000		0.16	0.025	2640	
NAZH100M50V4X6.1NLBF	50V		10	0.10	2.30	85
NAZH100M50V5X6.1NLBF			10	0.10	0.88	165
NAZH220M50V5X6.1NLBF		22	0.10	0.88	165	
NAZH470M50V6.3X6.1NLBF		47	0.10	0.68	195	
NAZH101M50V6.3X8NLBF		100	0.10	0.34	350	
NAZH221M50V8X10.5NLBF		220	0.10	0.18	670	
NAZH331M50V10X10.5NLBF		330	0.10	0.12	900	
NAZH471M50V10X14NLBF		470	0.10	0.12	750	
NAZH221M63V10X14KLSF		63V	220	0.08	0.14	600

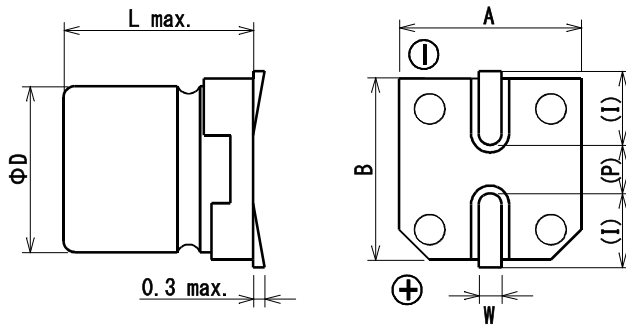
PART NUMBER SYSTEM



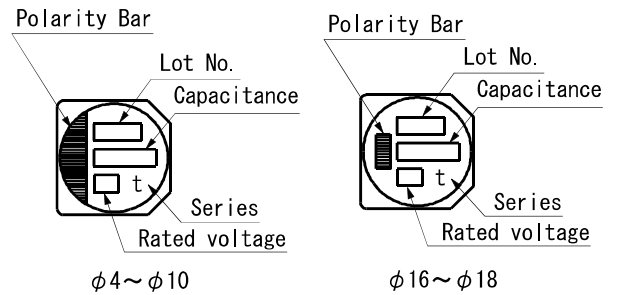
Temp. Code	Peak Temperacter
N	260°C
K	245°C

Code	Terminal Finish & Tape Reel
LBF	Sn-Bi Finish & 15" Reel
LSF	Sn 100% Finish & 15" Reel

DIMENSIONS (mm)



MARKING



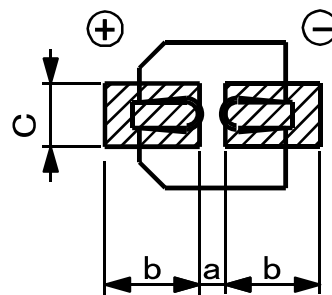
Note : L dimension does not include terminal deflection.

Case Size	φ D±0.5	L max	A±0.2	B±0.2	(I)	W	(P)
4X6.1	4	6.1	4.3	4.3	1.8	0.5~0.8	1.0
5X6.1	5	6.1	5.3	5.3	2.2	0.5~0.8	1.5
6.3X6.1	6.3	6.1	6.6	6.6	2.6	0.5~0.8	1.8
6.3X8	6.3	8.0	6.6	6.6	2.6	0.5~0.8	1.8
8X10.5	8	10.5	8.3	8.3	3.4	0.7~1.1	3.1
10X10.5	10	10.5	10.3	10.3	3.5	0.7~1.4	4.6
10X14	10	14.0	10.3	10.3	3.5	0.7~1.4	4.6
16X17	16	17.0	16.3	16.3	5.2	1.7~2.1	7.0
16X22	16	22.0	16.3	16.3	5.2	1.7~2.1	7.0
18X17.5	18	17.5	19.0	19.0	6.5	1.7~2.1	7.0
18X22	18	22.0	19.0	19.0	6.5	1.7~2.1	7.0

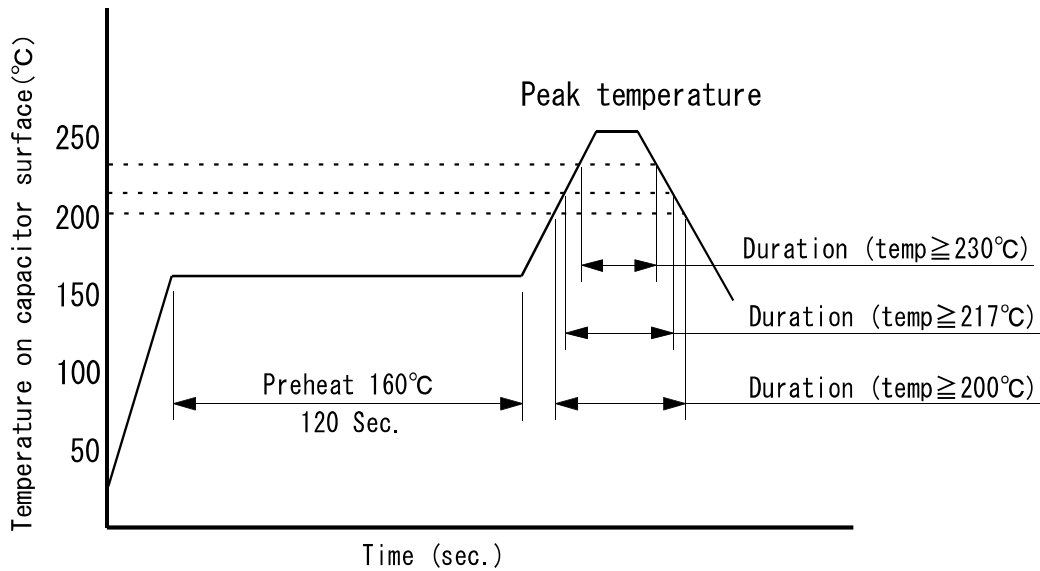
() : Reference value

RECOMMEND LAND PATTERN : (mm)

Case Size	a	b	c
Φ4	1.0	2.5	1.6
Φ5	1.5	2.8	1.6
Φ6.3	1.8	3.6	1.8
Φ8	2.8	4.1	2.1
Φ10	4.3	4.4	2.5
Φ16	6.6	6.5	5.0
Φ18	6.6	7.7	5.0



PERMISSIBLE REFLOW TEMPERATURE PROFILE



Rated Voltage : 6.3Vdc~50Vdc

Size	Peak temperature	Duration	Duration (temp ≥ 230°C)	Duration (temp ≥ 217°C)	Duration (temp ≥ 200°C)	Reflow frequency
Φ 4 ~ Φ 6.3	260°C	(temp ≥ 250°C) 5s	30s	40s	70s	2
	255°C	(temp ≥ 250°C) 10s				
Φ 8 ~ Φ 10	260°C	(temp ≥ 250°C) 5s	30s	40s	70s	1
	245°C	(temp ≥ 240°C) 10s				
Φ 16 ~ Φ 18	245°C	(temp ≥ 240°C) 5s	30s	40s	50s	1
	240°C	(temp ≥ 235°C) 10s				

Rated Voltage : 63Vdc

Size	Peak temperature	Duration	Duration (temp ≥ 230°C)	Duration (temp ≥ 217°C)	Duration (temp ≥ 200°C)	Reflow frequency
Φ 10	245°C	(temp ≥ 240°C) 5s	30s	40s	50s	1
	240°C	(temp ≥ 235°C) 10s				

For Φ 4 to Φ 6.3, our recommended reflow condition is either of following two conditions.

- (1) Peak temperature 260°C, 5s(temp. ≥ 250°C) 2 time reflow
- (2) Peak temperature 255°C, 10s(temp. ≥ 250°C) 2 time reflow

For Φ 8 to Φ 10, our recommended reflow condition is either of following two conditions.

- (1) Peak temperature 260°C, 5s(temp. ≥ 250°C) 1 time reflow
- (2) Peak temperature 245°C, 10s(temp. ≥ 240°C) 2 time reflow

For “Φ 10 (63Vdc)” and “Φ 16 to Φ 18”, our recommended reflow condition is either of following two conditions.

- (1) Peak temperature 245°C, 5s(temp. ≥ 240°C) 1 time reflow**
- (2) Peak temperature 240°C, 10s(temp. ≥ 235°C) 2 time reflow**

Two times of reflow

(The 2nd reflow must be done when the capacitor becomes normal condition regarding temperature.)

* Soldering Method : I.R. or I.R. + heated air.

(VPS Method is not Available.)

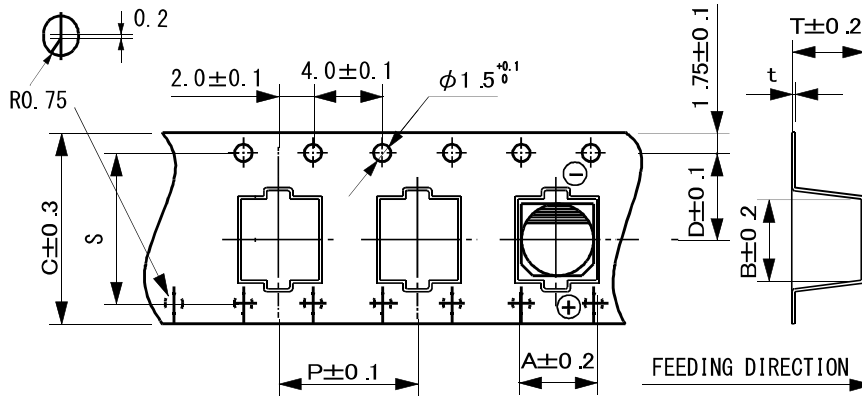
MULTIPLIER FOR RIPPLE CURRENT (Frequency coefficient)

Cap.(μ F)	Frequency (Hz)			
	$100 \leq F < 1k$	$1k \leq F < 10k$	$10k \leq F < 100k$	$100k \leq F$
$C \leq 470$	0.44	0.80	0.95	1.00
$560 \leq C$	0.70	0.90	0.95	1.00

TAPING SPECIFICATIONS :

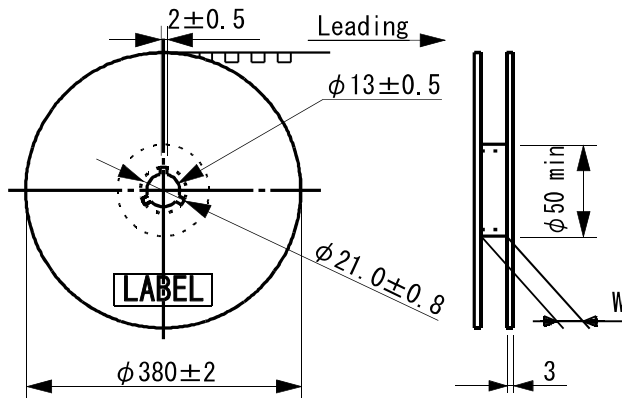
1. Leader and ending tape : Min. 10 cm empty pockets and min. 20 cm of cover tape.
2. Connection : Within 3 connections per reel.

CARRIER TAPE DIMENSIONS (mm) :



Case Size	A ± 0.2	B $^{+0.3}_{-0.2}$	C ± 0.3	D ± 0.1	P ± 0.1	T ± 0.2	t Max.	S ± 0.1
$\Phi 4 \times 6.1$	4.7	$4.6^{+0.2}_{-0.1}$	12.0	5.5	8.0	6.2	0.6	-
$\Phi 5 \times 6.1$	5.7	5.7	12.0	5.5	12.0	6.4	0.6	-
$\Phi 6.3 \times 6.1$	7.0	7.0	16.0	7.5	12.0	6.4	0.6	-
$\Phi 6.3 \times 8$	7.0	7.0	16.0	7.5	12.0	8.4	0.6	-
$\Phi 8 \times 10.5$	8.7	8.7	24.0	11.5	16.0	11.1	0.6	-
$\Phi 10 \times 10.5$	10.7	10.7	24.0	11.5	16.0	11.2	0.6	-
$\Phi 10 \times 14$	10.7	10.7	24.0	11.5	16.0	14.6	0.6	-
$\Phi 16 \times 17$	17.5	17.5	44.0	20.2	28.0	17.3	0.6	40.4
$\Phi 16 \times 22$	17.5	17.5	44.0	20.2	28.0	22.8	0.6	40.4
$\Phi 18 \times 17.5$	19.5	19.5	44.0	20.2	32.0	17.8	0.6	40.4
$\Phi 18 \times 22$	19.5	19.5	44.0	20.2	32.0	22.5	0.6	40.4

REEL DIMENSIONS (mm) :



Case Size	W	Q'ty per reel (pcs)
		TR15 (380mm)
$\Phi 4 \times 6.1$	14	2000
$\Phi 5 \times 6.1$	14	1000
$\Phi 6.3 \times 6.1$	18	1000
$\Phi 6.3 \times 8$	18	900
$\Phi 8 \times 10.5$	26	500
$\Phi 10 \times 10.5$	26	500
$\Phi 10 \times 14$	26	400
$\Phi 16 \times 17$	46	200
$\Phi 16 \times 22$	46	150
$\Phi 18 \times 17.5$	46	175
$\Phi 18 \times 22$	46	125