



ZLS series

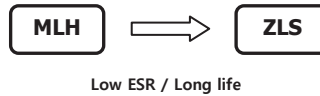
- 105°C 2,000~5,000Hrs assured.
- Low impedance
- For SMPS, IP-Board, Adaptor
- RoHS compliant
- Halogen-free capacitors are also available.

Low ESR

Low Profile

RoHS compliant

Solvent Proof

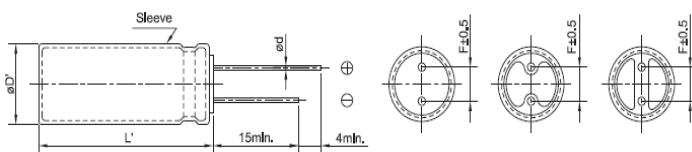


Specifications

Item	Characteristics																											
Rated Voltage Range	6.3 ~ 100Vdc																											
Operating Temperature Range	-55 ~ +105°C																											
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)																											
Leakage Current	I=0.01CV(μA) or 3μA, whichever is greater. Where, I:Max. Leakage current(μA), C:Nominal capacitance(μF), V:Rated voltage(VDC) (at 20°C, 2 minutes)																											
Dissipation Factor(Tanδ)	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>Rated Voltage(Vdc)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>Tanδ(Max.)</td> <td>0.22</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.08</td> <td>0.07</td> </tr> </table> <p>If the capacitance exceeds 1,000uF, then Tanδ will be added 0.02 every 1000uF increase.(at 20°C, 120Hz)</p>	Rated Voltage(Vdc)	6.3	10	16	25	35	50	63	100	Tanδ(Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.07									
Rated Voltage(Vdc)	6.3	10	16	25	35	50	63	100																				
Tanδ(Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.07																				
Temperature characteristics (Max,impedance ratio)	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>Rated Voltage(Vdc)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>ΔC(-55°C)/C(20°C)</td> <td colspan="8">30%</td> </tr> <tr> <td>Z(-55°C)/(20°C)</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table> <p style="text-align: right;">(at , 120Hz)</p>	Rated Voltage(Vdc)	6.3	10	16	25	35	50	63	100	ΔC(-55°C)/C(20°C)	30%								Z(-55°C)/(20°C)	4	3	3	3	3	3	3	3
Rated Voltage(Vdc)	6.3	10	16	25	35	50	63	100																				
ΔC(-55°C)/C(20°C)	30%																											
Z(-55°C)/(20°C)	4	3	3	3	3	3	3	3																				
Load life	<p>The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for specified life times at 105°C.</p> <table style="width: 100%;"> <tr> <td>Capacitance change</td> <td>≤±20% of the initial value</td> <td rowspan="3" style="border: 1px solid black; text-align: center;"> <table border="1" style="width: 100%;"> <tr> <th>ØD</th> <th>Life time</th> </tr> <tr> <td>Ø5, Ø6.3</td> <td>2,000hrs</td> </tr> <tr> <td>Ø8, Ø10</td> <td>3,000hrs</td> </tr> <tr> <td>Ø12.5~</td> <td>5,000hrs</td> </tr> </table> </td> </tr> <tr> <td>Tan δ</td> <td>≤200% of the initial specified value</td> </tr> <tr> <td>Leakage current</td> <td>≤The initial specified value</td> </tr> </table>	Capacitance change	≤±20% of the initial value	<table border="1" style="width: 100%;"> <tr> <th>ØD</th> <th>Life time</th> </tr> <tr> <td>Ø5, Ø6.3</td> <td>2,000hrs</td> </tr> <tr> <td>Ø8, Ø10</td> <td>3,000hrs</td> </tr> <tr> <td>Ø12.5~</td> <td>5,000hrs</td> </tr> </table>	ØD	Life time	Ø5, Ø6.3	2,000hrs	Ø8, Ø10	3,000hrs	Ø12.5~	5,000hrs	Tan δ	≤200% of the initial specified value	Leakage current	≤The initial specified value												
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Ø5, Ø6.3	2,000hrs																											
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Ø12.5~	5,000hrs																											
Tan δ	≤200% of the initial specified value																											
Leakage current	≤The initial specified value																											
Shelf life	<p>The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes at least 24 hours and not more than 48 hours before the measurements.</p> <table style="width: 100%;"> <tr> <td>Capacitance change</td> <td>≤±20% of the initial value</td> </tr> <tr> <td>Tanδ</td> <td>≤200% of the initial specified value</td> </tr> <tr> <td>Leakage current</td> <td>≤200%The initial specified value</td> </tr> </table>	Capacitance change	≤±20% of the initial value	Tanδ	≤200% of the initial specified value	Leakage current	≤200%The initial specified value																					
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Dimensions

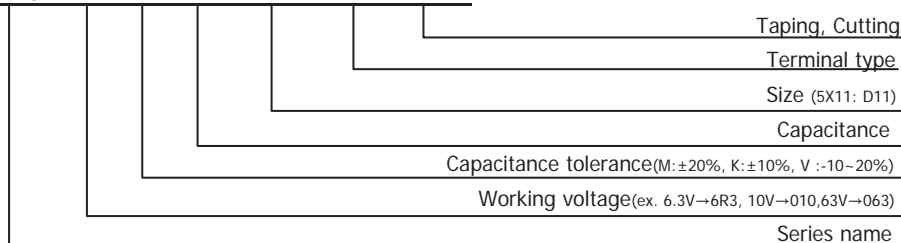
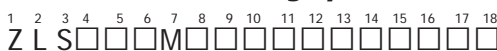
Unit(mm)



ØD	5	6.3	8	10	12.5	16	18
Ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
ØD'	ØD+0.5 max.						
L'	L+1.5 max			L+2.0 max			

- Printed black color letter on PET green sleeve

Code numbering system



Ø5	D
Ø6.3	E
Ø8	F
Ø10	G
Ø12.5	X
Ø16	J
Ø18	K



ZLS series

Standard Ratings

Note1) Imp. = $\Omega_{max} / 20^{\circ}C, 100kHz$ 2) Ripple current = $mArms / 105^{\circ}C, 100kHz$

WV (Vdc)	Cap (uF)	Size ØxL(mm)	Imp. ¹⁾	Ripple ²⁾	Code No
6.3	120	5 x 11	0.72	167	ZLS6R3□121D11CS□□□
	220	6.3 x 11	0.38	256	ZLS6R3□221E11CS□□□
	330	6.3 x 15	0.27	333	ZLS6R3□331E15CS□□□
		8 x 11.5	0.19	487	ZLS6R3□331F12CS□□□
	470	10 x 12.5	0.12	625	ZLS6R3□471G13CS□□□
	560	8 x 15	0.16	498	ZLS6R3□561F15CS□□□
	680	10 x 16	0.084	826	ZLS6R3□681G16CS□□□
	820	8 x 20	0.110	650	ZLS6R3□821F20CS□□□
	1,200	10 x 20	0.061	1,060	ZLS6R3□122G20CS□□□
	1,500	10 x 25	0.052	1,280	ZLS6R3□152G25CS□□□
	2,200	10 x 30	0.044	1,450	ZLS6R3□222G30CS□□□
	2,700	12.5 x 25	0.033	1,690	ZLS6R3□272X25CS□□□
	3,300	12.5 x 30	0.032	1,790	ZLS6R3□332X30CS□□□
	3,900	12.3 x 30	0.030	1,950	ZLS6R3□392X30CS□□□
	4,700	12.5 x 35	0.027	2,210	ZLS6R3□472X35CS□□□
	5,600	12.5 x 42.5	0.024	2,390	ZLS6R3□562X43CS□□□
	5,600	16 x 25	0.028	2,080	ZLS6R3□562J25CS□□□
	6,800	16 x 31.5	0.026	2,350	ZLS6R3□682J32CS□□□
	6,800	18 x 25	0.029	2,140	ZLS6R3□682K25CS□□□
	8,200	16 x 35.5	0.023	2,550	ZLS6R3□822J36CS□□□
10,000	18 x 31.5	0.025	2,420	ZLS6R3□103K32CS□□□	
12,000	18 x 35.5	0.024	2,660	ZLS6R3□123K36CS□□□	
15,000	18 x 40	0.019	3,020	ZLS6R3□153K40CS□□□	
10	82	5 x 11	0.72	167	ZLS010□820D11CS□□□
	180	6.3 x 11	0.38	256	ZLS010□181E11CS□□□
	270	6.3 x 15	0.27	333	ZLS010□271E15CS□□□
		8 x 11.5	0.19	487	ZLS010□271F12CS□□□
	470	8 x 11.5	0.25	330	ZLS010□471F12CS□□□
		8 x 15	0.16	495	ZLS010□471F15CS□□□
	680	8 x 20	0.11	640	ZLS010□681F20CS□□□
		10 x 16	0.084	825	ZLS010□681G16CS□□□
	1,000	10 x 20	0.062	1,040	ZLS010□102G20CS□□□
	1,200	10 x 25	0.052	1,260	ZLS010□122G25CS□□□
	1,500	10 x 30	0.044	1,440	ZLS010□152G30CS□□□
	1,800	12.5 x 20	0.046	1,340	ZLS010□182X20CS□□□
	2,200	12.5 x 25	0.034	1,690	ZLS010□222X25CS□□□
	2,700	12.5 x 30	0.030	1,950	ZLS010□272X30CS□□□
	3,300	12.5 x 35	0.027	2,200	ZLS010□332X35CS□□□
		16 x 20	0.039	1,630	ZLS010□332J20CS□□□
	3,900	12.5 x 42.5	0.024	2,390	ZLS010□392X43CS□□□
		16 x 25	0.029	2,070	ZLS010□392J25CS□□□
	4,700	16 x 31.5	0.025	2,280	ZLS010□472J32CS□□□
	5,600	16 x 31.5	0.026	2,350	ZLS010□562J32CS□□□
18 x 25		0.029	2,130	ZLS010□562K25CS□□□	
6,800	16 x 35.5	0.023	2,550	ZLS010□682J36CS□□□	
	18 x 31.5	0.026	2,410	ZLS010□682K32CS□□□	
8,200	18 x 35.5	0.023	2,660	ZLS010□822K36CS□□□	
10,000	18 x 40	0.019	3,010	ZLS010□103K40CS□□□	
16	56	5 x 11	0.72	165	ZLS016□560D11CS□□□
	120	6.3 x 11	0.38	255	ZLS016□121E11CS□□□
	180	6.3 x 15	0.27	330	ZLS016□181E15CS□□□
		8 x 11.5	0.19	485	ZLS016□181F12CS□□□
	270	10 x 12.5	0.12	625	ZLS016□271G13CS□□□
	330	8 x 15	0.16	495	ZLS016□331F15CS□□□
	470	8 x 20	0.11	640	ZLS016□471F20CS□□□
		10 x 16	0.084	825	ZLS016□471G16CS□□□
	680	10 x 20	0.062	1,040	ZLS016□681G20CS□□□
	820	10 x 25	0.052	1,260	ZLS016□821G25CS□□□
1,000	10 x 30	0.047	1,360	ZLS016□102G30CS□□□	

WV (Vdc)	Cap (uF)	Size ØxL(mm)	Imp. ¹⁾	Ripple ²⁾	Code No
16	1,200	10 x 30	0.044	1,440	ZLS016□122G30CS□□□
		12.5 x 20	0.046	1,340	ZLS016□122X20CS□□□
	1,500	12.5 x 25	0.034	1,690	ZLS016□152X25CS□□□
		12.5 x 30	0.030	1,950	ZLS016□222X30CS□□□
	2,200	16 x 20	0.039	1,630	ZLS016□222J20CS□□□
		12.5 x 35	0.027	2,200	ZLS016□272X35CS□□□
	2,700	16 x 25	0.029	2,070	ZLS016□272J25CS□□□
		12.5 x 42.5	0.024	2,390	ZLS016□332X43CS□□□
	3,300	18 x 20	0.038	1,750	ZLS016□332K20CS□□□
		16 x 31.5	0.026	2,350	ZLS016□392J32CS□□□
	3,900	18 x 25	0.029	2,130	ZLS016□392K25CS□□□
		16 x 35.5	0.023	2,550	ZLS016□472J36CS□□□
	4,700	18 x 31.5	0.026	2,410	ZLS016□562K32CS□□□
	5,600	18 x 35.5	0.023	2,660	ZLS016□682K36CS□□□
	8,200	18 x 40	0.019	3,010	ZLS016□822K40CS□□□
	25	39	5 x 11	0.72	165
47		5 x 11	0.72	194	ZLS025□470D11CS□□□
82		6.3 x 11	0.38	255	ZLS025□820E11CS□□□
100		6.3 x 11	0.35	280	ZLS025□101E11CS□□□
120		6.3 x 15	0.27	330	ZLS025□121E15CS□□□
		8 x 11.5	0.19	485	ZLS025□121F12CS□□□
180		10 x 12.5	0.12	625	ZLS025□181G13CS□□□
220		8 x 15	0.16	495	ZLS025□221F15CS□□□
330		8 x 20	0.11	640	ZLS025□331F20CS□□□
		10 x 16	0.084	825	ZLS025□331G16CS□□□
470		10 x 20	0.062	1,150	ZLS025□471G20CS□□□
560		10 x 25	0.052	1,260	ZLS025□561G25CS□□□
680		10 x 30	0.048	1,330	ZLS025□681G30CS□□□
820		12.5 x 20	0.046	1,440	ZLS025□821X20CS□□□
1,000		12.5 x 25	0.034	1,690	ZLS025□102X25CS□□□
		12.5 x 30	0.030	1,950	ZLS025□152X30CS□□□
1,500	16 x 20	0.039	1,630	ZLS025□152J20CS□□□	
	12.5 x 35	0.027	2,200	ZLS025□182X35CS□□□	
1,800	16 x 25	0.029	2,070	ZLS025□182J25CS□□□	
	12.5 x 42.5	0.024	2,390	ZLS025□222X43CS□□□	
2,200	18 x 20	0.038	1,750	ZLS025□222K20CS□□□	
	16 x 31.5	0.026	2,350	ZLS025□272J32CS□□□	
2,700	18 x 25	0.029	2,130	ZLS025□272K25CS□□□	
	16 x 35.5	0.023	2,550	ZLS025□332J36CS□□□	
3,300	18 x 31.5	0.026	2,410	ZLS025□332K32CS□□□	
	18 x 35.5	0.023	2,660	ZLS025□392K36CS□□□	
4,700	18 x 40	0.019	3,010	ZLS025□472K40CS□□□	
35	27	5 x 11	0.72	165	ZLS035□270D11CS□□□
	47	6.3 x 11	0.50	233	ZLS035□470E11CS□□□
	56	6.3 x 11	0.38	255	ZLS035□560E11CS□□□
	68	6.3 x 11	0.38	255	ZLS035□680E11CS□□□
	82	6.3 x 15	0.27	330	ZLS035□820E15CS□□□
		8 x 11.5	0.19	485	ZLS035□820F12CS□□□
	100	8 x 15	0.16	566	ZLS035□101F15CS□□□
	120	10 x 12.5	0.12	625	ZLS035□121G13CS□□□
	180	8 x 15	0.16	495	ZLS035□181F15CS□□□
	220	8 x 20	0.11	640	ZLS035□221F20CS□□□
		10 x 16	0.084	825	ZLS035□221G16CS□□□
	330	10 x 20	0.062	1,040	ZLS035□331G20CS□□□
	390	10 x 25	0.052	1,260	ZLS035□391G25CS□□□
	470	10 x 30	0.048	1,320	ZLS035□471G30CS□□□
	560	10 x 30	0.044	1,440	ZLS035□561G30CS□□□
		12.5 x 20	0.046	1,340	ZLS035□561X20CS□□□
680	12.5 x 25	0.034	1,690	ZLS035□681X25CS□□□	

ZLS series

Standard Ratings

Note1) Imp. = $\Omega_{max} / 20^{\circ}C, 100kHz$ 2) Ripple current = $mArms / 105^{\circ}C, 100kHz$

WV (Vdc)	Cap (uF)	Size ØxL(mm)	Imp. ¹⁾	Ripple ²⁾	Code No
35	1,000	12.5 x 25	0.040	1,690	ZLS035□102X25CS□□□
		12.5 x 30	0.030	1,950	ZLS035□102X30CS□□□
	1,200	12.5 x 35	0.027	2,200	ZLS035□122X35CS□□□
		16 x 25	0.029	2,070	ZLS035□122J25CS□□□
	1,500	12.5 x 42.5	0.024	2,390	ZLS035□152X43CS□□□
		18 x 20	0.038	1,750	ZLS035□152K20CS□□□
	1,800	16 x 31.5	0.026	2,350	ZLS035□182J32CS□□□
		18 x 25	0.029	2,130	ZLS035□182K25CS□□□
	2,200	16 x 35.5	0.023	2,550	ZLS035□222J36CS□□□
		18 x 31.5	0.026	2,410	ZLS035□222K32CS□□□
2,700	18 x 35.5	0.023	2,660	ZLS035□272K36CS□□□	
3,300	18 x 40	0.019	3,010	ZLS035□332K40CS□□□	
50	4.7	5 x 11	3.0	100	ZLS050□4R7D11CS□□□
	10	5 x 11	1.4	124	ZLS050□100D11CS□□□
	18	5 x 11	1.1	130	ZLS050□180D11CS□□□
	22	6.3 x 11	0.91	180	ZLS050□220E11CS□□□
	39	6.3 x 11	0.56	220	ZLS050□390E11CS□□□
	47	6.3 x 11	0.56	300	ZLS050□470E11CS□□□
	56	6.3 x 15	0.41	310	ZLS050□560E15CS□□□
		8 x 11.5	0.33	368	ZLS050□560F12CS□□□
	82	8 x 15	0.25	470	ZLS050□820F15CS□□□
		10 x 12.5	0.16	480	ZLS050□820G13CS□□□
	120	8 x 20	0.18	610	ZLS050□121F20CS□□□
		10 x 16	0.12	755	ZLS050□121G16CS□□□
	180	10 x 20	0.088	945	ZLS050□181G20CS□□□
	220	10 x 25	0.068	1,150	ZLS050□221G25CS□□□
	330	10 x 30	0.059	1,260	ZLS050□331G30CS□□□
		12.5 x 20	0.059	1,190	ZLS050□331X20CS□□□
	470	12.5 x 25	0.045	1,490	ZLS050□471X25CS□□□
	560	12.5 x 30	0.039	1,720	ZLS050□561X30CS□□□
	680	12.5 x 35	0.038	1,890	ZLS050□681X35CS□□□
		16 x 20	0.044	1,420	ZLS050□681J20CS□□□
	820	12.5 x 42.5	0.029	2,030	ZLS050□821X43CS□□□
		16 x 25	0.034	1,880	ZLS050□821J25CS□□□
		18 x 20	0.041	1,520	ZLS050□821K20CS□□□
	1,000	16 x 31.5	0.030	2,150	ZLS050□102J32CS□□□
18 x 25		0.032	1,930	ZLS050□102K25CS□□□	
1,200	16 x 35.5	0.027	2,320	ZLS050□122J36CS□□□	
1,500	18 x 31.5	0.028	2,200	ZLS050□152K32CS□□□	
1,800	18 x 35.5	0.024	2,400	ZLS050□182K36CS□□□	
2,200	18 x 40	0.022	2,610	ZLS050□222K40CS□□□	

WV (Vdc)	Cap (uF)	Size ØxL(mm)	Imp. ¹⁾	Ripple ²⁾	Code No
63	0.47	5 x 11	65.2	38	ZLS063□4R7D11CS□□□
	0.68	5 x 11	47.0	45	ZLS063□6R8D11CS□□□
	1.0	5 x 11	31.8	53	ZLS063□1R0D11CS□□□
	1.5	5 x 11	22.6	65	ZLS063□1R5D11CS□□□
	2.2	5 x 11	15.1	78	ZLS063□2R2D11CS□□□
	3.3	5 x 11	11.1	98	ZLS063□3R3D11CS□□□
	4.7	5 x 11	10.8	115	ZLS063□4R7D11CS□□□
	6.8	5 x 11	4.3	120	ZLS063□6R8D11CS□□□
	10	5 x 11	2.9	134	ZLS063□100D11CS□□□
	15	6.3 x 11	2.7	188	ZLS063□150E11CS□□□
	22	6.3 x 11	1.36	228	ZLS063□220E11CS□□□
	33	8 x 11.5	0.66	330	ZLS063□330F12CS□□□
	47	10 x 12.5	0.58	327	ZLS063□470G13CS□□□
	68	10 x 16	0.36	431	ZLS063□680G16CS□□□
	82	10 x 20	0.32	506	ZLS063□820G20CS□□□
	100	10 x 20	0.29	570	ZLS063□101G20CS□□□
	150	10 x 25	0.20	765	ZLS063□151G25CS□□□
	220	12.5 x 20	0.16	994	ZLS063□221X20CS□□□
	330	12.5 x 25	0.10	1,327	ZLS063□331X25CS□□□
	470	16 x 31.5	0.091	1,518	ZLS063□471J32CS□□□
680	16 x 35.5	0.065	2,060	ZLS063□681J36CS□□□	
1,000	16 x 35.5	0.049	2,250	ZLS063□102J36CS□□□	
100	0.47	5 x 11	31.2	38	ZLS100□4R7D11CS□□□
	0.68	5 x 11	22.1	45	ZLS100□6R8D11CS□□□
	1.0	5 x 11	14.7	53	ZLS100□1R0D11CS□□□
	1.5	5 x 11	9.8	65	ZLS100□1R5D11CS□□□
	2.2	5 x 11	5.4	78	ZLS100□2R2D11CS□□□
	3.3	5 x 11	4.6	98	ZLS100□3R3D11CS□□□
	4.7	5 x 11	3.9	115	ZLS100□4R7D11CS□□□
	6.8	6.3 x 11	3.2	128	ZLS100□6R8E11CS□□□
	10	6.3 x 11	1.7	154	ZLS100□100E11CS□□□
	15	8 x 11.5	1.2	222	ZLS100□150F12CS□□□
	22	8 x 11.5	0.82	270	ZLS100□220F12CS□□□
	33	10 x 12.5	0.41	384	ZLS100□330G13CS□□□
	47	10 x 16	0.37	400	ZLS100□470G16CS□□□
	68	10 x 20	0.27	470	ZLS100□680G20CS□□□
	82	10 x 25	0.26	572	ZLS100□820G25CS□□□
	100	12.5 x 20	0.27	670	ZLS100□101X20CS□□□
	150	12.5 x 25	0.21	894	ZLS100□151X25CS□□□
	220	16 x 25	0.17	1,200	ZLS100□221J25CS□□□
	330	16 x 31.5	0.11	1,470	ZLS100□331J32CS□□□
	470	16 x 35.5	0.091	1,680	ZLS100□471J36CS□□□
680	18 x 40	0.071	2,120	ZLS100□681K40CS□□□	
1,000	18 x 40	0.051	2,900	ZLS100□102K40CS□□□	

Rated ripple current multipliers

Rated voltage (Vdc)	ØD (mm)	Frequency (Hz)				
		120	1K	10K	50K	100K
6.3-10	Ø5-Ø8	0.65	0.83	0.95	0.97	1.00
	Ø10-Ø12.5	0.70	0.85	0.96	0.98	1.00
	Ø16-Ø18	0.85	0.92	0.97	0.99	1.00
16-25	Ø5-Ø8	0.55	0.76	0.91	0.95	1.00
	Ø10-Ø12.5	0.65	0.83	0.93	0.96	1.00
	Ø16-Ø18	0.70	0.87	0.96	0.98	1.00
35-50	Ø5-Ø8	0.40	0.66	0.85	0.90	1.00
	Ø10-Ø12.5	0.50	0.73	0.89	0.94	1.00
	Ø16-Ø18	0.60	0.81	0.94	0.97	1.00
63-100	Ø5-Ø8	0.20	0.55	0.80	0.88	1.00
	Ø10-Ø12.5	0.35	0.65	0.85	0.92	1.00
	Ø16-Ø18	0.50	0.75	0.90	0.95	1.00