Test Report

Client Name	:	Ningbo ZQ Lighting Co., Ltd.
Client Address	:	No. 8, Tongguang Industrial District, Fengshan Street, Yuyao City, Ningbo China.
Product Name	:	T80-20W
Report Date	:	2022-07-05

Shenzhen Anbotek Compliance Laboratory Limited

TEST REPORT

COMMISSION REGULATION (EU) 2019/2020 of 1 October 2019 laying down ecodesign requirements for light sources and separate control gears pursuant to Directive 2009/125/EC of the European Parliament and of the Council and repealing Commission Regulations (EC) No 244/2009, (EC) No 245/2009 and (EU) No 1194/2012

Report Reference No..... :	18260LC20030201
Tested by (printed name + signature)..... :	Xander Yuan
Supervised by Lab Manager (printed name + signature)..... :	Flora Zhang
Testing Laboratory..... :	Shenzhen Anbotek Compliance Laboratory Limited
Address..... :	Zone South, 1/F., Building 2, Hengchangrong High-Tech Industrial Park, Huangtian, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.
Testing location..... :	Same as above
Applicant's Name..... :	Ningbo ZQ Lighting Co., Ltd.
Address..... :	No. 8, Tongguang Industrial District, Fengshan Street, Yuyao City, Ningbo China.
Standard..... :	COMMISSION REGULATION (EU) 2019/2020 COMMISSION REGULATION (EU) 2021/341 COMMISSION DELEGATED REGULATION (EU) 2019/2015 COMMISSION DELEGATED REGULATION (EU) 2021/340
Test procedure..... :	Type test
Non-standard test method……..:	N/A
Test Item Description..... :	T80-20W
Trade Mark..... :	N/A
Manufacturer..... :	Ningbo ZQ Lighting Co., Ltd.
Address..... :	No. 8, Tongguang Industrial District, Fengshan Street, Yuyao City, Ningbo China.
Model/Type reference..... :	T80-20W
Model Difference..... :	The above models are all the same, except for CCT.
Ratings..... :	220-240VAC, 50Hz, 20W

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or use in part without prior written consent from Shenzhen Anbotek Compliance Laboratory Limited. The test results presented in this report relate only to the object tested.

Summary of Testing:	
Tests performed (name of test and test clause):	**Testing location:**
The sample(s) tested complies with the requirements of COMMISSION REGULATION (EU) 2019/2020 and COMMISSION REGULATION (EU) 2021/341. When determining the test conclusion. the Measurement Uncertainty of test has been considered.	Shenzhen Anbotek Compliance Laboratory Limited Zone South, 1/F., Building 2, Hengchangrong High-Tech Industrial Park, Huangtian, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.

Normative References:	
☒ EN 61000-3-2:2014	☐ EN 60061-1:1993+A61:2021
☒ EN 13032-1:2004+A1:2012	☐ EN 60064:1995+A5:2009
☒ EN 13032-4:2015+A1:2019	☐ EN 60357:2003+A11:2016
☒ CIE 13.3:1995	☐ EN 60969:1993
☒ CIE 15:2018	☒ EN 62612:2013+A2:2018
☒ CIE 18.2:1983	☐ EN 62717:2017+A2:2019
☒ CIE 84:1989	☐ EN 62722-1:2016
☒ CIE 97:2005	☐ EN 62722-2-1:2016
☐ CIE 154:2003	☒ EN 60081:1998+A11:2018
☐ EN 60188:2001+A11:2019	☐ EN 60901:1996+A6:2017

Copy of Marking Plate:
N/A

Test Item Particulars:	
Product type	☒ Light source ☐ Separate control gears
Containing product	☐ Yes ☒ No
Lighting technology used	☒ LED ☐ OLED ☐ Other
Non-directional or directional	☐ DLS ☒ NDLS
Light source cap-type	-
Mains or non-mains	☒ MLS ☐ NMLS
Lamp cap	-
Connected light source (CLS)	☐ Yes ☒ No
Colour-tuneable light source	☐ Yes ☒ No
Envelope	☒ No ☐ Second ☐ Non-clear
High luminance light source	☐ Yes ☒ No
Anti-glare shield	☐ Yes ☒ No
Dimmable	☐ Yes ☒ No ☐ only with specific dimmers
Declared energy consumption in on-mode (kWh/1 000 h)	20 kWh/1000h
Declared energy efficiency class	see the below table☐A ☐B ☐C ☐D ☐E ☐F ☐G
Declared useful luminous flux (Φuse)	see the below table ☒ sphere(360°) ☐ wide cone (120°) ☐ narrow cone(90°)
Declared correlated colour temperature	see the below table
Rated on-mode power (Pon)	20.0W
Rated standby power (Psb)	see the below table
Rated networked standby power (Pnet)	-
Declared color tendering (CRI)	see the below table
Declared chromaticity coordinates (x and y)	Certre point of CCT 2700K is declared by client: x= 0.463, y=0.420 Certre point of CCT 3000K is declared by client: x= 0.440, y=0.403 Certre point of CCT 4000K is declared by client: x= 0.380, y=0.380 Certre point of CCT 6500K is declared by client: x= 0.313, y=0.337
Rated life (h)	25000h
Lamp dimensions (mm)	136mm*80mm*80mm
Rated claim of equivalent power	☐ Yes ☒ -
Rated peak luminous intensity (cd)	-
Rated beam angle	-
Declared R9	see the below table
Declared survival factor	1

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Declared lumen maintenance factor.....:	0.96
Declared displacement factor (cos ϕ1).....:	see the below table
Declared colour consistency.....:	see the below table
Declared flicker metric (Pst LM).....:	see the below table
Declared stroboscopic effect metric (SVM).....:	see the below table
Claims that an LED light source replaces a fluorescent light source without integrated ballast of a particular wattage.....:	☐ Yes ☒ -
If yes then replacement claim (W).....:	-

Possible Test Case Verdicts:

Test case does not apply to the test object.....:	N/A (Not Applicable)
Test object does meet the requirement.....:	P (Pass)
Test object does not meet the requirement.....:	F (Fail)

Testing:

Ambient temperature of tested.....:	25.1℃
Test inputs.....:	230VAC, 50Hz
Sample size for tested.....:	40Pcs
Test model.....:	see the below table
Date of receipt of test item.....:	2022-01-23
Date (s) of performance of tests.....:	2022-01-21 to 2022-06-30

General Remarks:

The test results presented in this report relate only to the object tested.

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"(See Enclosure #)" refers to additional information appended to the report.

"(See appended table)" refers to a table appended to the report.

Throughout this report a point is used as the decimal separator.

List of test equipment must be kept on file and available for review.

Product Information:

Product information:

Test model	Rated Pon (W)	Declared Φuse(lm)	Declared CCT (K)	Declared CRI	Declared R9	Declared colour consistency	Declared energy efficiency class
T80-20W (2700K)	20.0	2250	2700	80	11	4	E
T80-20W (3000K)	20.0	2250	3000	80	3	3	E
T80-20W (4000K)	20.0	2400	4000	80	9	2	E
T80-20W (6500K)	20.0	2400	6500	80	9	4	E

Test model	Rated peak luminous intensity(cd)	Rated beam angle(°)	Rated Psb(W)	Rated Pnet(W)	Declared DF	Declared Pst LM	Declared SVM
T80-20W (2700K)	-	-	0.00	-	0.95	0.1	0.3
T80-20W (3000K)	-	-	0.00	-	0.95	0.1	0.3
T80-20W (4000K)	-	-	0.00	-	0.95	0.1	0.3
T80-20W (6500K)	-	-	0.00	-	0.95	0.1	0.3

LED chip information:

Item	Manufacturer / trademark	Type /model	Technical data
LED chip	Jiangxi MTC Lighting Co., Ltd	MK8XM-GX	1W/9V/100mA

(EU) 2019/2020			
Clause	Requirement + Test	Result – Remark	Verdict
ANNEX II	**ECODESIGN REQUIREMENTS**		**P**
1	**ENERGY EFFICIENCY REQUIREMENTS**		**P**
(a)	The declared power consumption of a light source P_{on} shall not exceed the maximum allowed power P_{onmax} (in W), defined as a function of the declared useful luminous flux Φuse (in lm) and the declared colour rendering index CRI (-) as follows: Ponmax = C *（L +Φuse/（F * η））* R where:	Ponmax＞Pon	P
	-The values for threshold efficacy (η in lm/W) and end loss factor (L in W) are specified in Table 1, depending on the light source type.		P
Table 1	Light source description / η (lm/W) / L (W) Other light sources / 120.0 / 1.5	η =120.0 lm/W; L=1.5W	P
	-Basic values for correction factor (C) depending on light source type, and additions to C for special light source features are specified in Table 2.		P
Table 2	Light source type / Basic C value NDLS+NMLS / 1.00 NDLS+MLS / 1.08 DLS+NMLS / 1.15 DLS+MLS / 1.23 Special light source feature / Bonus on C DLS with anti-glare shield / +0.20 Colour-tuneable light sources(CTLS) / +0.10 High luminance light sources(HLLS) / +0.0058*luminance-HLLS-0.0167	C=NDLS+MLS=1.08	P
	-Efficacy factor (F) is: 1.00 for NDLS, using total flux 0.85 for DLS, using flux in a cone	F=1.00	P
	-CRI factor (R) is: 0.65 for CRI≤25 (CRI+80)/160 for CRI＞25, round to two decimals	R=(CRI+80)/160	P
	The standby power P_{sb} of a light source shall not exceed 0,5 W.		P
	The networked standby power P_{net} of a connected light source shall not exceed 0,5 W.		N/A
	The allowable values for Psb and Pnet shall not be added together.		N/A
(b)	The values set in Table 3 for the minimum energy efficiency requirements of a separate control gear		N/A

(EU) 2019/2020				
Clause	Requirement + Test		Result – Remark	Verdict
	operating at full-load shall apply:			
Table 3	Declared output power of the control gear (P_{cg}) or declared power of the light source (P_{ls}) in W, as applicable: Minimum energy efficiency Control gear for LED or OLED light sources, all wattages P_{cg}: $P_{cg0,81}/(1,09 \times P_{cg0,81} + 2,10)$			N/A
	Multi-wattage separate control gears shall comply with the requirements in Table 3 according to the maximum declared power on which they can operate.			N/A
	The no-load power P_{no} of a separate control gear shall not exceed 0,5 W.			N/A
	The standby power P_{sb} of a separate control gear shall not exceed 0,5 W.			N/A
	The networked standby power Pnet of a connected separate control gear shall not exceed 0,5W. The allowable values for P_{sb} and Pnet shall not be added together.			N/A
2	**FUNCTIONAL REQUIREMENTS**			P
	The functional requirements specified in Table 4 shall apply for light sources:			P
Table 4	Functional requirements for light sources			P
	Colour rendering	CRI ⩾ 80		P
	Displacement factor (DF, cos ϕ 1) at power input P_{on} for LED and OLED MLS	No limit at Pon ⩽ 5 W, DF ⩾ 0,5 at 5 W < Pon ⩽ 10 W, DF ⩾ 0,7 at 10 W < Pon ⩽ 25 W DF ⩾ 0,9 at 25 W < Pon		P
	Lumen maintenance factor (for LED and OLED)	The lumen maintenance factor X_{LMF}% after endurance testing according to Annex V shall be at least $X_{LMF,MIN}$ % calculated as follows: $X_{LMF,MIN}$% = 100 × e (3000 × ln(0.7)) /L_{70} where L_{70} is the declared $L_{70}B_{50}$ lifetime (in hours) If the calculated value for $X_{LMF,MIN}$ exceeds 96,0 %, an $X_{LMF,MIN}$ value of 96,0 % shall be used	X_{LMF}%=96.34%＞ $X_{LMF,MIN}$ %=95.81%	P
	Survival factor (for LED and OLED)	Light sources should be operational as specified in row ‘Survival factor (for LED and OLED)’ of Annex IV, Table 6, following the endurance testing given in Annex V.	Survival factor=1.00	P
	Colour consistency for LED and OLED light sources	Variation of chromaticity coordinates within a six-step MacAdam ellipse or less.		P
	Flicker for LED and OLED MLS	P_{st} LM ⩽ 1,0 at full-load	P_{st} LM =0.034	P

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(EU) 2019/2020				
Clause	Requirement + Test		Result – Remark	Verdict
	Stroboscopic effect for LED and OLED MLS	SVM ⩽ 0,9 at full-load SVM⩽0,4 (after 1 September 2024)	SVM= 0.226	P
3	**INFORMATION REQUIREMENTS**			**N/A**
ANNEX III	**Exemptions**			**N/A**
ANNEX IV	**Verification procedure for market surveillance purposes**			N/A
ANNEX V	**Functionality after endurance testing**			P
	Models of LED- and OLED- light sources shall undergo endurance testing to verify their lumen maintenance and survival factor. This endurance testing consists of the test method outlined below. The authorities of a Member State shall test 10 units of the model for this test.			P
	The endurance test for LED and OLED light sources shall be conducted as follows:			P
(a)	Ambient conditions and test setup:			P
(i)	The switching cycles are to be conducted in a room with an ambient temperature of 25 ± 10 ° C and an average air velocity of less than 0,2 m/s.			P
(ii)	The switching cycles on the sample shall be conducted in free air in a vertical base-up position. However, if a manufacturer or importer has declared the light source suitable for use in a specific orientation only, then the sample shall be mounted in that orientation.			P
(iii)	The applied voltage during the switching cycles shall have a tolerance within 2 %. The total harmonic content of the supply voltage shall not exceed 3 %. Standards provide guidance on the supply voltage source. Light sources designed to be operated on mains voltage shall be tested at 230 V, 50 Hz supply, even if the products are able to be operated on variable supply conditions.			P
(b)	Endurance test method:			P
(i)	Initial flux measurement: measure the luminous flux of the light source prior to starting the endurance test switching cycle.			P
(ii)	Switching cycles: operate the light source for 1 200 cycles of repeated, continuous switching cycles without interruption. One complete switching cycle consists of 150 minutes of the light source switched ON at full power followed by 30 minutes of the light source switched OFF. The hours of operation recorded (i.e. 3 000 hours) include only the periods of the switching cycle when the light source was switched ON, i.e. the total test time is 3600 hours.			P
(iii)	Final flux measurement: at the end of the 1 200 switching cycles, note if any light sources have failed (see ‘Survival factor’ in Annex IV, Table 6 of this Regulation) and measure the luminous flux of the light sources that have not failed.			P
(iv)	For each of the units in the sample which have not failed,			P

(EU) 2019/2020			
Clause	Requirement + Test	Result – Remark	Verdict
	divide the measured final flux by the measured initial flux. Average the resulting values over all the units that did not fail to compute the determined value for the lumen maintenance factor XLMF %.		
ANNEX VI	**Benchmarks**		P
	The best available technology on the market for light sources in terms of their efficacy based on useful luminous flux was identified as follows:		P
	-Mains voltage non-directional light sources: 120-140 lm/W		P
	-Mains voltage directional light sources: 90-100 lm/W		P
	-Directional light sources not operating on the mains: 85-95 lm/W		P
	-Linear light sources (tubes): 140-160 lm/W		P
	The best available technology on the market for separate control gears has an energy efficiency of 95 %.		P
	The best available technology on the market for light sources and separate control gears do not have any mercury content.		P

(EU) 2019/2015			
Clause	Requirement + Test	Result – Remark	Verdict
ANNEX II	**ENERGY EFFICIENCY CLASSES AND CALCULATION METHOD**		**P**
	The energy efficiency class of light sources shall be determined as set out in Table 1, on the basis of the total mains efficacy η_{TM}, which is calculated by dividing the declared useful luminous flux Φ_{use} (expressed in lm) by the declared onmode power consumption P_{on} (expressed in W) and multiplying by the applicable factor F_{TM} of Table 2, as follows: $\eta_{TM} = (\Phi_{use}/P_{on}) \times F_{TM}$ (lm/W).		P
Table 1		E	P

Energy efficiency class	Total mains efficacy η_{TM} lm/W)
A	210 ≤ η_{TM}
B	185 ≤ η_{TM} < 10
C	160 ≤ η_{TM} < 185
D	135 ≤ η_{TM} < 160
E	110 ≤ η_{TM} < 135
F	85 ≤ η_{TM} < 110
G	η_{TM} < 85

<table>
<tr><th colspan="4">(EU) 2019/2015</th></tr>
<tr><th>Clause</th><th>Requirement + Test</th><th>Result – Remark</th><th>Verdict</th></tr>
<tr><td>Table 2</td><td>
<table>
<tr><th>Light source type</th><th>Factor F_{TM}</th></tr>
<tr><td>Non-directional (NDLS) operating on mains (MLS)</td><td>1.000</td></tr>
<tr><td>Non-directional (NDLS) not operating on mains (NMLS)</td><td>0.926</td></tr>
<tr><td>Directional (DLS) operating on mains (MLS)</td><td>1.176</td></tr>
<tr><td>Directional (DLS) not operating on mains (NMLS)</td><td>1.089</td></tr>
</table>
</td><td>F_{TM}=1.000</td><td>P</td></tr>
</table>

Test Result

Model		T80-20W(2700K)				
Sample No.	P_{on}(W)	Ponmax (W)	Φuse (lm) at 0h	Factor F_{TM}	Total mains efficacy η_{TM} (lm/W)	Energy Efficiency Class
1-10-1	19.85	22.38	2256.4	1.000	113.67	E
1-10-2	19.87	22.32	2250.3	1.000	113.25	E
1-10-3	19.86	22.36	2254.6	1.000	113.52	E
1-10-4	19.85	22.39	2257.7	1.000	113.74	E
1-10-5	19.87	22.33	2251.5	1.000	113.31	E
1-10-6	19.86	22.37	2254.9	1.000	113.54	E
1-10-7	19.86	22.41	2259.2	1.000	113.76	E
1-10-8	19.85	22.34	2252.1	1.000	113.46	E
1-10-9	19.86	22.39	2257.4	1.000	113.67	E
1-10-10	19.85	22.35	2253.3	1.000	113.52	E
Average value	19.86	22.36	2254.7	1.000	113.54	E

Sample No.	Beam Angle(°)	Peak luminous intensity(cd)	No-load power Pno(W)	Standby power Psb(W)	Networked standby power Pnet(W)	Displacement factor
1-10-1	N/A	N/A	N/A	0.00	N/A	0.9593
1-10-2	N/A	N/A	N/A	0.00	N/A	0.9596
1-10-3	N/A	N/A	N/A	0.00	N/A	0.9593
1-10-4	N/A	N/A	N/A	0.00	N/A	0.9596
1-10-5	N/A	N/A	N/A	0.00	N/A	0.9592
1-10-6	N/A	N/A	N/A	0.00	N/A	0.9593
1-10-7	N/A	N/A	N/A	0.00	N/A	0.9593
1-10-8	N/A	N/A	N/A	0.00	N/A	0.9592
1-10-9	N/A	N/A	N/A	0.00	N/A	0.9593
1-10-10	N/A	N/A	N/A	0.00	N/A	0.9592
Average value	N/A	N/A	N/A	0.00	N/A	0.9593

Sample No.	CRI	R9	SDCM	CCT(K)	x	y	P_{st}	SVM
1-10-1	83.3	11	3.8	2758	0.4565	0.4174	0.034	0.266
1-10-2	83.3	11	3.7	2759	0.4564	0.4172	0.034	0.266
1-10-3	83.3	11	3.7	2759	0.4565	0.4174	0.034	0.266
1-10-4	83.3	11	3.7	2758	0.4565	0.4173	0.034	0.266
1-10-5	83.3	11	3.8	2758	0.4566	0.4174	0.034	0.266
1-10-6	83.3	11	3.6	2759	0.4564	0.4173	0.034	0.266
1-10-7	83.3	11	3.8	2758	0.4563	0.4174	0.034	0.266
1-10-8	83.3	11	3.6	2759	0.4564	0.4174	0.034	0.266
1-10-9	83.3	11	3.6	2759	0.4563	0.4172	0.034	0.266
1-10-10	83.3	11	3.8	2759	0.4566	0.4172	0.034	0.266
Average value	83.3	11	3.7	2759	0.4565	0.4173	0.034	0.266

Sample No.	Φuse (lm) at 0h	Φuse (lm) at 3600h	Lumen maintenance	Survival factor
1-10-1	2256.4	2173.8	96.34%	1.00
1-10-2	2250.3	2167.9	96.34%	1.00
1-10-3	2254.6	2172.3	96.35%	1.00
1-10-4	2257.7	2175.5	96.36%	1.00
1-10-5	2251.5	2169.1	96.34%	1.00
1-10-6	2254.9	2172.6	96.35%	1.00
1-10-7	2259.2	2176.1	96.32%	1.00
1-10-8	2252.1	2169.0	96.31%	1.00
1-10-9	2257.4	2174.6	96.33%	1.00
1-10-10	2253.3	2170.6	96.33%	1.00
Average value	2254.7	2172.1	96.34%	1.00

Model	T80-20W(3000K)					
Sample No.	P_{on}(W)	Ponmax (W)	Φuse (lm) at 0h	Factor F_{TM}	Total mains efficacy η_{TM} (lm/W)	Energy Efficiency Class
1-10-1	19.93	22.37	2280.5	1.000	114.43	E
1-10-2	19.95	22.42	2286.3	1.000	114.60	E
1-10-3	19.93	22.36	2280.1	1.000	114.41	E
1-10-4	19.95	22.32	2274.9	1.000	114.03	E
1-10-5	19.95	22.39	2281.3	1.000	114.35	E
1-10-6	19.94	22.33	2276.7	1.000	114.18	E
1-10-7	19.93	22.39	2282.0	1.000	114.50	E
1-10-8	19.94	22.41	2284.0	1.000	114.54	E
1-10-9	19.94	22.38	2281.6	1.000	114.42	E
1-10-10	19.93	22.32	2275.5	1.000	114.17	E
Average value	19.94	22.37	2280.3	1.000	114.36	E

Sample No.	Beam Angle(°)	Peak luminous intensity(cd)	No-load power Pno(W)	Standby power Psb(W)	Networked standby power Pnet(W)	Displacement factor
1-10-1	N/A	N/A	N/A	0.00	N/A	0.9546
1-10-2	N/A	N/A	N/A	0.00	N/A	0.9543
1-10-3	N/A	N/A	N/A	0.00	N/A	0.9542
1-10-4	N/A	N/A	N/A	0.00	N/A	0.9543
1-10-5	N/A	N/A	N/A	0.00	N/A	0.9542
1-10-6	N/A	N/A	N/A	0.00	N/A	0.9546
1-10-7	N/A	N/A	N/A	0.00	N/A	0.9542
1-10-8	N/A	N/A	N/A	0.00	N/A	0.9546
1-10-9	N/A	N/A	N/A	0.00	N/A	0.9543
1-10-10	N/A	N/A	N/A	0.00	N/A	0.9546
Average value	N/A	N/A	N/A	0.00	N/A	0.9544

Sample No.	CRI	R9	SDCM	CCT(K)	x	y	P_{st}	SVM
1-10-1	81.6	3	2.3	3002	0.4358	0.4019	0.034	0.266
1-10-2	81.6	3	2.4	3002	0.4356	0.4018	0.034	0.266
1-10-3	81.6	3	2.3	3004	0.4357	0.4018	0.034	0.266
1-10-4	81.6	3	2.2	3002	0.4357	0.4018	0.034	0.266
1-10-5	81.7	3	2.3	3002	0.4356	0.4019	0.034	0.266
1-10-6	81.6	3	2.2	3006	0.4358	0.4019	0.034	0.266
1-10-7	81.7	3	2.2	3006	0.4357	0.4018	0.034	0.266
1-10-8	81.7	3	2.3	3002	0.4357	0.4018	0.034	0.266
1-10-9	81.6	3	2.2	3004	0.4356	0.4019	0.034	0.266
1-10-10	81.6	3	2.3	3002	0.4358	0.4019	0.034	0.266
Average value	81.6	3	2.3	3003	0.4357	0.4019	0.034	0.266

Model		T80-20W(4000K)				
Sample No.	P_{on}(W)	Ponmax (W)	Φuse (lm) at 0h	Factor F_{TM}	Total mains efficacy η_{TM} (lm/W)	Energy Efficiency Class
1-10-1	19.85	24.08	2452.9	1.000	123.57	E
1-10-2	19.84	24.09	2454.2	1.000	123.70	E
1-10-3	19.87	24.12	2457.6	1.000	123.68	E
1-10-4	19.85	24.06	2451.1	1.000	123.48	E
1-10-5	19.87	24.11	2455.9	1.000	123.60	E
1-10-6	19.84	24.15	2459.3	1.000	123.96	E
1-10-7	19.87	24.09	2454.3	1.000	123.52	E
1-10-8	19.85	24.13	2458.1	1.000	123.83	E
1-10-9	19.87	24.08	2452.4	1.000	123.42	E
1-10-10	19.84	24.12	2456.8	1.000	123.83	E
Average value	19.86	24.10	2455.3	1.000	123.66	E

Sample No.	Beam Angle(°)	Peak luminous intensity(cd)	No-load power Pno(W)	Standby power Psb(W)	Networked standby power Pnet(W)	Displacement factor
1-10-1	N/A	N/A	N/A	0.00	N/A	0.9584
1-10-2	N/A	N/A	N/A	0.00	N/A	0.9584
1-10-3	N/A	N/A	N/A	0.00	N/A	0.9585
1-10-4	N/A	N/A	N/A	0.00	N/A	0.9584
1-10-5	N/A	N/A	N/A	0.00	N/A	0.9581
1-10-6	N/A	N/A	N/A	0.00	N/A	0.9585
1-10-7	N/A	N/A	N/A	0.00	N/A	0.9585
1-10-8	N/A	N/A	N/A	0.00	N/A	0.9584
1-10-9	N/A	N/A	N/A	0.00	N/A	0.9587
1-10-10	N/A	N/A	N/A	0.00	N/A	0.9584
Average value	N/A	N/A	N/A	0.00	N/A	0.9584

Sample No.	CRI	R9	SDCM	CCT(K)	x	y	P_{st}	SVM
1-10-1	82.6	9	1.2	3982	0.3822	0.3816	0.034	0.266
1-10-2	82.6	9	1.3	3985	0.3824	0.3816	0.034	0.266
1-10-3	82.6	9	1.2	3982	0.3824	0.3815	0.034	0.266
1-10-4	82.6	9	1.4	3982	0.3822	0.3816	0.034	0.266
1-10-5	82.6	9	1.3	3985	0.3824	0.3816	0.034	0.266
1-10-6	82.7	9	1.3	3983	0.3825	0.3815	0.034	0.266
1-10-7	82.6	9	1.4	3982	0.3824	0.3816	0.034	0.266
1-10-8	82.6	9	1.2	3983	0.3822	0.3815	0.034	0.266
1-10-9	82.6	9	1.3	3985	0.3825	0.3815	0.034	0.266
1-10-10	82.6	9	1.2	3983	0.3824	0.3815	0.034	0.266
Average value	82.6	9	1.3	3983	0.3824	0.3816	0.034	0.266

Model		T80-20W(6500K)				
Sample No.	P_{on}(W)	Ponmax (W)	Φuse (lm) at 0h	Factor F_{TM}	Total mains efficacy η_{TM} (lm/W)	Energy Efficiency Class
1-10-1	19.60	23.92	2411.5	1.000	123.04	E
1-10-2	19.62	23.97	2416.5	1.000	123.17	E
1-10-3	19.60	23.94	2413.2	1.000	123.12	E
1-10-4	19.62	23.98	2418.2	1.000	123.25	E
1-10-5	19.60	24.00	2419.8	1.000	123.46	E
1-10-6	19.60	23.95	2414.5	1.000	123.19	E
1-10-7	19.64	23.93	2412.0	1.000	122.81	E
1-10-8	19.64	23.96	2415.5	1.000	122.99	E
1-10-9	19.60	23.98	2417.8	1.000	123.36	E
1-10-10	19.62	23.93	2412.0	1.000	122.94	E
Average value	19.61	23.95	2415.1	1.000	123.13	E

Sample No.	Beam Angle(°)	Peak luminous intensity(cd)	No-load power Pno(W)	Standby power Psb(W)	Networked standby power Pnet(W)	Displacement factor
1-10-1	N/A	N/A	N/A	0.00	N/A	0.9568
1-10-2	N/A	N/A	N/A	0.00	N/A	0.9565
1-10-3	N/A	N/A	N/A	0.00	N/A	0.9563
1-10-4	N/A	N/A	N/A	0.00	N/A	0.9565
1-10-5	N/A	N/A	N/A	0.00	N/A	0.9563
1-10-6	N/A	N/A	N/A	0.00	N/A	0.9568
1-10-7	N/A	N/A	N/A	0.00	N/A	0.9568
1-10-8	N/A	N/A	N/A	0.00	N/A	0.9565
1-10-9	N/A	N/A	N/A	0.00	N/A	0.9563
1-10-10	N/A	N/A	N/A	0.00	N/A	0.9568
Average value	N/A	N/A	N/A	0.00	N/A	0.9566

Sample No.	CRI	R9	SDCM	CCT(K)	x	y	P_{st}	SVM
1-10-1	84.1	9	3.4	6649	0.3099	0.3304	0.034	0.266
1-10-2	84.1	9	3.6	6652	0.3100	0.3304	0.034	0.266
1-10-3	84.1	9	3.4	6645	0.3100	0.3305	0.034	0.266
1-10-4	84.1	9	3.5	6649	0.3100	0.3305	0.034	0.266
1-10-5	84.1	9	3.6	6649	0.3099	0.3304	0.034	0.266
1-10-6	84.1	9	3.4	6639	0.3100	0.3308	0.034	0.266
1-10-7	84.1	9	3.6	6645	0.3099	0.3305	0.034	0.266
1-10-8	84.1	9	3.4	6654	0.3098	0.3304	0.034	0.266
1-10-9	84.1	9	3.5	6645	0.3100	0.3304	0.034	0.266
1-10-10	84.1	9	3.4	6649	0.3099	0.3304	0.034	0.266
Average value	84.1	9	3.5	6648	0.3099	0.3305	0.034	0.266

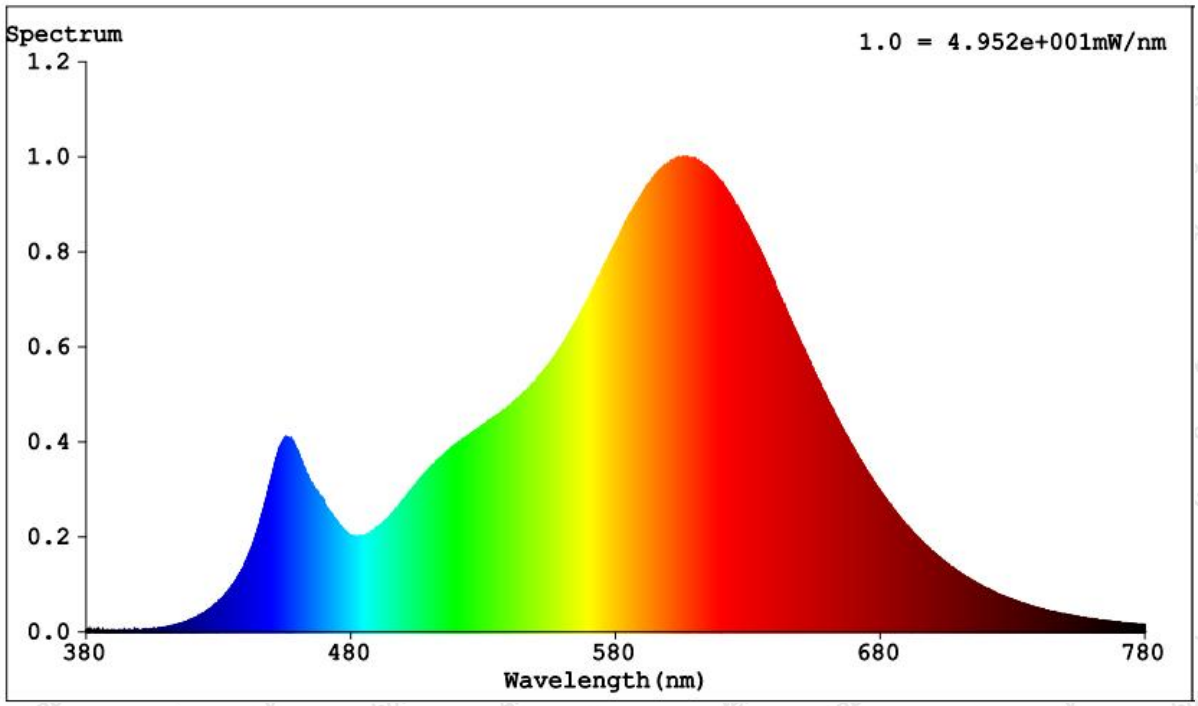
Attachment A - Test Equipment List

Equipment Name	Manufacturer	Model No	Reference No	Calibration Due Date
Integrating Sphere (2.0m)	EVERFINE	YF-1000	SE-599	Before use
Standard Lamp	Laikuo intelligent	24V/100W	SE-2239	2023-04-12
Standard Lamp	Laikuo intelligent	110V/300W	SE-4549	2023-04-20
Digital Power Meter	YOKOGAWA	WT210	SE-074	2023-04-23
AC Power Source	EVERFINE	DPS1010	SE-602	2023-04-23
AC Power Source	HUAYANG	HY9010	SE-268	2023-04-23
DC Power Source	EVERFINE	WY605	SE-605	2023-04-23
Temperature Sensor	WALVICO	HG126D	SE-616	2023-04-26
Goniophotometer System	SENSING	GMS-3000	SE-450	Before use
Temperature & Humidity Meter	XINIXI	CTH608	SE-260	2023-05-08
Digital Power Meter	YOKOGAWA	WT310	SE-381	2023-04-23
AC Power Source	Ainuo	AN97001W	SE-434	2023-04-23
Flicker Analyzer	EVERFINE	LFA-3000	SE-2042	2023-04-26
Digital Caliper	SHANGHAI TOOL	150mm	SE-2084	2023-04-26

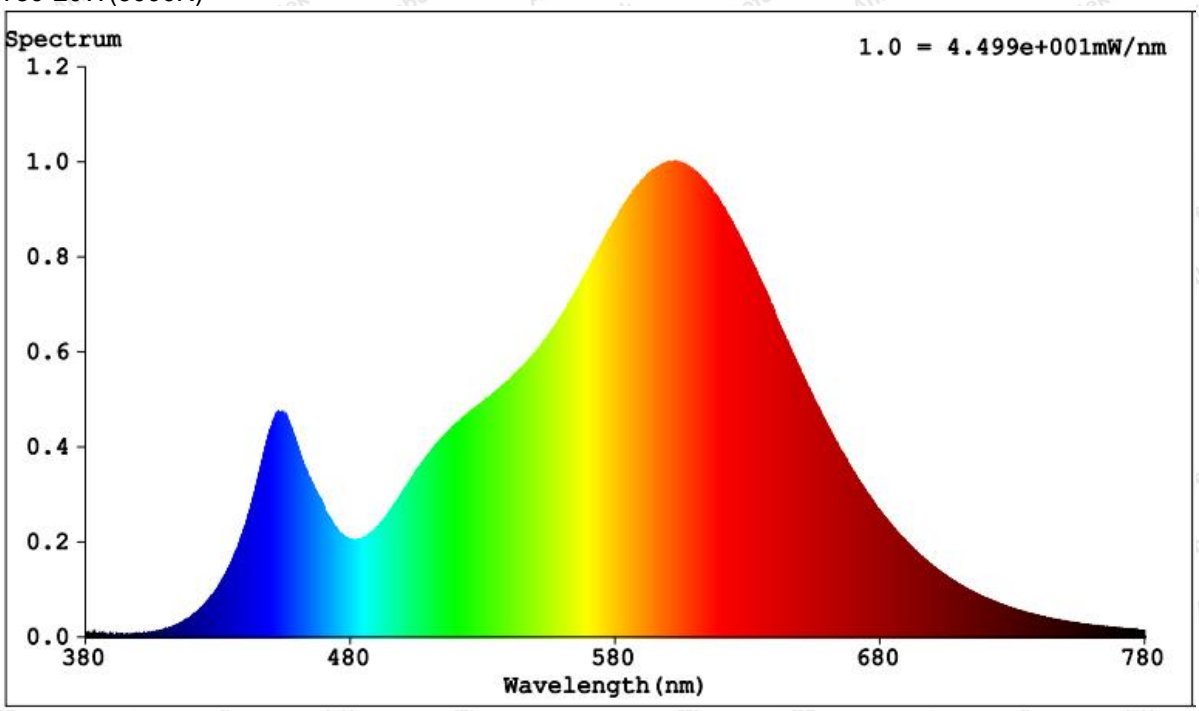
Attachment B – Product Photo

Attachment C – Spectral Power Distribution

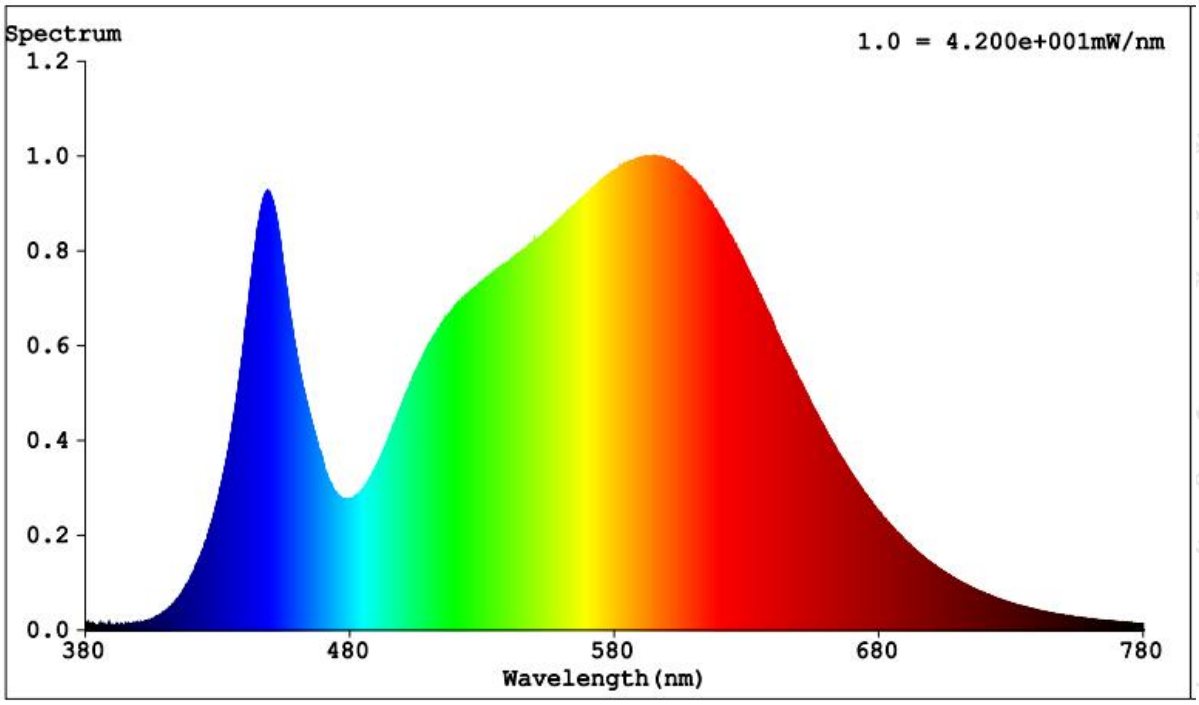
T80-20W(2700K)



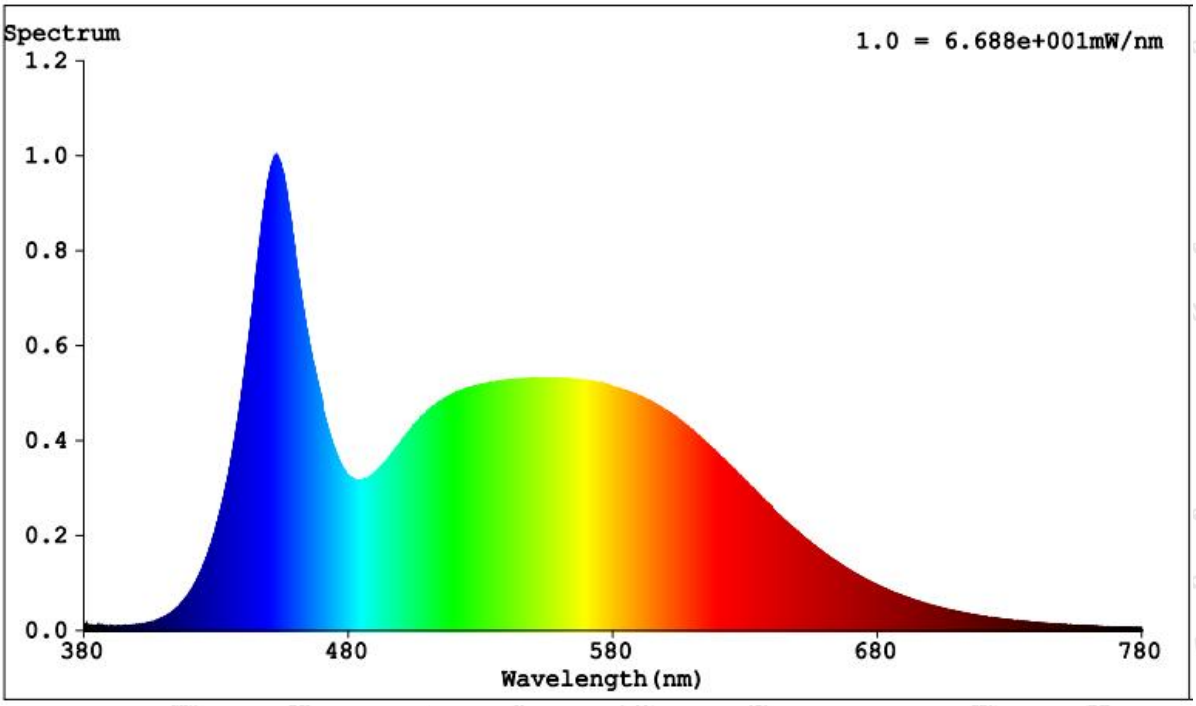
T80-20W(3000K)



T80-20W(4000K)



T80-20W(6500K)



Attachment D – Product information sheet

Supplier's name or trade mark: Ningbo ZQ Lighting Co., Ltd.				
Supplier's address: No. 8, Tongguang Industrial District, Fengshan Street, Yuyao City, Ningbo China.				
Model identifier: T80-20W(2700K)				
Type of light source: T80-20W				
Lighting technology used:	☐HL ☐LFL T5 HE ☐LFL T5 HO ☐CFLni ☐other FL ☐HPS ☐MH ☐other HID ☑LED ☐OLED ☐mixed ☐other		Non-directional or directional:	☑NDLS ☐DLS
Light source cap-type (or other electric interface)	-			
Mains or non-mains:	☑MLS ☐NMLS		Connected light source (CLS):	☐yes ☑no
Colour-tuneable light source:	☐yes ☑no		Envelope:	☑no ☐second ☐non-clear
High luminance light source:	☐yes ☑no			
Anti-glare shield:	☐yes ☑no		Dimmable:	☐yes ☑no ☐only with specific dimmers
Product parameters				
Parameter	Value		Parameter	Value
General product parameters:				
Energy consumption in on-mode (kWh/1 000 h), rounded up to the nearest integer	20		Energy efficiency class	☐A ☐B ☐C ☐D ☑E ☐F ☐G
Useful luminous flux (Φuse), indicating if it refers to the flux in a sphere (360°), in a wide cone (120°) or in a narrow cone (90°)	2250lm in ☑sphere ☐wide cone ☐narrow cone		Correlated colour temperature, rounded to the nearest 100 K, or the range of correlated colour temperatures, rounded to the nearest 100 K, that can be set	2700K
On-mode power (Pon), expressed in W	20.0		Standby power (Psb), expressed in W and rounded to the second decimal	-
Networked standby power (Pnet) for CLS, expressed in W and rounded to the second decimal	-		Colour rendering index, rounded to the nearest integer, or the range of CRI-values that can be set	80
Outer dimensions	Height	136	Spectral power distribution in the	See Attachment C
	Width	80		

without separate control gear, lighting control parts and non-lighting control parts, if any (millimetre)	Depth	80	range 250 nm to 800 nm, at full-load	
Claim of equivalent power		☐yes ☑-	If yes, equivalent power (W)	-
			Chromaticity coordinates (x and y)	x= 0.463 y=0.420
Parameters for directional light sources:				
Peak luminous intensity (cd)		-	Beam angle in degrees, or the range of beam angles that can be set	-
Parameters for LED and OLED light sources:				
R9 colour rendering index value		11	Survival factor	1.00
the lumen maintenance factor		0.96		
Parameters for LED and OLED mains light sources:				
displacement factor (cos φ1)		0.95	Colour consistency in McAdam ellipses	4
Claims that an LED light source replaces a fluorescent light source without integrated ballast of a particular wattage.		☐yes ☑-	If yes then replacement claim (W)	-
Flicker metric (Pst LM)		0.1	Stroboscopic effect metric (SVM)	0.3

Attachment D – Product information sheet

Supplier's name or trade mark: Ningbo ZQ Lighting Co., Ltd.				
Supplier's address: No. 8, Tongguang Industrial District, Fengshan Street, Yuyao City, Ningbo China.				
Model identifier: T80-20W(3000K)				
Type of light source: T80-20W				
Lighting technology used:	☐HL ☐LFL T5 HE ☐LFL T5 HO ☐CFLni ☐other FL ☐HPS ☐MH ☐other HID ☑LED ☐OLED ☐mixed ☐other		Non-directional or directional:	☑NDLS ☐DLS
Light source cap-type (or other electric interface)	-			
Mains or non-mains:	☑MLS ☐NMLS		Connected light source (CLS):	☐yes ☑no
Colour-tuneable light source:	☐yes ☑no		Envelope:	☑no ☐second ☐non-clear
High luminance light source:	☐yes ☑no			
Anti-glare shield:	☐yes ☑no		Dimmable:	☐yes ☑no ☐only with specific dimmers
Product parameters				
Parameter	Value		Parameter	Value
General product parameters:				
Energy consumption in on-mode (kWh/1 000 h), rounded up to the nearest integer	20		Energy efficiency class	☐A ☐B ☐C ☐D ☑E ☐F ☐G
Useful luminous flux (Φuse), indicating if it refers to the flux in a sphere (360°), in a wide cone (120°) or in a narrow cone (90°)	2250lm in ☑sphere ☐wide cone ☐narrow cone		Correlated colour temperature, rounded to the nearest 100 K, or the range of correlated colour temperatures, rounded to the nearest 100 K, that can be set	3000K
On-mode power (Pon), expressed in W	20.0		Standby power (Psb), expressed in W and rounded to the second decimal	-
Networked standby power (Pnet) for CLS, expressed in W and rounded to the second decimal	-		Colour rendering index, rounded to the nearest integer, or the range of CRI-values that can be set	80
Outer dimensions	Height	136	Spectral power distribution in the	See Attachment C
	Width	80		

without separate control gear, lighting control parts and non-lighting control parts, if any (millimetre)	Depth	80	range 250 nm to 800 nm, at full-load	
Claim of equivalent power		☐yes ☑-	If yes, equivalent power (W)	-
			Chromaticity coordinates (x and y)	x= 0.440 y=0.403
Parameters for directional light sources:				
Peak luminous intensity (cd)		-	Beam angle in degrees, or the range of beam angles that can be set	-
Parameters for LED and OLED light sources:				
R9 colour rendering index value		3	Survival factor	1.00
the lumen maintenance factor		0.96		
Parameters for LED and OLED mains light sources:				
displacement factor (cos φ1)		0.95	Colour consistency in McAdam ellipses	3
Claims that an LED light source replaces a fluorescent light source without integrated ballast of a particular wattage.		☐yes ☑-	If yes then replacement claim (W)	-
Flicker metric (Pst LM)		0.1	Stroboscopic effect metric (SVM)	0.3

Attachment D – Product information sheet

Supplier's name or trade mark: Ningbo ZQ Lighting Co., Ltd.				
Supplier's address: No. 8, Tongguang Industrial District, Fengshan Street, Yuyao City, Ningbo China.				
Model identifier: T80-20W(4000K)				
Type of light source: T80-20W				
Lighting technology used:	☐HL ☐LFL T5 HE ☐LFL T5 HO ☐CFLni ☐other FL ☐HPS ☐MH ☐other HID ☑LED ☐OLED ☐mixed ☐other		Non-directional or directional:	☑NDLS ☐DLS
Light source cap-type (or other electric interface)	-			
Mains or non-mains:	☑MLS ☐NMLS		Connected light source (CLS):	☐yes ☑no
Colour-tuneable light source:	☐yes ☑no		Envelope:	☑no ☐second ☐non-clear
High luminance light source:	☐yes ☑no			
Anti-glare shield:	☐yes ☑no		Dimmable:	☐yes ☑no ☐only with specific dimmers
Product parameters				
Parameter	Value		Parameter	Value
General product parameters:				
Energy consumption in on-mode (kWh/1 000 h), rounded up to the nearest integer	20		Energy efficiency class	☐A ☐B ☐C ☐D ☑E ☐F ☐G
Useful luminous flux (Φuse), indicating if it refers to the flux in a sphere (360°), in a wide cone (120°) or in a narrow cone (90°)	2400lm in ☑sphere ☐wide cone ☐narrow cone		Correlated colour temperature, rounded to the nearest 100 K, or the range of correlated colour temperatures, rounded to the nearest 100 K, that can be set	4000K
On-mode power (Pon), expressed in W	20.0		Standby power (Psb), expressed in W and rounded to the second decimal	-
Networked standby power (Pnet) for CLS, expressed in W and rounded to the second decimal	-		Colour rendering index, rounded to the nearest integer, or the range of CRI-values that can be set	80
Outer dimensions	Height	136	Spectral power distribution in the	See Attachment C
	Width	80		

without separate control gear, lighting control parts and non-lighting control parts, if any (millimetre)	Depth	80	range 250 nm to 800 nm, at full-load	
Claim of equivalent power		☐yes ☑-	If yes, equivalent power (W)	-
			Chromaticity coordinates (x and y)	x= 0.380 y=0.380
Parameters for directional light sources:				
Peak luminous intensity (cd)		-	Beam angle in degrees, or the range of beam angles that can be set	-
Parameters for LED and OLED light sources:				
R9 colour rendering index value		9	Survival factor	1.00
the lumen maintenance factor		0.96		
Parameters for LED and OLED mains light sources:				
displacement factor (cos φ1)		0.95	Colour consistency in McAdam ellipses	2
Claims that an LED light source replaces a fluorescent light source without integrated ballast of a particular wattage.		☐yes ☑-	If yes then replacement claim (W)	-
Flicker metric (Pst LM)		0.1	Stroboscopic effect metric (SVM)	0.3

Attachment D – Product information sheet

Supplier's name or trade mark: Ningbo ZQ Lighting Co., Ltd.				
Supplier's address: No. 8, Tongguang Industrial District, Fengshan Street, Yuyao City, Ningbo China.				
Model identifier: T80-20W(6500K)				
Type of light source: T80-20W				
Lighting technology used:	☐HL ☐LFL T5 HE ☐LFL T5 HO ☐CFLni ☐other FL ☐HPS ☐MH ☐other HID ☑LED ☐OLED ☐mixed ☐other		Non-directional or directional:	☑NDLS ☐DLS
Light source cap-type (or other electric interface)	-			
Mains or non-mains:	☑MLS ☐NMLS		Connected light source (CLS):	☐yes ☑no
Colour-tuneable light source:	☐yes ☑no		Envelope:	☑no ☐second ☐non-clear
High luminance light source:	☐yes ☑no			
Anti-glare shield:	☐yes ☑no		Dimmable:	☐yes ☑no ☐only with specific dimmers
Product parameters				
Parameter	Value		Parameter	Value
General product parameters:				
Energy consumption in on-mode (kWh/1 000 h), rounded up to the nearest integer	20		Energy efficiency class	☐A ☐B ☐C ☐D ☑E ☐F ☐G
Useful luminous flux (Φuse), indicating if it refers to the flux in a sphere (360°), in a wide cone (120°) or in a narrow cone (90°)	2400lm in ☑sphere ☐wide cone ☐narrow cone		Correlated colour temperature, rounded to the nearest 100 K, or the range of correlated colour temperatures, rounded to the nearest 100 K, that can be set	6500K
On-mode power (Pon), expressed in W	20.0		Standby power (Psb), expressed in W and rounded to the second decimal	-
Networked standby power (Pnet) for CLS, expressed in W and rounded to the second decimal	-		Colour rendering index, rounded to the nearest integer, or the range of CRI-values that can be set	80
Outer dimensions	Height	136	Spectral power distribution in the	See Attachment C
	Width	80		

without separate control gear, lighting control parts and non-lighting control parts, if any (millimetre)	Depth	80	range 250 nm to 800 nm, at full-load	
Claim of equivalent power		☐yes ☑-	If yes, equivalent power (W)	-
			Chromaticity coordinates (x and y)	x= 0.313 y=0.337
Parameters for directional light sources:				
Peak luminous intensity (cd)		-	Beam angle in degrees, or the range of beam angles that can be set	-
Parameters for LED and OLED light sources:				
R9 colour rendering index value		9	Survival factor	1.00
the lumen maintenance factor		0.96		
Parameters for LED and OLED mains light sources:				
displacement factor (cos φ1)		0.95	Colour consistency in McAdam ellipses	4
Claims that an LED light source replaces a fluorescent light source without integrated ballast of a particular wattage.		☐yes ☑-	If yes then replacement claim (W)	-
Flicker metric (Pst LM)		0.1	Stroboscopic effect metric (SVM)	0.3

*****END OF TEST REPORT*****