

The background of the image is a dark, monochromatic photograph of various clear plastic mold trays. These trays are arranged in a scattered, overlapping manner, showing different sizes and shapes. Some trays contain small, clear plastic components, likely lenses or light guides, which are the products of the molds. A prominent blue curved graphic element, resembling a stylized 'L' or a swoosh, is positioned on the right side of the image, partially overlapping the text and the mold trays. The overall aesthetic is technical and industrial.

# LIMBUS

CONTROL YOUR LIGHT

# CUSTOMIZATION PROCESS

1

## Optical Requirement

Target FWHM, IES  
Lens Size  
LED  
Application

## Optical Design Report

Our R&D will design and share the datas within 10 days.

2

3

## Structure Design

If you are satisfied with the optical report, we will process to structure designing. Please provide us with the assembly drawing, structure drawing and any files that are helpful for us to design structure which will perfectly meet your expectations.

## Structure Confirm

We ask for your confirmation whether the lens structure conflict with the PCB, component location and luminaire.

4

5

## Mold Production

We need 20-35 working days to produce the mold, then will send you the samples when the mold finished.

## Confirm The Samples

Whether the samples are the same as the optical design and structure design.

6

7

## Mass Production

After sample approval, we will start producing the best optics for you!



## CORPORATE

LIMBUS is a trademark of LED optical products designed by TD Lighting Solutions.

TD Elektronik and TD Lighting Solutions group companies have unique experience and production capability in LED lighting sector. This experience and with knowledge; we manage the design, development of new technologies, mass production, test-control and laboratory processes from the headquarter factory in Istanbul, Turkey.

From the narrowest angle to the widest angle, for all application areas such as street lighting, retail lighting, tunnel lighting, area lighting, architectural lighting and other custom solutions we are here for you. You will find a solution at Limbus.

### Structural Design

Comprehensive design possibilities, to LED module design that compatible with our optic, from automation, traffic and solutions with our senior engineers at R&D Design Center



### Mass Production

Full automatic production lines with our injection machines equipped with robot arms and laser cutting machines, ISO 9001/14001 certified



### Special Software

To not leave our business to luck, we use software to our optic designs which are compatible with more than one LED, with fine mechanical design, providing multiple mounting options and keeping efficiency at the highest level



### Optical Team

Our optical team, which produces innovative solutions in mechanical, mold and optical designs, is within the R & D Design Center consisting of more than 20 expert technicians and engineers





Flood Lighting  
Highbay Lighting  
Indoor Lighting

TLS01NI-D12-90

## TLS01NI-D12

**Compatibility: Up to 3535 size LEDs**

PRODUCT CODE	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS01NI-D12-12-Tape	Ø13	6.9	12	90
TLS01NI-D12-30-Tape	Ø13	6.9	38	88
TLS01NI-D12-45-Tape	Ø13	6.9	44	88
TLS01NI-D12-60-Tape	Ø13	6.9	56	88
TLS01NI-D12-90-Tape	Ø13	6.9	67	88
TLS01NI-D12-2550-Tape	Ø13	6.9	19x34	90

## TLS01NI-D15

**Compatibility: Up to 3535 size LEDs**

PRODUCT CODE	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS01NI-D15-15-Tape	Ø15,2	9.06	17	94
TLS01NI-D15-40-Tape	Ø15,2	9.06	26	93
TLS01NI-D15-60-Tape	Ø15,2	9.06	49	92
TLS01NI-D15-90-Tape	Ø15,2	9.06	46.5	92
TLS01NI-D15-1065-Tape	Ø15,2	9.06	22x43	94

## TLS01NI-D17-168-BKL

**Compatibility: Up to 3030 size LEDs**

PRODUCT CODE	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS01NI-D17-168-BKL	Ø17	4.73	165	92

## TLS01NI-D20

**Compatibility: Up to 3535 size LEDs**

PRODUCT CODE	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS01NI-D20-8-Tape	Ø21.5	9.06	17	94
TLS01NI-D20-25-Tape	Ø21.5	9.06	26	93
TLS01NI-D20-40-Tape	Ø21.5	9.06	49	92
TLS01NI-D20-60-Tape	Ø21.5	9.06	46.5	92
TLS01NI-D20-1045-Tape	Ø21.5	9.06	22x43	94



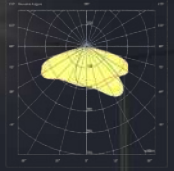


## Street Lighting

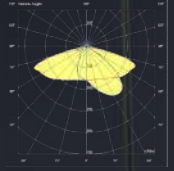
TLS04NI-5050-STL-M2M3



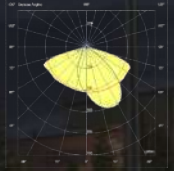
NICHIA 219C



NICHIA 319B



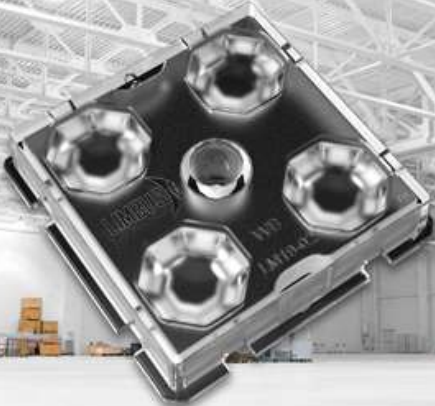
LUMILEDS 5050



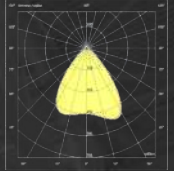
**PATENT  
PENDING**

## Highbay Lighting

TLS04NI-5050-90-WB



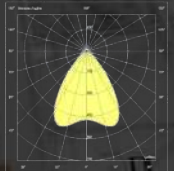
NICHIA 219C



LUMILEDS 5050



ETI 3535 AV1



**PATENT  
PENDING**



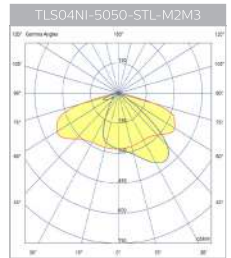
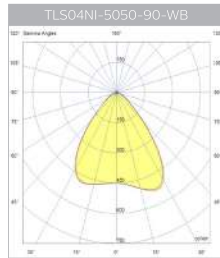
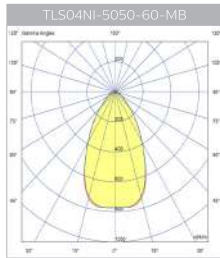
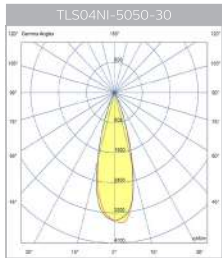
TLS04NI-5050-90-WB

## TLS04NI-5050

Compatibility: Up to 5050 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS04NI-5050-30	4	50x50	8.5	30	92
TLS04NI-5050-60-MB	4	50x50	10.5	60	93
TLS04NI-5050-90-WB	4	50x50	10.5	90	93
TLS04NI-5050-STL-M2M3	4	50x50	6.35	ASYM	90

## OPTICAL RESULTS







Highbay Lighting  
Street Lighting  
Area and Parking Lighting

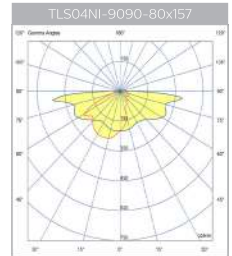
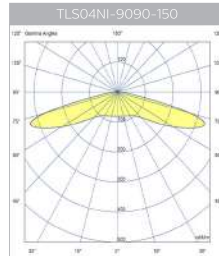
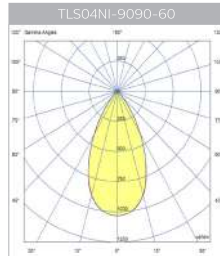
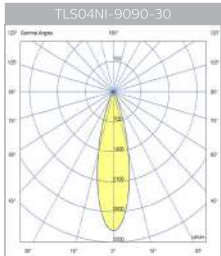
TLS04NI-9090-30

## TLS04NI-9090

Compatibility: Up to 7070 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS04NI-9090-30	4	90x90	9	28	92
TLS04NI-9090-60	4	90x90	9.3	56	92
TLS04NI-9090-150	4	90x90	9.3	156	92
TLS04NI-9090-80x157	4	90x90	13.5	ASYM	92

## OPTICAL RESULTS





Area and Parking Lighting

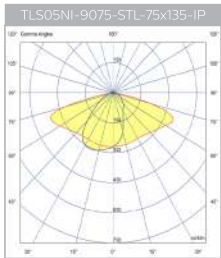
TLS05NI-9075-STL-75x135-IP

## TLS05NI-9075 IP

Compatibility: Up to 5050 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS05NI-9075-STL-75x135-IP	5	90x75	5	ASYM	93

## OPTICAL RESULTS





Highbay Lighting  
Street Lighting  
Area and Parking Lighting

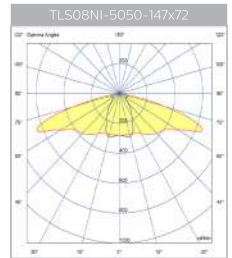
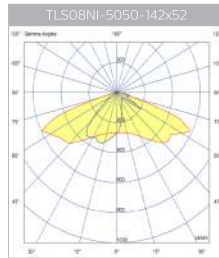
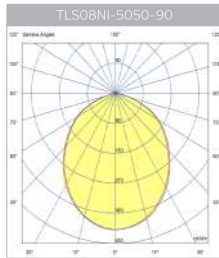
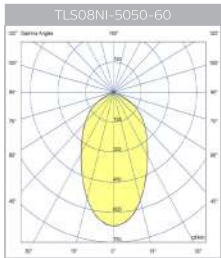
TLS08NI-5050-STL-147x72

## TLS08NI-5050

Compatibility: Up to 3030 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS08NI-5050-60	8	50x50	5.3	60	92
TLS08NI-5050-90	8	50x50	5	90	92
TLS08NI-5050-STL-142x52	8	50x50	5.33	ASYM	92
TLS08NI-5050-STL-147x72	8	50x50	5.1	ASYM	92

## OPTICAL RESULTS







Office Lighting  
Downlighting  
Indoor Architectural

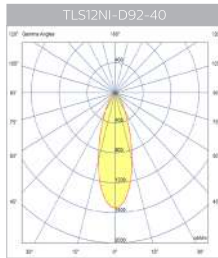
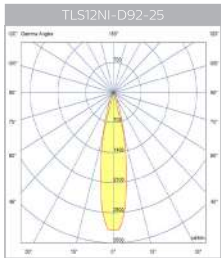
TLS12NI-D92-25

## TLS12NI-D92

Compatibility: Up to 3535 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS12NI-D92-25	12	Ø92	16.2	23	92
TLS12NI-D92-40	12	Ø92	16.2	36	91

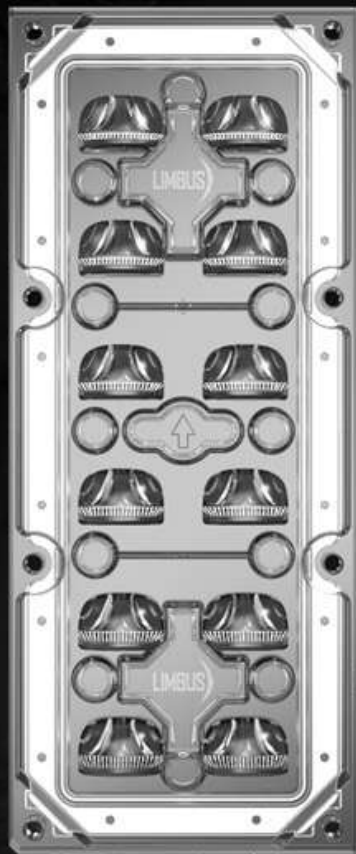
## OPTICAL RESULTS



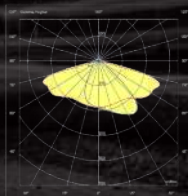
## Street Lighting

TL512NI-W71L173-V-M2M3-IP

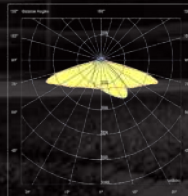
- ✓  $Lm[cd/m^2] \geq 0,75$
- ✓  $U_o \geq 0,40$
- ✓  $U_i \geq 0,50$
- ✓  $T_i[\%] \leq 15$
- ✓  $SR \geq 0,50$



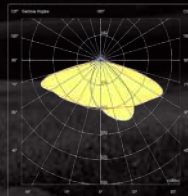
NICHIA 219C



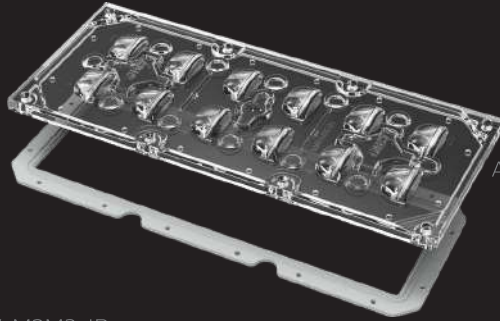
NICHIA 319B



LUMILEDS 5050



PATENT  
PENDING



Street Lighting  
Area and Parking Lighting  
Highbay Lighting

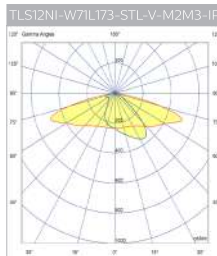
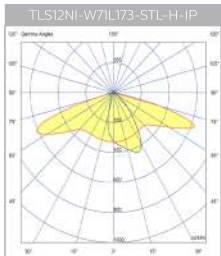
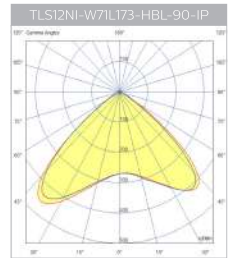
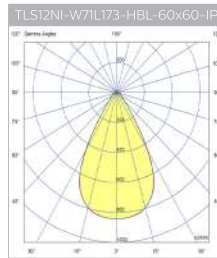
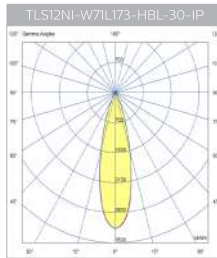
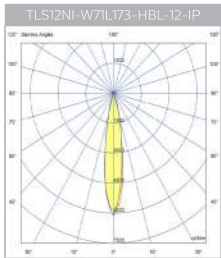
TLS12NI-W71L173-V-M2M3-IP

## TLS12NI-W71L173

Compatibility: Up to 5050 size LEDs

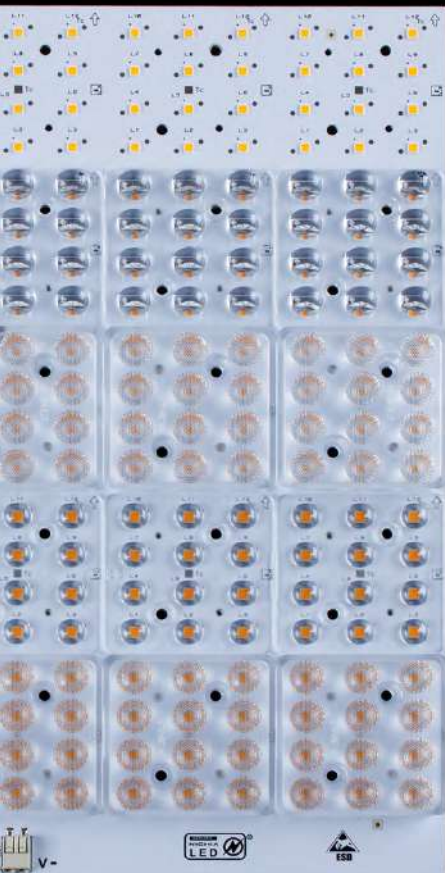
PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS12NI-W71L173-HBL-12-IP	12	71x173	7.5	16	91
TLS12NI-W71L173-HBL-30-IP	12	71x173	7.5	27	92
TLS12NI-W71L173-HBL-60x60-IP	12	71x173	7.5	65	92
TLS12NI-W71L173-HBL-90-IP	12	71x173	10.7	103	92
TLS12NI-W71L173-STL-H-IP	12	71x173	7.5	ASYM	90
TLS12NI-W71L173-STL-V-M2M3-IP	12	71x173	8.14	ASYM	91

## OPTICAL RESULTS





# ONE PCB DESIGN FOR SIX DIFFERENT OPTICS



## PCB

1.6mm PCB  
2 Oz copper  
2 W/mK thermal conductivity

## UPL-ASY

Application Under pass lighting  
Flood lighting  
Wallwasher

Viewing angle Asymetrical

Efficiency 94% PMMA

## HBL-60

Application Highbay lighting  
Flood lighting  
Wallwasher

Viewing angle 60°

Efficiency 94% PMMA

## GSL-SYM

Application Gas station lighting  
Highbay & Lowbay lighting  
Flood lighting

Viewing angle 90°

Efficiency 94% PMMA

## HBL-40

Application Highbay & Lowbay lighting  
Flood lighting  
Wallwasher

Viewing angle 40°

Efficiency 94% PMMA



Tunnel Lighting  
 Highbay Lighting  
 Flood Lighting  
 Gas Station Lighting  
 Street Lighting

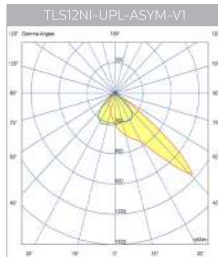
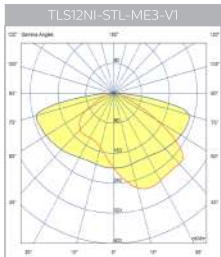
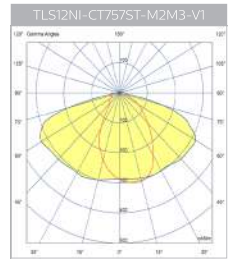
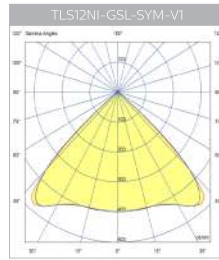
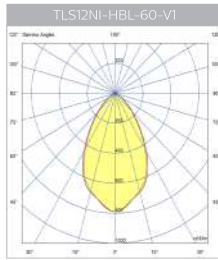
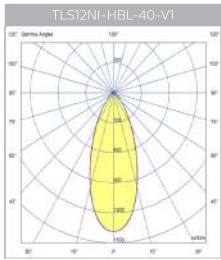
TLS12NI-HBL-40-V1

## TLS12NI-5050

Compatibility: Up to 3030 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS12NI-HBL-40-V1	12	50x50	4.79	42	94
TLS12NI-HBL-60-V1	12	50x50	4.79	64	94
TLS12NI-GSL-SYM-V1	12	50x50	4.79	90	94
TLS12NI-CT757ST-M2M3-V1	12	50x50	5.75	ASYM	92
TLS12NI-STL-ME3-V1	12	50x50	4.79	ASYM	94
TLS12NI-UPL-ASYM-V1	12	50x50	4.79	ASYM	94

## OPTICAL RESULTS





Wall-washing Lighting  
Outdoor Lighting

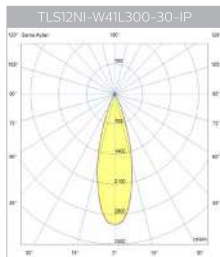
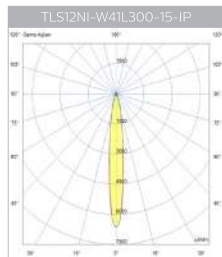
TLS12NI-W41L300-15-IP

## TLS12NI-W41L300

Compatibility: Up to 5050 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS12NI-W41L300-15-IP	12	41x300	17.5	12.9	93
TLS12NI-W41L300-30-IP	12	41x300	10.5	92	

## OPTICAL RESULTS





Highbay Lighting  
Street Lighting  
Area and Parking Lighting

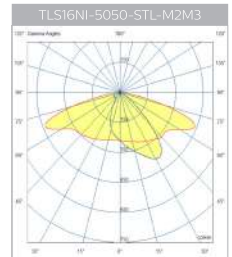
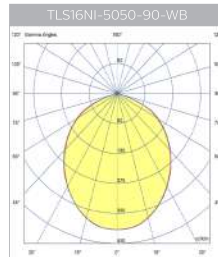
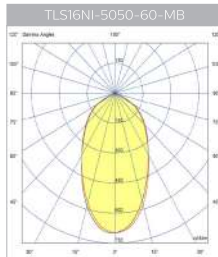
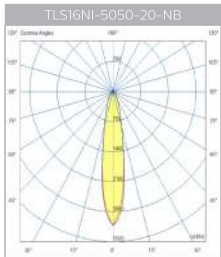
TLS16NI-5050-STL-M2M3

## TLS16NI-5050

Compatibility: Up to 3030 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS16NI-5050-20-NB	16	50x50	8.3	22	92
TLS16NI-5050-60-MB	16	50x50	6.3	61	95
TLS16NI-5050-90-WB	16	50x50	6.0	91	95
TLS16NI-5050-STL-M2M3	16	50x50	4.45	ASYM	92

## OPTICAL RESULTS





Street Lighting  
Area and Parking Lighting  
Outdoor Architectural

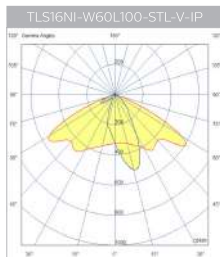
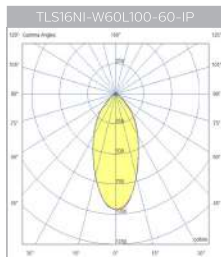
TLS16NI-W60L100-STL-V-IP

## TLS16NI-W60L100

Compatibility: Up to 3535 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS16NI-W60L100-60-IP	16	60x100	6.8	50	93
TLS16NI-W60L100-STL-V-IP	16	60x100	6.6	ASYM	92

## OPTICAL RESULTS







Retail Lighting  
Office Lighting  
Indoor Architectural

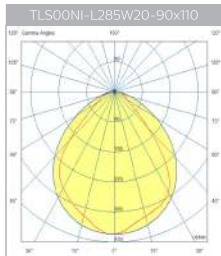
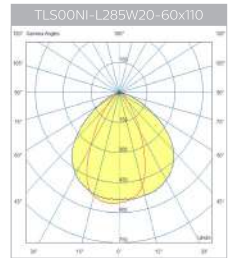
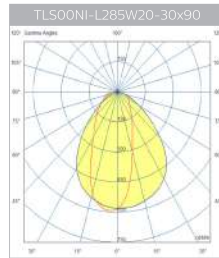
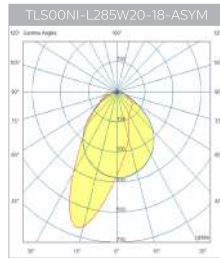
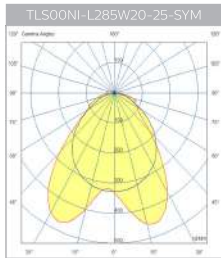
TLS00NI-L285W20-90X110  
TLS00NI-L285W20-90X110-3IN1

## TLS00NI-L285

Compatibility: Up to 3030 size LEDs

PRODUCT CODE	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS00NI-L285W20-25-SYM & 3IN1	285.7x20	6.6	SYM	92
TLS00NI-L285W20-18-ASYM & 3IN1	285.7x20	7.31	ASYM	92
TLS00NI-L285W20-30x90 & 3IN1	285.7x20	7.1	ASYM	92
TLS00NI-L285W20-60x110 & 3IN1	285.7x20	7.9	ASYM	92
TLS00NI-L285W20-90x110 & 3IN1	285.7x20	7.0	ASYM	92

## OPTICAL RESULTS





Highbay Lighting  
Area and Parking Lighting  
Street Lighting

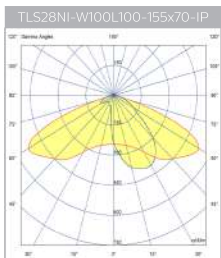
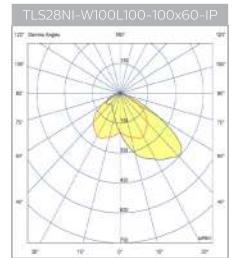
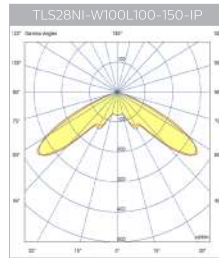
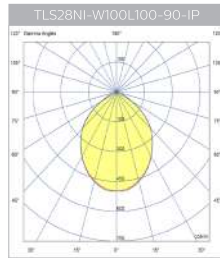
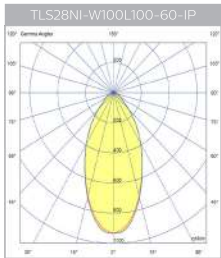
TLS28NI-W100L100-155x70-IP

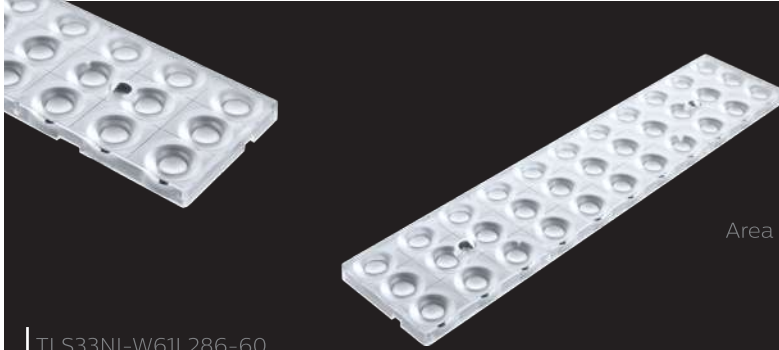
## TLS28NI-W100L100

Compatibility: Up to 3535 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS28NI-W100L100-60-IP	28	100x100	8.5	49.8	89
TLS28NI-W100L100-90-IP	28	100x100	8.5	91.6	93
TLS28NI-W100L100-150	28	100x100	8.5	130	95
TLS28NI-W100L100-100x60-IP	28	100x100	8.5	ASYM	93
TLS28NI-W100L100-155x70-IP	28	100x100	8.5	ASYM	92

## OPTICAL RESULTS





Retail Lighting  
Office Lighting  
Lowbay Lighting  
Area and Parking Lighting

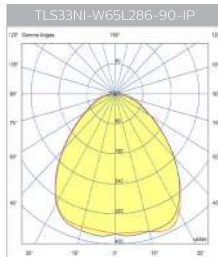
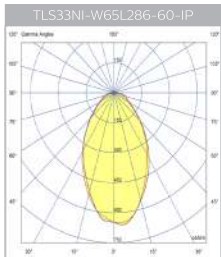
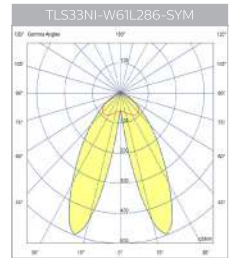
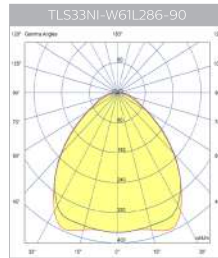
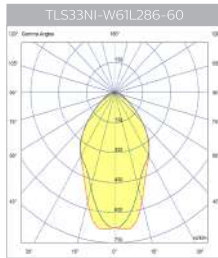
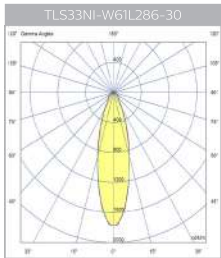
TLS33NI-W61L286-60

## TLS33NI-W61L286 / W65L286

Compatibility: Up to 3030 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS33NI-W61L286-30	33	61x286	8.6	30	92
TLS33NI-W61L286-60	33	61x286	8.6	66	93
TLS33NI-W61L286-90	33	61x286	8.6	99	93
TLS33NI-W61L286-SYM	33	61x286	12.1	SYM	93
TLS33NI-W65L286-60-IP	33	65x286	9.2	64	81
TLS33NI-W65L286-90-IP	33	65x286	9.2	98	80

## OPTICAL RESULTS





Street Lighting  
Area and Parking Lighting  
Highbay Lighting

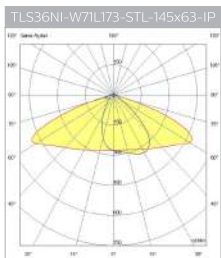
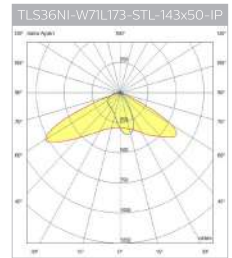
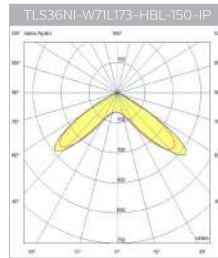
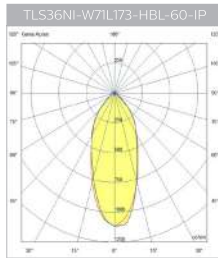
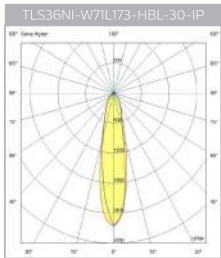
TLS36NI-W71L173-STL-143x50-IP

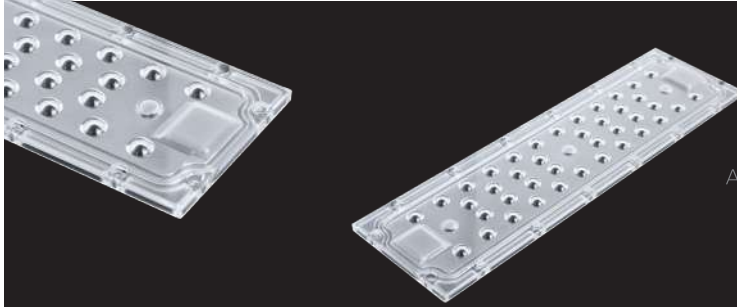
## TLS36NI-W71L173

Compatibility: Up to 3030 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS36NI-W71L173-HBL-30-IP	36	71x173	9.08	30	92
TLS36NI-W71L173-HBL-60-IP	36	71x173	6.89	60	92
TLS36NI-W71L173-HBL-150-IP	36	71x173	6.5	150	92
TLS36NI-W71L173-STL-143x50-IP	36	71x173	5.2	ASYM	92
TLS36NI-W71L173-STL-145x63-IP	36	71x173	6.5	ASYM	92

## OPTICAL RESULTS





Area and Parking Lighting  
Highbay Lighting

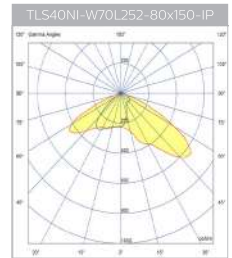
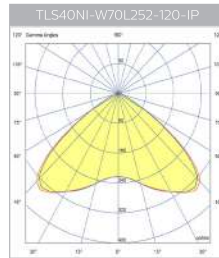
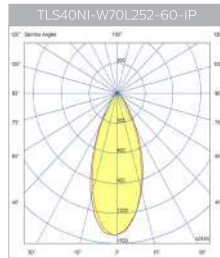
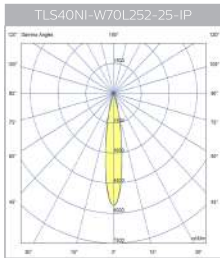
TLS05NI-9075-STL-75x135-IP

## TLS40NI-W70L252

Compatibility: Up to 3030 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS40NI-W70L252-25-IP	40	70x252	11.2	25	91
TLS40NI-W70L252-60-IP	40	70x252	11.2	60	93
TLS40NI-W70L252-80x150-IP	40	70x252	11.2	ASYM	93
TLS40NI-W70L252-120-IP	40	70x252	5	98	90

## OPTICAL RESULTS







Highbay Lighting  
Midbay Lighting  
Lowbay Lighting

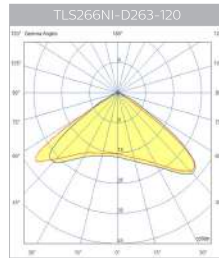
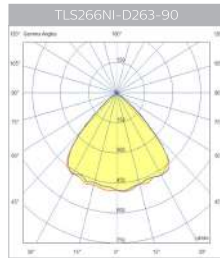
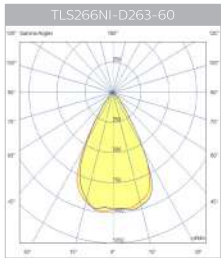
TLS266NI-D263-60

## TLS266NI-D263-IP

Compatibility: Up to 3030 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS266NI-D263-60	266	Ø262.8	9.6	64	92
TLS266NI-D263-90	266	Ø262.8	9.6	90	92
TLS266NI-D263-120	266	Ø262.8	9.6	120	92

## OPTICAL RESULTS





Office Lighting  
Indoor Architectural

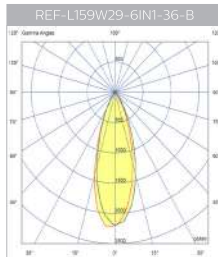
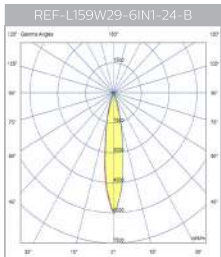
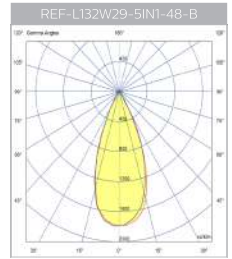
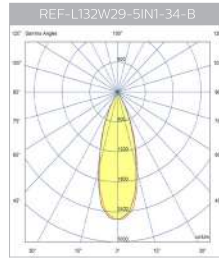
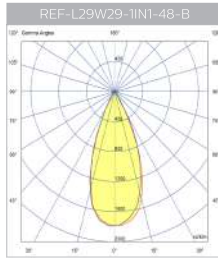
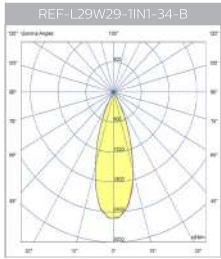
REF-L29W29-1IN1-48-B  
REF-L132W29-5IN1-48-B  
REF-L159W29-6IN1-24-B

## 1IN1 - 5IN1 - 6IN1

Compatibility: Up to 3535 size LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
REF-L29W29-1IN1-34-B	1	29.6x29.6	25	35	92
REF-L29W29-1IN1-48-B	1	29.6x29.6	25	44	92
REF-L132W29-5IN1-34-B	5	29.6x132.4	25	35	92
REF-L132W29-5IN1-48-B	5	29.6x132.4	25	44	92
REF-L159W29-6IN1-24-B	6	29.6x159.4	25	24	92
REF-L159W29-6IN1-36-B	6	29.6x159.4	25	35	92

## OPTICAL RESULTS





Street Lighting  
Highbay Lighting

TLS01NI-D107-75x155-GL

## TLS01NI-D50-GL

Compatibility: 10W-30W COB LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS01NI-D50-40-GL	1	50	28.0	40	94
TLS01NI-D50-60-GL	1	50	28.0	60	94
TLS01NI-D50-70-GL	1	50	28.0	70	94
TLS01NI-D50-80-GL	1	50	28.0	80	94
TLS01NI-D50-90-GL	1	50	28.0	90	94

## TLS01NI-D66-GL

Compatibility: 10W-30W COB LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS01NI-D66-45-GL	1	66	47.5	45	94
TLS01NI-D66-60-GL	1	66	33.7	60	94
TLS01NI-D66-90-GL	1	66	26.0	90	94
TLS01NI-D66-120-GL	1	66	23.0	120	94

## TLS01NI-D78-GL

Compatibility: 30W-100W COB LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS01NI-D78-45-GL	1	78	44.0	45	94
TLS01NI-D78-60-GL	1	78	40.0	60	94
TLS01NI-D78-90-GL	1	78	35.4	90	94
TLS01NI-D78-120-GL	1	78	27.5	120	94
TLS01NI-D78-120x80-GL	1	78	30.0	ASYM	94

## TLS01NI-D107-GL

Compatibility: 30W-100W COB LEDs

PRODUCT CODE	LEDs	DIMENSIONS(mm)	HEIGHT(mm)	FWHM(°)	EFFICIENCY(%)
TLS01NI-D107-90-GL	1	107x87	29.0	90	94
TLS01NI-D107-120-GL	1	107x87	23.0	120	94
TLS01NI-D107-75x155-GL	1	107x87	31.1	ASYM	94
TLS01NI-D107-120x160-GL	1	107x87	29.0	ASYM	94

# OVER 3 COUNTRIES

Being a solution provider-partner in energy, telecommunication and lighting industries over the regions of Eastern Europe, Turkey and Middle East.



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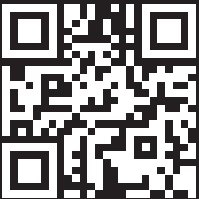
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