

STOANE LIGHTING

EQUIPMENT DESIGN + MANUFACTURE

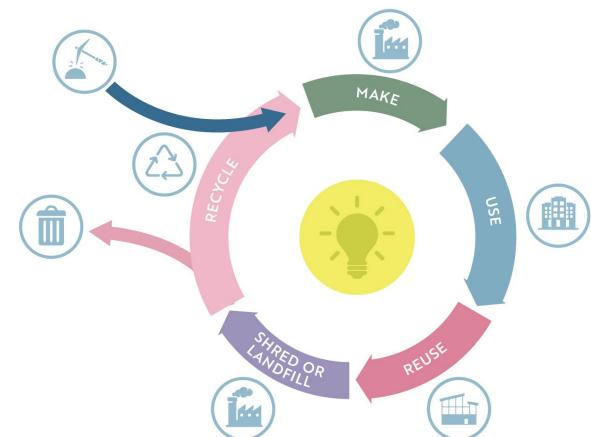
Luminaire Design to the Circular Economy

Topics

- CIBSE TM66 Framework: 'Creating a Circular Economy in the Lighting Industry'
- Product Design
- Manufacturing
- Materials
- Ecosystem

TM66: ZTA.50.Surface

Creating a circular economy in the lighting industry



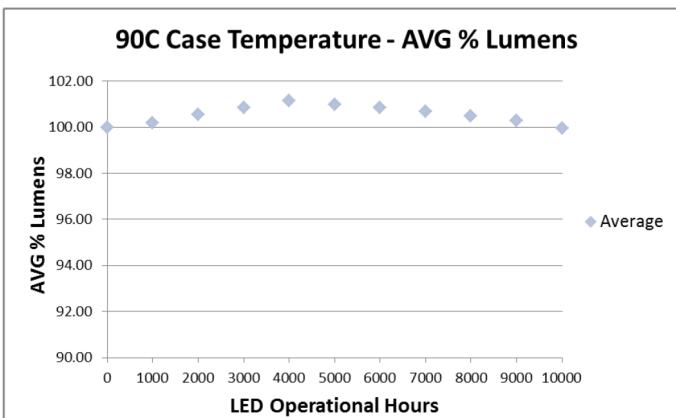
TM66: 2021



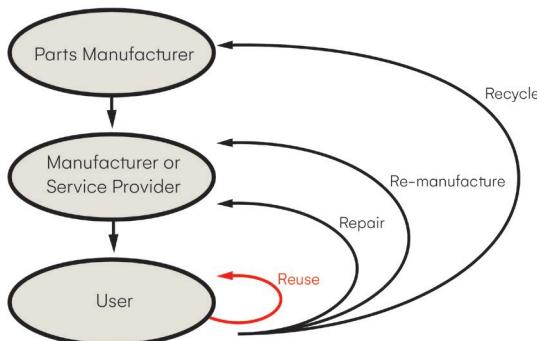
Product Design

- Keep products in use
 - Durability of housing and design for long-lived components
 - Information retrieval on usage.
 - Making light sources, drivers and optics easily replaceable / upgradeable

LED Lifetime



Case Temperature 1	
Temperature (°C):	90
Temperature (°K):	363.15
α :	1.96E-06
B:	1.02
Calculated L70 (hrs):	192000
Reported L70 (hrs):	>55000



Stoane Lighting - Thermal Test Sheet

Job No. / Product/Component	ZTA.50 Surf XTM at 16.5W	Pass @16.5W
Date:	25/1/21	Fail
Test set up: (see over) Show test as sketch and/or photograph printed and stapled overleaf . Clearly illustrate exactly where the probes are situated and number them 1-9.		
Checklist for Product testing - fill in as appropriate.		
Accessories added? Describe	CEW optic and HC louvre	
Worst possible orientation? Describe	horizontal	
Worst possible finish? Describe	RAL 9010	
Enclosure? Describe:	NA	

LED Source (use part number if known) XTM19803030CCA

CCT	3000K
Drive Current or DC Voltage	700mA
Wattage	16.5W
Max Ts/TC of the LED @ 25°C (see Recent LED Type info)	80°C
Max Temperature measured @ 25°C	76.2°C
Max Safe Ambient of LED (°C)	35°C
Max Tc of Driver (if required)	
Max Driver temp measured @ 25°C	
Max Safe Ambient of driver (°C)	
Optic	
Max temp of optic @ 25°C	

Discrete LED type: Note, temps often limited by PCB material.
 Xicato XOB max Ts: 85°C at ambient 25°C
 Cree XM-L colour max Ts: 75°C at 25°C
 Luminus CHM-6 max Ts: 95°C at 25°C
 Luminus MP2016 max Ts: 75°C at 25°C
 Osram Oslon Square max Ts: 75°C at 25°C
 Xicato XIM/XTM module Max Tc = 80°C at 25°C

Fitting Case Temperature:
 For metal fittings it must be noted if the (touchable) case temperature, particularly around the adjustment areas (locks etc.) exceeds 60 degrees. For non-metal fittings it must be noted if the surface temperature exceeds 75°C. Measured at 25°C ambient.

Metal fitting max surface temp at 25°C ambient:	60°C
Non-metal fitting max surface temp at 25°C ambient:	

Other Considerations - Please specify mount surface or any other critical thermal considerations below.

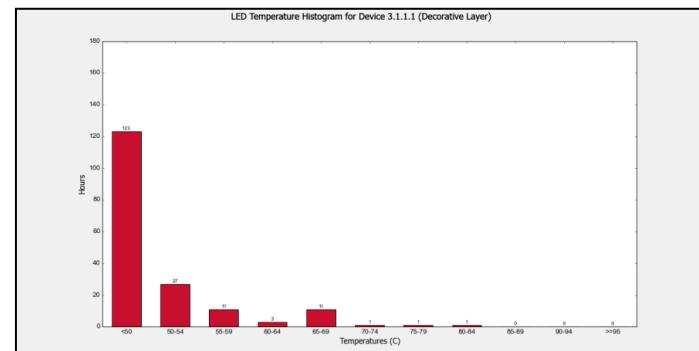
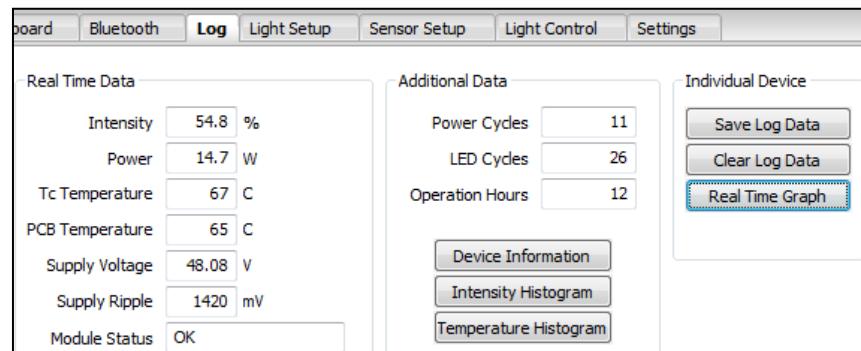
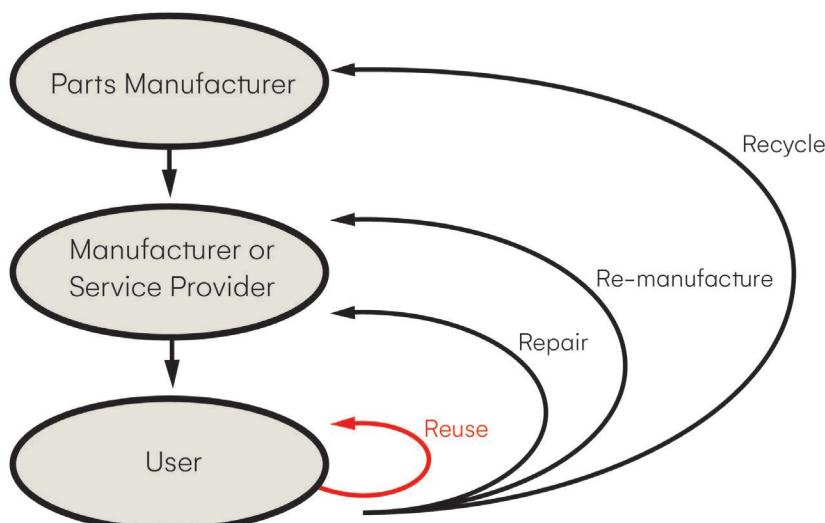
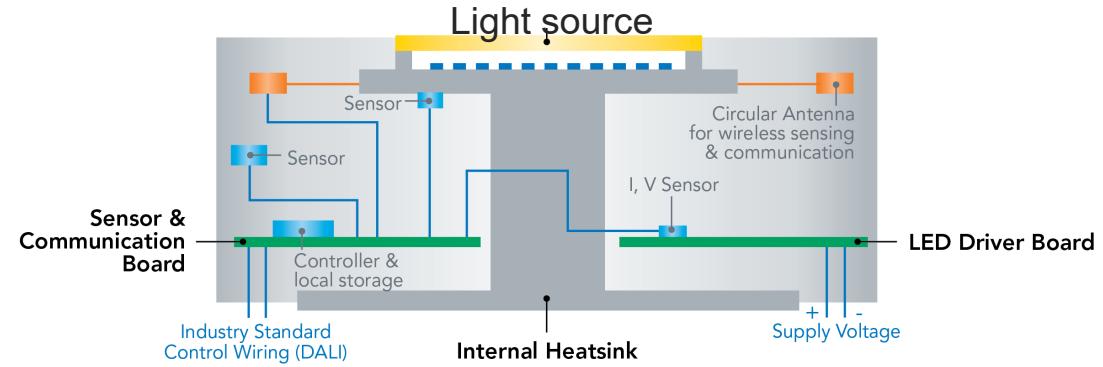
MAINSERVER\MSL Data\thermal tests, lamp, weights and other data\thermal testing data sheet.doc

	Ambient (°C)	XTM Tc POINT (°C)	Case Temp (°C)
		Max.	Max.
00:00:00	16.4	67.6	53.9
00:20:00	16.9	68.2	54.3
00:40:00	17.5	68.7	54.7
01:00:00	18.0	69.0	54.8
01:20:00	18.5	69.6	55.2
01:40:00	19.0	69.9	55.4
02:00:00	19.3	70.3	55.7
02:20:00	19.5	70.4	55.6
02:40:00	19.9	70.7	55.8
03:00:00	20.0	71.1	56.2
03:20:00	19.9	71.2	56.2
03:40:00	20.1	71.4	56.1
04:00:00	20.6	71.8	56.1
04:20:00	20.8	72.1	56.1
04:40:00	21.0	72.2	56.0

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Information Retrieval



Images courtesy Xicato

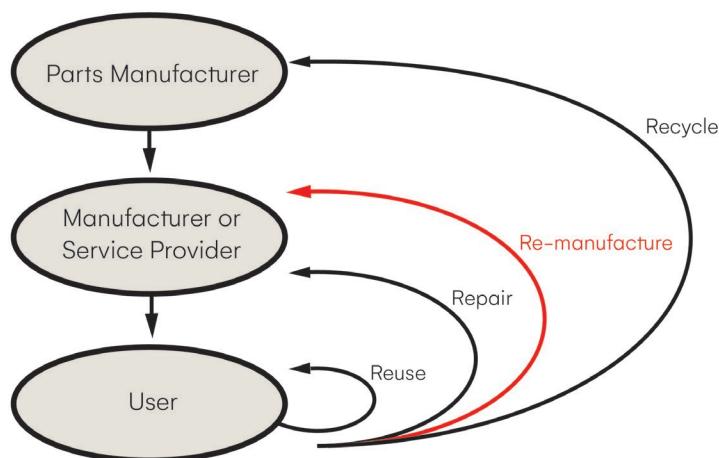
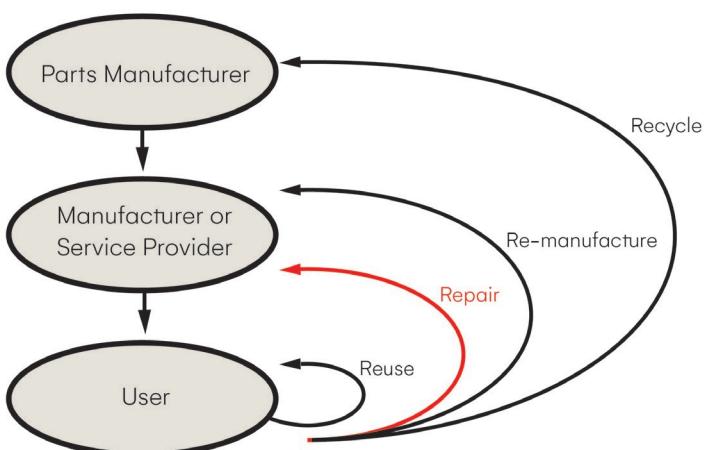
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EQUIPMENT DESIGN + MANUFACTURE

Replaceable / Upgradeable Optics, Light Sources and Drivers

Design of repairable and re-manufacturable luminaires.

- Easy access to and replacement of components that are predicted to fail during the life of the luminaire
- Product designs ease the use of alternate or upgraded parts.
 - Extra fixing holes to facilitate subsequent use of different component types
 - Leeway mechanically
 - Leeway thermally



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EQUIPMENT DESIGN + MANUFACTURE

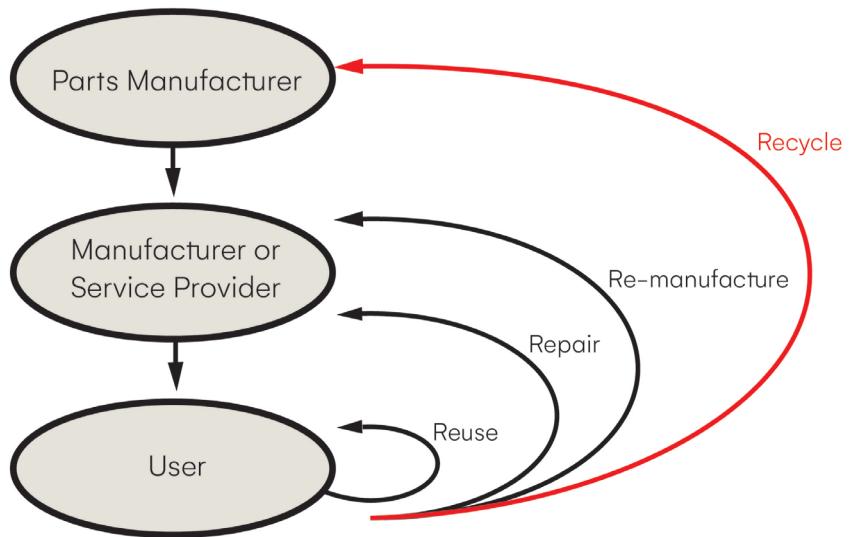
Materials

- Recycled materials
- EOL recycling

Aluminium Recyclability

Recycled aluminium is indistinguishable from Primary Alloys.

- Recycling aluminium requires only 5% of the energy used to create primary aluminium
- Recycling aluminium produces only 5% of the GHG gas emissions generated in primary production
- 75% of all material produced, about 1 billion tonnes, is still in use today

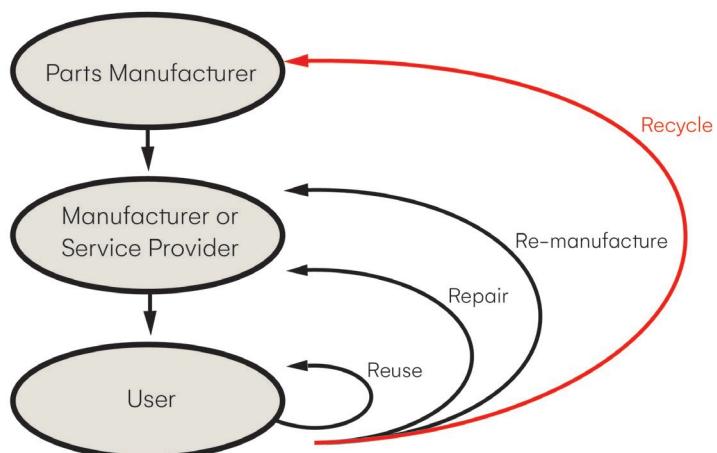


With permission from The Aluminium Federation

PMMA Recyclability

Acrylic and the environment

- PMMA is not biodegradable but infinitely recyclable
- Lower energy and emissions with recycling c/w new production



PMMA for recycling is shredded and then granulated. The PMMA granules can be recast.



Stoane Lighting fixtures with virgin and recycled PMMA.

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EQUIPMENT DESIGN + MANUFACTURE

EOL recycling

Sticker* directs operator to website



Enter Unique Serial Number
into maintain and recycle
part of web site

disassembly information

Enter serial number

*could be QR, NFC etc if we trust for longevity.

ZTA.50.SURFACE.ZOOM DISASSEMBLY AND MAINTENANCE NOTES

Fitting must be turned off and isolated from the supply
before performing maintenance.

CATEGORY:
LIGHT SOURCE
CONTAINING PRODUCT
CONTROL GEAR



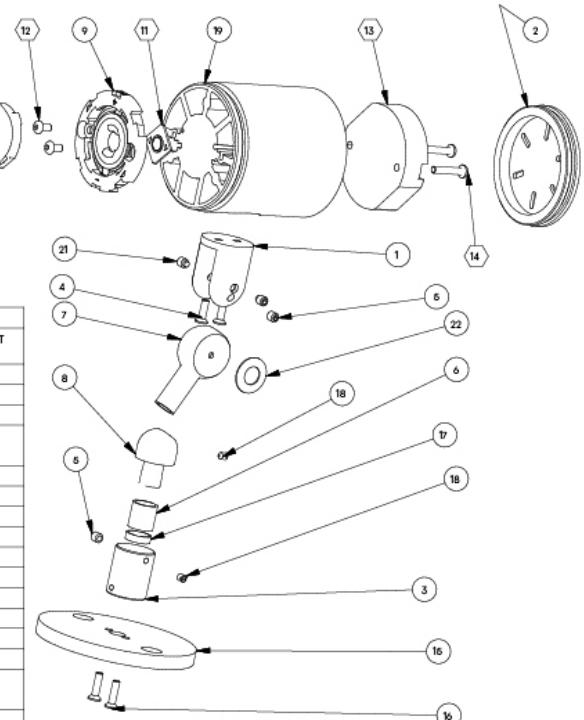
ITEM	DESCRIPTION	STOCK NUMBER	CONTACT 3RD PARTY	TOOL REQUIRED	MATERIAL	MASS	REPLACEABLE BY	JUSTIFICATION IF NOT REPLACEABLE
1	SL COMPONENT	ITY-002662			ALUMINIUM	0.011 kg		
2	SL COMPONENT				ALUMINIUM	0.017 kg		
3	SL COMPONENT				ALUMINIUM	0.008 kg		
4	CONSUMABLE: Socket Head Countersunk Screw			2mm ALLEN KEY	STAINLESS STEEL	0.001 kg		
6	CONSUMABLE: GRUB SCREW			2mm ALLEN KEY	STAINLESS STEEL	0.001 kg		
6	SL COMPONENT				BRASS	0.003 kg		
7	SL COMPONENT				ALUMINIUM	0.012 kg		
8	SL COMPONENT				ALUMINIUM	0.006 kg		
9	LED HOLDER				PC	0.004 kg		
11	XICATO 6mm XCB	XICATO	SOLDERING IRON	CONTACT 3RD PARTY	0.005 kg			
12	CONSUMABLE: Socket Button Head Screw			2mm ALLEN KEY	STAINLESS STEEL	0.001 kg		
13	DRIVER	XICATO		CONTACT 3RD PARTY	0.026 kg			
14	CONSUMABLE: Socket Button Head Screw			2mm ALLEN KEY	STAINLESS STEEL	0.001 kg		
15	SL COMPONENT	ITY-001026			ALUMINIUM	0.061 kg		
16	CONSUMABLE: Socket Head Countersunk Screw			2mm ALLEN KEY	STAINLESS STEEL	0.001 kg		
17	SL COMPONENT	ITY-003676			Brass	0.001 kg		
18	CONSUMABLE: SET SCREWS			SMALL FLATHEAD SCREWDRIVER	Steel Mild	0.000 kg		
19	SL COMPONENT	ITY-003689			ALUMINIUM	0.165 kg		
20	SL COMPONENT	ITY-004301			ALUMINIUM	0.043 kg		
21	CONSUMABLE: Socket Set Screw			2mm ALLEN KEY	Steel Mild	0.000 kg		
22	CONSUMABLE: SPRING WASHER	ITY-004670			STAINLESS STEEL	0.001 kg		
23	OPTIC				PMMA	0.033 kg		
24	OPTIC				PMMA	0.006 kg		
25	SL COMPONENT				ALUMINIUM	0.013 kg		
29	CONSUMABLE: O-RING				SILICONE	0.001 kg		
30	WIRE LOOM (NOT SHOWN)	XICATO		CONTACT 3RD PARTY				
32	WIRES (NOT SHOWN)	XICATO		CONTACT 3RD PARTY				

LIGHT SOURCE/CONTROL GEAR

PROFESSIONAL
 USER
 NOT REPLACEABLE

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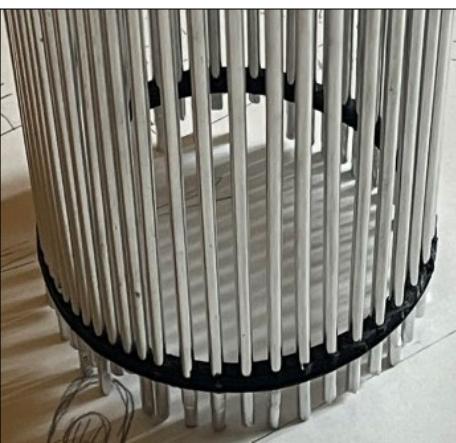
EQUIPMENT DESIGN + MANUFACTURE



Manufacturing

- Subtractive and additive manufacturing
- Modular design
- Repurposing waste

Subtractive and additive manufacturing



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EQUIPMENT DESIGN + MANUFACTURE

Modular Design and Reusing Components



STX2.50



ZTA.50.Surface



Frog Type X



Frog Type X Zoom



STX2.70



ZTA.70.Surface



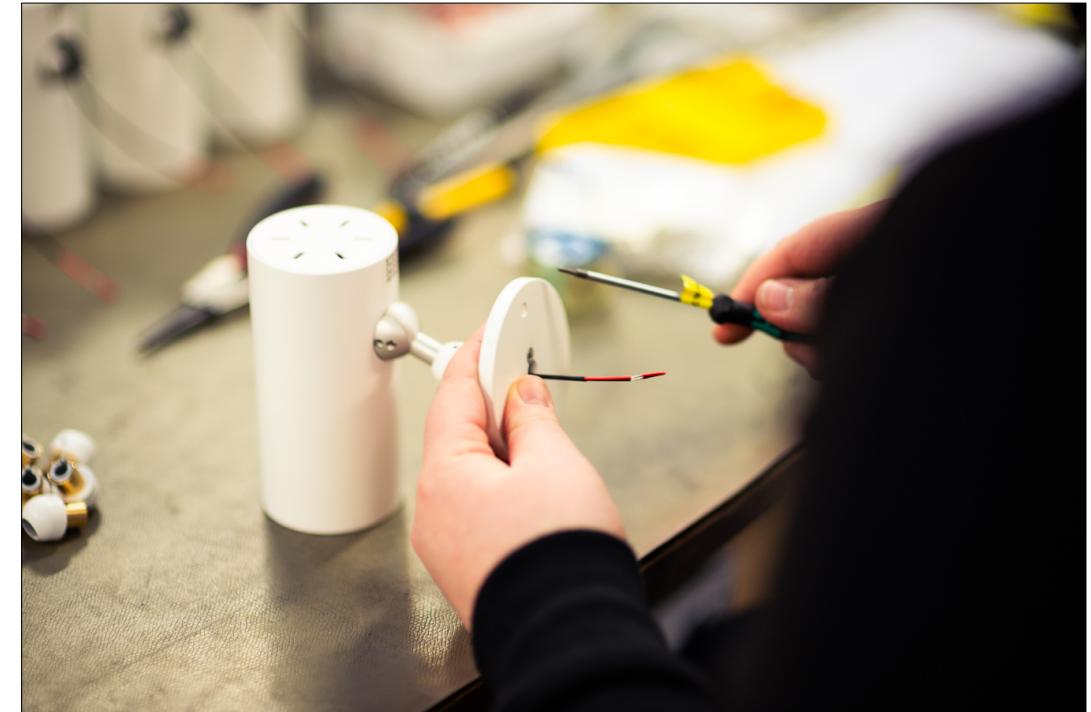
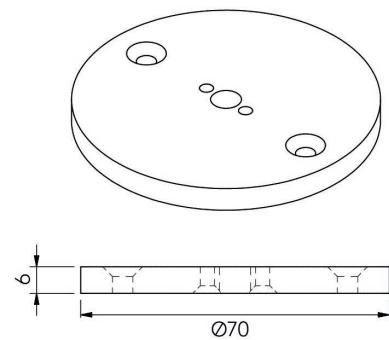
Croc Type X



STX2.111



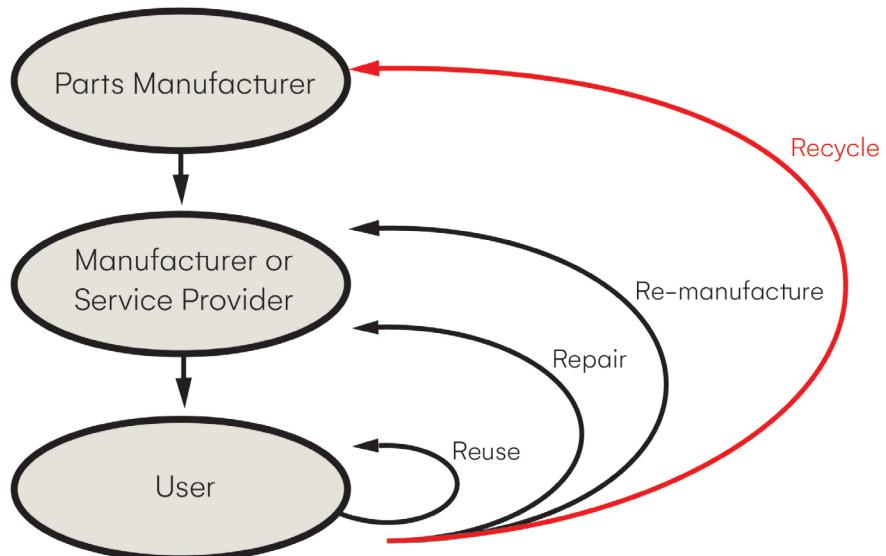
Toad Type X



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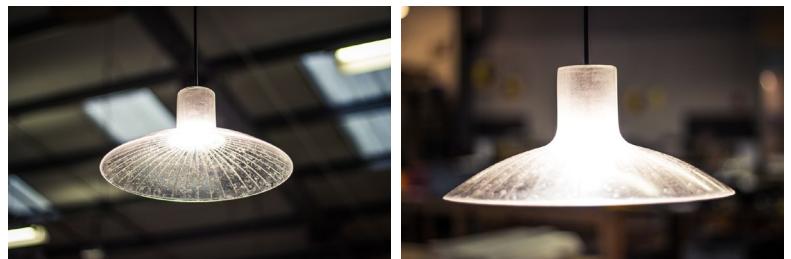
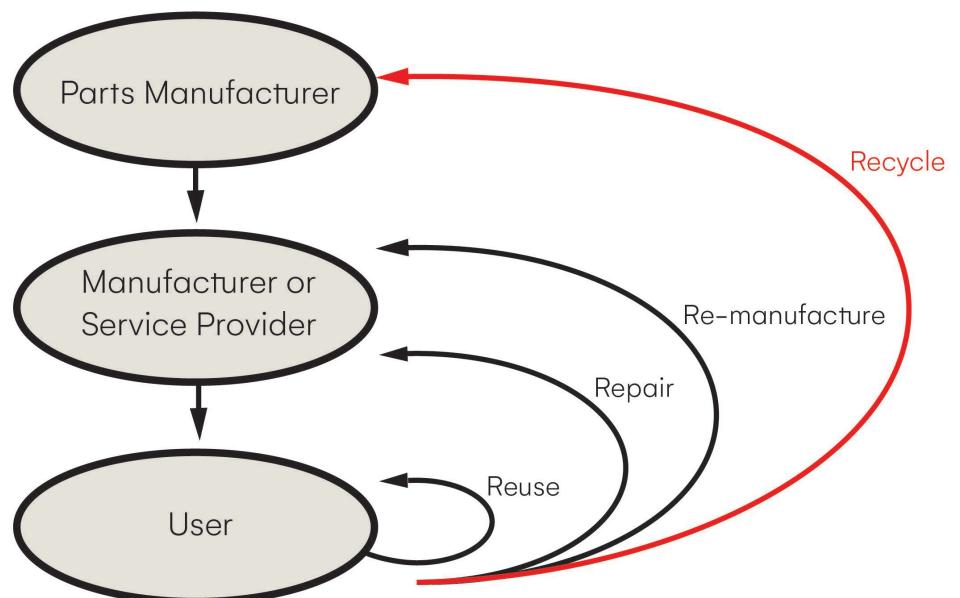
Repurposing Waste: Aluminium



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EQUIPMENT DESIGN + MANUFACTURE

Repurposing Waste: Plastic



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EQUIPMENT DESIGN + MANUFACTURE

Ecosystem

- Systems to repurpose or repair packaging and products
 - Repurposing packaging
 - Repairing or remanufacturing luminaires

Packaging

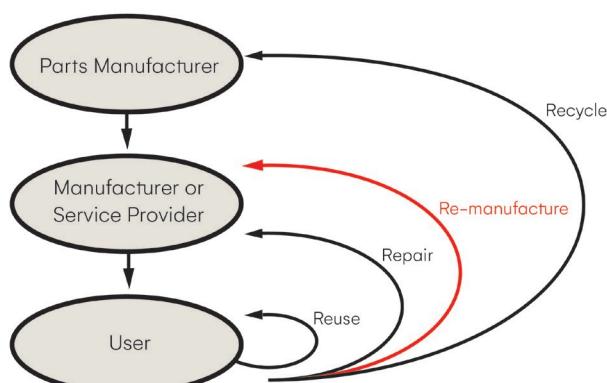
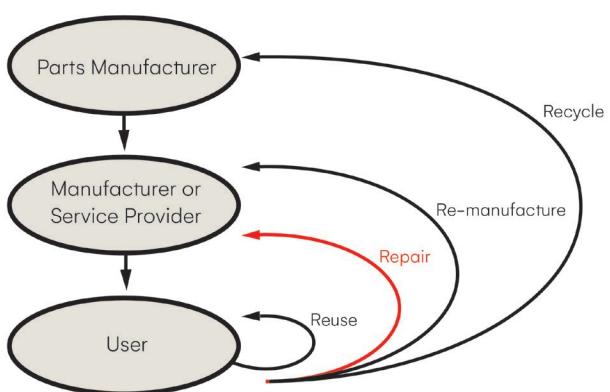
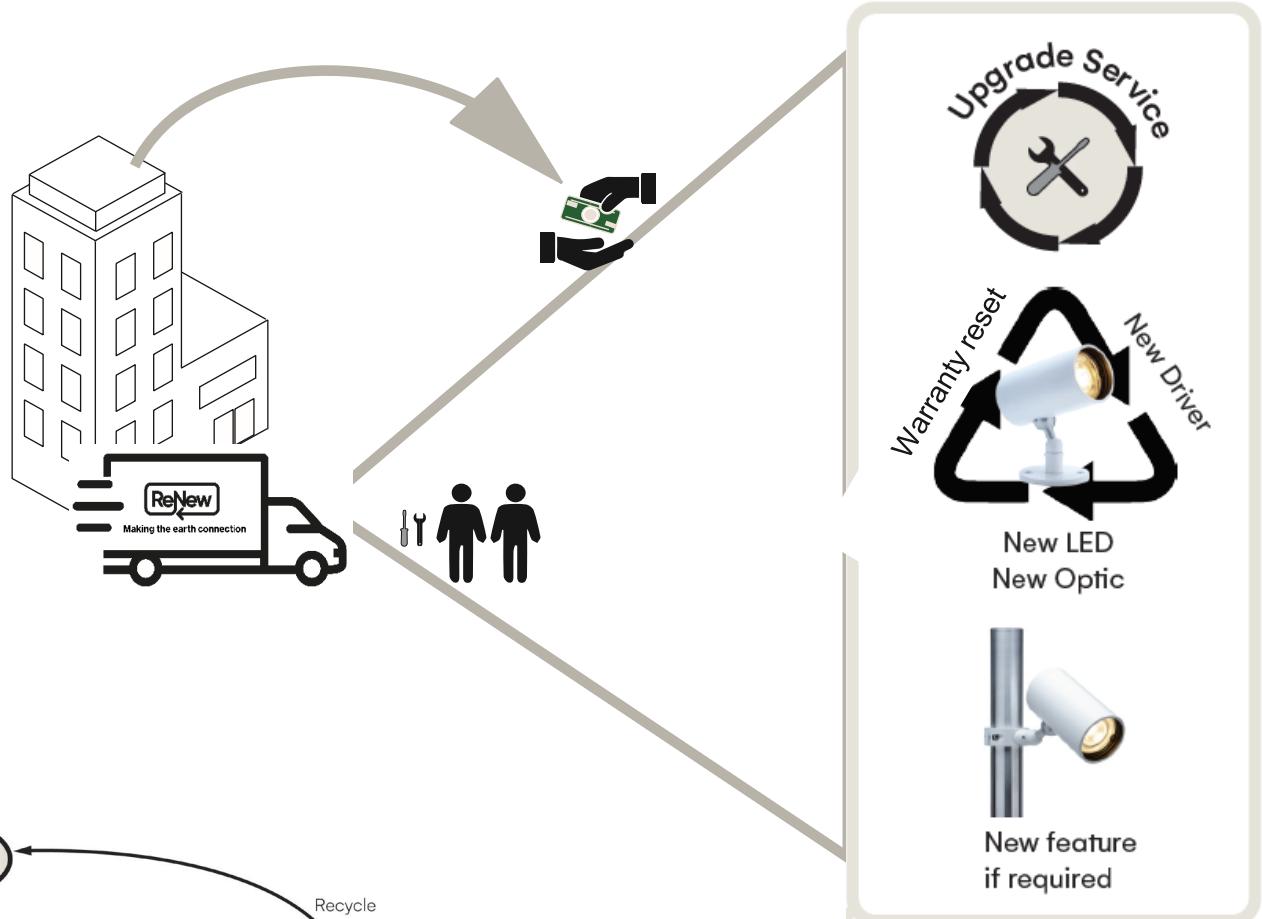
- Reuse packaging
- Recycle packaging
- Eliminate plastic
- Replacement of traditional inks with VOC-free vegetable carrier for the packaging branding.



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EQUIPMENT DESIGN + MANUFACTURE

Making Repairs and Remanufactures Happen: On-site Upgrades



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EQUIPMENT DESIGN + MANUFACTURE

Circular Economy in Action



SL distributor: The Lux Company, The Netherlands
Lighting Design: Henk van der Geest
Photography: Jan Kees Steenman

Van Gogh Museum
Remanufacturing: standard track spots to Bluetooth controlled versions

[Video link.](#)



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