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Project 4789377474.3

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REPORT

on

LIGHT-EMITTING-DIODE SURFACE-MOUNTED LUMINAIRES

NERI SPA
LONGIANO FC, ITALY

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DESCRIPTION

PRODUCT COVERED:	USL, CNL - LED Surface-mounted Luminaire, pole.	
MODELS COVERED /NOMENCLATURE:	Series "Nebula Bollard", models: - Nebula Bollard ST; - Nebula Bollard ST+RGBW; - Nebula Bollard PR; - Nebula Bollard PR+PR; - Nebula Bollard A; - Nebula Bollard PR+A; - Nebula Bollard RGBW; - Nebula Bollard PR+RGBW; - Nebula Bollard ST+ST; - Nebula Bollard A+A; - Nebula Bollard ST+PR; - Nebula Bollard A+RGBW; - Nebula Bollard ST+A; - Nebula Bollard RGBW+RGBW.	
ENVIRONMENTAL RATING:	Suitable for Wet locations	
GENERAL CONSTRUCTION:	This product complies with the applicable Standards for USL and/or CNL luminaires as explained under the "Technical Considerations" section noted below, the UL 1598 FUII (Follow-Up Inspection Instructions), and the Description within this report.	
TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):	USL indicates product complies with the Standard for Luminaires, UL 1598 and the United States country specific requirements contained within the Standard, along with the relevant parts of the UL Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products, UL 8750.	CNL indicates product complies with the Standard for Luminaires, CSA C22.2 No. 250.0 and the Canadian country-specific requirements contained within the Standard, along with the relevant parts of the Canadian Standard for Light Emitting Diode (LED) Equipment for Lighting Applications, CSA C22.2 No. 250.13.
ELECTRICAL RATINGS:	See "Table 1" in the next page	
MARKINGS:	In accordance with the FUII's, the UL 1598 Standard and the following. SUITABLE FOR WET LOCATIONS (Verbatim)	
INSTRUCTIONS:	In accordance with the Standard. Shall also indicate the proper dimming method to regulate the luminous flux during the installation, which shall be demanded to qualified personnel only.	

Table 1
Electrical ratings

Model	Max ratings	LEDs type
Nebula Bollard ST	19 W, 120-277 Vac, 50/60Hz	8 x E21
Nebula Bollard PR	24 W, 120-277 Vac, 50/60Hz	1 x CMA2550
Nebula Bollard A	17 W, 120-277 Vac, 50/60Hz	12 x XB-D
Nebula Bollard RGBW	15 W, 120-277 Vac, 50/60Hz	3 x XML color
Nebula Bollard ST+ST	38 W, 120-277 Vac, 50/60Hz	8 x E21 + 8 x E21
Nebula Bollard ST+PR	43 W, 120-277 Vac, 50/60Hz	8 x E21 + 1 x CMA2550
Nebula Bollard ST+A	36 W, 120-277 Vac, 50/60Hz	8 x E21 + 12 x XB-D
Nebula Bollard ST+RGBW	34 W, 120-277 Vac, 50/60Hz	8 x E21 + 3 x XML color
Nebula Bollard PR+PR	48 W, 120-277 Vac, 50/60Hz	1 x CMA2550 + 1 x CMA2550
Nebula Bollard PR+A	41 W, 120-277 Vac, 50/60Hz	1 x CMA2550 + 12 x XB-D
Nebula Bollard PR+RGBW	39 W, 120-277 Vac, 50/60Hz	1 x CMA2550 + 3 x XML color
Nebula Bollard A+A	34 W, 120-277 Vac, 50/60Hz	12 x XB-D + 12 x XB-D
Nebula Bollard A+RGBW	32 W, 120-277 Vac, 50/60Hz	12 x XB-D + 3 x XML color
Nebula Bollard RGBW+RGBW	30 W, 120-277 Vac, 50/60Hz	3 x XML color + 3 x XML color

Photo #	CONSTRUCTION FEATURE:	TECHNICAL DATA and/or DESCRIPTION
1, 4	Floor fixing means	The general design, shape and arrangement shall be as shown and as described. All dimensions are nominal, within engineering tolerances, except where specifically indicated as a minimum or a maximum. Made of galvanized steel, shaped as shown in Ill.1, intended to be fixed to the floor by screws.
1, 5	Support pole	Made of aluminum, composed by two parts: First part, shaped as shown in Ill.2, intended as fixing, supporting means and enclosure of electrical connections. Second part, shaped as shown in Ill.3, intended as First part's Top cover and mounting means for Luminaire Body's Bracket(s), fixed to the First part by screws with the Gasket interposed. The Support pole is intended to be mounted on the Floor fixing means and fixed to it by screws.
5, 6	Silicon Gasket	Made of silicon rubber, shaped as shown in Ill.4, located between First and Second part of Support pole and between First and Second part of Luminaire body.
1, 2, 3, 6	Luminaire Body	Made of aluminum, composed by three main parts: First part: Back cover, shaped as shown in Ill.3, intended to be fixed to the Luminaire Body's bracket and fixed to the Second part by screws; Second part: tube, shaped as shown in Ill.5, intended as enclosure and luminaire body's main part. Third part: Top termination, shaped as shown in Ill.6, intended as luminaire body's closure and screen/diffuser support; screwed to the Second part. Alternate Third part: Top termination, shaped as shown in Ill.10, intended as luminaire body's closure and screen/diffuser support; screwed to the Second part, intended as supporting means for additional aesthetic parts.
	Diffuser	Tempered flat glass, Shaped as shown in Ill.7, approx. 4 mm thick. Located between the Second and the Third part of Luminaire Body with the addition of a Silicon O-ring.
8	Bracket	Made of metal, composed by two parts: First part, shaped as shown in Ill.8, fixed by screws to the second part of Support pole and jointed by screws to the Second part; Second part, shaped as shown in Ill.9, fixed by screws to the First part (Back cover) of Luminaire body.
7	Component Mounting Plate	Galvanized steel, minimum 1 mm thick., shaped as shown in Ill.11. Fixed to Support pole's Top cover by screws, intended as fixing plate for components. Alternate for models with double Luminaire body: Same as above except shaped as shown in Ill.12.

	CONSTRUCTION FEATURE:	TECHNICAL DATA and/or DESCRIPITON (CONT'D)
6	LED array Mounting Plate	Galvanized steel, minimum 1 mm thick., four different dimensions, based on the LED array used, shaped as shown in Ills.13, 14, 15 and 16. Fixed to Back cover of Luminaire body by screws, intended as fixing plate for LED array.
1, 2, 3	Aesthetic cover (optional)	Any shape and material, fixed by screws or snap fitted to the Support pole's Top cover and/or to the Back cover of Luminaire body. See Ills. 17 and 18 for an example of shape.
	Grounding/Bonding	In accordance with the Standard.
	Labels	PGDQ2/CN or PGJI2/CN suitable for surface, environment.

Photo #	COMPONENTS	TECHNICAL DATA and/or DESCRIPTION
	Supply connector (optionally provided)	Components described as R/C (by CCN identifier) or Listed must be UL Certified for the USA. Unless otherwise specified, components described as /CN must be UL Certified for Canada or CSA Certified.
	Supply Cord	Listed (CYJV/CN) E355693, manufactured by TECHNOSRL, model THB.387.A5A.L + THB.387.B5A.L, rated 10A, 400V, located on the external extremity of Supply Cord.
	DMX signal cable (optional)	Any Listed (ZJCZ/CN), type SJTW, min 3 or 4 or 5x18AWG, rated min 300 V, 60°C. Alternate for LED driver with SF wired control isolated: Any for DMX signal
	Strain Relief	Liquid tight Cord grip - Listed (QCRV/CN), by BIMED TEKNIK ALETTER SAN TIC A S (E199260), model BS-15. Trade size PG13.5. One or two provided. Alternate: Liquid tight Cord grip - Listed (QCRV/CN), by U I LAPP GMBH (E79903). Model ST-pg13.5. Alternate for DMX signal and/or secondary circuit: Same as above except: Model ST-pg7
	Internal Wiring (Primary circuit)	Any Listed (ZJCZ/CN) cord type min. SPT-2 or R/C (AVLV2/CN), rated min. 18 AWG, 300 V, 90°C.
	Internal Wiring (Secondary circuit)	Any located in a Class 2 circuit rated min. 24 AWG, 60V, 105°C, located between LED driver output and LED source.
	Terminal Block (for internal connection in primary circuit)	R/C (XCFR2/CN) manufactured by Wago Kontakttechnik GmbH, (E45172) model 261 or 264, rated 300V, 15A, and min. 60°C; snap fitted into Component mounting plate and secured to main body by screws. Alternate: R/C (XCFR2/CN), manufactured by ADELS-CONTACT ELEKTROTECHNISCHE FABRIK GMBH & CO. KG (E63492), model LK 980-01, rated 600 V, 15 A, 105°C Alternate: any Listed (ZMVV/CN), rated min 300V, 10 A, min. 90°C

	COMPONENTS	TECHNICAL DATA and/or DESCRIPTION (CONT'D)
	Terminals (secondary circuit)	Any located in a Class 2 circuit, rated min 60V, 2 A, min. 90°C
	Surge Protector (Optionally provided)	R/C (VZCA2/CN), manufactured by LITTLEFUSE INC (E320116), model LSP10277P, type 4CA, rated 277 Vac, MCOV 320 Vac, 85°C. Secured to Component mounting plate. Alternate: Same as above except for: model LSP10120P, type 4CA, rated 120 Vac, MCOV 150 Vac, 85°C. Alternate: R/C (VZCA2/CN), manufactured by INVENTRONICS (HANGZHOU) INC (E467129), model PU-20KS10KHT, type 5, rated 277 Vac, MCOV 320 Vac, 85°C.
	LED Driver (for models Nebula Bollard ST, Nebula Bollard PR and Nebula Bollard A)	R/C (FKSZ2/CN) by ENEDO SPA (E330583), model RTLD040-1400A-Dx-xx, Class 2 type, damp, with connectors. Rated Input 120-277 Vac, 50/60 Hz, 0.4 A; Output 20-43 Vdc, constant current 0.2-1.4 A (set at max 700 mA).
	LED Module (for model Nebula Bollard ST)	Located in a Class 2 circuit, composed by a circular PWB metal clad, approx. 88 mm diam., equipped with eight LED chips by NICHIA model NVSLE21AT, with total ratings max 17 W, Vf 24 Vdc, series connected and driven at max 700 mA Alternate: Any located in a Class 2 circuit with same characteristics
	LED Module (for model Nebula Bollard A)	Located in a Class 2 circuit, composed by a circular PWB metal clad, approx. 88 mm diam., equipped with twelve LED chips by CREE INC model XB-D, each rated max 1 A, Vf 2.3 Vdc, series connected and driven at max 500 mA Alternate: Any located in a Class 2 circuit with same characteristics

	COMPONENTS	TECHNICAL DATA and/or DESCRIPITON (CONT'D)
	LED Module (for model Nebula Bollard PR)	<p>R/C (OOQL2/CN) by CREE INC (E349212), model CMA2550, COB, rated max 3300 mA, Vf 34 Vdc, driven at max 600 mA, Located in a Class 2 circuit.</p> <p>Alternate: R/C (OOQL2/CN) by LUMILEDS MALAYSIA SDN BHD (E352519), model L2C5-30801211x19xx, COB, rated max 3300 mA, Vf 34 Vdc, driven at max 600 mA, Located in a Class 2 circuit.</p> <p>Alternate: R/C (OOQL2/CN) by CITIZEN ELECTRONICS CO LTD (E358566), model CLU03J-1210C9, COB, rated max 1800 mA, Vf 36 Vdc, driven at max 600 mA, Located in a Class 2 circuit.</p> <p>Alternate: Any located in a Class 2 circuit with same characteristics</p>
	LED holder (for model Nebula Bollard PR)	<p>R/C (ECBT2/CN) by TYCO ELECTRONICS CORP (E28476), model Z50, rated 300 Vdc, 5 A, 105 °C, located in a Class 2 circuit.</p> <p>Alternate: Any located in a Class 2 circuit rated min 40 Vdc, 1 A, 105 °C.</p>
	LED Driver (for model Nebula Bollard RGBW)	<p>R/C (FKSZ2/CN) by ELDOLED (E333135), model POWERdrive 50S-M4Z0X, Class 2 type, Class P, damp. Rated Input 120-277 Vac, 50/60 Hz, 0.7 A; Output 55 Vdc, constant current 4 channels each 0.15-1.4 Adc (max cumulative current 3.4 A), set at max 350 mA, max output power 50W (1 channel or divided across any channel). SF wired control isolated.</p> <p>Alternate: Any Listed (FKSZ/CN), Class P, with the same input voltage and frequency ratings and connection method as the original driver, and the following characteristics: Input Ratings: 0.7 A max, 50 W max Output Ratings: 0.15-1.4 Adc max (55 Vdc max) CC Output Type: Class 2</p>

	COMPONENTS	TECHNICAL DATA and/or DESCRIPITON (CONT'D)
	LED Module (for model Nebula Bollard RGBW)	<p>Located in a Class 2 circuit, composed by a circular PWB metal clad, approx. 88 mm diam., equipped with three LED chips by CREE INC model XML Color (RGBW), each rated max 1 A, Vf 2.25-3.3 Vdc, each color series connected and driven at max 550 mA</p> <p>Alternate: Located in a Class 2 circuit, composed by a PWB metal clad, approx. 65 mm by 36 mm, equipped with fortyeight LED chips by NICHIA model NCSxE17A (RGBW), each rated max 700 mA, Vf 3.3 Vdc max, four circuit (one for color)of twelve LEDs series connected, each driven with a current so that the total power of the LED module will not exceed 16 W</p> <p>Alternate: Any located in a Class 2 circuit with same characteristics</p>

Photos	
Photo 1 Luminaire overview	
Photo 2 Luminaire overview (model with double Luminaire body)	

Photo 3

Luminaire
overview
(with
aesthetic
covers
removed)

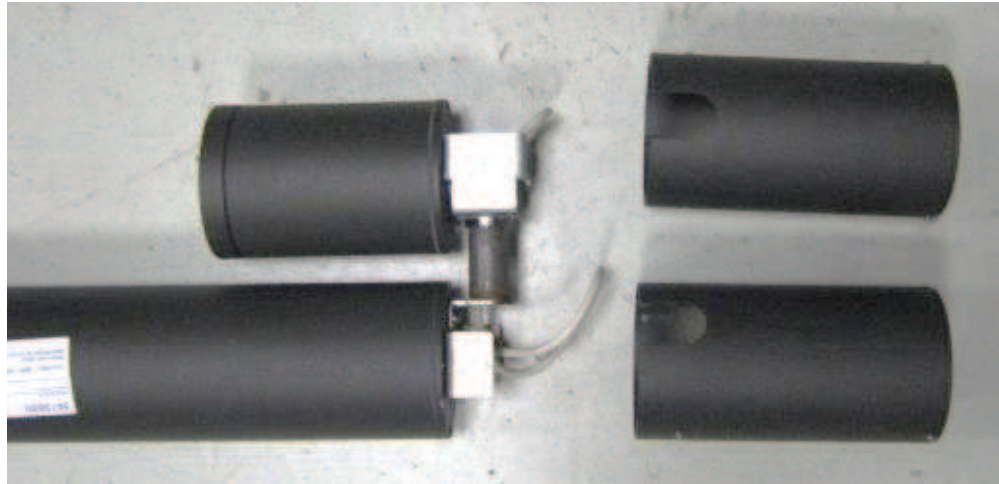


Photo 4

Floor
fixing
means



Photo 5

Support
pole, Top
cover



Photo 6

Luminaire
Body
(dismount
ed)

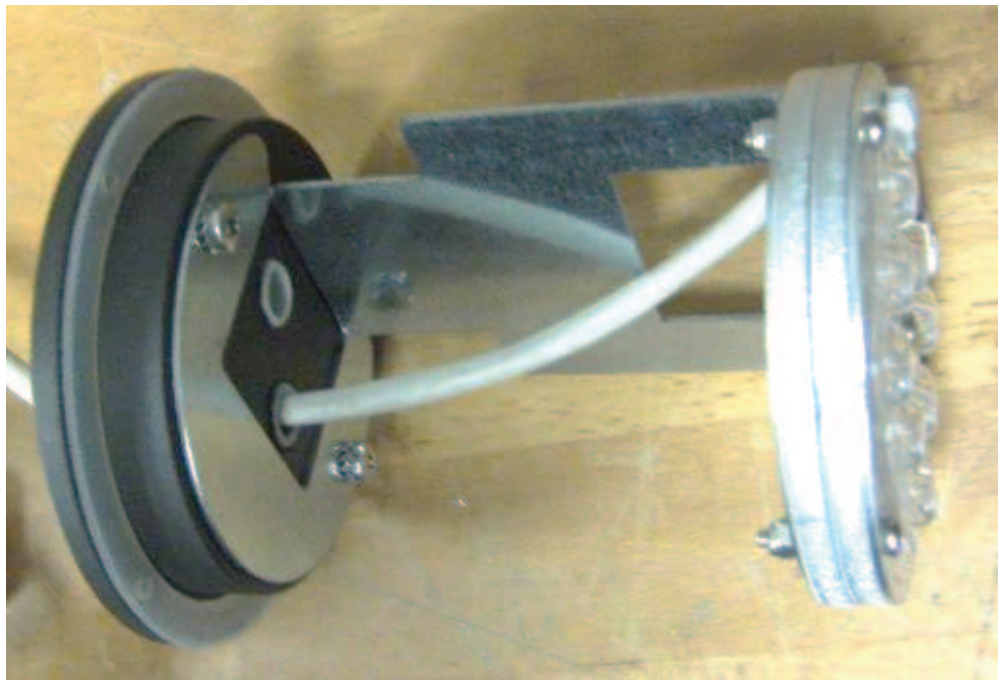


Photo 7

Component
Mounting
Plate

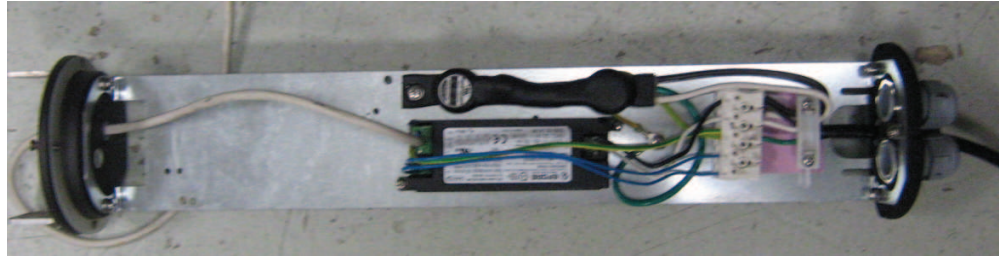
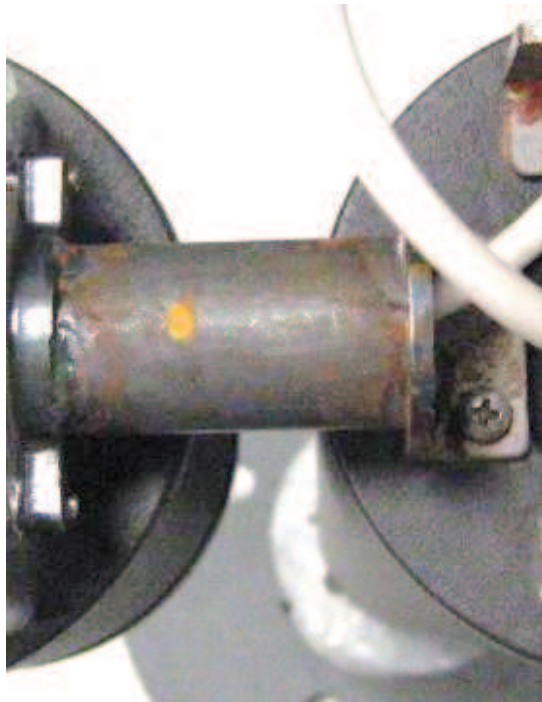


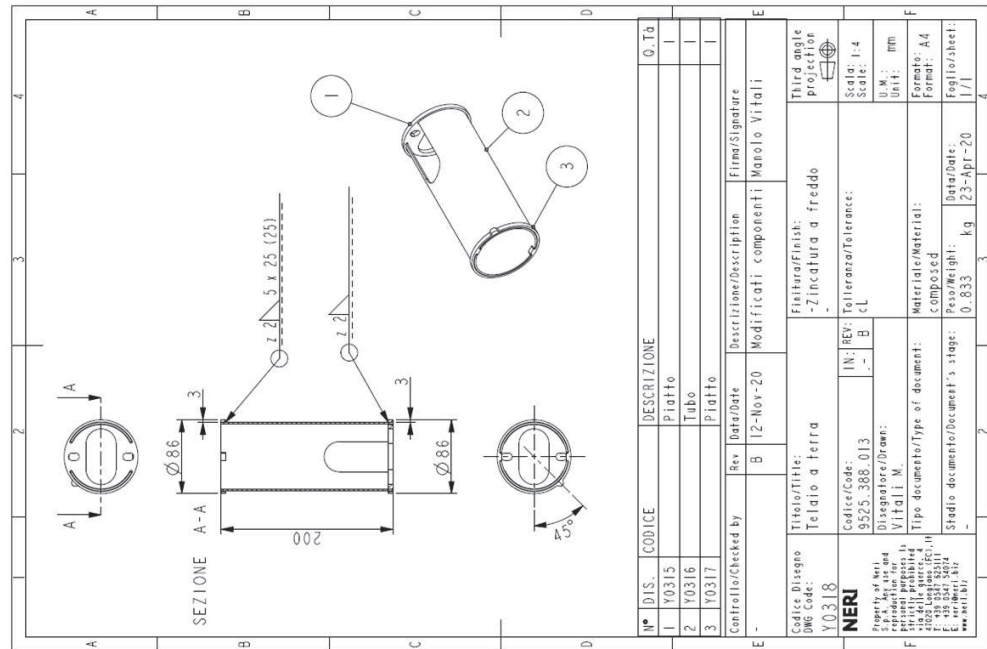
Photo 8

Bracket

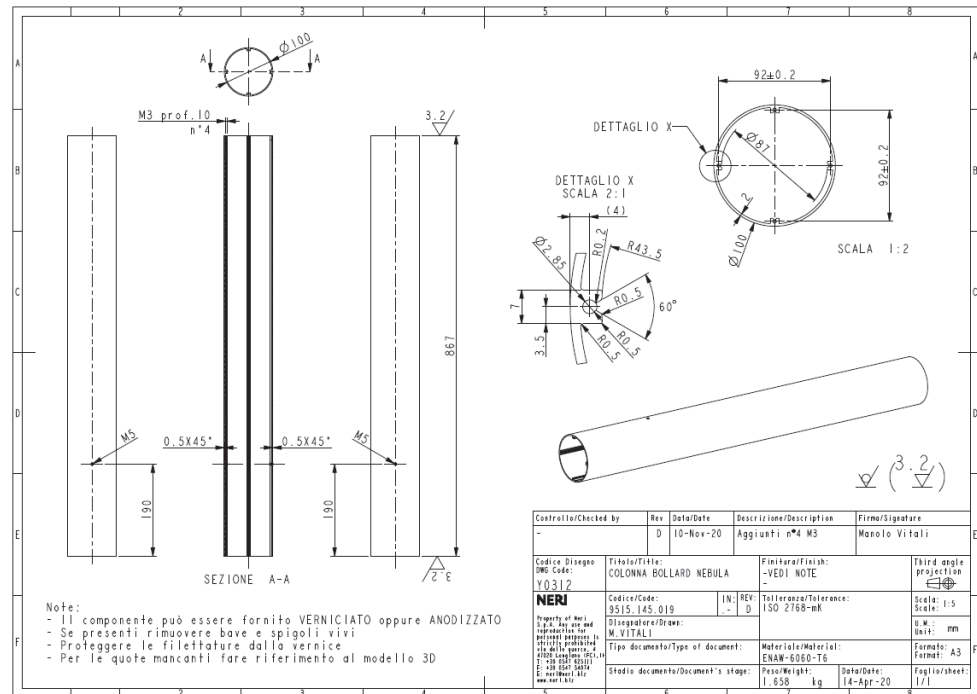


Illustrations

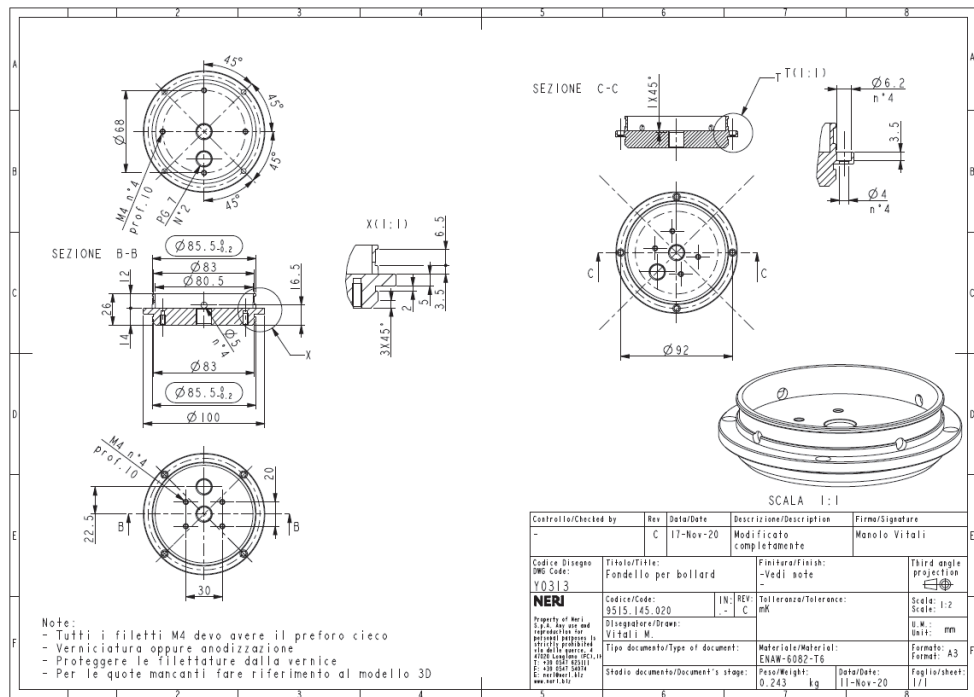
Ill.1



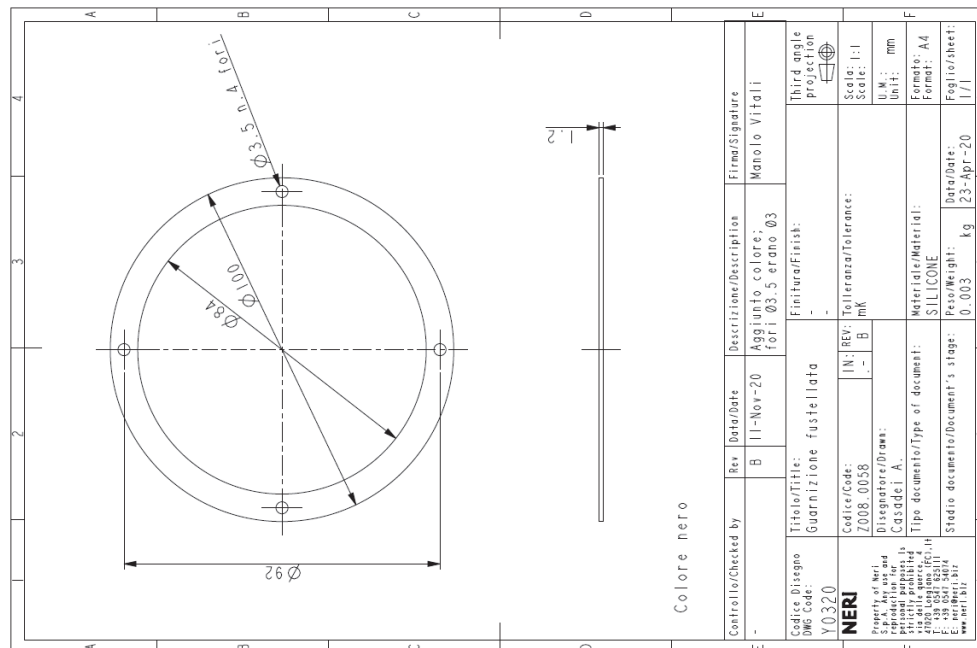
Ill.2



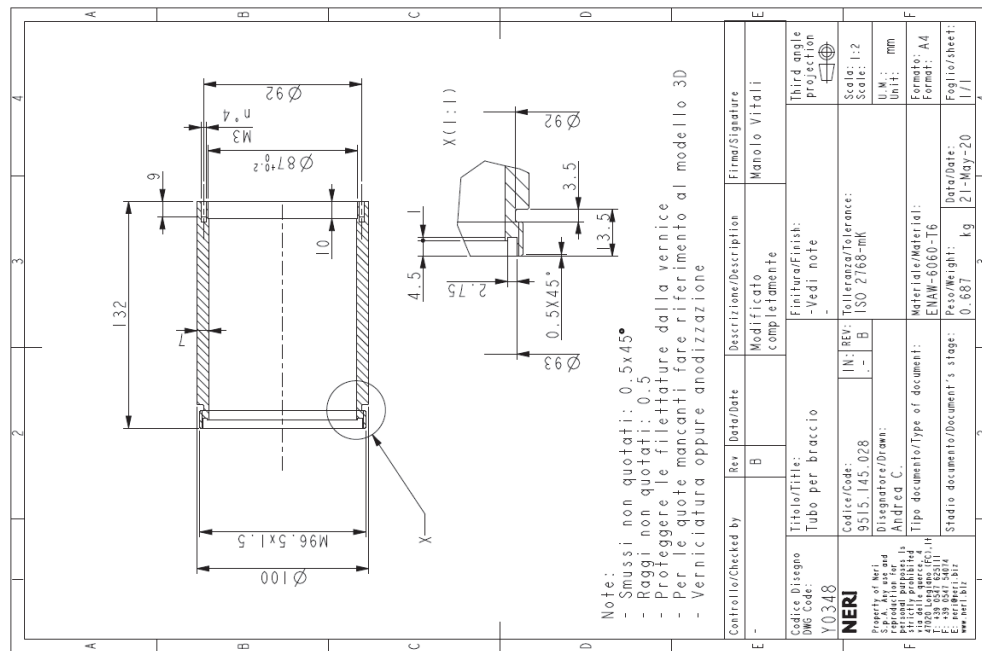
I11.3



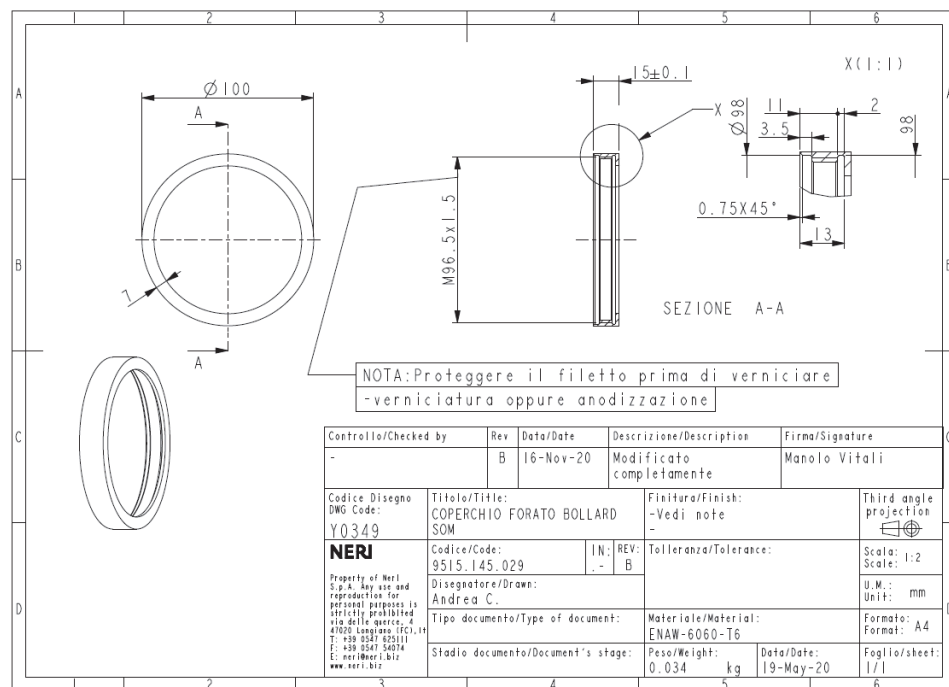
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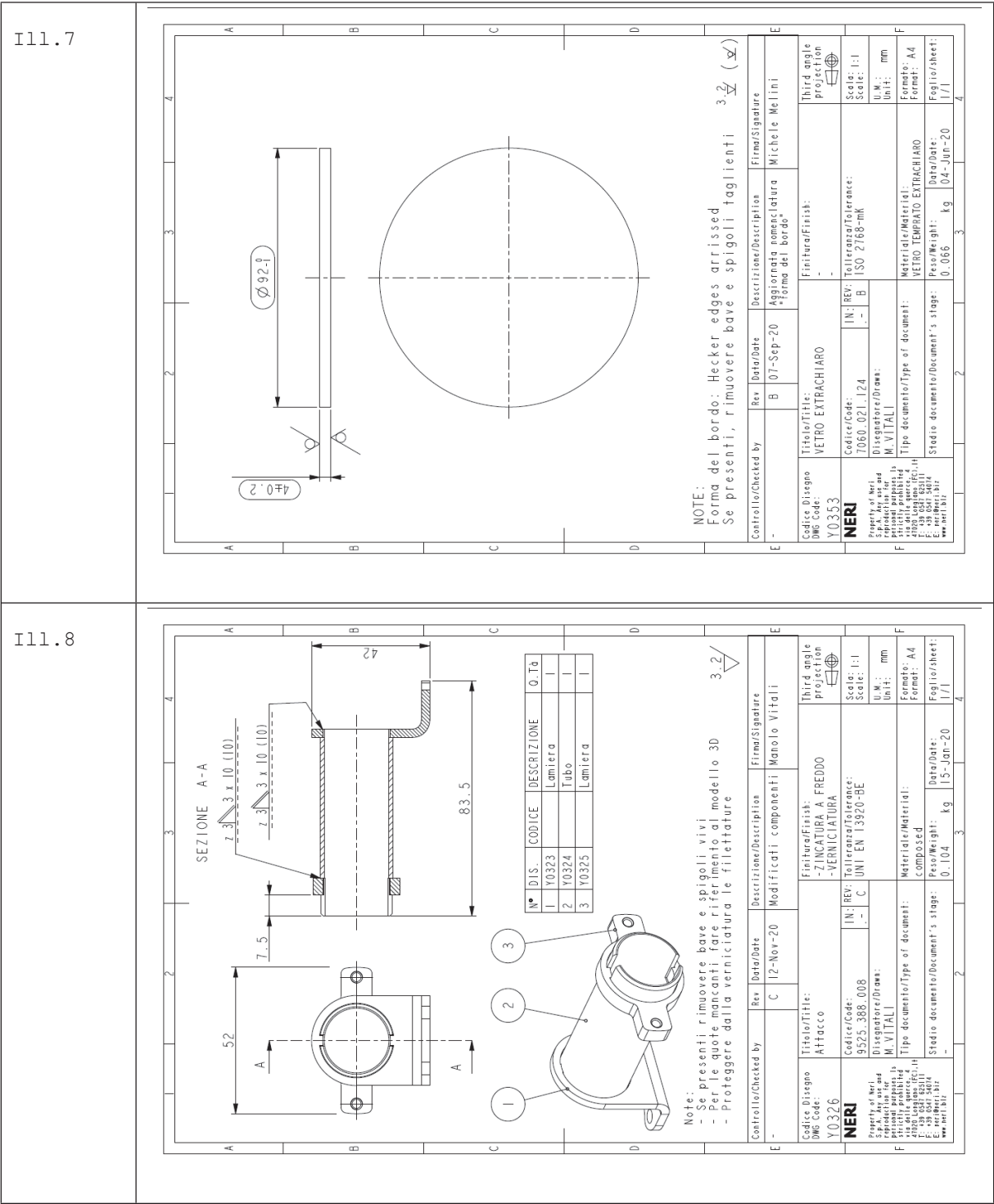


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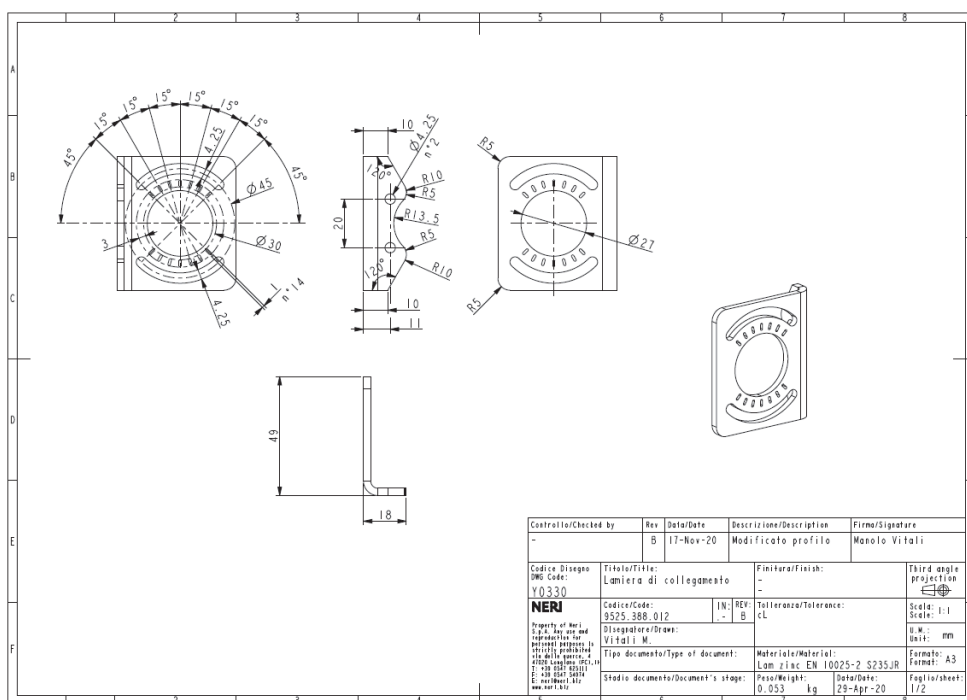


I11.6

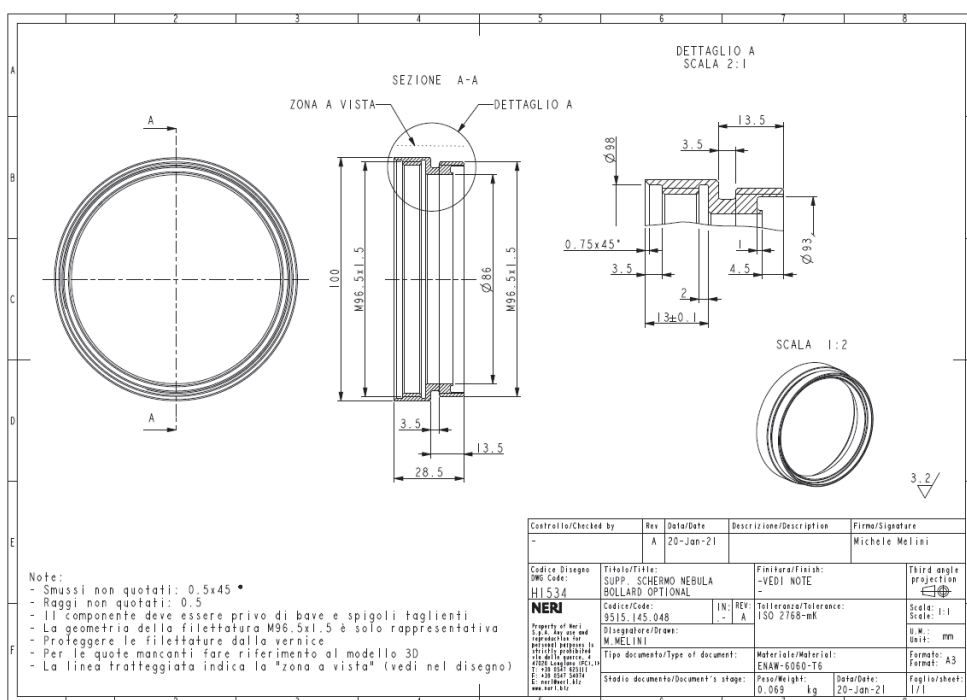




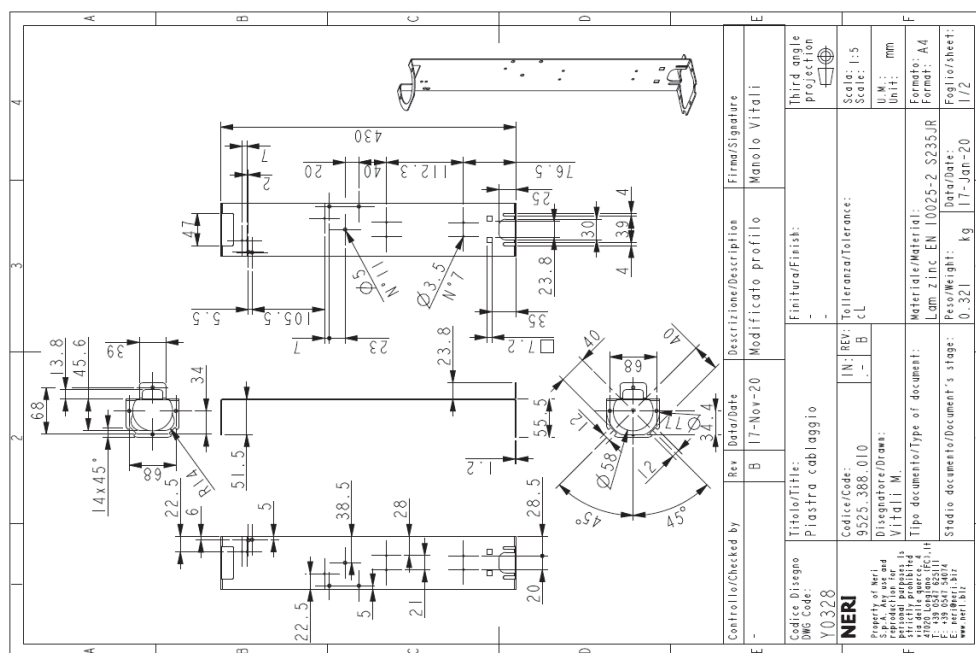
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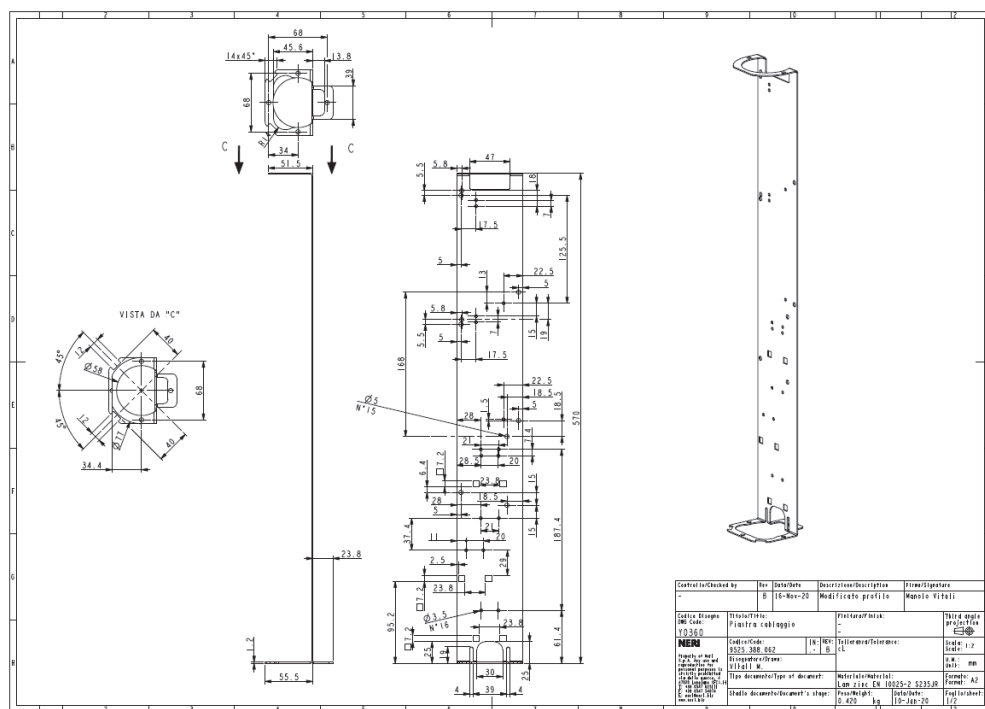
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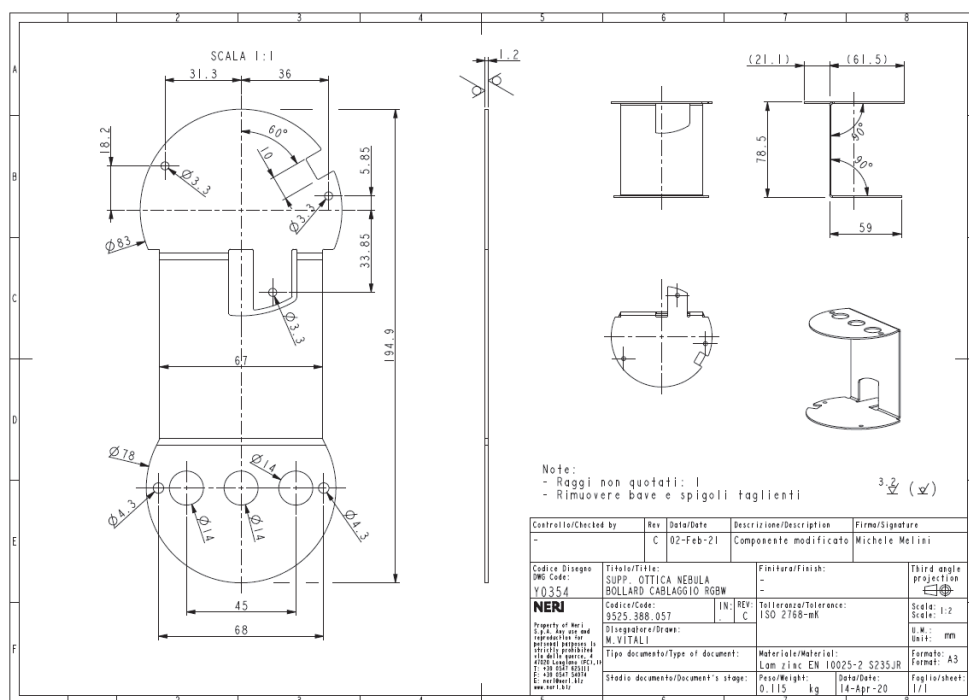
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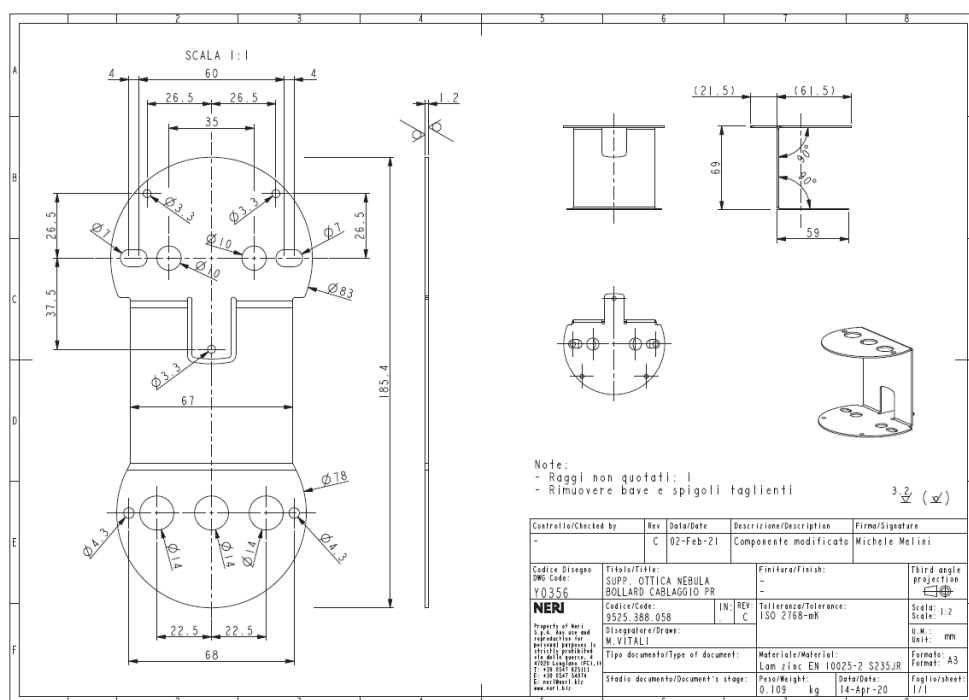
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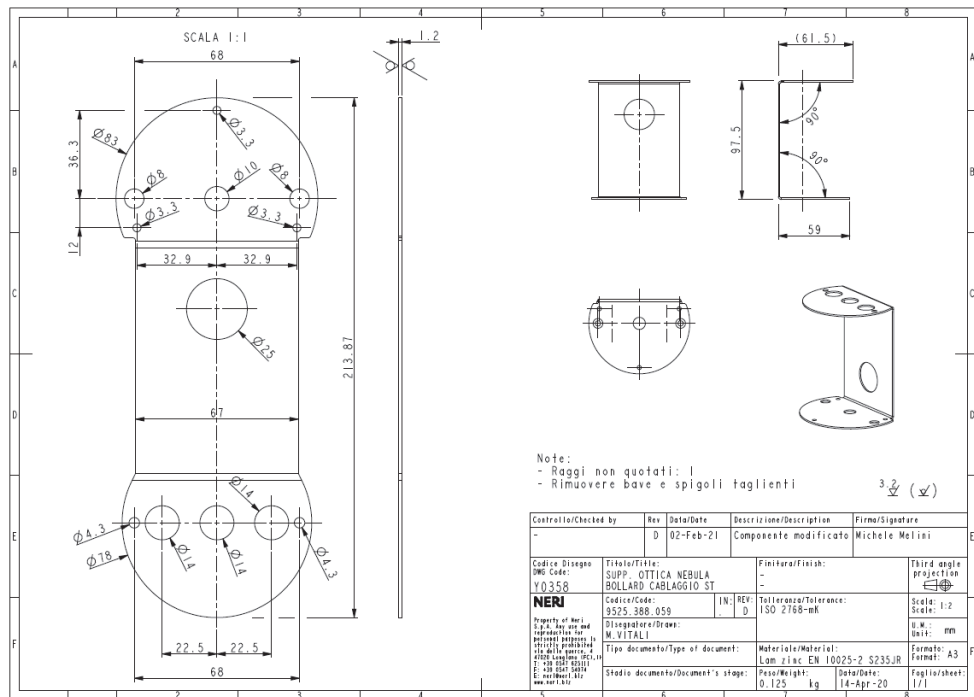
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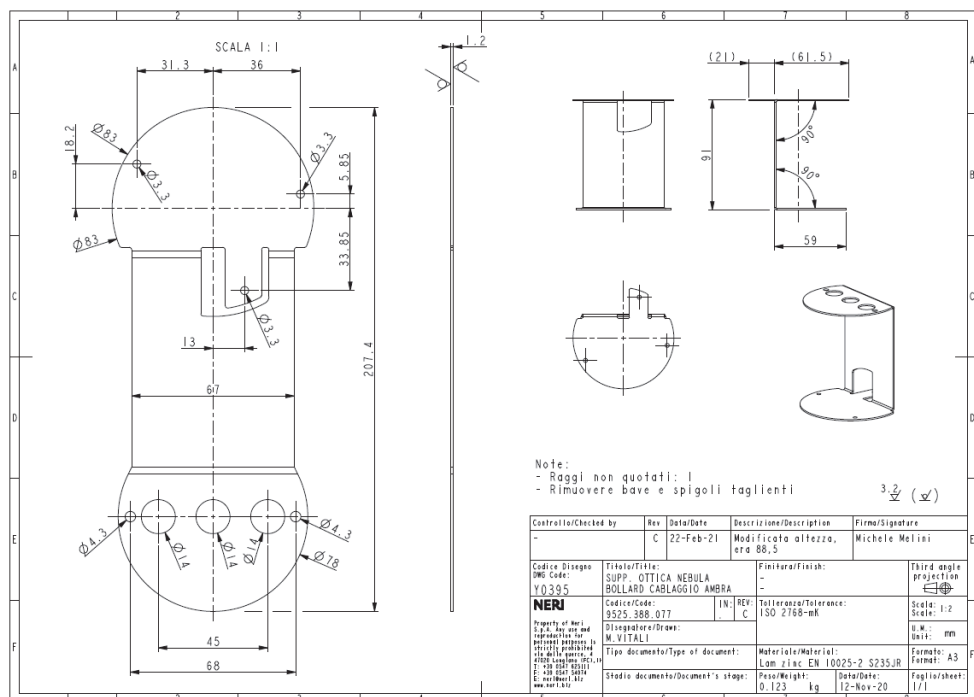
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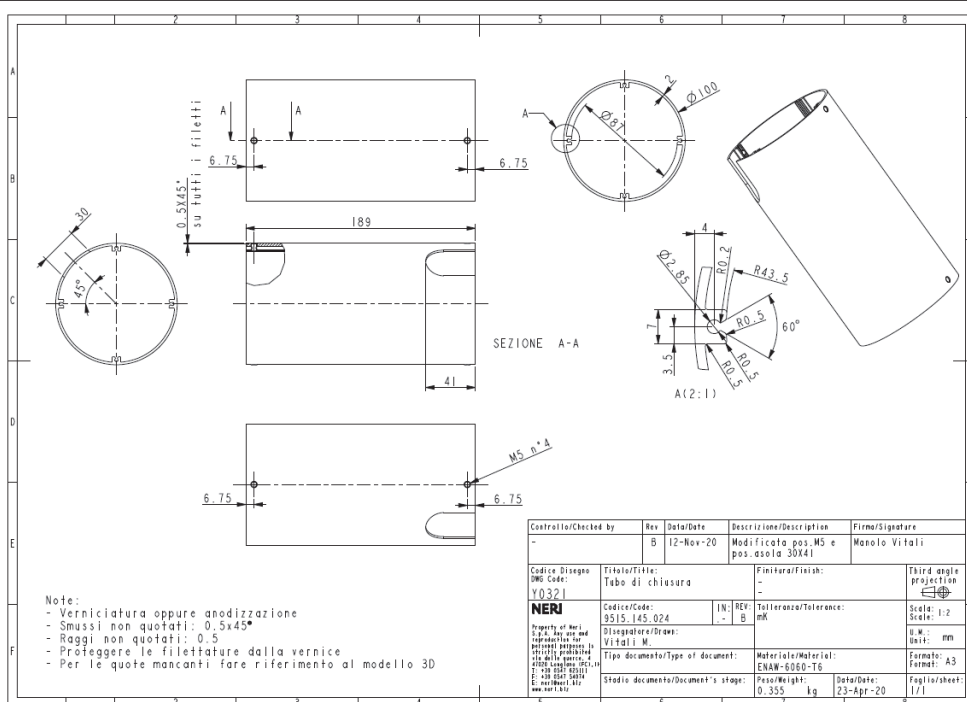
Ill.15



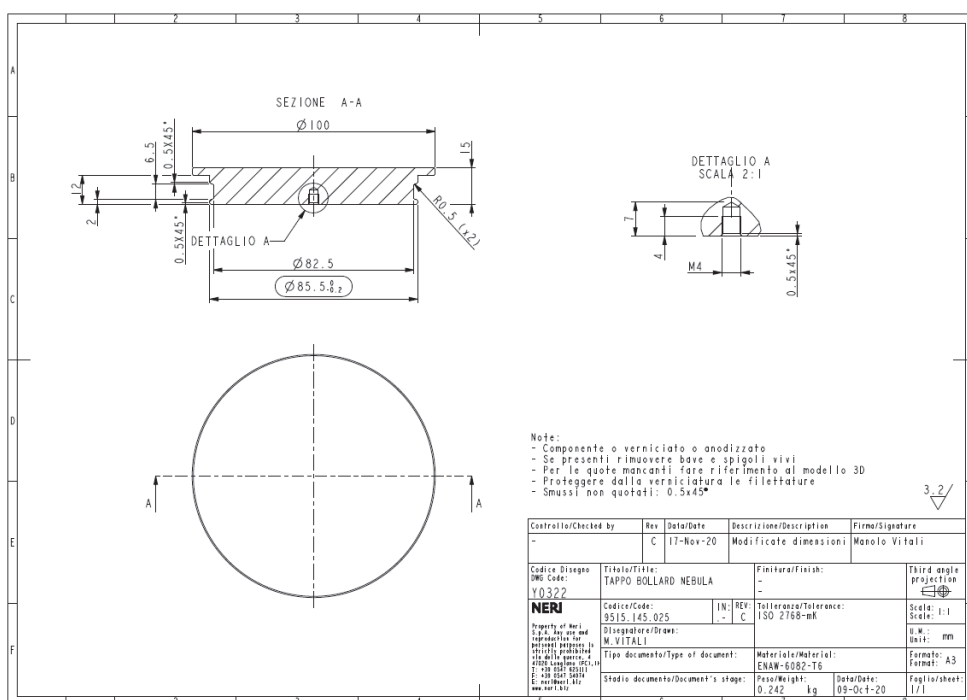
Ill.16



111.17



111.18



TEST RECORD NO. 1

SAMPLES:

Samples of the LED luminaires series "Nebula Bollard" as indicated below and constructed as described herein, were submitted by the manufacturer for examination and test.

Model	Max ratings	LEDs type
Nebula Bollard ST	19 W, 120-277 Vac, 50/60Hz	8 x E21
Nebula Bollard PR	24 W, 120-277 Vac, 50/60Hz	1 x CMA2550
Nebula Bollard A	17 W, 120-277 Vac, 50/60Hz	12 x XB-D
Nebula Bollard RGBW	15 W, 120-277 Vac, 50/60Hz	3 x XML color
Nebula Bollard ST+ST	38 W, 120-277 Vac, 50/60Hz	8 x E21 + 8 x E21
Nebula Bollard ST+PR	43 W, 120-277 Vac, 50/60Hz	8 x E21 + 1 x CMA2550
Nebula Bollard ST+A	36 W, 120-277 Vac, 50/60Hz	8 x E21 + 12 x XB-D
Nebula Bollard ST+RGBW	34 W, 120-277 Vac, 50/60Hz	8 x E21 + 3 x XML color
Nebula Bollard PR+PR	48 W, 120-277 Vac, 50/60Hz	1 x CMA2550 + 1 x CMA2550
Nebula Bollard PR+A	41 W, 120-277 Vac, 50/60Hz	1 x CMA2550 + 12 x XB-D
Nebula Bollard PR+RGBW	39 W, 120-277 Vac, 50/60Hz	1 x CMA2550 + 3 x XML color
Nebula Bollard A+A	34 W, 120-277 Vac, 50/60Hz	12 x XB-D + 12 x XB-D
Nebula Bollard A+RGBW	32 W, 120-277 Vac, 50/60Hz	12 x XB-D + 3 x XML color
Nebula Bollard RGBW+RGBW	30 W, 120-277 Vac, 50/60Hz	3 x XML color + 3 x XML color

[X]The following tests were conducted:			
TEST	STANDARD	CODE (See Below)	CLAUSE
Dielectric Voltage- Withstand	UL 1598	S	18.1
Bonding Circuit Impedance	UL 1598	S	18.2
Led Normal Temperature, Surface, General	UL 1598	S	15, 19
Input Test	UL 8750 CSA 250.13	OS	8.2 9.2
Loading	UL 1598	S	17.15
Rain Test	UL 1598	S	17.5.2
S = Same test. C = Combined test (identified by the test names of two or more similar tests in multiple standards) to represent the worst-case parameters of the similar tests. OS = Testing requirements come from one standard only. MS = One of the two or more standards identified is more severe and the more severe one is indicated by underlining.			
Test results relate only to the items tested.			

Rain Test was performed on model Nebula Bollard ST and considered representative for entire series.
All the models were examined and tested.

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the standard(s) noted below and, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report.

Standard	Title	Edition or Publication Date	Latest Revision Date
UL 1598	Luminaires	4th Edition	2018-08-28
CSA C22.2 NO 250.0	Luminaires	4th Edition	2018-08-28

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

CONCLUSION

Samples of the products covered by this Report have been found to comply with the requirements covering the category and the products are found to comply with UL's applicable requirements. The description and test result in this Report are only applicable to the samples investigated by UL and does not signify UL certification or that the products described are covered under UL's Follow-Up Service Program. When covered under UL's Follow-Up Service Program, the manufacturer is authorized to use the Certification Mark of UL on such products which comply with UL's Follow-Up Service Procedure and any other applicable requirements of UL LLC. The Certification Mark of UL on the product, or the UL symbol on the product and the Certification Mark of UL on the smallest unit container in which the product is packaged, is the only method to identify products investigated by UL to published requirements and manufactured under UL's Listing and Follow-Up Service.

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Report by:

Reviewed by:

Marco Caroli
Senior Engineering Associate
UL International Italia srl

Andrea Panzeri
Staff Engineer
UL International Italia srl

