Listing Constructional Data Report (CDR)

1.0 Reference and Address			
Report Number	3171541CRT-004	Original Issued: 27-Oct-2009	Revised: None
Standard(s)	UL 1638 Visual Signaling Appliance - Private Mode Emergency and General Utility Signaling, 4th Edition, April 11, 2001		

Applicant	Dialight Corporation	Manufacturer	Dialight Corporation
Address	1501 Route 34 South Farmingdale, NJ 08005	Address	Calle S/N, Col. Carlos Pacheco Ensenada, B.C. Mexico 22830
Country	USA	Country	Mexico
Contact	Peter Hagan	Contact	Angel Escamilla
Phone	(732) 751-5845	Phone	52-646-156-7080
FAX	(732) 223-4832	FAX	
Email	phagan@dialight.com	Email	Aescamilla@dailight.com

2.0 Product Description	
Product	Visual Signal Light
Brand name	Dialight
Description	The product covered by this report is an LED visual signal light.
Models	FLS2W09001, FLS2B09001, FLS2R09001, FLS2Y09001, FLS2G09001
Model Similarity	The model with a "W" uses a white light, the model with a "B" uses a blue light, the sample with a "R" uses a red light, the sample with a "Y" uses a yellow light, and the sample with a "G" uses a green light. Lenses are colored to match LED color
Ratings	10-48VDC
Other Ratings	NA

3.0 Product Photographs

Photo 1 - External view of model FLS2B09001

Photo 2 - internal view

4.0 Critical Components						
Photo #	Item no.[1]	Name	Manufacturer/ trademark[2]	Type / model[2]	Technical data and securement means	Mark(s) of conformity[3]
1	1	Enclosure	Dialight	1200-860-0002-00	Cast Aluminum Alloy with the largest outside diameter being 5.5" near the top of the enclosure and 4.55" diameter at the bottom. Refer to illustration 2	NR
1	2	Globe	Kopp Glass Inc	860-400x	Glass lens that comes in five colors; red, green, blue, white, yellow. The lens has a height of 7.2" and is 5.5" wide at its base. Refer to illustration 4	NR
1	3	Single wire housing	Dialight	860-1000	Provides the light a means of mounting. Internals have been smoothed out to protect the wires from being cut or torn.	NR
1	4	Shield	Dialight	various	Stainless steel cage has been made to protect the lamp from impacts. Refer to illustration 3	NR
2	5	LED	Luxeon Emitter, Lambertain	4500-521-9927-20	Rated 60V, 4A	NR
2	6	Potting	P.D. George Company	U510S	Urethane is enclosed in the luminaire,190 psi tensile strength, 500 volts/mil dielectric strength, 100% elongation	NR
2	7	Locking Ring	CLAMPCO	V01352DBN-562-S4	Stainless steel ring clamp, secures the lens to the main enclosure, I.D. 5.6" , Height 0.875"	NR
1	8	Lead Wires	Various	TEW, AWM	16 AWG, 19 stranded copper conductor rated for 600V, 105˚C	UL
2	9	PCB (not shown)	Arnold's Electronics	1500-860-0007-00	FR-4, 0.062" thick, double sided with 1 oz of copper on each side, flame rating V-0	UR
			Saehan Electronics America	1500-860-0007-00	FR-4, 0.062" thick, double sided with 1 oz of copper on each side, flame rating V-0	UR
2	10	LED PCB	The Berquist Company	Metal Core Printed Circuit Board	Aluminum type: 5052/6061, Thermal conductivity of 1.0-1.8 W/mK, Flame rating V-0	UR
			Saehan Electronics America	Metal Core Printed Circuit Board	Aluminum type: 5052/6061, Thermal conductivity of 1.0-1.8 W/mK, Flame rating V-0	UL
2	11	Gasket	AMP Custom Rubber INC.	50E213.	Compound 50E213, 40% neoprene, temperature range of -30 to 200 ˚F, 0.07" thick, 4.5" I.D., 5" O.D.	NR
2	12	Capacitor	Panasonic	ECQE2475	Rated for 250VAC, metalized polyester film	cURus
2	13	Resistor	H.E.I.	ALSR-5	Silicon based resistor rated for 5W, Leads are dipped in hot tin, Standard Tolerance of 5% for 1 ohm and greater	cURus
1	14	Grounding	Various	TEW, AWM	16 AWG, 19 stranded copper, 600	UL

4.0 Critical Components

Photo #	Item no.[1]	Name	Manufacturer/ trademark[2]	Type / model[2]	Technical data and securement means	Mark(s) of conformity[3]
1	15	Label	Various	Various	1"x 2" metal polyester label with lettering .08" in size	NR

NOTES:

1) Not all item numbers are indicated (called out) in the photos, as their location is obvious.

2) “Various“ means any type, from any manufacturer that complies with the "Technical data and securement means" and meets the "Mark(s) of conformity" can be used.

3) Indicates specific marks to be verified, which assures the agreed level of surveillance for the component. "NR" - indicates Unlisted and

5.0 Critical Unlisted CEC Components

No Unlisted CEC components are used in this report.

6.0 Critical Features

Recognized Component - A component part, which has been previously evaluated by an accredited certification body with restrictions and must be evaluated as part of the basic product considering the restrictions as specified by the Conditions of Acceptability.

Listed Component - A component part, which has been previously Listed or Certified by an accredited Certification Organization with no restrictions and is used in the intended application within its ratings.

Unlisted Component - A part that has not been previously evaluated to the appropriate designated component standard. It may also be a Listed or Recognized component that is being used outside of its evaluated Listing or component recognition.

Critical Features/Components - An essential part, material, subassembly, system, software, or accessory of a product that has a direct bearing on the product's conformance to applicable requirements of the product standard.

Construction Details - For specific construction details, reference should be made to the photographs and descriptions. All dimensions are approximate unless specified as exact or within a tolerance. In addition to the specific construction details described in this Report, the following general requirements also apply.

1. Spacing - In primary circuits, 1.6 mm minimum spacing are maintained through uninsulated live parts of different potential and 1.6 mm minimum through uninsulated live parts and non-current-carrying metal parts
2. Mechanical Assembly - Components such as switches, fuse holders, connectors, wiring terminals and display lamps are mounted and prevented from shifting or rotating by the use of lock washers, star washers, or other mounting format that prevents turning of the component.
3. Corrosion Protection - All ferrous metal parts are protected against corrosion by painting, plating or the equivalent.
4. Accessibility of Live Parts - All uninsulated live parts in primary circuitry are housed within a metal enclosure constructed with no openings other than those specifically described in Sections 4 and 5.
5. Grounding - All exposed dead-metal parts and all dead-metal parts within the enclosure that are exposed are connected to the equipment grounding terminal. Grounding wire is green and attached to the enclosure with a green grounding screw.
6. Internal Wiring - Internal wiring is routed away from sharp or moving parts. Internal wiring leads terminating in soldered connections are made mechanically secure prior to soldering. Recognized Component separable (quick disconnect) connectors of the positive detent type, closed loop connectors, or other types specifically described in the text of this report are also acceptable as internal wiring terminals. At points where internal wiring passes through metal walls or partitions, the wiring insulation is protected against abrasion or damage by plastic bushings or grommets. All wiring is minimum 14 AWG, with a minimum rating of 600V, 105℃.
7. Markings - The product is marked on as labeling system as described in item no. 15 of Section 4.0; as follows: refer to illustration 1.
8. Cautionary Markings - "WARNING" "Not To Be Used As A Visual Public Mode Alarm Notification Appliance"
9. Installation, Operating and Safety Instructions - Instructions for installation and use of this product are provided by the manufacturer.

7.0 Illustrations

Illustration 1 - Label *Inspector is to verify the context and the dimensions of the label*

Manufacturer	Address and phone	<- 0.062 inches minimum
Product Name	Type:	<- Model number, 0.062 inches minimum
Part No:xxx-xxx	Flash:	
Serial No: xxxxxxxxx		
Voltage:		
Suitable for		
Suitable for		
TEMP CODE:		

Amps:
Duty Cycle:

"WARNING" "NOT TO BE USED AS A VISUAL PUBLIC MODE ALARM NOTIFICATION APPLIANCE"

"WARNING" text height is no less then 7/64 of an inch
The following statement text height shall be no less then 3/32 of an inch.

Illustration 2 Part 1 - Base *Verify inside and outside diameters of both the upper and lower portions of the enclosure.*

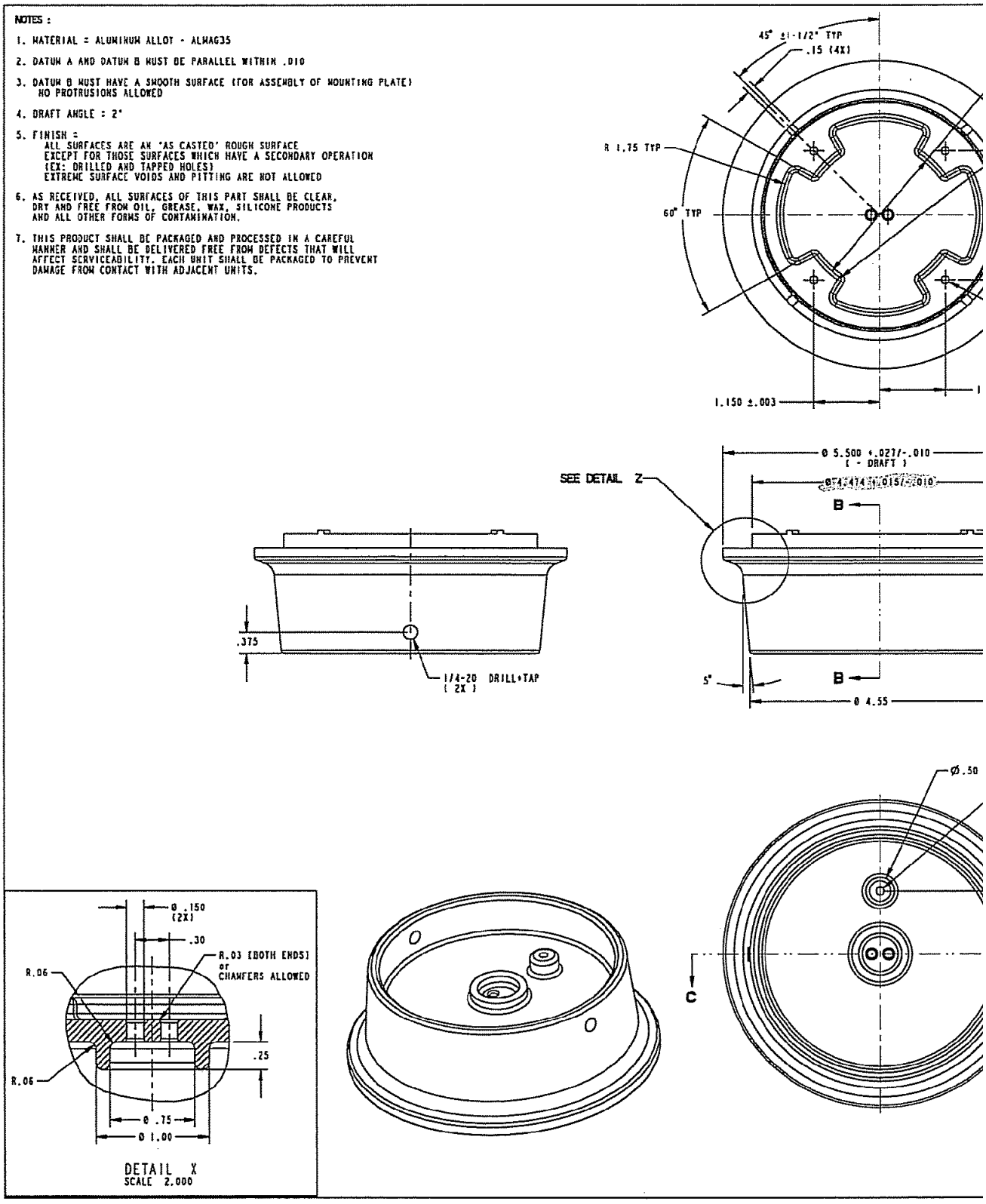


Illustration 2 Part 2 - Base

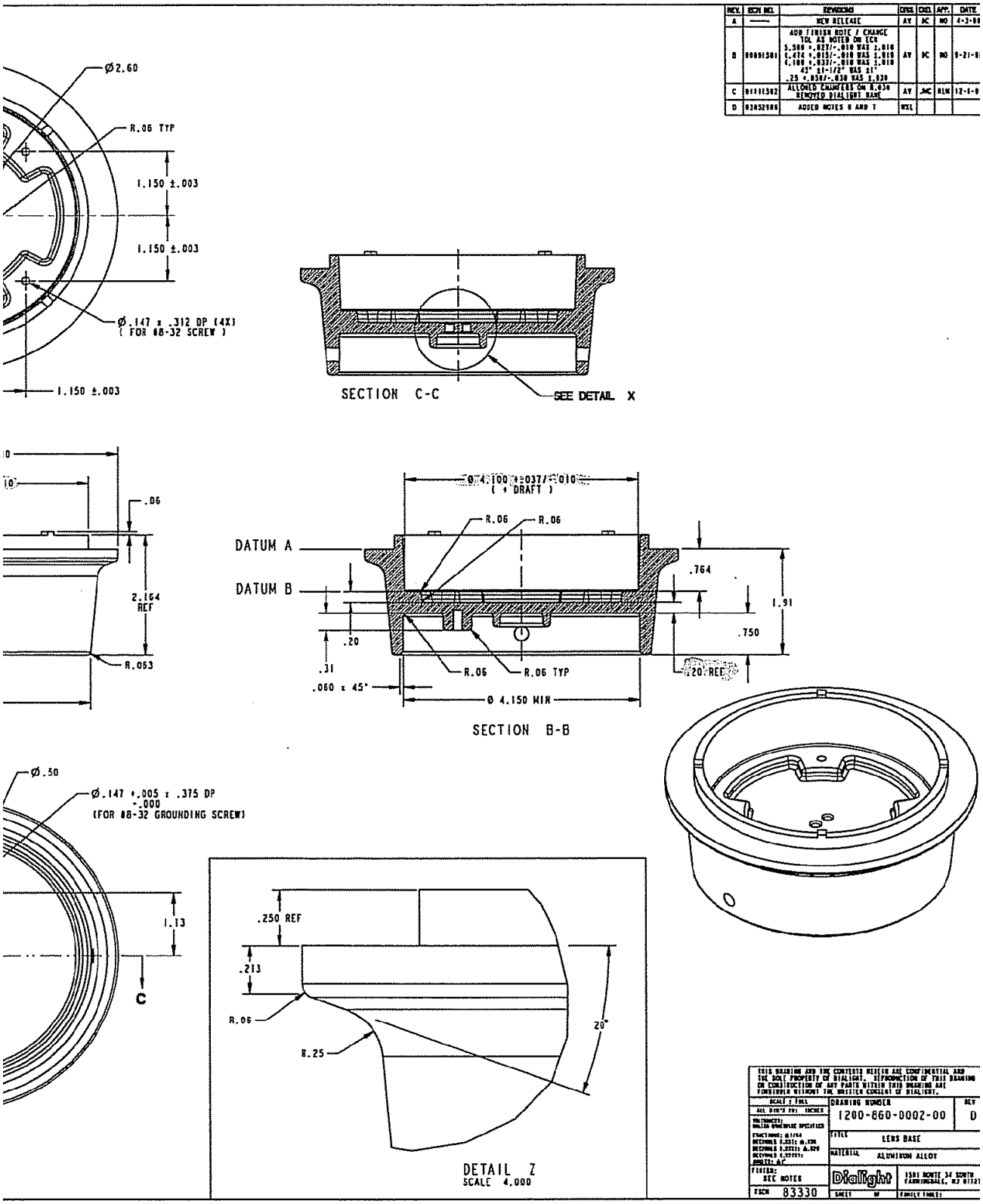


Illustration 3 Part 1 - Shield

Verify material used is stainless steel and the construction of the component is the same.

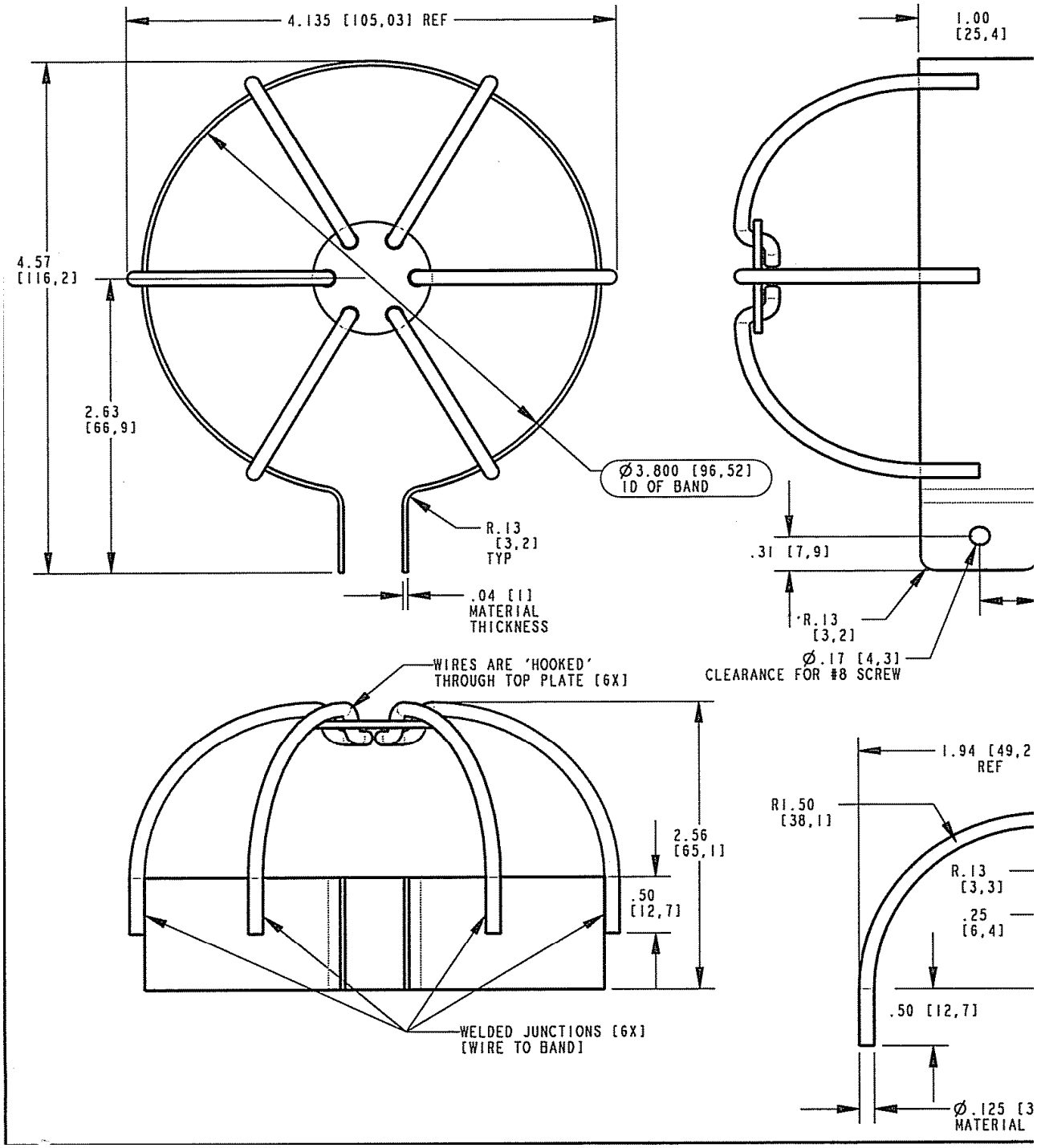


Illustration 3 Part 2 - Shield

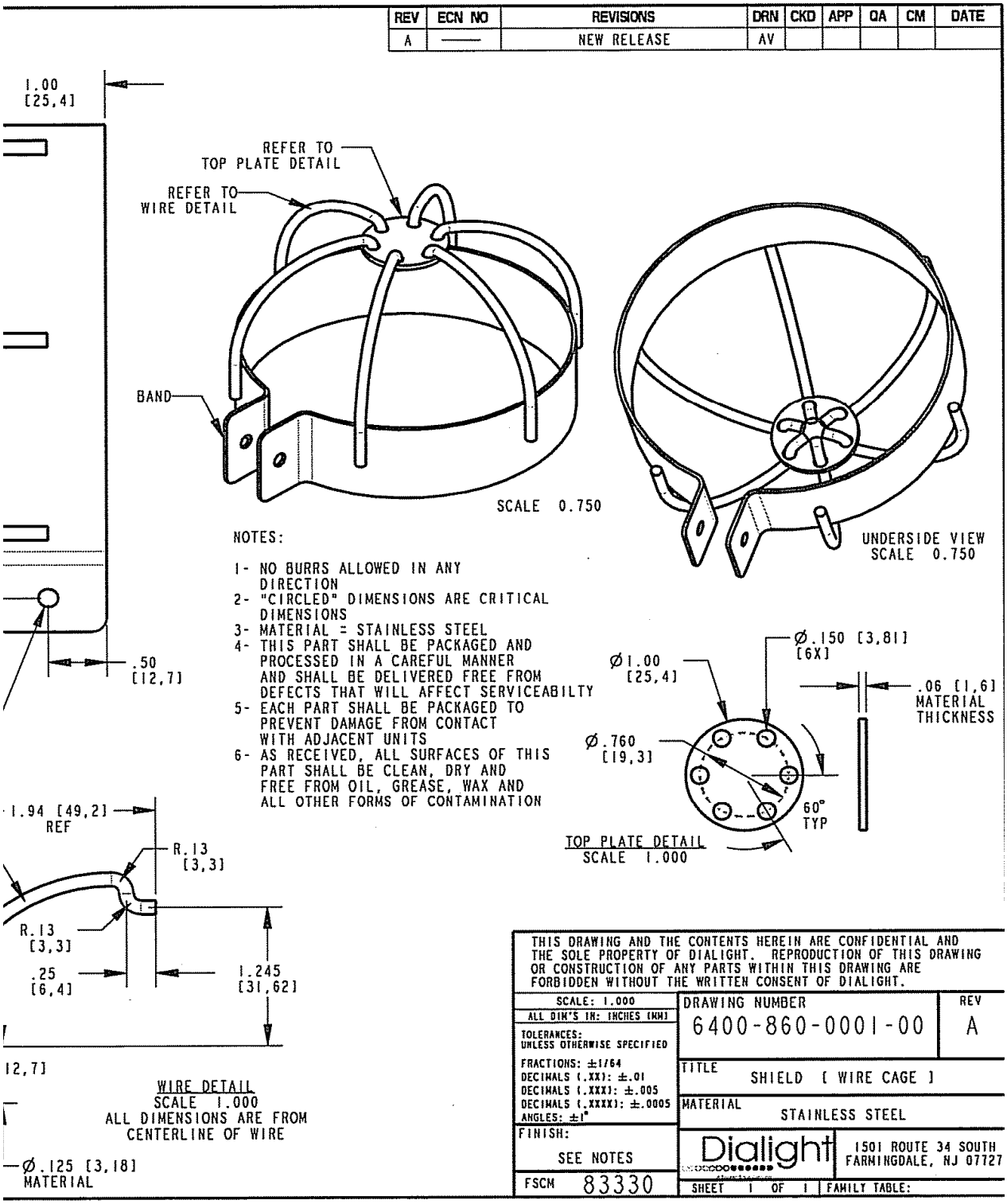


Illustration 4 Part 1 - Lens

Verify that the inside and outside diameters are the same for both the lower and upper portions of the light. Also verify that the height of the lens has not changed.

PART NUMBER	GLASS COLOR	COLOR NUMBER	REV.	ECN NO.	DRN.	DATE
1700-860-0091-00	RED	8159	H	010927D1	AY	1-9-01
1700-860-0091-01	CLEAR	9000	B	030711D3	RAF	3-18-03
1700-860-0091-02	GREEN	4288	A	----------	TT	7/11/03
1700-860-0091-03	YELLOW	5550	A	----------	TT	7/11/03
1700-860-0091-04	BLUE	2454	A	----------	TT	7/11/03

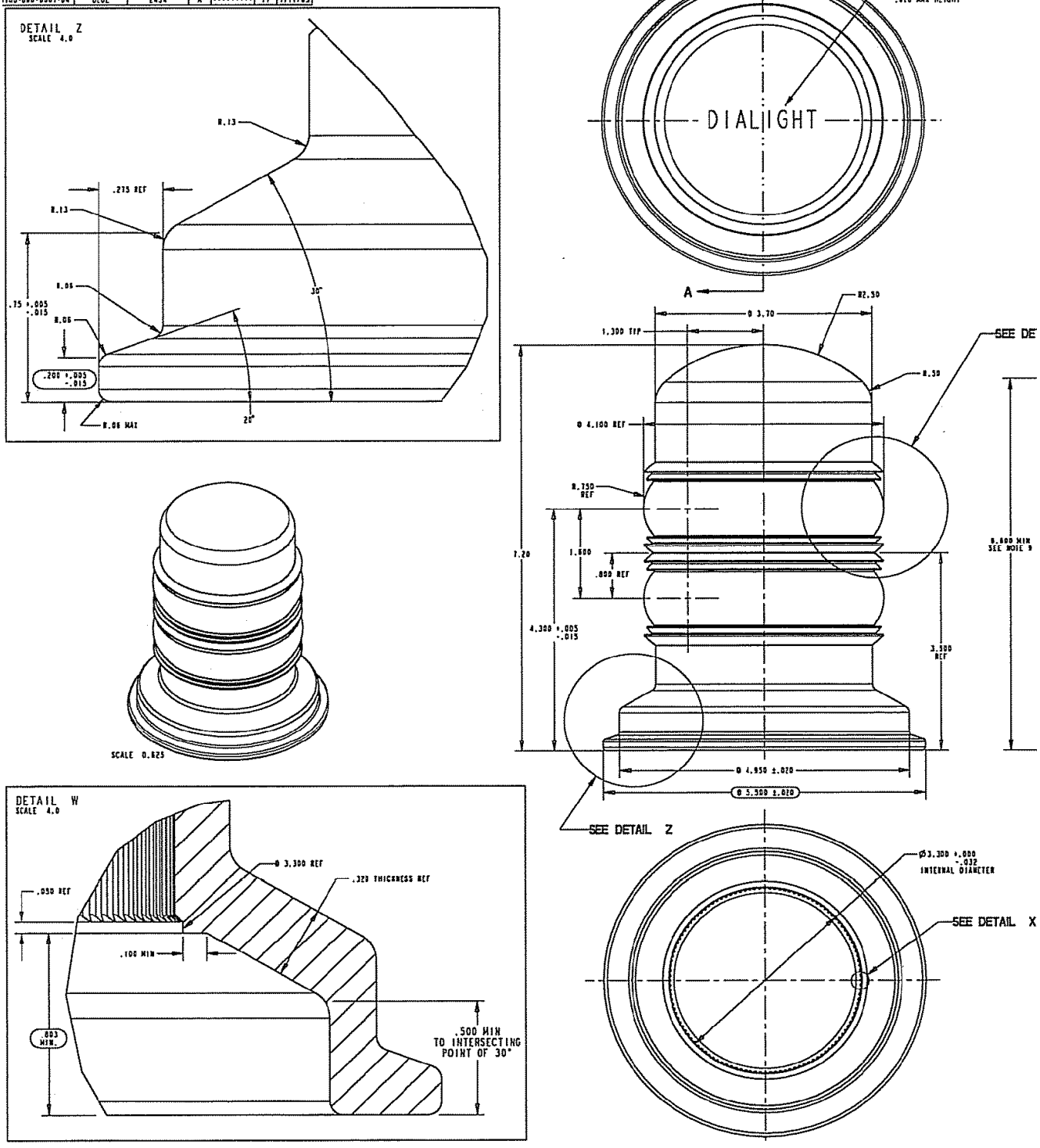
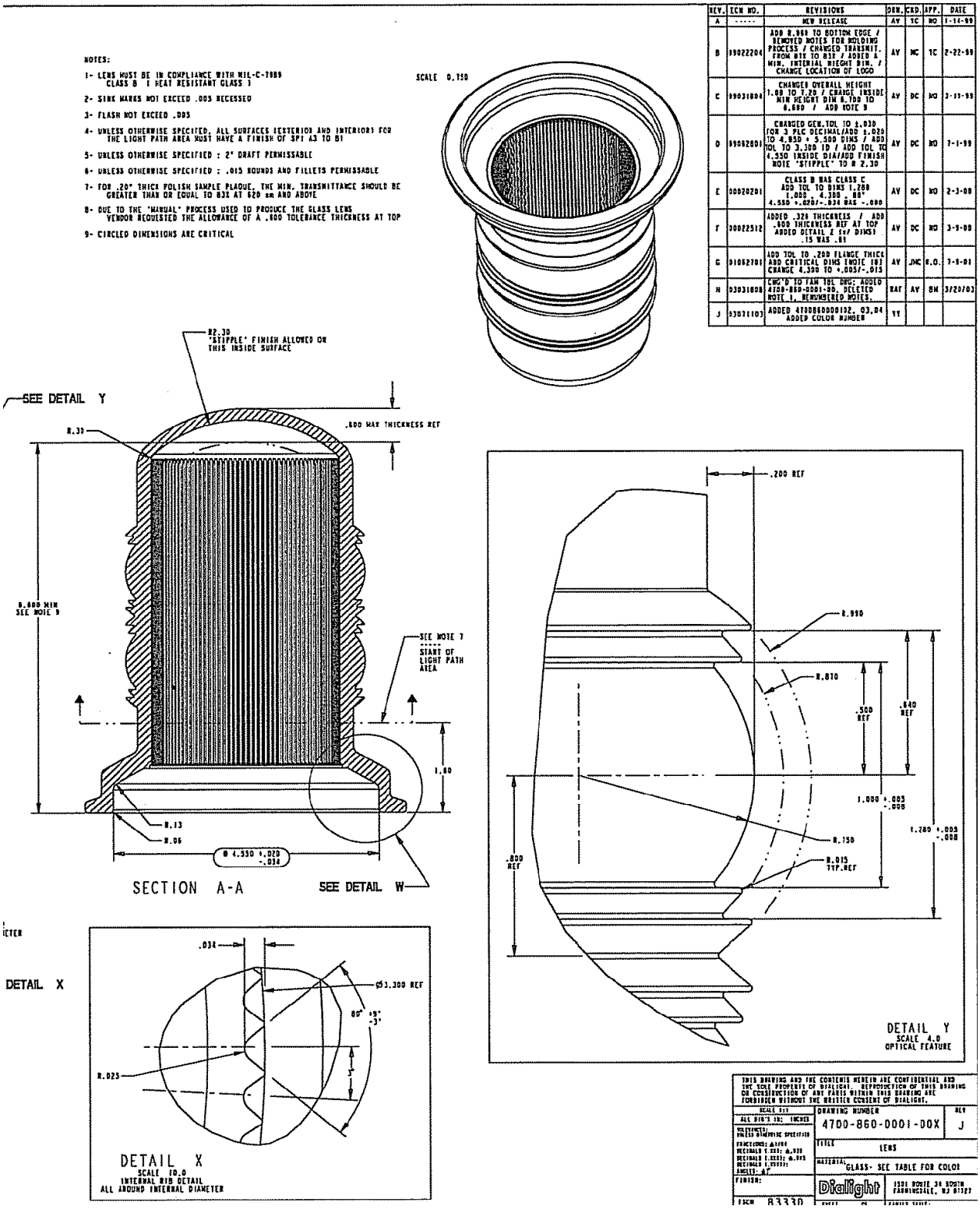


Illustration 4 Part 2 - Lens



REV.	ECN NO.	REVISIONS	DRN.	CKD.	APP.	DATE
A	-----	NEW RELEASE	AV	TC	MO	1-14-99
B	99022204	ADD R.999 TO BOTTOM EDGE / REMOVED NOTES FOR MOLDING PROCESS / CHANGED TRANSMIT. FROM 81% TO 83% / ADDED A MIN. INTERNAL HEIGHT DIM. / CHANGE LOCATION OF LOGO	AV	MC	TC	2-22-99
C	99031804	CHANGED OVERALL HEIGHT 7.08 TO 7.20 / CHANGE INSIDE MIN HEIGHT DIM 6.700 TO 6.880 / ADD NOTE 9	AV	DC	MO	3-11-99
D	99082601	CHANGED GEN.TOL TO ±.030 FOR 3 PLC DECIMAL/ADD ±.020 TO 4.850 & 5.500 DIMS / ADD TOL TO 3.300 ID / ADD TOL TO 4.550 INSIDE DIA/ADD FINISH NOTE "STIPPLE" TO R 2.30	AV	DC	MO	7-1-99
E	00020201	CLASS B WAS CLASS C ADD TOL TO DIMS 1.280 1.000, 4.300, 88° 4.550 +.020/-.034 WAS +-.080	AV	DC	MO	2-1-00
F	00022512	ADDED .324 THICKNESS / ADD .800 THICKNESS REF AT TOP ADDED DETAIL Z for DIMS) .15 WAS .61	AV	DC	MO	3-1-00
G	01062701	ADD TOL TO .200 FLANGE THICK ADD CRITICAL DIMS (NOTE 10) CHANGE 4.300 TO +.005/-.015	AV	JMC	N.O.	7-1-01
H	03031808	CHG'D TO FAM 1BL DWG; ADDED 4700-860-0001-00, DELETED NOTE 1, RENUMBERED NOTES.	RAT	AV	BM	3/20/03
J	03071103	ADDED 4700860000102, 03,04 ADDED COLOR NUMBER	YY			

8.0 Test Summary

Evaluation Period	April 2007 through September 2007			Project No.	3171541CRT-004
Sample Rec. Date	26-Feb-09	Condition	Production	Sample ID.	2009-02-183161
Test Location	Cortland, NY				
Test Procedure	Testing Lab				

Determination of the result includes consideration of measurement uncertainty from the test equipment and methods. The product was tested as indicated below with results in conformance to the relevant test criteria.

The following tests were performed:

Test Description	UL 1638 Clause		
Variable Voltage Operation Test	14		
Light Output and Flash Rate/Duration Between Pulses	13		
Temperature	15		
Endurance	16		
Component Failure	17		
Dielectric Voltage Withstand	19		
Rain	20		
Variable Ambient Conditions A, B, and C	21		
Internally induced transients	22		
Vibration	23		
Jarring	24		
Corrosion	25		

8.1 Signatures

A representative sample of the product covered by this report has been evaluated and found to comply with the applicable requirements of the standards indicated in Section 1.0.

Completed by:	Justin Simon	Reviewed by:	David Tobias, Jr.
Title:	Engineer	Title:	Engineering Team Leader
Signature:		Signature:	

9.0 Correlation Page For Multiple Listings	
The following products, which are identical to those identified in this report except for model number and Listee name, are authorized to bear the ETL label under provisions of the Intertek Multiple Listing Program.	
BASIC LISTEE	Dialight Corporation
Address	1501 Route 34 South Farmingdale, NJ 08005
Country	USA
Product	Visual Signal Light

MULTIPLE LISTEE 1	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 1 MODELS	BASIC LISTEE MODELS

MULTIPLE LISTEE 2	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 2 MODELS	BASIC LISTEE MODELS

MULTIPLE LISTEE 3	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 3 MODELS	BASIC LISTEE MODELS

10.0 General Information

The Applicant and Manufacturer have agreed to produce, test and label ETL Listed products in accordance with the requirements of this Report. The Manufacturer has also agreed to notify Intertek and to request authorization prior to using alternate parts, components or materials.

COMPONENTS

Components used shall be those itemized in this Intertek report covering the product, including any amendments and/or revisions.

LISTING MARK

The ETL Listing mark applied to the products shall either be separable in form, such as labels purchased from Intertek, or on a product nameplate or other media only as specifically authorized by Intertek. Use of the mark is subject to the control of Intertek.

MANUFACTURING AND PRODUCTION TESTS

Manufacturing and Production Tests shall be performed as required in this Report.

FOLLOW UP SERVICE

Periodic unannounced audits of the manufacturing facility (and any locations authorized to apply the mark) shall be scheduled by Intertek. An audit report shall be issued after each visit. Special attention will be given to the following:

1. Conformance of the manufactured product to the descriptions in this Report.
2. Conformance of the use of the ETL mark with the requirements of this Report and the Certification Agreement.
3. Manufacturing changes.
4. Performance of specified Manufacturing and Production Tests.

In the event that the Intertek representative identifies non-conformance(s) to any provision of this Report, the Applicant shall take one or more of the following actions:

1. Correct the non-conformance.
2. Remove the ETL Mark from non-conforming product.
3. Contact the issuing product safety evaluation center for instructions.

10.1 Evaluation of Unlisted Components

Because Unlisted Components are uncontrolled, and they do not fall under a third party follow up program, Intertek may require these components to be tested and/or evaluated at least once annually, more often for certain components, as part of the independent certification process. The Unlisted Components in Section 5.0

Note to Intertek Follow Up Inspector: The Component Evaluation Center, CEC, will notify you in writing when these components must be selected and sent to the CEC for re-evaluation

Ship the samples to:
Intertek Testing Services NA Inc.
ETL Component Evaluation Center
13200 Levan Road
Livonia, MI 48150 USA
Attn: Component Evaluation Center
Sample Disposition: Due to the destructive nature of the testing, all samples will be discarded at the conclusion of testing unless, the manufacturer specifically requests the return of the samples. The request for return **must** accompany the initial component shipment.

11.0 Manufacturing and Production Tests

The manufacturer agrees to conduct the following Manufacturing and Production Tests as specified:

Required Tests

Dielectric Voltage Withstand Test
Grounding Continuity Test

11.1 Dielectric Voltage Withstand Test

Method

One hundred percent of production of the products covered by this Report shall be subjected to a routine production line dielectric withstand test.

The test shall be conducted on products, which are fully assembled. Prior to applying the test potential, all switches, contractors, relays, etc., should be closed so that all primary circuits are energized by the test potential. If all primary circuits cannot be tested at one time, then separate applications of the test potential shall be made.

The test voltage specified below shall be applied between primary circuits and accessible dead-metal parts. The test voltage may be gradually increased to the specified value but must be maintained at the specified value for one second or one minute as required.

Test Equipment

The test equipment shall incorporate a transformer with an essentially sinusoidal output, a means to indicate the applied test potential, and an audible and/or visual indicator of dielectric breakdown.
The test equipment shall incorporate a voltmeter in the output circuit to indicate directly the applied test potential if the rated output of the test equipment is less than 500VA.
If the rated output of the test equipment is 500VA or more, the applied test potential may be indicated by either:
1 - a voltmeter in the primary circuit;
2 - a selector switch marked to indicate the test potential; or
3 - a marking in a readily visible location to indicate the test potential for test equipment having a single test potential output.
In cases 2 and 3, the test equipment shall include a lamp or other visual means to indicate that the test potential is present at the test equipment output. All test equipment shall be maintained in current calibration.

Products Requiring Dielectric Voltage Withstand Test:

Product	Test Voltage	Test Time
All products covered by this Report.	1000V or 1200V	60 s 1 s

11.2 Grounding Continuity Test

Method

Each product listed below shall be subjected to a test to determine that there is continuity between accessible dead-metal parts of the product and the grounding pin or blade of the attachment plug.

If all accessible dead metal is connected, only a single test need be performed. A visual or audible device (ohmmeter, buzzer, etc.) may be used to indicate grounding continuity.

Products Requiring Grounding Continuity Test:

All products covered by this Report.

Products Requiring Pressure Tests for Leakage and Strength:

All products covered by this Report.

12.0 Revision Summary				
The following changes are incompliance with the declaration of Section 8.1:				
Date/ Proj # Site ID	Project Handler/ Reviewer	Section	Item	Description of Change
				None