

FR™ Enclosed and Gasketed; FZ™ and FD™ Hazardous Locations Luminaires Nonmetallic Fluorescent

4 foot, 2 lamp fixtures. High-impact fiberglass reinforced polyester fixtures suitable for use in wet and damp locations.

FR Series
Wet Locations
IP65 when used with optional polycarbonate lens

FZ Series
Class I, Zone 2, IIC
AEx nA IIC T5 IP65
Ex nA IIC T5 IP65

FD Series
Class I, Division 2, Groups A, B, C, D
Class I, Zone 2, IIC

Applications

- For use in locations where a high degree of corrosion resistance is required.
- FR Series:
 - For use in areas where high humidity or water vapor are present
 - Typical uses include meat- or food-processing plants, dairy or drug plants, breweries, kitchens, chemical plants, car washes, laundries and parking garages.
 - Can be used indoors or outdoors in protected locations (wet locations).
 - Operates safely in 131 °F/55 °C ambient temperature areas.
- FZ and FD Series:
 - For use in hazardous locations defined by the NEC as Class I, Division 2; and Class I, Zone 2.
 - For wet-location use where protection against dirt, water and moisture is necessary.
 - Typical applications include oil refineries, petrochemical facilities, pulp and paper mills, food-processing plants, warehouses, underground tunnels and general manufacturing facilities.
- FZ Series is UL Listed for Class I, Zone 2.
- FD Series fixture is UL listed for Class I, Division 2.

Features

- Fixtures are available with ballasts to support T12 and T8 lamps for nearly all U.S. and foreign voltage and frequency combinations.
- Low operating costs provide more lumens per Watt than incandescent fixtures.
- Housing is smooth, seamless, one-piece injection molded.
- Lens comes in high-impact polycarbonate plastic or impact-resistant acrylic.
- Fixtures are washable, non-conductive and corrosion-resistant.
- Enclosure is rated at IP65 (using polycarbonate lens), dust-proof and protected against water spray.
- A compressible, one-piece, non-thixotropic polyol gasket is bonded to the housing around the entire perimeter. It forms a continuous tight seal with the lens to keep out dirt, vapor and moisture.
- Lens is securely clamped to fixture using six captive corrosion-proof molded celcon tension latches. Lens is impact-resistant acrylic to protect lamps against breakage, and protect work area from broken lamp glass.
- Electrical components are mounted on a metallic wireway. Reflector is supported by internal safety springs to simplify installation and servicing.
- Optional fusing protects circuitry against occasional line voltage spikes.
- FR Series fixtures are available with one or two watertight 1/2" hubs for electrical-feed mounting or single-entry mounting.
- FZ fixtures are available with either 1/2" NPT or cable gland entries.
 - Cable glands are not available with FD series.

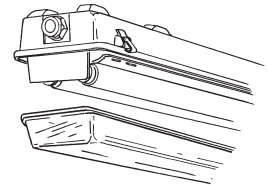
Standard Materials

- Housing: fiberglass reinforced polyester
- Lens: polycarbonate or acrylic. (Fixture has IP65 rating with polycarbonate lens.) Acrylic lens supplied as standard
- Latches: celcon
- Ceiling mounting bracket: stainless steel
- Adjustable wall mount: copperfree (4/10 of 1% max.) aluminum
- Fixed wall mount: stainless steel



Illustrated Features

Non-thixotropic polyol gasket is bonded to housing. With plastic latches closed, it forms a continuous, tight seal with lens. Keeps out moisture, vapor and dirt. Allows fast, easy fixture washing.



- Chain mount: zinc plated steel
- Gasket: non-thixotropic polyol
- Hubs: zinc plated steel with neoprene o-ring
- Lampholders: polycarbonate

Standard Finishes

- Housing: white color finish
- Celcon latches: white color finish
- Adjustable wall mount: epoxy powder coat

Options:

- F - Fused
- T - Terminal Blocks
- P - Polycarbonate Lens for IP65 Rating
- E - Emergency Battery Pack capability in moments of power interruption. Luminaire automatically switches to emergency mode, keeping one lamp illuminated for a minimum of 90 minutes. When AC power is restored, battery automatically recharges in 24 hours. Initial light output is 600-700 lumens.

Compliances and Certifications

- FR Series:
 - UL Standard: UL 1598
 - UL Listed: E187946
 - CSA Standard: C22.2 No. 250
 - cUL Listed: E187946
- FZ Series:
 - UL Standard: UL 1598, UL 844, UL 60079-0, UL 60079-15
 - UL Listed: E10794
 - CSA Standard: C22.2 No. 250, C22.2 No. 137, CAN E60079-0, CAN E60079-15
 - cUL Listed: E10794
- FD Series:
 - UL Standard: UL 1598, UL 844
 - UL Listed: E10794
 - CSA Standard: C22.2 No. 250, C22.2 No. 137
 - cUL Listed: E10794

FR™ Enclosed and Gasketed; FZ™ and FD™ Hazardous Locations Luminaires

Nonmetallic Fluorescent

4 foot, 2 lamp fixtures. High-impact fiberglass reinforced polyester fixtures suitable for use in wet and damp locations.

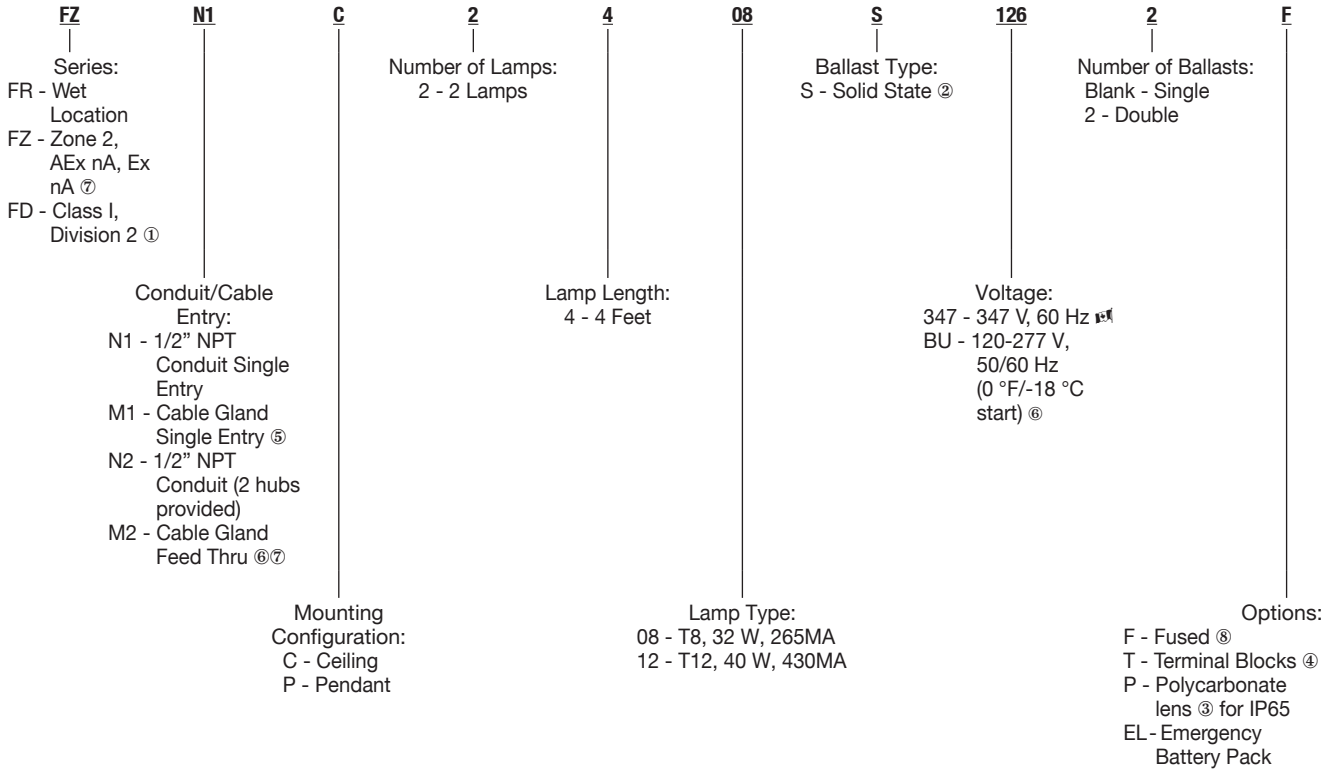
FR Series
Wet Locations
IP65 when used with optional polycarbonate lens

FZ Series
Class I, Division 2, Groups A, B, C, D
Class I, Zone 2, IIC
AEx nA IIC T5 IP65
Ex nA IIC T5 IP65

FD Series
Class I, Division 2, Groups A, B, C, D
Class I, Zone 2, IIC

Order using catalog numbering guide below.

Catalog Numbering Guide For FR, FZ And FD Nonmetallic Fluorescent Lighting Fixtures



Lighting








LIGHTING: ENCLOSED AND GASKETED - AREA - FLUORESCENT

① Fixture is not available with M1 or M2 cable entry options
 ② Cold weather standard for T8.
 ③ Use polycarbonate lens for IP65 rating. Polycarbonate lens is standard on FZ Series.
 ④ Standard equipment for FZ series
 ⑤ Fixture will be supplied with a 5'11.5 m length of #14/3 cord and 3 prong plug (120 V) pre-installed when ordered with cable gland. Fixture with cable gland can only be used with hook and chain mounting.
 ⑥ T8-RS only.
 ⑦ FZ Series fixtures are not UL Listed for Class I, Division 2 when used with cable glands. FZ Series fixtures are UL Classified for Class I, Zone 2 when used with cable glands.
 ⑧ Canadian Electrical Code does NOT allow fusing in hazardous locations [Ⓜ].
[Ⓜ] CSA Certification only.

FR™ Enclosed and Gasketed; FZ™ and FD™ Hazardous Locations Luminaires

Nonmetallic Fluorescent. Accessories and Replacement Parts

4 foot, 2 lamp fixtures. High-impact fiberglass reinforced polyester fixtures suitable for use in wet and damp locations.

Item	Description	Catalog Number
Hub 	1/2" NPT watertight conduit hub	FHUB
Cable Gland 	Cable gland	FGLAND
Lampholder 	32 W (T8) and 40 W (T12) lampholder	FS0C40
Lens Clip 	Standard plastic clips	FPCLIP
Lens 	Acrylic lens cover	FLENS
	Polycarbonate lens cover ①	FPLENS
Ceiling Mounting Bracket (Supplied standard with product) 	Stainless steel bracket with mounting hardware (set of 2)	FBRACKET
Fixed 45° Wall Mount 	11 gauge (1/8") stainless steel (set of 2)	FVWFM

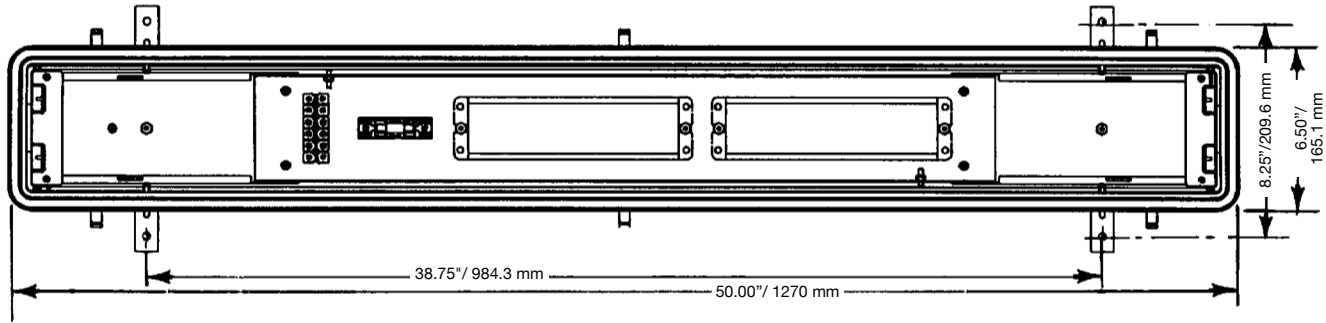
① Polycarbonate lens standard for FZ series. When used with FD series, fixture has an IP65 rating.

FR™ Enclosed and Gasketed; FZ™ and FD™ Hazardous Locations Luminaires

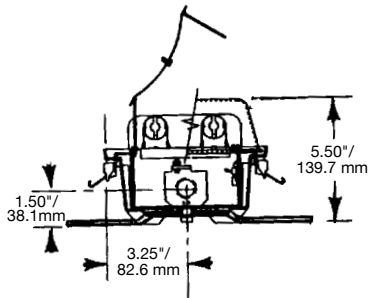
Nonmetallic Fluorescent. Dimensions

4 foot, 2 lamp fixtures. High-impact fiberglass reinforced polyester fixtures suitable for use in wet and damp locations.

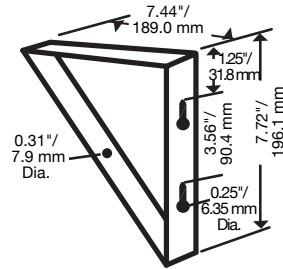
View of Fixture Cover



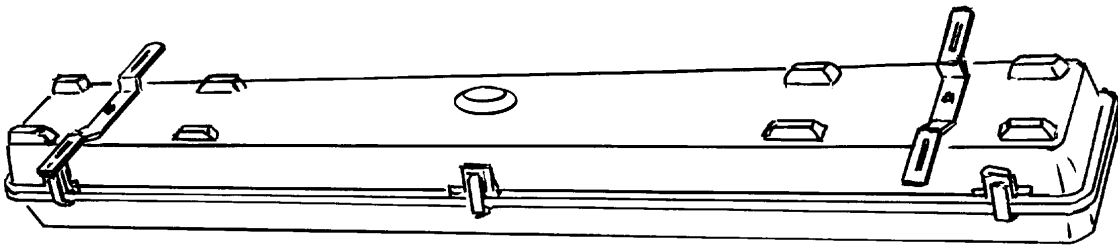
Side View



Fixed 45° Wall Mount — FVWFM



View of Fixture Mounting



FR™ Enclosed and Gasketed; FZ™ and FD™ Hazardous Locations Luminaires

Nonmetallic Fluorescent. Photometric Data

4 foot, 2 lamp fixtures. High-impact fiberglass reinforced polyester fixtures suitable for use in wet and damp locations.

CANDELA DISTRIBUTION						TOTAL LUMINAIRE EFFICIENCY = 84.6%		REPORT NUMBER: ITL 47240		
0.0	22.5	45.0	67.5	90.0	Flux	CIE Type – Semi-Direct		Lamps: Two 32 W, 4-foot F32T8/TL735 fluorescents, 2850 lumens per lamp with acrylic lens.		
0	1155	1155	1155	1155	1155	Plane:	0°	90°		
5	1159	1153	1150	1148	1148	Spacing Criteria:	1.3	1.5		
15	1118	1118	1124	1134	1137	Shielding Angles:	1	0		
25	1036	1049	1071	1109	1125					
35	918	945	1010	1087	1114					
45	766	812	927	1026	1056					
55	569	652	788	900	927					
65	342	450	598	719	753					
75	148	259	432	567	604					
85	25	133	318	444	473					
90	4	98	270	376	412					
95	5	84	258	372	414					
105	2	42	182	292	341					
115	0	13	69	139	182					
125	0	3	22	36	50					
135	0	0	9	15	19					
145	0	0	2	7	9					
155	0	0	0	0	2					
165	0	0	0	0	0					
175	0	0	0	0	0					
180	0	0	0	0	0					

ZONAL LUMEN SUMMARY		COEFFICIENTS OF UTILIZATION – ZONAL CAVITY METHOD																		
ZONE	LUMENS	EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20																		
0-30	926	% Ceiling RC	80		70		50		30		10		0							
0-40	1562	% Walls RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	0			
0-60	2962	0	.98	.98	.98	.98	.95	.95	.95	.95	.89	.89	.89	.83	.83	.83	.78	.78	.78	.75
0-90	4282	1	.88	.83	.78	.74	.84	.80	.76	.72	.75	.71	.68	.70	.67	.65	.65	.63	.61	.58
90-120	509	2	.79	.71	.65	.59	.76	.69	.63	.58	.64	.59	.55	.60	.56	.52	.56	.52	.50	.47
90-130	529	3	.71	.62	.54	.48	.68	.60	.53	.47	.56	.50	.45	.52	.47	.43	.49	.45	.41	.39
90-150	538	4	.65	.54	.46	.40	.62	.52	.45	.39	.49	.43	.38	.46	.41	.36	.43	.38	.35	.32
90-180	539	5	.60	.48	.40	.34	.57	.47	.39	.33	.44	.37	.32	.41	.35	.31	.38	.34	.30	.28
0-180	4820	6	.55	.43	.35	.29	.53	.42	.34	.29	.39	.33	.28	.37	.31	.27	.35	.30	.26	.24
		7	.51	.39	.31	.26	.49	.38	.30	.25	.36	.29	.24	.33	.28	.24	.32	.27	.23	.21
		8	.47	.35	.28	.23	.45	.34	.27	.22	.32	.26	.22	.31	.25	.21	.29	.24	.20	.19
		9	.44	.32	.25	.20	.42	.31	.25	.20	.30	.24	.19	.28	.23	.19	.27	.22	.18	.17
		10	.41	.30	.23	.18	.40	.29	.22	.18	.27	.22	.17	.26	.21	.17	.25	.20	.16	.15

CANDELA DISTRIBUTION						TOTAL LUMINAIRE EFFICIENCY = 83.6%		REPORT NUMBER: ITL 47241		
0.0	22.5	45.0	67.5	90.0	Flux	CIE Type – Semi-Direct		Lamps: Two 32 W, 4-foot F32T8/TL735 fluorescents, 2850 lumens per lamp with polycarbonate lens.		
0	566	566	566	566	566	Plane:	0°	90°		
5	568	565	564	563	563	Spacing Criteria:	1.3	1.5		
15	548	549	550	554	555	Shielding Angles:	1	0		
25	506	512	523	543	552					
35	448	461	495	535	549					
45	374	396	458	509	525					
55	283	324	399	457	475					
65	177	241	318	393	409					
75	72	142	211	259	267					
85	6	63	150	212	228					
90	1	46	118	167	186					
95	1	43	122	176	198					
105	0	20	84	131	154					
115	0	5	33	74	92					
125	0	1	10	18	24					
135	0	0	5	9	10					
145	0	0	1	4	5					
155	0	0	0	1	1					
165	0	0	0	0	0					
175	0	0	0	0	0					
180	0	0	0	0	0					

ZONAL LUMEN SUMMARY		COEFFICIENTS OF UTILIZATION – ZONAL CAVITY METHOD																		
ZONE	LUMENS	EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20																		
0-30	453	% Ceiling RC	80		70		50		30		10		0							
0-40	765	% Walls RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	0			
0-60	1464	0	.97	.97	.97	.97	.94	.94	.94	.94	.88	.88	.88	.82	.82	.82	.77	.77	.77	.75
0-90	2126	1	.87	.82	.78	.74	.84	.79	.75	.72	.74	.71	.68	.69	.67	.64	.65	.63	.61	.58
90-120	241	2	.78	.70	.64	.58	.75	.68	.62	.57	.63	.59	.54	.59	.55	.52	.55	.52	.49	.47
90-130	251	3	.71	.61	.53	.48	.68	.59	.52	.47	.55	.49	.45	.52	.47	.43	.48	.44	.41	.38
90-150	256	4	.64	.54	.46	.40	.62	.52	.44	.39	.48	.42	.37	.45	.40	.36	.43	.38	.34	.32
90-180	256	5	.59	.47	.39	.34	.56	.46	.39	.33	.43	.37	.32	.40	.35	.31	.38	.33	.29	.27
0-180	2383	6	.54	.42	.35	.29	.52	.41	.34	.28	.39	.32	.27	.36	.31	.27	.34	.29	.26	.24
		7	.50	.38	.31	.25	.48	.37	.30	.25	.35	.29	.24	.33	.27	.23	.31	.26	.22	.21
		8	.46	.35	.27	.22	.45	.34	.27	.22	.32	.26	.21	.30	.25	.21	.28	.24	.20	.18
		9	.43	.32	.25	.20	.42	.31	.24	.20	.29	.23	.19	.28	.22	.18	.26	.21	.18	.16
		10	.41	.29	.22	.18	.39	.28	.22	.18	.27	.21	.17	.26	.20	.17	.24	.20	.16	.15

FR™ Enclosed and Gasketed; FZ™ and FD™ Hazardous Locations Luminaires

Nonmetallic Fluorescent. Photometric Data

4 foot, 2 lamp fixtures. High-impact fiberglass reinforced polyester fixtures suitable for use in wet and damp locations.

Lighting

LIGHTING: ENCLOSED AND GASKETED – AREA – FLUORESCENT

CANDELA DISTRIBUTION TOTAL LUMINAIRE EFFICIENCY = 80.7%

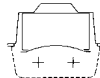
0.0	22.5	45.0	67.5	90.0	Flux
0	1224	1224	1224	1224	1224
5	1228	1223	1221	1219	1218 116
15	1185	1190	1204	1219	1222 341
25	1097	1122	1158	1200	1214 535
35	974	1020	1090	1166	1192 683
45	811	881	993	1094	1122 759
55	600	701	837	943	967 729
65	358	476	625	736	761 595
75	154	271	443	566	600 441
85	25	136	325	455	490 321
90	5	101	285	401	442
95	5	84	260	372	415 253
105	2	45	187	294	343 184
115	0	14	85	163	204 91
125	0	3	23	53	81 28
135	0	0	9	16	20 7
145	0	0	0	5	7 2
155	0	0	0	0	0
165	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

CIE Type – Semi-Direct

Plane: 0° 90°

Spacing Criteria: 1.3 1.5

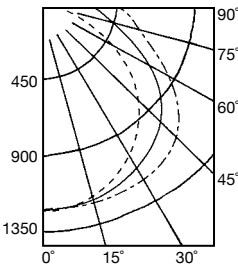
Shielding Angles: 1 0



ZONAL LUMEN SUMMARY

ZONE LUMENS

0-30	992
0-40	1676
0-60	3164
0-90	4521
90-120	528
90-130	556
90-150	564
90-180	564
0-180	5085



LEGEND

0-deg - - - - -
 45-deg - - - - -
 90-deg - - - - -

REPORT NUMBER: ITL 47242

Lamps: Two 40 W, 4-foot F40WW fluorescents, 3150 lumens per lamp with acrylic lens.

COEFFICIENTS OF UTILIZATION – ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

% Ceiling RC	% Walls RW	80				70				50				30				10				0			
		70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10				
0	.94	.94	.94	.94	.91	.91	.91	.91	.85	.85	.85	.79	.79	.79	.74	.74	.74	.72							
1	.84	.79	.75	.71	.81	.76	.73	.69	.71	.68	.65	.67	.64	.62	.62	.60	.58	.56							
2	.76	.68	.62	.57	.72	.66	.60	.55	.61	.57	.53	.57	.53	.50	.54	.50	.48	.45							
3	.68	.59	.52	.46	.66	.57	.51	.45	.53	.48	.43	.50	.45	.41	.47	.43	.40	.37							
4	.62	.52	.44	.39	.60	.50	.43	.38	.47	.41	.36	.44	.39	.35	.41	.37	.33	.31							
5	.57	.46	.39	.33	.55	.45	.38	.32	.42	.36	.31	.39	.34	.30	.37	.32	.29	.27							
6	.53	.41	.34	.28	.50	.40	.33	.28	.38	.32	.27	.35	.30	.26	.33	.29	.25	.23							
7	.49	.37	.30	.25	.47	.36	.29	.24	.34	.28	.24	.32	.27	.23	.30	.26	.22	.20							
8	.45	.34	.27	.22	.43	.33	.26	.22	.31	.25	.21	.29	.24	.20	.28	.23	.20	.18							
9	.42	.31	.24	.20	.40	.30	.24	.19	.29	.23	.19	.27	.22	.18	.26	.21	.18	.16							
10	.39	.28	.22	.18	.38	.28	.22	.17	.26	.21	.17	.25	.20	.16	.24	.19	.16	.14							

CANDELA DISTRIBUTION TOTAL LUMINAIRE EFFICIENCY = 78.9%

0.0	22.5	45.0	67.5	90.0	Flux
0	1188	1188	1188	1188	1188
5	1188	1186	1186	1184	1183 113
15	1146	1155	1165	1177	1181 330
25	1060	1085	1122	1165	1178 519
35	940	984	1055	1135	1161 663
45	782	850	970	1073	1102 738
55	589	687	836	950	977 725
65	367	500	652	765	791 618
75	145	293	437	548	563 431
85	12	132	306	428	464 302
90	4	106	270	381	421
95	5	86	244	348	389 240
105	2	42	178	278	321 172
115	0	8	82	163	201 88
125	0	1	19	54	82 27
135	0	0	8	16	18 6
145	0	0	1	5	8 2
155	0	0	0	0	0
165	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0

CIE Type – Semi-Direct

Plane: 0° 90°

Spacing Criteria: 1.3 1.5

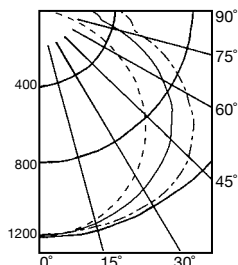
Shielding Angles: 1 0



ZONAL LUMEN SUMMARY

ZONE LUMENS

0-30	961
0-40	1624
0-60	3087
0-90	4438
90-120	500
90-130	527
90-150	535
90-180	535
0-180	4973



LEGEND

0-deg - - - - -
 45-deg - - - - -
 90-deg - - - - -

REPORT NUMBER: ITL 47243

Lamps: Two 40 W, 4-foot F40WW fluorescents, 3150 lumens per lamp with polycarbonate lens.

COEFFICIENTS OF UTILIZATION – ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

% Ceiling RC	% Walls RW	80				70				50				30				10				0			
		70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10				
0	.92	.92	.92	.92	.89	.89	.89	.89	.83	.83	.83	.78	.78	.78	.73	.73	.73	.70							
1	.82	.78	.74	.70	.79	.75	.71	.68	.70	.67	.64	.65	.63	.61	.61	.59	.57	.55							
2	.74	.67	.61	.55	.71	.64	.59	.54	.60	.55	.52	.56	.52	.49	.53	.49	.47	.44							
3	.67	.58	.51	.45	.64	.56	.49	.44	.52	.47	.42	.49	.44	.41	.46	.42	.39	.37							
4	.61	.51	.43	.38	.58	.49	.42	.37	.46	.40	.35	.43	.38	.34	.40	.36	.33	.31							
5	.56	.45	.38	.32	.53	.44	.37	.31	.41	.35	.30	.38	.33	.29	.36	.32	.28	.26							
6	.51	.40	.33	.28	.49	.39	.32	.27	.37	.31	.26	.35	.29	.25	.33	.28	.24	.23							
7	.47	.36	.29	.24	.46	.35	.29	.24	.33	.27	.23	.31	.26	.22	.30	.25	.21	.20							
8	.44	.33	.26	.21	.42	.32	.26	.21	.30	.25	.20	.29	.23	.20	.27	.23	.19	.17							
9	.41	.30	.24	.19	.39	.29	.23	.19	.28	.22	.18	.26	.21	.18	.25	.20	.17	.16							
10	.38	.28	.21	.17	.37	.27	.21	.17	.26	.20	.16	.24	.19	.16	.23	.19	.15	.14							