

Magnification and size

Mag. (x)	IF (mm)	WD (mm)	Field of View			Model name
			H	V	D	
0.035	11	470	248	186	310	MTL-31011C-004
0.041	11	540	213	159	266	MTL-26511C-004
0.046	11	375	192	144	240	MTL-24011C-005
0.056	11	365	156	117	195	MTL-19511C-006
0.060	18.5	470	237	174	294	MTL-31018C-006
0.061	11	350	144	108	180	MTL-18011C-006
0.070	18.5	540	203	149	251	MTL-26518C-007
0.073	11	300	120	90	150	MTL-15011C-007
0.074	23	470	249	186	311	MTL-31023P-007
0.077	18.5	375	183	134	227	MTL-24018C-008
0.081	11	260	108	81	135	MTL-13511C-008
0.087	23	540	213	160	266	MTL-26523P-009
0.092	11	255	96	72	120	MTL-12011C-009
0.095	18.5	365	149	109	185	MTL-19518C-009
0.096	23	375	192	144	240	MTL-24023P-010
0.103	18.5	350	137	101	170	MTL-18018C-010
0.110	11	220	80	60	100	MTL-10011C-011
0.113	35	470	204	204	288	MTL-31035P-011
0.118	23	365	156	117	195	MTL-19523P-012
0.122	11	120	72	54	90	MTL-9011C-012
0.123	18.5	300	115	84	142	MTL-15018C-012
0.128	23	350	144	108	180	MTL-18023P-013
0.132	35	540	175	175	247	MTL-26535P-013
0.137	18.5	260	103	75	128	MTL-13518C-014
0.140	43.5	470	258	172	310	MTL-31043M58-014
0.146	35	375	158	158	223	MTL-24035P-015
0.153	23	300	120	90	150	MTL-15023P-015
0.154	18.5	255	92	67	114	MTL-12018C-015
0.164	43.5	540	221	147	265	MTL-26543M58-016
0.170	23	260	108	81	135	MTL-13523P-017
0.180	35	365	128	128	181	MTL-19535P-018
0.182	43.5	375	199	133	239	MTL-24043M58-018
0.185	18.5	220	76	56	95	MTL-10018C-019
0.185	57.3	470	263	157	306	MTL-31057V74-019
0.192	23	255	96	72	120	MTL-12023P-019
0.195	35	350	118	118	167	MTL-18035P-019
0.206	18.5	120	69	50	85	MTL-9018C-021
0.216	57.3	540	225	134	262	MTL-26557V74-022
0.223	43.5	365	162	108	195	MTL-19543M58-022
0.228	18.5	165	62	45	77	MTL-8018C-023
0.230	23	220	80	60	100	MTL-10023P-023
0.233	35	300	99	99	140	MTL-15035P-023
0.240	57.3	375	203	121	237	MTL-24057V74-024
0.242	43.5	350	149	100	180	MTL-18043M58-024
0.256	23	120	72	54	90	MTL-9023P-026
0.260	35	260	89	89	125	MTL-13535P-026
0.268	82	470	-	-	306	MTL-31082M95-026
0.284	23	165	65	49	81	MTL-8023P-029
0.285	18.5	135	50	36	61	MTL-6518C-029
0.290	43.5	300	125	83	150	MTL-15043M58-029

Mag. (x)	IF (mm)	WD (mm)	Field of View			Model name
			H	V	D	
0.292	35	255	79	79	112	MTL-12035P-029
0.294	57.3	365	166	99	193	MTL-19557V74-029
0.313	82	540	-	-	262	MTL-26582M95-031
0.319	57.3	350	153	91	178	MTL-18057V74-032
0.322	43.5	260	112	75	135	MTL-13543M58-032
0.335	18.5	135	42	31	52	MTL-5518C-034
0.347	82	375	-	-	236	MTL-24082M95-034
0.351	35	220	66	66	93	MTL-10035P-035
0.354	23	135	52	39	65	MTL-6523P-035
0.362	43.5	255	100	67	120	MTL-12043M58-036
0.382	57.3	300	127	76	148	MTL-15057V74-038
0.390	35	120	59	59	84	MTL-9035P-039
0.410	18.5	110	34	25	43	MTL-4518C-041
0.417	23	135	44	33	55	MTL-5523P-042
0.425	57.3	260	114	68	133	MTL-13557V74-043
0.426	82	365	-	-	192	MTL-19582M95-042
0.433	35	165	53	53	75	MTL-8035P-044
0.435	43.5	220	83	55	100	MTL-10043M58-044
0.462	82	350	-	-	177	MTL-18082M95-046
0.478	57.3	255	102	61	119	MTL-12057V74-048
0.484	43.5	120	75	50	90	MTL-9043M58-048
0.509	23	110	36	27	45	MTL-4523P-051
0.527	18.5	95	27	20	33	MTL-3518C-053
0.537	43.5	165	67	45	81	MTL-8043M58-054
0.540	35	135	43	43	60	MTL-6535P-054
0.553	82	300	-	-	148	MTL-15082M95-055
0.574	57.3	220	85	51	99	MTL-10057V74-057
0.615	82	260	-	-	133	MTL-13582M95-061
0.635	35	135	36	36	51	MTL-5535P-064
0.638	57.3	120	76	46	89	MTL-9057V74-064
0.655	23	95	28	21	35	MTL-3523P-066
0.670	43.5	135	54	36	65	MTL-6543M58-067
0.692	82	255	-	-	118	MTL-12082M95-068
0.709	57.3	165	69	41	80	MTL-8057V74-072
0.776	35	110	30	30	42	MTL-4535P-078
0.788	43.5	135	46	31	55	MTL-5543M58-079
0.831	82	220	-	-	99	MTL-10082M95-082
0.884	57.3	135	55	33	64	MTL-6557V74-088
0.923	82	120	-	-	89	MTL-9082M95-091
0.964	43.5	110	38	25	45	MTL-4543M58-096
0.999	35	95	23	23	33	MTL-3535P-100
1.026	82	165	-	-	80	MTL-8082M95-103
1.040	57.3	135	47	28	55	MTL-5557V74-104
1.240	43.5	95	29	19	35	MTL-3543M58-124
1.272	57.3	110	38	23	45	MTL-4557V74-127
1.279	82	135	-	-	64	MTL-6582M95-126
1.505	82	135	-	-	54	MTL-5582M95-149
1.636	57.3	95	30	18	35	MTL-3557V74-164
1.840	82	110	-	-	45	MTL-4582M95-182



Bi-Telecentric Lenses

Bi-Telecentric Lenses MTL Series

Bi-telecentric lens offered is cutting-edge designed with technology proven by legacy telecentric lens.

Our bi-telecentric lens has wide range of selection and is capable of fitting to many cameras available in the market, and shows the best fit to wide range of precise measurement application.

Our unique optical design capabilities result in the tightest object and image side telecentricity in the market and enable near-zero distortion performance with the highest resolution from the center to the edge along the system FOV.

This enables an optimized measurement condition for the highest accuracy that can be easily achieved by coupling these lenses with matched telecentric backlight illuminators.

∴ **99** types of bi - telecentric lenses
∴ **13** types of parallel beam back lights

∴ High resolution design Designed for 3.5 μ m/pixel sensor

∴ Offering **15** FOVs

35mm, 45mm, 55mm, 65mm, 80mm, 90mm, 100mm, 120mm
135mm, 150mm, 180mm, 195mm, 240mm, 265mm, 310mm

∴ Supporting **7** different sensor sizes Maximum sensor size 82mm

∴ Inspection report provided for each unit,
proving that achieves the best performance



Bi-Telecentric Lenses

MTL Series

Image Format 1/3" - 4/3"

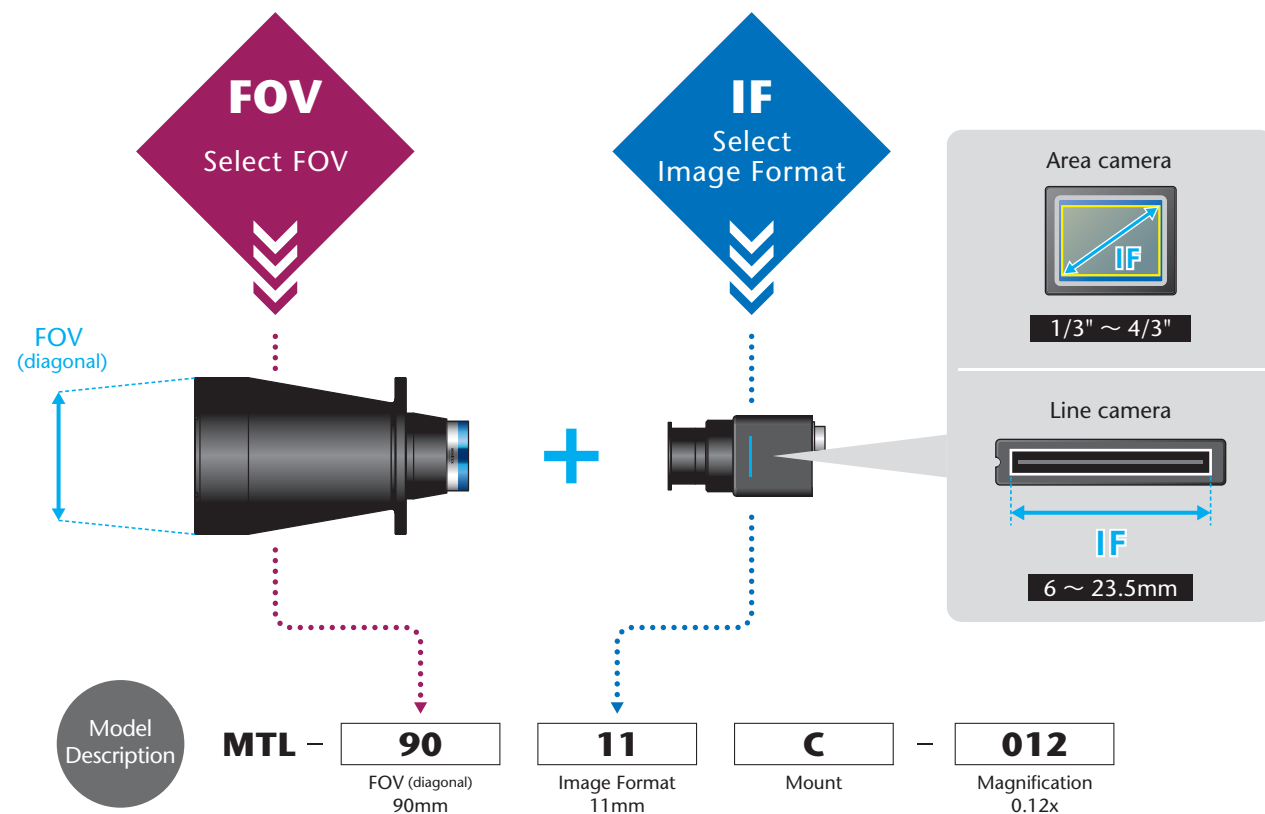


Chart for sensors sizes

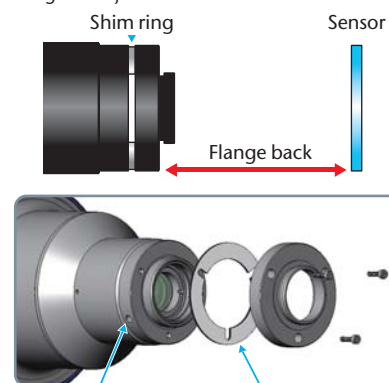
Max IF	11mm	18.5mm	23mm
Model name	MTL-xxx11C	MTL-xxx18C	MTL-xxx23P
Min Pixel size	3.5μm	3.5μm	3.5μm
Mount	C	C	P, C, M48, M58
Area camera	1/3"	○	○
	1/2.5"	○	○
	1/2"	○	○
	1/1.8"	○	○
	2/3"	●	○
	1"	○	○
	1.1"	●	○
Line camera	1.2"	○	○
	4/3"	○	●
	1K 10μm	○	○
	1K 14μm	○	○
	2K 7μm	○	○
	2K 10μm	○	○

● Recommendation
○ FOV varies according to a camera

Camera sensor position adjustment function

bi-telecentric lenses feature a camera adjustment function that can draw out the maximum performance. A filter can also be fitted to the lens, with the location designed with performance in mind.

Shim rings for adjustment based on camera sensor position



Camera rotation position adjustment screw
3 sets of M3 set-screw
Shim ring / 0.05mm : 1
0.1mm : 1

Specification

Max IF (mm)	FOV type	Mag. (x)		WD (mm)		Field of View												Optical specifications					Mechanical specifications				Model name
						1/2" (Max IF : 8)			2/3" (Max IF : 11)			1.1" (Max IF : 18.5)			4/3" (Max IF : 23)			Effective F#	Distortion (%)	Telecentricity (deg.)	Resolution @520µm (µm)	DOF @40µm (mm)	Front Outer dia. (ømm)	Barrel Length (mm)	Weight (kg)	Standard Mount	
11mm	90	0.122	120	52	39	65	72	54	90							8.0	-0.02	0.03	41.8	43.1	125	301	1.85	C	MTL-9011C-01		
	100	0.110	220	58	44	73	80	60	100							8.0	0.01	0.03	46.4	53.2	125	297	1.89	C	MTL-10011C-01		
	120	0.092	255	70	52	87	96	72	120							8.0	-0.03	0.04	55.7	76.7	160	316.7	3.20	C	MTL-12011C-00		
	135	0.081	260	79	59	98	108	81	135							8.0	-0.02	0.05	62.6	96.9	160	378.4	3.55	C	MTL-13511C-00		
	150	0.073	300	87	66	109	120	90	150							8.0	-0.01	0.04	69.7	120.0	180	408.9	4.45	C	MTL-15011C-00		
	180	0.061	350	105	78	131	144	108	180							8.0	0.02	0.05	83.5	172.1	210	461.8	7.09	C	MTL-18011C-00		
	195	0.056	365	114	85	142	156	117	195							8.0	-0.05	0.04	90.6	202.6	230	505.8	7.95	C	MTL-19511C-00		
	240	0.046	375	140	105	174	192	144	240							8.0	0.04	0.05	111.3	305.9	300	654.6	15.2	C	MTL-24011C-00		
	265	0.041	540	155	116	193	213	159	266							8.0	0.03	0.05	123.3	375.5	300	689.8	15.2	C	MTL-26511C-00		
	310	0.035	470	181	135	226	248	186	310							8.0	-0.04	0.05	144.0	512.5	350	733.6	25.4	C	MTL-31011C-00		
18.5mm	35	0.527	95	12	9	15	17	13	21	27	20	33				8.0	-0.03	0.05	9.6	2.3	60	138.3	0.51	C	MTL-3518C-053		
	45	0.410	110	16	12	20	21	16	27	34	25	43				8.0	-0.04	0.05	12.4	3.8	71	163.2	0.69	C	MTL-4518C-041		
	55	0.335	135	19	14	24	26	20	33	42	31	52				8.0	-0.03	0.04	15.2	5.7	78	198.1	0.79	C	MTL-5518C-034		
	65	0.285	135	22	17	28	31	23	39	50	36	61				8.0	-0.04	0.04	17.8	7.9	86	223.1	0.85	C	MTL-6518C-029		
	80	0.228	165	28	21	35	39	29	48	62	45	77				8.0	-0.03	0.03	22.2	12.3	104	272.0	1.33	C	MTL-8018C-023		
	90	0.206	120	31	23	39	43	32	53	69	50	85				8.0	0.02	0.03	24.7	15.2	125	331.5	2.07	C	MTL-9018C-021		
	100	0.185	220	35	26	43	48	36	59	76	56	95				8.0	0.02	0.03	27.5	18.7	125	327.3	2.11	C	MTL-10018C-01		
	120	0.154	255	42	31	52	57	43	71	92	67	114				8.0	0.03	0.04	33.0	27.0	160	347.6	3.42	C	MTL-12018C-01		
	135	0.137	260	47	35	58	64	48	80	103	75	128				8.0	0.03	0.05	37.1	34.1	160	409.2	3.77	C	MTL-13518C-01		
	150	0.123	300	52	39	65	71	54	89	115	84	142				8.0	0.02	0.04	41.2	42.2	180	439.7	4.67	C	MTL-15018C-01		
	180	0.103	350	62	47	78	86	64	107	137	101	170				8.0	0.03	0.05	49.4	60.6	210	492.7	7.31	C	MTL-18018C-01		
	195	0.095	365	67	51	84	93	70	116	149	109	185				8.0	-0.04	0.04	53.6	71.3	230	536.6	8.17	C	MTL-19518C-00		
	240	0.077	375	83	62	104	114	86	143	183	134	227				8.0	0.05	0.05	65.8	107.6	300	685.4	15.5	C	MTL-24018C-00		
	265	0.070	540	92	69	115	126	95	158	203	149	251				8.0	0.03	0.05	72.9	132.1	300	720.6	15.5	C	MTL-26518C-00		
	310	0.060	470	107	81	134	148	111	185	237	174	294				8.0	0.04	0.05	85.2	180.2	350	764.5	25.6	C	MTL-31018C-00		
23mm	35	0.655	95	10	7	12	13	10	17	22	16	27	28	21	35	8.0	-0.03	0.05	7.7	1.5	60	164.3	0.55	P	MTL-3523P-066		
	45	0.509	110	13	9	16	17	13	22	28	20	34	36	27	45	8.0	-0.04	0.05	10.0	2.5	71	189.2	0.73	P	MTL-4523P-051		
	55	0.417	135	15	12	19	21	16	26	34	25	42	44	33	55	8.0	-0.04	0.04	12.2	3.7	78	224.2	0.83	P	MTL-5523P-042		
	65	0.354	135	18	14	23	25	19	31	40	29	49	52	39	65	8.0	-0.04	0.04	14.3	5.1	86	249.1	0.89	P	MTL-6523P-035		
	80	0.284	165	23	17	28	31	23	39	50	36	62	65	49	81	8.0	-0.03	0.03	17.9	7.9	104	298.0	1.38	P	MTL-8023P-029		
	90	0.256	120	25	19	31	34	26	43	55	40	69	72	54	90	8.0	0.02	0.03	19.9	9.8	125	357.5	2.14	P	MTL-9023P-026		
	100	0.230	220	28	21	35	38	29	48	61	45	76	80	60	100	8.0	0.02	0.03	22.1	12.1	125	353.3	2.18	P	MTL-10023P-02		
	120	0.192	255	33	25	42	46	34	57	74	54	91	96	72	120	8.0	0.03	0.04	26.5	17.4	160	373.7	3.49	P	MTL-12023P-01		
	135	0.170	260	38	28	47	52	39	65	83	61	103	108	81	135	8.0	0.03	0.05	29.8	22.0	160	435.3	3.84	P	MTL-13523P-01		
	150	0.153	300	42	31	52	57	43	72	92	68	114	120	90	150	8.0	0.02	0.04	33.1	27.3	180	465.8	4.74	P	MTL-15023P-01		
	180	0.128	350	50	38	63	69	52	86	110	81	137	144	108	180	8.0	0.03	0.05	39.7	39.2	210	518.7	7.38	P	MTL-18023P-01		
	195	0.118	365	54	41	68	75	56	93	120	88	149	156	117	195	8.0	-0.04	0.04	43.1	46.1	230	562.6	8.24	P	MTL-19523P-01		
	240	0.096	375	67	50	83	92	69	115	147	108	183	192	144	240	8.0	0.04	0.05	52.9	69.5	300	711.4	15.5	P	MTL-24023P-01		
	265	0.087	540	74	55	92	102	76	127	163	120	202	213	160	266	8.0	0.03	0.05	58.6	85.4	300	746.6	15.5	P	MTL-26523P-00		
	310	0.074	470	86	65	108	119	89	148	191	140	236	249	186	311	8.0	0.04	0.05	68.5	116.5	350	790.5	25.7	P	MTL-31023P-00		

C : 1-32UNF FB17.526
P : M42 P1 FB11.48
M58 : M58 P0.75 FB24.06
V74 : V-φ74 FB48.3
M95 : M95 P1 FB9.4

Bi-Telecentric Lenses

MTL Series

Image Format 35mm - 82mm

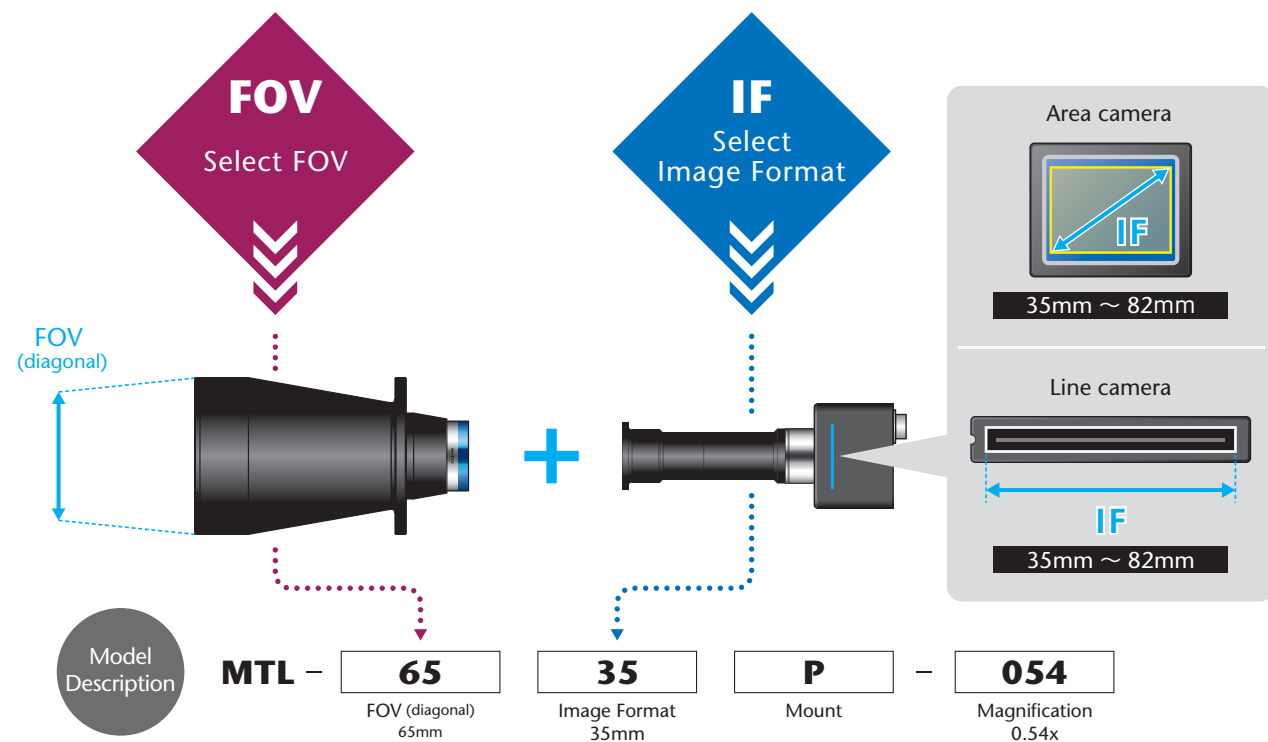
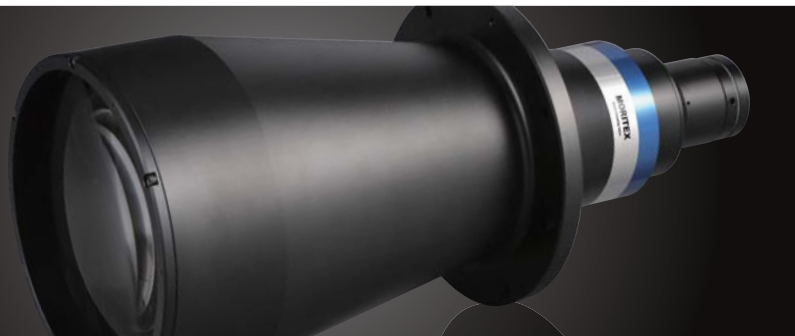


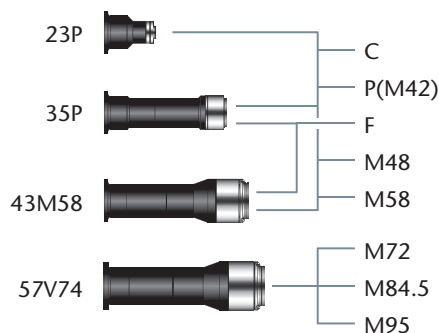
Chart for sensors sizes

Max IF	35mm	43.5mm	57.3mm	82mm
Model name	MTL-xxx35P	MTL-xxx43M58	MTL-xxx57V74	MTL-xxx82M95
Min Pixel size	3.5μm	5μm	5μm	5μm
Mount	P, F, M48, M58	P, F, M48, M58	V74(CA-M72)	M95
Area camera	12M pixel	○	○	○
	16M pixel	○	○	○
	20M pixel	○	○	○
	25M pixel	●	○	○
	29M pixel		●	○
	47M pixel		○	○
	60M pixel		○	○
	71M pixel	○	○	○
Line camera	80M pixel		○	○
	4K 7μm	○	○	○
	6K 7μm		○	○
	8K 3.5μm	●	○	○
	8K 7μm		○	○
	12K 3.5μm	●	○	○
	12K 5μm		○	○
	16K 3.5μm		●	○
	16K 5μm			○
	18K 3.5μm			●

● Recommendation
○ FOV varies according to a camera

Mounts

It corresponds to a number of types of camera mount.

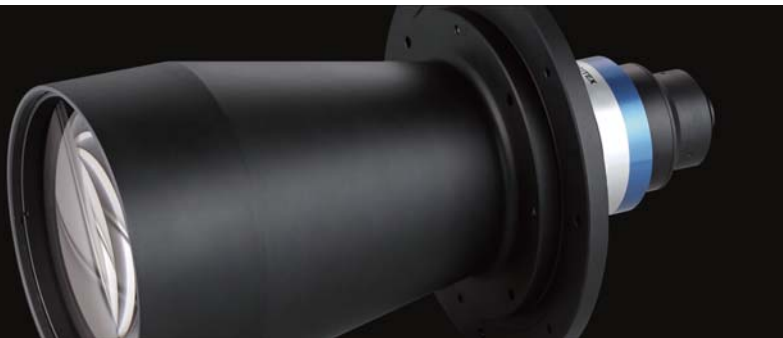


Specification

Max IF (mm)	FOV type	Mag. (x)	WD (mm)	Field of View												Optical specifications				Mechanical specifications				Model name	
				35mm (Max IF : 35mm)			43.5mm (Max IF : 43.5mm)			57.3mm (Max IF : 57.3mm)			82mm 16K 5μm			Effective F#	Distortion (%)	Telecentricity (deg.)	Resolution @520μm (μm)	DOF @40μm (mm)	Front Outer dia. (φmm)	Barrel Length (mm)	Weight (kg)	Standard Mount	
35mm	35	0.999	95	23	23	33										9.2	-0.03	0.05	5.8	0.7	60	222.1	0.86	P	MTL-3535P-100
	45	0.776	110	30	30	42										9.2	-0.04	0.05	7.5	1.2	71	247.0	1.04	P	MTL-4535P-078
	55	0.635	135	36	36	51										9.2	-0.04	0.04	9.2	1.8	78	281.9	1.14	P	MTL-5535P-064
	65	0.540	135	43	43	60										9.2	-0.04	0.04	10.8	2.5	86	306.8	1.20	P	MTL-6535P-054
	80	0.433	165	53	53	75										9.2	-0.03	0.03	13.5	3.9	104	355.8	1.68	P	MTL-8035P-044
	90	0.390	120	59	59	84										9.2	0.02	0.03	14.9	4.8	125	415.3	2.35	P	MTL-9035P-039
	100	0.351	220	66	66	93										9.2	0.02	0.03	16.6	6.0	125	411.1	2.39	P	MTL-10035P-035
	120	0.292	255	79	79	112										9.2	0.03	0.04	19.9	8.6	160	431.5	3.70	P	MTL-12035P-029
	135	0.260	260	89	89	125										9.2	0.03	0.05	22.4	10.9	160	493.0	4.05	P	MTL-13535P-026
	150	0.233	300	99	99	140										9.2	0.02	0.04	24.9	13.5	180	523.4	4.95	P	MTL-15035P-023
	180	0.195	350	118	118	167										9.2	0.03	0.05	29.8	19.3	210	576.4	7.59	P	MTL-18035P-019
	195	0.180	365	128	128	181										9.2	0.04	0.04	32.4	22.7	230	620.3	8.45	P	MTL-19535P-018
	240	0.146	375	158	158	223										9.2	0.05	0.05	39.8	34.3	300	769.2	15.7	P	MTL-24035P-015
	265	0.132	540	175	175	247										9.2	0.03	0.05	44.1	42.1	300	804.4	15.7	P	MTL-26535P-013
	310	0.113	470	204	204	288										9.2	0.04	0.05	51.5	57.5	350	848.2	25.9	P	MTL-31035P-011
43.5mm	35	1.240	95	19	19	26	29	19	35							13.7	-0.03	0.05	7	0.7	60	253.6	0.78	M58	MTL-3543M58-124
	45	0.964	110	24	24	34	38	25	45							13.7	-0.04	0.05	9	1.2	71	278.6	0.96	M58	MTL-4543M58-096
	55	0.788	135	29	29	41	46	31	55							13.7	-0.04	0.04	11	1.8	78	313.5	1.06	M58	MTL-5543M58-079
	65	0.670	135	34	34	49	54	36	65							13.7	-0.04	0.04	13	2.4	86	338.5	1.12	M58	MTL-6543M58-067
	80	0.537	165	43	43	61	67	45	81							13.7	-0.03	0.03	16.2	3.8	104	387.4	1.60	M58	MTL-8043M58-054
	90	0.484	120	48	48	67	75	50	90							13.7	0.02	0.03	18	4.7	125	446.9	2.50	M58	MTL-9043M58-048
	100	0.435	220	53	53	75	83	55	100							13.7	0.02	0.03	20	5.8	125	442.7	2.54	M58	MTL-10043M58-044
	120	0.362	255	64	64	90	100	67	120							13.7	0.03	0.04	24	8.3	160	463.2	3.85	M58	MTL-12043M58-036
	135	0.322	260	71	71	101	112	75	135							13.7	0.03	0.05	26.9	10.5	160	524.6	4.20	M58	MTL-13543M58-032
	150	0.290	300	79	79	112	125	83	150							13.7	0.02	0.04	30	13.0	180	555.0	5.10	M58	MTL-15043M58-029
	180	0.242	350	95	95	135	149	100	180							13.7	0.03	0.05	35.9	18.7	210	608.0	7.74	M58	MTL-18043M58-024
	195	0.223	365	103	103	146	162	108	195							13.7	-0.04	0.04	39	22.0	230	652.0	8.60	M58	MTL-19543M58-022
	240	0.182	375	127	127	179	199	133	239							13.7	0.05	0.05	47.9	33.2	300	800.8	15.8	M58	MTL-24043M58-018
	265	0.164	540	141	141	199	221	147	265							13.7	0.03	0.05	53	40.8	300	836.0	15.8	M58	MTL-26543M58-016
	310	0.140	470	164	164	232	258	172	310							13.7	0.04	0.05	61.9	55.7	350	879.8	26.0	M58	MTL-31043M58-014
57.3mm	35	1.636	95	14	14	20	22	15	27	30	18	35				15.0	0.03	0.05	5.8	0.4	60	295.1	1.26	V74	MTL-3557V74-164
	45	1.272	110	18	18	26	28	19	34	38	23	45				15.0	0.03	0.05	7.5	0.7	71	320.1	1.44	V74	MTL-4557V74-127
	55	1.040	135	22	22	31	35	23	42	47	28	55				15.0	0.03	0.04	9.2	1.1	78	355.0	1.54	V74	MTL-5557V74-104
	65	0.884	135	26	26	37	41	27	49	55	33	64				15.0	0.04	0.04	10.8	1.5	86	379.9	1.60	V74	MTL-6557V74-088
	80	0.709	165	33	33	46	51	34	61	69	41	80				15.0	0.03	0.03	13.5	2.4	104	428.9	2.08	V74	MTL-8057V74-072
	90	0.638	120	36	36	51	57	38	68	76	46	89				15.0	0.03	0.03	14.9	3.0	125	488.5	2.97	V74	MTL-9057V74-064
	100	0.574	220	40	40	57	63	42	76	85	51	99				15.0	0.03	0.03	16.6	3.6	125	484.2	3.01	V74	MTL-10057V74-057
	120	0.478	255	48	48	68	76	50	91	102	61	119				15.0	0.03	0.04	19.9	5.3	160	504.8	4.32	V74	MTL-12057V74-048
	135	0.425	260	54	54	77	85	57	102	114	68	133				15.0	0.04	0.05	22.4	6.6	160	566.0	4.67	V74	MTL-13557V74-043
	150	0.382	300	60	60	85	95	63	114	127	76	148				15.0	0.02	0.04	24.9	8.2	180	596.3	5.57	V74	MTL-15057V74-038
	180	0.319	350	72	72	102	113	76	136	153	91	178				15.0	0.03	0.04	29.8	11.8	210	649.4	8.21	V74	MTL-18057V74-032
	195	0.294	365	78	78	111	123	82	148	166	99	193				15.0	0.03	0.04	32.4	13.9	230	693.3	9.07	V74	MTL-19557V74-029
	240	0.240	375	96	96	136	151	101	181	203	121	237				15.0	0.05	0.05	39.8	20.9	300	842.2	16.3	V74	MTL-24057V74-024
	265	0.216	540	107	107	151	167	112	201	225	134	262				15.0	0.03	0.05	44.1	25.7	300	877.4	16.3	V74	MTL-26557V74-022
	310	0.185	470	125	125	176	195	130	235	263	157	306				15.0	0.05	0.05	51.5	35.1	350	921.2	26.5	V74	MTL-31057V74-019
82mm	45	1.840	110	13	13	18	20	13	24	26	16	31	-	-	45	18.0	0.03	0.05	6.2	0.4	71	511.7	2.06	M95	MTL-4582M95-182
	55	1.505	135	15	15	22	24	16	29	32	19	38	-	-	54	18.0	0.03	0.04	7.6	0.6	78	546.7	2.16	M95	MTL-5582M95-149
	65	1.279	135	18	18	25	28	19	34	38	23	44	-	-	64	18.0	0.03	0.04	8.9	0.9	86	571.6			

Telecentric Illuminators

MTI Series



Large area telecentric illuminator for silhouette inspection, provides optimized parallel beam to best match the MTL Series.

Straight type

LINEUP			
MTI-45	Lighting Area	φ45mm	
MTI-65	Lighting Area	φ65mm	
MTI-100	Lighting Area	φ100mm	
MTI-120	Lighting Area	φ120mm	
MTI-135	Lighting Area	φ135mm	
MTI-150	Lighting Area	φ150mm	
MTI-180	Lighting Area	φ180mm	
MTI-195	Lighting Area	φ195mm	
MTI-265	Lighting Area	φ265mm	

L shape type

LINEUP			
MTI-45-L	Lighting Area	φ45mm	
MTI-65-L	Lighting Area	φ65mm	
MTI-100-L	Lighting Area	φ100mm	
MTI-120-L	Lighting Area	φ120mm	



Model Description

MTI – 45 – C G – 070

Lighting Area 45mm

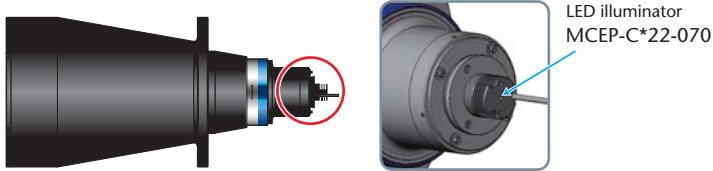
Color Green

Model name	Color	Optical specifications		Mechanical specifications		
		Lighting Area (φmm)	WD (mm)	Length *1 (mm)	Front Outer dia. (φmm)	Weight (kg)
MTI-45-CG-070	● Green	45	115	148.4	65	0.58
MTI-45-CW-070	○ White	45	115	156.4	65	0.58
MTI-45-CG-070-L	● Green	45	115	100 x 90 x 128.4	65	0.7
MTI-65-CG-070	● Green	65	140	169	86	0.76
MTI-65-CW-070	○ White	65	140	177	86	0.76
MTI-65-CG-070-L	● Green	65	140	120 x 107 x 141	86	1.1
MTI-100-CG-070	● Green	100	220	279	125	1.7
MTI-100-CW-070	○ White	100	220	287	125	1.7
MTI-100-CG-070-L	● Green	100	59.5	160 x 128.9 x 230.1	124	2.6
MTI-120-CG-070	● Green	120	175	292.9	160	3.6
MTI-120-CW-070	○ White	120	175	300.9	160	3.6
MTI-120-CG-070-L	● Green	120	175	200 x 166.6 x 256.4	160	6.1
MTI-135-CG-070	● Green	135	260	360.9	160	3.5
MTI-135-CW-070	○ White	135	260	368.9	160	3.5
MTI-150-CG-070	● Green	150	300	391.4	180	4.5
MTI-150-CW-070	○ White	150	300	399.4	180	4.5
MTI-180-CG-070	● Green	180	350	444.3	210	7.1
MTI-180-CW-070	○ White	180	350	452.3	210	7.1
MTI-195-CG-070	● Green	195	365	488.3	230	7.9
MTI-195-CW-070	○ White	195	365	496.3	230	7.9
MTI-265-CG-070	● Green	265	540	672.3	300	15.1
MTI-265-CW-070	○ White	265	540	680.3	300	15.1

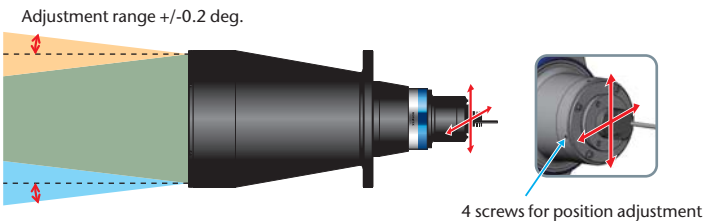
Maximum rated current is 700mA and electrical power consumption is 3W. Recommended controller is MLEP-B070W Series.
Blue color and red color is production on demand basis.
Constant voltage operation type is available on your request.
*1 Lens tube length includes LED illumination unit, and adjustable length allowance is 2.5mm maximum depends on LED.

Beam angle adjustment function

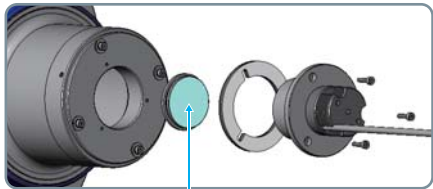
The telecentric illuminators for the bi-telecentric lenses have a beam angle adjustment function so that the beam angle can be fine tuned when the LED lamp is replaced. This enables optimum position adjustment.



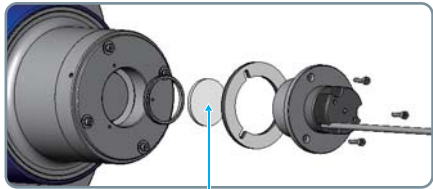
Utilizes the special features of a telecentric lens to make it possible to adjust beam angle irradiation by up to 0.2 degrees by changing the position of the LED element.



Filter insertion function

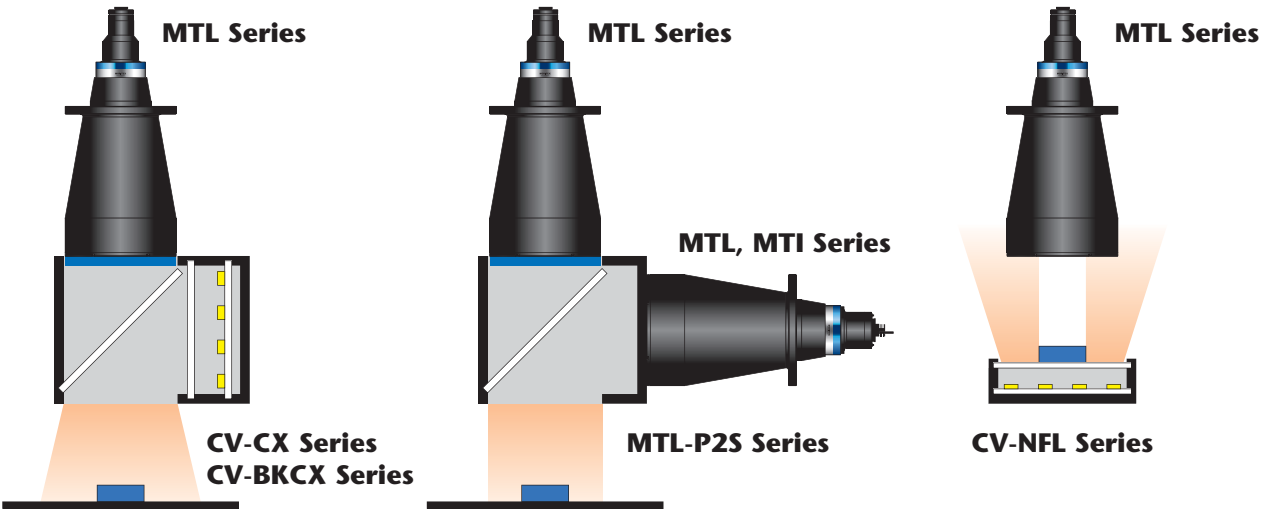


Compatible with most ND filters, color filters and edge filters sold in stores, etc.(M25.5xP0.75)



Achieve even more uniform images by inserting a diffuser. (Non white light illumination MTI***-CW-070 available as an optional product)
*Some measurement accuracy will be affected. Contact us if you would like to use a diffuser.

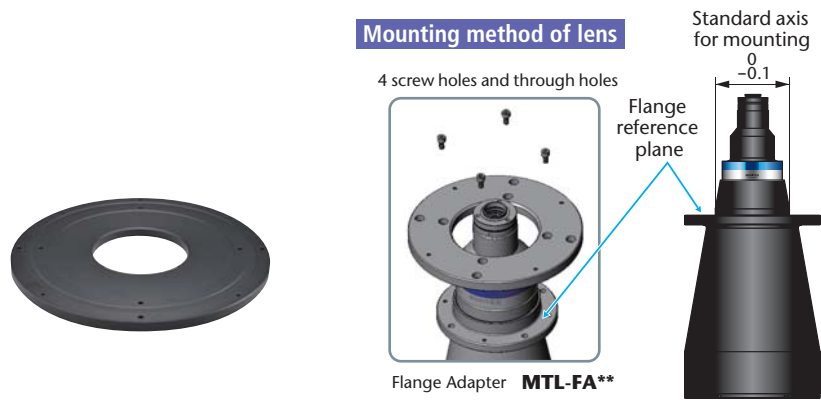
Other illuminators



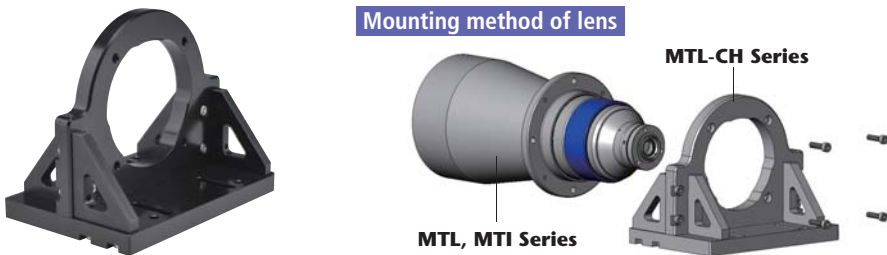
FOV Type	Model name		
	★Simulated Coaxial Box illumination	★Half Mirror Unit	★Narrow Back Light
35	CV-CX-94X60X58□	MTL-P2S45 *1	CV-NFL-51X51□
45	CV-CX-120X84X79□	MTL-P2S45 *2	CV-NFL-51X51□
55	CV-CX-120X84X79□	MTL-P2S65 *3	CV-NFL-63X60□
65	CV-CX-120X84X79□	MTL-P2S65	CV-NFL-63X60□
80	CV-BKCX-100□-B	MTL-P2S100	CV-NFL-83X75□
90	—	—	CV-NFL-100X96□
100	CV-BKCX-100□-B	MTL-P2S100	CV-NFL-100X96□
120	CV-BKCX-135□-B	MTL-P2S135	CV-NFL-150X146□
135	CV-BKCX-135□-B	MTL-P2S135	CV-NFL-150X146□
150	CV-BKCX-195□-B	MTL-P2S150	CV-NFL-150X146□
180	CV-BKCX-195□-B	MTL-P2S195	CV-NFL-230X230□
195	CV-BKCX-195□-B	MTL-P2S195	CV-NFL-230X230□
240	—	—	CV-NFL-230X230□
265	—	—	—
310	—	—	—

★ Made-to-order products.
□ indicates the illumination color.
* Please be noted the resolution may be decreased when to connect with MTL Series.
*1 Connect with MTL-P35-ADR when using MTL-35 Series.
*2 Connect with MTL-P45-ADR when using MTL-45 Series.
*3 Connect with MTL-P55-ADR when using MTL-55 Series.

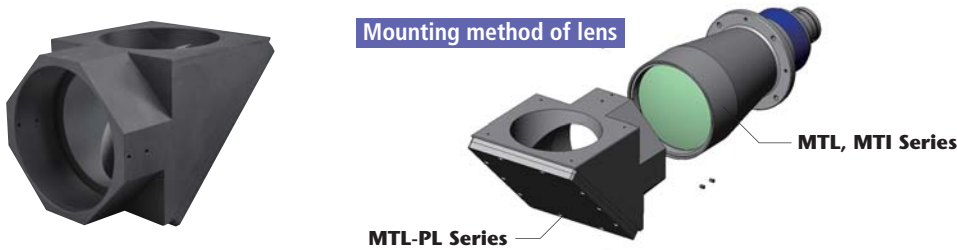
Flange Adapter
MTL-FA Series



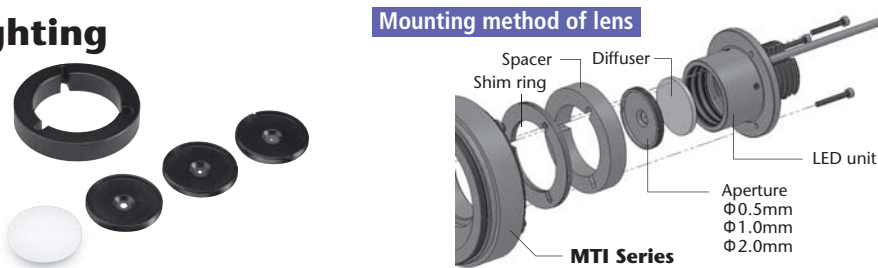
Clamping Holder
MTL-CH Series



Mirror Unit
MTL-PL Series



Apertures for Lighting
MTI-APS



FOV Type	Model name			
	Flange Adapter	Clamping Holder	★Mirror Unit	Apertures for Lighting
35	—	—	MTL-PL45 ^{*2}	MTI-APS
45	—	—	MTL-PL45 ^{*3}	
55	—	—	MTL-PL65 ^{*4}	
65	—	—	MTL-PL65	
80	—	—	MTL-PL80	
90	MTL-FA100 ^{*1}	MTL-CH100 ^{*1}	—	
100	MTL-FA100 ^{*1}	MTL-CH100 ^{*1}	MTL-PL100	
120	MTL-FA135 ^{*1}	MTL-CH135 ^{*1}	MTL-PL135	
135	MTL-FA135 ^{*1}	MTL-CH135 ^{*1}	MTL-PL135	
150	MTL-FA150 ^{*1}	MTL-CH150 ^{*1}	MTL-PL150	
180	MTL-FA180 ^{*1}	MTL-CH180 ^{*1}	MTL-PL180	
195	MTL-FA195	MTL-CH195	MTL-PL195	
240	MTL-FA265	MTL-CH265	MTL-PL265	
265	MTL-FA265	MTL-CH265	MTL-PL265	
310	—	MTL-CH310	—	

★ Made-to-order products.
* Please be noted the resolution may be decreased when to connect with MTL Series.
*1 Can not be connected with MTL-IF82 Series.
*2 Connect with MTL-P35-ADR when using MTL-35 Series.
*3 Connect with MTL-P45-ADR when using MTL-45 Series.
*4 Connect with MTL-P55-ADR when using MTL-55 Series.

Customizing example

Customizing is available for your specific needs.

Two FOVs type of lens
MTL-W Series (Under development)



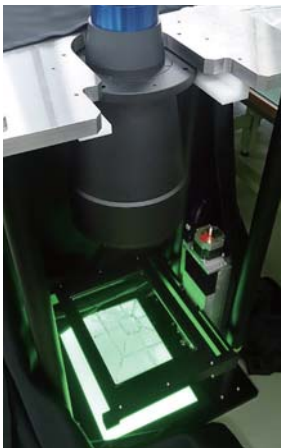
Model name	WD (mm)	IF (mm)	Mag.A	Mag.B
MTL-10011C-012W056	110	11	x0.12	x0.56
MTL-15011C-008W014	200	11	x0.075	x0.141

Coaxial Illumination type of lens
MTL-D Series (Under development)



Model name	
MTL-3518C-053-D	MTL-3543M58-124-D
MTL-4518C-041-D	MTL-4543M58-096-D
MTL-5518C-034-D	MTL-5543M58-079-D
MTL-6518C-029-D	MTL-6543M58-067-D
MTL-8018C-023-D	MTL-8043M58-054-D
MTL-3523P-066-D	MTL-3557V74-164-D
MTL-4523P-051-D	MTL-4557V74-127-D
MTL-5523P-042-D	MTL-5557V74-104-D
MTL-6523P-035-D	MTL-6557V74-088-D
MTL-8023P-029-D	MTL-8057V74-072-D
MTL-3535P-100-D	
MTL-4535P-078-D	
MTL-5535P-064-D	
MTL-6535P-054-D	
MTL-8035P-044-D	

Quality Assurance



Inspection report data provided for every single unit.

[Lens]

- Telecentricity measurement
- Distortion measurement
- MTF measurement

[Illuminator]

- Parallelism
- Uniformity testing

* MTF (Modulation Transfer Function) is spatial frequency.
It indicates contrast degradation of B/W pattern at 1mm area on image surface when B/W pattern chart with continuously changing spatial frequency and this is a characteristics evaluation method of reproducibility of the contrast.
This method provides the quality of image forming and contrast at same time, and inspected area covers from center to the edges.