Panasonic ideas for life

PT-DW730 Series

1-Chip DLP™ Projectors

PT-DW730ES PT-DW730ELS PT-DX800ES PT-DX800ELS





PT-**DW730**ES PT-**DW730**ELS

WXGA

7,000 lm

PT-**DX800**ES PT-**DX800**ELS

XGA

8,000 lm



Compact yet Bright and Versatile

If you are looking for a compact but powerful projector, check out the Panasonic PT-DW730 Series 1-chip DLP™ projectors. The PT-DX800ES and PT-DW730ES produce 8,000 and 7,000 Im of brightness, respectively. The RGB Booster ensures vivid, colourful images, and the original Eco Filter eliminates the need for filter replacement for up to 12,000 hours.*¹ Complete with a dual-lamp system, the PT-DW730 Series gives you high reliability and hassle-free maintenance. Both models enable easy and flexible system configuration.



Vivid Picture Quality with High Brightness

Bright 8,000/7,000 lm from Compact Body

New lamp drive system has helped to make the body as compact as Panasonic's original PT-DZ6700 Series;² while providing high brightness of 8,000 lm for the PT-DX800ES and 7,000 lm for the PT-DW730ES.

RGB Booster Significantly Improves Colour Reproduction

The RGB Booster achieves high image quality with levels of colour reproduction and brightness that make each colour stand out. It combines Panasonic's proprietary Vivid Colour Control technology with a newly engineered Lamp Modulation Drive System for a 1-chip DLP™ projector that produces bright and vivid colours.

Vivid Colour Control

This unique control technology epitomises the use of the colour segment areas of the colour wheel. It increases the brightness of each RGB colour by minimizing the unallocated portions between the colours, to achieve truly vivid colouring.

• Lamp Modulation Drive System

With the advanced lamp modulation technology, the projector is able to control the lamp intensity for each of the red, green, blue, and white segments of the colour wheel separately. Because the actual light output is controlled in relation to each colour segment, light usage is optimised and colour balance is obtained without lowering the brightness. This results in bright vivid images with increased colour fidelity.

RGB Booster



By modulating the lamp power, we can maximize the colour reproduction of each colour without sacrificing brightness. Light usage is optimised, and colour balance is obtained without lowering the brightness.

Conventional system







Because the lamp power was fixed in conventional projectors, colour reproduction was enhanced by sacrificing brightness.

Detail Clarity Processor Brings Depth and Clarity to Details

This advanced image-processing circuit analyses the video signal frequency range for each scene by extracting data on the distribution of high, mid, and low-frequency components, and brings out fine details accordingly. The resulting images have a more natural, three-dimensional appearance with crisp, clear detail.

System Daylight View 2 for Enhanced Colour Perception

Image details are less clear when a projector is used in a room with the lights on. Panasonic's System Daylight View 2 improves brightness perception by adjusting sharpness,

gamma curves, and colour corrections. This produces crisper, more stunning images with vivid colours even under bright conditions.





Without System Daylight View 2

PT-DW730 series with System

Easy Maintenance and Superior Reliability

Eco Filter that Needs No Maintenance for up to 12,000 Hours*1

The original Eco Filter consists of two Micro Cut Filters (electrostatic filters), a pre-filter and a main filter, which use an ion effect to collect extremely small dust particles. The pre-filter has a honeycomb configuration and the main filter is pleated to achieve a large surface area that raises its dust collecting performance. Thanks to these features, the Eco Filter has a replacement cycle of up to 12,000 hours*1, which reduces the hassle of maintenance.

And, as an environmental consideration, the filter can be washed with water and reused.*3



Dual-Lamp System Prevents Image Interruptions

The Dual-Lamp System eliminates the need to interrupt a presentation if a lamp should burn out (in dual-lamp operation mode). The Lamp Relay mode also operates the lamps alternately to enable 24/7 projector operation.

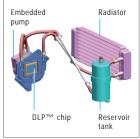
Cost and Space-Saving Lamp Compatibility

The replacement lamp unit*4 can be used with all of the Panasonic PT-DZ6700 Series*2 and PT-DZ570 Series projectors.*5 This reduces the number of lamp types that need to be kept in stock when multiple projectors are used.

Liquid Cooling System Attains a High Level of Reliability

The original, newly designed liquid cooling system directly cools the DLP™ chip to improve performance and enable operation up to 45°C (113°F).*6 This allows use in a wider variety of environments, while stabilizing performance and keeping the unit quiet even in harsh con-

ditions. It also contributes to realizing the compact body. Plus, Panasonic's liquid cooling system is hermetically sealed, so you don't need to replenish the liquid.



System Integration Flexibility

Flexible Installation

The wide adjustment range of the powered horizontal/vertical lens shift function assures convenience and versatility during installation. It lets you easily make adjustments with the remote control. The unit can also be rotated 360 degrees vertically. This means you can install it at any angle you want, to accommodate different installation conditions.



Multi-Screen Support System Seamlessly Connects Multiple Screens

The Multi-Screen Support System optimally adjusts multiple screens: Edge blending, colour matching and multi-screen processor.

Edge Blending

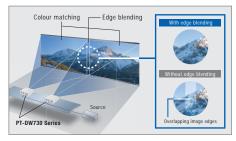
The edges of adjacent screens can be blended and their luminance controlled.

Colour Matching

This function corrects for slight variations in the colour reproduction range of individual projectors.

Multi-Screen Processor

The PT-DW730 Series projector can project large, multi-screen images without any additional equipment. Up to 100 units (10 x 10) can be edge-blended at a time



Side-by-Side Function*7 (PT-DW730ES/DW730ELS)

The PT-DW730ES/ DW730ELS can simultaneously display images from two sources onto a single screen. For exam-

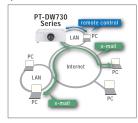


ple, you can display a PC image on the left and a video image on the right. Taking advantage of the wide-screen projection, this function gives you a host of new application possibilities to explore.

Web Browser Control/Monitoring and E-mail Message Alert

The PT-DW730 Series can be easily operated remotely over a LAN network, because it is all done using the computer's familiar web brows-

er. Furthermore, the projector sends an e-mail message to notify the operator when an error has occurred, or a lamp needs to be replaced.



PJLink™ Compatibility

The LAN terminals support PJLink $^{\rm TM}$ Class 1 connection, which is highly convenient for system construction.

Multi Projector Monitoring & Control Software

Panasonic's original freeware, "Multi Projector Monitoring & Control Software," allows the user to control and monitor multiple projectors at the same time via LAN. Projectors can be scheduled to turn on and off at a certain hour everyday. When a problem occurs, an alarm message is sent to the monitoring/controlling PC.

Standby Mode: Eco*8

The PT-DW730 Series has attained a low standby power level of 0.3 W (standby mode: eco). It also helps to slash running costs, and reduces environmental impact.

Other Valuable Features

- 3D colour management system
- HD IP conversion
- · Digital noise reduction
- Dynamic sharpness control
- 30m long-range wireless remote control
- · Mechanical lens shutter
- Direct Power Off allows unplugging the power cord right after use

Recommended Applications

The PT-DW730 Series boasts superior image quality, flexible installation, and easy maintenance, making either model an ideal choice for use in classrooms, auditoriums, houses of worship, museums, and much more.

- Conferences, classrooms
- · Auditoriums, houses of worship
- Rental, staging
- Museums

Ecology-conscious Design

Panasonic works from every angle to minimize environmental impact in the product design, production and delivery processes, and in the performance of the product during its life cycle. The PT-DW730 Series projector reflects the following ecological considerations.

- No halogenated flame retardants are used in the cabinet.
- Lead-free solder is used to mount components to the printed circuit boards.
- Lamp power switching further reduces power consumption.
- Standby power consumption of only 0.3 W has been achieved (standby mode: eco).*
 Auto Power Save activates standby mode when no
- signal is input.



All PT-DW730 Series projectors are carefully manufactured at the Panasonic factory in Japan, under strict quality control. This is another, very important advantage of a Panasonic projector.

- *1 The usage environment affects the duration of the filter.
- *2 PT-DZ6710E/DZ6710EL/DZ6700E/DZ6700EL/DW6300ES/DW6300ELS/D6000ES/D6000ELS/D5000ES/D5000ELS.
- *3 When washing with water, please follow the procedures listed in the operating instructions. Also, we recommend replacing the filter with a new one after it has been washed and reused twice. If the filter is not sufficiently clean after washing, replace it with a new one.
- *4 ET-LAD60A/LAD60AW
- *5 PT-DZ570E/DW530E/DX500E.

- *6 The operating temperature range is 0°C to 40°C (32°F to 104°F) when the fan control is set to High Altitude mode (for altitudes from 1,400 m to 2,700 m (4,593 ft to 8,858 ft) above sea level). Also, if the ambient temperature exceeds 40°C (104°F) (35°C (95°F) in High Altitude mode) when the projector is being used with Lamp Select set to Dual and Lamp Power set to High, the light output may be reduced approximately 20% to protect the projector.
- *7 This function is not effective for some source combinations
- *8 When the standby mode is set to eco, network functions such as power on over the LAN will not operate. Also, only certain commands can be received for external control using the serial terminal.

Specifications

Specifications									
Model	PT-DW730ES/DW730ELS	PT-DX800ES/DX800ELS							
Power supply	220-240 V AC, 4.3 A, 50/60 Hz								
Power consumption	760 W (950 VA) at 240 V AC (0.3 W at 220- 9 W at 220-240 V AC when standby mode								
DLP™ chip Panel size Display method	16.5 mm (0.65 inches) diagonal (16:10 aspect ratio) DLP™ chip × 1, DLP™ projection system	17.8 mm (0.7 inches) diagonal (4:3 aspect ratio)							
Pixels Lens	1,024,000 (1,280 × 800) pixels	786,432 (1,024 × 768) pixels							
PT-DW730ES/DX800ES PT-DW730ELS/DX800ELS									
Lamp	300 W (max. 310 W) UHM lamp × 2								
Screen size (diagonal)	1.27-15.24 m (50-600 inches), 1.27-5.08 m (50-200 inches) with the ET-DLE055, 16:10 aspect ratio	1.27-15.24 m (50-600 inches), 1.27-5.08 m (50-200 inches) with the ET-DLE055, 4:3 aspect ratio							
Brightness*2	7,000 lm (dual-lamp, lamp mode: high)	8,000 lm (dual-lamp, lamp mode: high)							
Centre-to-corner uniformity*2	90 %								
Contrast*2	2,500:1 (full on/full off, contrast mode: high*3)	2,000:1 (full on/full off, contrast mode: high*3)							
Resolution	1,280 \times 800 pixels (Input signals that exceed this resolution will be converted to 1,280 \times 800 pixels.)	1,024 × 768 pixels (Input signals that exceed this resolution will be converted to 1,024 × 768 pixels.)							
Scanning frequency DVI-D	E., 15 O1 III - E., 50 O5 II - Het electronic	CO Mile or lever							
RGB	fH: 15-91 kHz, fv: 50-85 Hz, dot clock: 1 fH: 15-91 kHz, fv: 50-85 Hz, dot clock: 1 fH: 15.75 kHz, fv: 60 Hz [480i (525i)]	50 MHz or lower							
YPBPR (YCBCR)	fis: 15.75 kHz, fis: 60 Hz [480] (525)] fis: 31.50 kHz, fis: 60 Hz [480] (525)] fis: 15.63 kHz, fis: 50 Hz [576] (625)] fis: 31.25 kHz, fis: 50 Hz [576] (625)] fis: 37.50 kHz, fis: 60 Hz [720] (750)/60p] fis: 37.50 kHz, fis: 50 Hz [720] (750)/50p] fis: 33.75 kHz, fis: 60 Hz [720] (750)/50p]	fix: 28.13 kHz, fiv. 50 Hz [1080 (1125)/50]] fix: 28.13 kHz, fiv. 25 Hz [1080/25p] fix: 27.00 kHz, fiv. 24 Hz [1080/24p] fix: 27.00 kHz, fiv. 24 Hz [1080/24p] fix: 27.00 kHz, fiv. 30 Hz [1080/30p] fix: 67.50 kHz, fiv. 30 Hz [1080/60p] fix: 67.50 kHz, fiv. 50 Hz [1080/60p]							
Video/S-Video	fii: 33.75 kHz, fiv: 60 Hz [1080 (1125)/60i] fii: 15.75 kHz, fiv: 60 Hz [NTSC/NTSC4.43/PAL-M/PAL60], fii: 15.63 kHz, fiv: 50 Hz [PAL/PAL-N/SECAM]								
Optical axis shift Vertical	+60% from centre of screen (powered)	+50% (+45% with the ET-DLE080) from centre of screen (powered)							
Horizontal	±10% from centre of screen (powered)	±10% from centre of screen (powered)							
Keystone correction range	Vertical: ±40° (±30° with the ET-DLE055/	DLE080)							
Installation	Ceiling/floor, front/rear								
Terminals DVI-D IN	DVI-D 24-pin × 1 (DVI 1.0 compliant, compatible with HDCP, compatible with single link only) 480p, 576p, 720/60p, 720/50p, 1080/60i, 1080/50i, 1080/24p, 1080/24sF, 1080/25p, 1080/30p, 1080/60p, 1080/50p, VGA (640 × 480)—WUXGA (1,920 × 1,200)*4 compatible with non-interlaced signals only, dot clock: 25–162 MHz								
RGB 1 IN	BNC × 5 (RGB/YPBPR/YCBCR × 1)								
RGB 2 IN VIDEO IN	D-Sub HD 15-pin (female) × 1 (RGB/YPBPR/YCBCR × 1) BNC × 1 (composite video)								
S-VIDEO IN	Mini DIN 4-pin × 1 (S-Video)								
SERIAL IN SERIAL OUT	D-sub 9-pin (female) × 1 for external control (RS-232C compliant) D-sub 9-pin (male) × 1 for link control (RS-232C compliant)								
REMOTE 1 IN	M3 × 1 for wired remote control								
REMOTE 1 OUT REMOTE 2 IN	M3 × 1 for link control (for wired remote control) D-sub 9-pin (female) × 1 for external control (parallel)								
LAN	RJ-45 $ imes$ 1 (for network connection, 10Base-T/100Base-TX, compliant with PJLink TM)								
Cabinet materials	Moulded plastic								
Dimensions (W × H × D) PT-DW730ES/DX800ES PT-DW730ELS/DX800ELS	498 × 175* ⁵ × 466* ⁶ mm (19-19/32" × 6- 498 × 175* ⁵ × 432* ⁶ mm (19-19/32" × 6-	7/8" *5 × 18-11/32" *6)(with supplied lens) 7/8" *5 × 17" *6) (without lens)							
Weight PT-DW730ES/DX800ES PT-DW730ELS/DX800ELS	Approximately 16.3 kg (35.9 lbs) (with supplied lens) Approximately 15.4 kg (34.0 lbs) (without lens)								
Operating environment	Operating temperature: 0°C-45°C (32°F-113°F)* ⁷ , operating humidity: 20%-80% (no condensation)								
Supplied accessories	Power cord, power cord secure lock, wireless/wired remote control unit, batteries (R6/AA type \times 2)								



Terminals

- Video input S-Video input RGB 1 input RGB 2 Input
- DVI-D input LAN connector
- Remote 1 input
 Remote 1 output
 Remote 2 input
 Serial input
 Serial output

Panasonic



Projection distance

PT-DW730E (16:10 aspect ratio)

Diagon		Throw distance												
image	size	ET-D	LE080	ET-DLE150 Supplied lens			ed lens	ET-DLE250		ET-DLE350		ET-DLE450		ET-DLE055
<throw ratio=""></throw>			< 0.8 - 1.0:1 >		<1.4-2.0:1>		<1.8-2.5:1>		< 2.4 - 3.8:1>		< 3.8 - 5.7:1>		9.0:1>	< 0.8:1>
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	
1.27	[50"]	0.87	1.09 (3.6)	1.45 (4.7)	2.12 (6.9)	1.91 (6.3)	2.70 (8.9)	2.54 (8.3)	4.06 (13.3)	4.00 (13.1)	6.11 (20.1)	5.96 (19.5)	9.60 (31.5)	0.87 (2.9)
2.03	[80"]	1.42	1.77 (5.8)	2.35 (7.7)	3.42 (11.2)	3.11 (10.2)	4.37 (14.3)	4.12 (13.5)	6.55 (21.5)	6.48 (21.3)	9.86 (32.3)	9.71 (31.9)	15.53 (51.0)	1.42 (4.7)
2.54	[100~]	1.78 (5.9)	2.22 (7.3)	2.95 (9.7)	4.28 (14.0)	3.90 (12.8)	5.48 (18.0)	5.17 (16.9)	8.20 (26.9)	8.13 (26.7)	12.36 (40.5)	12.22 (40.1)	19.49 (63.9)	1.79 (5.9)
3.81	[150"]	2.70 (8.9)	3.36 (11.0)	4.45 (14.6)	6.45 (21.2)	5.89 (19.3)	8.25 (27.1)	7.79 (25.5)	12.35 (40.5)	12.27 (40.2)	18.61 (61.0)	18.47 (60.6)	29.38 (96.4)	2.71 (8.9)
5.08	[200"]	3.62 (11.9)	4.49 (14.7)	5.95 (19.5)	8.61 (28.3)	7.88 (25.8)	11.03 (36.2)	10.41 (34.2)	16.49 (54.1)	16.40 (53.8)	24.85 (81.5)	24.73 (81.1)	39.28 (128.9)	3.63 (11.9)
7.62	[300~]	5.45 (17.9)	6.76 (22.2)	8.96 (29.4)	12.95 (42.5)	11.85 (38.9)	16.58 (54.4)	15.65 (51.4)	24.77 (81.3)	24.67 (80.9)	37.35 (122.5)	37.25 (122.2)	59.06 (193.8)	(-)
10.16	[400"]	7.28 (23.9)	9.02 (29.6)	11.96 (39.2)	17.28 (56.7)	15.83 (51.9)	22.13 (72.6)	20.90 (68.6)	33.06 (108.4)	32.94 (108.1)	49.84 (163.5)	49.76 (163.3)	78.85 (258.7)	_ (-)
12.70	[500"]	9.11 (29.9)	11.29 (37.0)	14.96 (49.1)	21.61 (70.9)	19.80 (65.0)	27.68 (90.8)	26.14 (85.8)	41.34 (135.6)	41.20 (135.2)	62.33 (204.5)	62.28 (204.3)		_ (-)
15.24	[600~]	10.94 (35.9)	13.56 (44.5)	17.96 (58.9)	25.94 (85.1)	23.78 (78.0)	33.23 (109.0)	31.39 (103.0)	49.62 (162.8)	49.47 (162.3)	74.82 (245.5)	74.80 (245.4)	118.43 (388.5)	_ (-)

PT-DX800E (4:3 aspect ratio)

Diagona		Throw distance												
image s	ize	ET-D	LE080	ET-DLE150 Supp			olied lens ET-DLE		LE250	E250 ET-DLE350		ET-DLE450		ET-DLE05
<throw ratio=""></throw>		< 0.8 - 1.0:1>		<1.3-2.0:1>		<1.8-2.5:1>		< 2.4 - 3.7:1>		<3.7-5.6:1>		<5.5-8.9:1>		< 0.8:1>
		min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	
1.27	[50"]	(2.6)	1.01 (3.3)	1.34	1.97 (6.5)	1.78 (5.8)	2.51 (8.2)	2.36 (7.7)	3.78 (12.4)	3.71 (12.2)	5.68 (18.6)	5.53 (18.1)	8.91 (29.2)	0.81 (2.7)
2.03	[80"]	1.32	1.64	2.18 (7.2)	3.18 (10.4)	2.89 (9.5)	4.06 (13.3)	3.83	6.09 (20.0)	6.02	9.17 (30.1)	9.02	14.44 (47.4)	1.32 (4.3)
2.54	[100"]	1.66 (5.4)	2.07 (6.8)	2.74 (9.0)	3.98 (13.1)	3.63 (11.9)	5.10 (16.7)	4.80 (15.8)	7.63 (25.0)	7.56 (24.8)	11.50 (37.7)	11.35 (37.2)	18.12 (59.5)	1.66 (5.5)
3.81	[150"]	2.51 (8.2)	3.12 (10.2)	4.14 (13.6)	6.00 (19.7)	5.48 (18.0)	7.68 (25.2)	7.24 (23.8)	11.49 (37.7)	11.41 (37.4)	17.31 (56.8)	17.18 (56.4)	27.33 (89.7)	2.52 (8.3)
5.08	[200"]	3.36 (11.0)	4.18 (13.7)	5.54 (18.2)	8.02 (26.3)	7.33 (24.0)	10.26 (33.7)	9.69 (31.8)	15.34 (50.3)	15.26 (50.1)	23.13 (75.9)	23.00 (75.5)	36.54 (119.9)	3.38 (11.1)
7.62	[300~]	5.07 (16.6)	6.29 (20.6)	8.33 (27.3)	12.05 (39.5)	11.03 (36.2)	15.43 (50.6)	14.57 (47.8)	23.06 (75.6)	22.96 (75.3)	34.76 (114.0)	34.66 (113.7)	54.97 (180.3)	_ (-)
10.16	[400~]	6.77	8.40 (27.5)	11.13 (36.5)	16.08 (52.8)	14.73 (48.3)	20.60 (67.6)	19.45 (63.8)	30.77 (100.9)	30.65 (100.6)	46.39 (152.2)	46.31 (151.9)	73.39 (240.8)	_ (-)
12.70	[500"]	8.48 (27.8)	10.51 (34.5)	13.92 (45.7)	20.12 (66.0)	18.43 (60.5)	25.77 (84.5)	24.33 (79.8)	38.48 (126.2)	38.35 (125.8)	58.02 (190.4)	57.96 (190.2)	91.81 (301.2)	_ (-)
15.24	[600"]	10.18 (33.4)	12.62 (41.4)	16.72 (54.9)	24.15 (79.2)	22.13 (72.6)	30.94 (101.5)	29.22 (95.9)	46.19 (151.5)	46.05 (151.1)	69.65	69.61 (228.4)	110.23	_ (-)

Black models

Black cabinet models are also available as built-to-order.

The specifications are the same as those of the PT-DW730ES/DW730ELS and PT-DX800ES/DX800ELS.

PT-DW730EK/ DX800EK

PT-DW730ELK/ DX800ELK

unit: metres (feet)





Optional accessories















ET-PKD55S

0

ET-EMF300 Replacement filter unit





Replacement lamp unit (twin pack)



Optional lens throw ratios

Model	PT-DW730ES/ DW730ELS	PT-DX800ES/ DX800ELS
Aspect ratio	16:10	4:3
ET-DLE080	0.8-1.0:1	0.8-1.0:1
ET-DLE150	1.4-2.0:1	1.3-2.0:1
ET-DLE250	2.4-3.8:1	2.4 - 3.7:1
ET-DLE350	3.8-5.7:1	3.7 - 5.6:1
ET-DLE450	5.6-9.0:1	5.5-8.9:1
ET-DLE055	0.8:1	0.8:1

NOTES ON USE

700m lens

Zoom lens

- Do not install the projector in locations that are subject to excessive water, humidity, steam, or oily smoke. Doing so may result in fire, malfunction, or electric shock.

- Do not install the projector in locations that are subject to excessive water, humidity, steam, or oily smoke. Doing so may result in fire, malfunction, or electric shock.

 The projector uses a high-voltage mercury lamp that contains high internal pressure. This lamp may break, emitting a large sound, or fail to illuminate, due to impact or extended use.

 The projector uses a high-wattage lamp that becomes very hot during operation. Please observe the following precautions:

 Never place objects on top of the projector while it is in operation.

 Make sure there is an unobstructed space of 500 mm (19-11/16 in) or more around the projector's intake and exhaust openings.

 Do not stack projector units is drectly on top of one another for the purpose of multiple (stacked) projection. When stacking projector units, be sure to provide the amount of space indicated between them. These space requirements also apply to installation where only one projector unit is operating at one tilm each the other unit is used as a backup.

 If the projector is placed in a box or enclosure, the temperature of the air surrounding the projector must be between 0°C (32°F) and 40°C (104°F). Also, make sure the projector's intake and exhaust openings are not blocked. Take particular care to ensure that hot air from the exhaust openings is not sucked into the intake openings. Even when the ambient temperature can the intake opening is 40°C (104°F) or lower, an accumulation of thot air inside the cabinet may cause the protective circuit to activate and shut down the projector. Please give ample consideration to the design with regard to ambient temperature conditions. If the projector is to be operated continuously 24 hours a day use the dual-lamp potical systems alternating lamp operation (lamp change) function. The projector cannot be operated continuously 24 hours a day in dual-lamp mode. Allow a minimum of two hours per day of non-operation lime per lamp if using the dual-lamp mode and per lamp of the projector in the projector in the proj

For more information about Panasonic projectors

http://panasonic.net/avc/projector



Factories of Business Solutions Business Group have received ISO 14001:2004—the Environmental Management System certificatio (overent for third parties' peripherals)