 <b>BOSCH</b> <b>Security Systems</b> 850 Greenfield Road Lancaster, PA 17601	<b>Product Tests Report</b>	
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## Product Tests Report

Product name: MIC IP dynamic 7000 HD Camera

Model number and description:


MIC-7230-PB4 MIC IP dynamic 7000 HD 30x D/N PTZ Camera, Black  
 MIC-7230-PW4 MIC IP dynamic 7000 HD 30x D/N PTZ Camera, White  
 MIC-7230-PG4 MIC IP dynamic 7000 HD 30x D/N PTZ Camera, Grey  
 MIC-ILB-100 Illuminator, IR/White light combo, Black  
 MIC-ILW-100 Illuminator, IR/White light combo, White  
 MIC-ILG-100 Illuminator, IR/White light combo, Grey  
 MIC-67SUNSHLD Sunshield for MIC7000 cameras

The above-mentioned Bosch Security Systems product has been tested in accordance and was found to comply with the tests listed below which were carried out during the development phase of the product. Please note that for some tests, test conditions exceed the range that Bosch recommends for effective continuous operation of the camera.

Data subject to change without notice.

### ENVIRONMENTAL TEST


BS EN 50130-5:1999 Alarm systems Part 5: Environmental test methods	Specific Test Description (Temperatures stated are outside of the camera housing)	Comments	Passed
Dry heat Operational IEC 60068-2-2:1974 +A1:1993+ A2:1994	Temp. +65 °C, duration 48 hours	Illuminator included.	Yes
Dry heat Storage IEC 60068-2-2:1974 +A1:1993+ A2:1994	Temp. +75 °C, duration 4 hours	Illuminator included.	Yes
Cold operational IEC 60068-2-1:1990 +A1:1993+ A2:1994	Temp. -45 °C, duration 48 hours	Illuminator included.	Yes
Cold start test	Power off, soak overnight (8 hours) @ -45 °C, power up unit, unit must power up & function normally within < 30 minutes.	Illuminator included.	Yes
Cold Endurance IEC 60068-2-1:1990 +A1:1993+ A2:1994	Temp -45 °C, Duration 4 hours	Illuminator included.	Yes
Humidity, operational Damp heat, steady state operational IEC 60068-2-2:1988	65 °C / 95 %RH for 6 hours, 35 °C/85% RH for 16 hours. Repeat for 5 cycles total.	Illuminator included.	Yes
IEC 60529 Ingress Protection Rating (IPxx) Degrees of protection provided by enclosures (IP Code) [Dust, water ingress (operational)]	(Camera with mounting adaptor) Dust tight (no dust ingress; complete protection against contact). Water immersion: 24 hours Water depth: 1.8 meters	IP68 Illuminator included.	Yes
IEC 60529 Ingress Protection Rating (IPxx) Degrees of protection provided by enclosures (IP Code) [Dust, water ingress (operational)]	(Camera without mounting adaptor; exposed connectors in base of camera) Dust tight (no dust ingress; complete protection against contact). Water immersion: 30 minutes Water depth: 1 meter	IP67 Illuminator included.	Yes
UL Type rating (similar to NEMA XX)	Water immersion: 24 hours Water depth: 1.8 meters Corrosion: 200 hour salt spray	Type 6P (UL) Illuminator included.	Yes
Salt Spray ASTM B117 standard for corrosion resistance	2000 hrs at 35 °C, 95%RH, 5% NaCl	Illuminator included.	Yes

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BS EN 50130-5:1999 Alarm systems Part 5: Environmental test methods	Specific Test Description (Temperatures stated are outside of the camera housing)	Comments	Passed
External Mechanical Impact (IK Code) IK## Rating ["Vandalism-proof test"] IEC 62262:2002-02	Energy 20J, 5.05 kg steel mass test slug, 50 mm striking radius, drop height 0.4037 m 5 drops per side, impact 5 sides, 25 total impacts Excludes window.	IK10 Fully functional after all impacts and cycling power Illuminator included.	Yes
Vibration sinusoidal operational IEC 60068-2-6:1995 Test Fc: 10 m/s <sup>2</sup> (1.0 g)	Freq. Range 10-150Hz, 20m/s <sup>2</sup> , 3 axes, sweep rate 1 octave/m 20 sweeps/axis, (2.0g)		Yes
Sinusoidal vibration test IAW MIL-STD-167-1A	Exploratory Test 4Hz - 25Hz @ .01-in single amplitude (.02-in DAD) 1Hz frequency intervals for (15) second dwells.  Variable Frequency Test 4Hz - 15Hz @ .03-in single amplitude (.06-in DAD) 16Hz - 25Hz @ .02-in single amplitude (.04-in DAD) 1Hz frequency intervals for (5) minute dwells.  Endurance Testing 25Hz @ .02-in single amplitude (.04-in DAD) The duration of Endurance Testing is to be 2 hours total, and should be performed at each frequency of prominence identified in the Exploratory and Variable Freq Tests previously performed		Yes
Shock operational IEC 60068-2-27:1987	Half sine wave 11 ms pulse width, 30g 400 m/s <sup>2</sup> (40 g)	Illuminator included.	Yes
Medium weight Hammer Shock IAW MIL-S-901D	Equipment class I, Shock test type A, grade A & B		Yes
Wind speed (150mph wind tunnel test)	(MIC7000 camera only, MIC sunshield, MIC7000 illuminator) Sustained 120-150 mph winds for a 40 minute period without structural damage or loss of video or PTZ function.	Illuminator and sunshield included.	Yes
Sound level (audible noise)	< 65 dB		Yes
Transportation Tests (ISTA Procedure 1A)	ISTA - Vibration 14,200 vibratory shocks - 2 axis	Illuminator included.	Yes
Transportation Tests (ISTA Procedure 1A)	ISTA - 36 inches (0.9 m) free fall drop 6 faces of box	Illuminator included.	Yes

#### ADDITIONAL CERTIFICATIONS


Functional tests description	Description	Comments	Passed
SMPTE 274M-2008 Standard 1920 x 1080 Image Sample Structure, Digital Representation and Digital Timing Reference Sequences for Multiple Picture Rates	Resolution: 1920x1080 Scan: Progressive Color representation: complies with ITU-R BT.709 Aspect ratio: 16:9 Frame rate: 25 and 30 frames/s	For HD cameras	Yes
SMPTE 296M-2001 Standard 1280 x 720 Progressive Image Sample Structure - Analogue and Digital Representation and Analogue Interface	Resolution: 1280x720 Scan: Progressive Color representation: complies with ITU-R BT.709 Aspect ratio: 16:9 Frame rate: 25, 30, 50 and 60 frames/s	For HD cameras	Yes
Conformant with NTCIP protocols 1205, 2301, 1101:1996, 2202:2001, 2101:2001, 2102:2003			Yes

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Conformant with Open Network Video Interface Forum (ONVIF)	Interoperability between network video products, regardless of manufacturer		Yes
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**ADDITIONAL ENVIRONMENTAL – FUNCTIONAL BOSCH TESTS**


Environmental test methods	Specific Test Description	Comments	Passed
MTBF calculation of used components Based on: for electronics, MIL-HDBK-217FN1, GB, GC, 25C.	MIC7000 camera only: MTBF 91,000 hours Camera + illuminator: MTBF 80,000 hours	Illuminator included.	Yes
HALT (Highly Accelerated Life Test)	<p>Ambient Operational Test: +25 °C Completed: 11/26/2013</p> <p>HALT LOL/UOL Voltage Test: 1 - Step mains voltage down from nominal 24VAC by 2 volts every 5 minutes until operational failure and/or destruct failure. Completed: 01/22/2014*</p> <p>2 - Step mains voltage up from nominal 24 VAC by 2 volts every 5 minutes until operational failure and/or destruct failure. Completed: 01/24/2014*</p> <p>HALT LOL/UOL Temperature Test: 1 - Step temperature down from -40 °C by 5 °C every 4 hours (minimum) until operational failure and/or destruct failure. Completed: 01/16/2014*</p> <p>2 - Step temperature up from +40 °C by 5 °C every 4 hours (minimum) until operational failure and/or destruct failure. Completed: 01/23/2014*</p> <p>HALT Vibration Test: 1 - The DUT is initially vibrated at acceleration level of 5g (rms) for minimum period of at least 10 minutes. After 10 minutes exposure, the DUT is tested operationally and results are recorded. The operating vibration level is then increased by 5g (rms) and the process is repeated for the next step in the test. This sequence is repeated until the DUT fails operational testing or the test level reaches 50g (rms). Completed: 02/28/2014</p> <p>COLD Start Test: 1 - Set chamber temperature at -45 °C. Power removed from test unit for minimum period of 5 hours, then operate the test switch to restore power. The test unit shall complete its start-up sequence and then resume operation. Completed: 11/27/2013</p>	Illuminator included.	Yes
NEMA TS-2 Traffic Controller Assemblies with NTCIP Requirements	TS 2 Section 2.2.7 Transients, Temperature, Voltage, and Humidity Tests	Illuminator included.	Yes
NEMA TS-2 Traffic Controller Assemblies with NTCIP Requirements	TS 2 Section 2.2.8 Vibration - 5-30 Hz, 0.5g, Resonant Frequency Search 1 hour endurance test	Illuminator included.	Yes

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NEMA TS-2 Traffic Controller Assemblies with NTCIP Requirements	TS 2 Section 2.2.9 Shock (Impact) Test Half sine wave 11 ms, 10g	Illuminator included.	Yes
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#### Approvals Safety, EMC and Environmental

Specific Approval	Description	Comments	Passed
<b>EMC Europe</b>			<b>Passed</b>
EN 55022:2010	Information Technology Equipment- Radio disturbance characteristics Limits and Methods of measurement. Class A	Illuminator included.	Yes
EN 50130-4:2011	Part 4: Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder and social alarm systems.	Illuminator included.	Yes
EN 61000-3-2:2006 + A2:2009	Mains harmonics Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)	Illuminator included.	Yes
EN 61000-3-3:2008	Voltage fluctuations Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection.	Illuminator included.	Yes
EN 50121-4:2006	Railway applications	Illuminator included.	Yes
<b>EMC USA</b>			<b>Passed</b>
CFR 47 FCC part 15 Class A	Conducted + Radiated Emission based on VERIFICATION procedure	Illuminator included.	Yes
Australian AS/NZS CISPR 22 equal to CISPR 22	Product market with BOSCH supplier code N663		Yes
Mains Voltage Tolerance Test (Brown out supply voltage test)	Camera fully operational down to 105V (230 V PSU) and 55V (120V PSU). Below this voltage, the camera is not operational. Camera must be power- cycled for the camera block to reset.	Illuminator included.	Yes
Lightning protection EN 61000-4-5:1995	Levels ±0.5, 1 and 2kV common mode. ± 0.5, 1 and 2kV differential mode. To ALL input / output - and supply-wiring.		Yes
<b>Safety Europe</b>			<b>Passed</b>
IEC 60950-1:2005 (2nd Edition) + A1:2009 EN 60950-1:2006, EN 60950-1, 2nd Edition, 2007-03-27 + A12:2011	Information technology equipment – Safety – Part 1: General requirements	Illuminator included.	Yes
<b>Safety USA + Canada</b>			<b>Passed</b>
UL 60950-1 (2nd edition dated March 27, 2007; revised December 19, 2011) CAN/CSA-C22.2 No.E60950-1 (CSA C22.2 No. 60950-1-07, R2012)	UL listing + cUL listing. Information technology equipment – Safety – Part 1: General requirements	Illuminator included.	Yes

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Environmental			Passed
Restriction of Hazardous Substances	ROHS complaint	Illuminator and sunshield included.	Yes
Prohibited and declarable substances in products, components, materials and preparations.	Manufacturer's declaration database based on N 2580-1	Illuminator and sunshield included.	Yes
IEC 60950-22	Part 1: General requirements	Report - US-23589-UL Illuminator included.	Yes
UL 60950-22 EN 60950-22 UL 50E		Report - E183863-A34-CB-1 Illuminator included.	Yes

#### Functional and specification test

Functional tests description		Comments
Camera Performance	Refer to MIC IP starlight 7000 HD datasheet.	
Illuminator Performance	Refer to MIC7000 Illuminator datasheet.	

#### Miscellaneous specifications

Description		Comments
Pan and tilt drive output torque	Pan = 8.5 N m (6.72 ft lb) Tilt = 15.84 N m (11.62 ft lb)	

The product is produced by a manufacturing organization which is certified on **ISO9001** and **ISO14001** standards.