Product Tests Report

Product name: MIC inteox 7100i - 8MP, MIC inteox 7100i - 2MP, MIC inteox 7100i - 8MP OC, MIC inteox 7100i - 2MP OC

Model number and description:

MIC-7602-Z30B, PTZ 2MP 30x starlight black  
MIC-7602-Z30W, PTZ 2MP 30x starlight white  
MIC-7602-Z30G, PTZ 2MP 30x starlight gray

MIC-7602-Z30BR, PTZ 2MP 30x starlight enhanced black  
MIC-7602-Z30WR, PTZ 2MP 30x starlight enhanced white  
MIC-7602-Z30GR, PTZ 2MP 30x starlight enhanced gray  
MIC-7602-Z30BR OC, PTZ 2MP 30x starlight enhanced black OC  
MIC-7602-Z30WR-OC, PTZ 2MP 30x starlight enhanced white OC  
MIC-7602-Z30GR-OC, PTZ 2MP 30x starlight enhanced gray OC  
MIC-7604-Z12BR, PTZ 8MP 12x enhanced black   
MIC-7604-Z12WR, PTZ 8MP 12x enhanced white   
MIC-7604-Z12GR, PTZ 8MP 12x enhanced gray

MIC-7604-Z12BR-OC, PTZ 8MP 12x enhanced black OC   
MIC-7604-Z12WR-OC, PTZ 8MP 12x enhanced white OC   
MIC-7604-Z12GR-OC, PTZ 8MP 12x enhanced gray OC

# 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**

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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** |
| Dry heat Operational  IEC-60068-2-2, edition 6.0 (2007-07-16) | Temp. +70 °C, duration 48 hours | Illuminator included. | Yes |
| Dry heat Storage  IEC-60068-2-2, edition 5.0 (2007-07-16) | Temp. +70 °C, duration 4 hours | Illuminator included. | Yes |
| Cold storage  IEC-60068-2-1, edition 6.0 (2007-03-13) | Temp. -40 °C, duration 4 hours | Illuminator included. | Yes |
| Cold operational  IEC-60068-2-1, edition 6.0 (2007-03-13) | Temp. -40 °C, duration 48 hours | Illuminator included. | Yes |
| Cold start test | Power off, soak (4 hours) @ -40 °C, power up unit, unit must power up & function normally within < 50 minutes. | Illuminator included. | Yes |
| Cold Operational Endurance  IEC-60068-2-1, edition 6.0 (2007-03-13) | Temp -40 °C, Duration 48 hours | Illuminator included. | Yes |
| Damp Heat (Operational)  IEC-60068-2-30, edition 3.0 (2005-08-10) | 70 °C / 95 %RH for 6 hours, 35 ⁰C/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 with MIC-IP67-5PK kit) 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 | Type 6P (UL)  Illuminator included. | Yes |

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| Salt Mist Spray  ISO 12944-6: C5-M (High); Aluminum Housing Components | 1440 hrs at 35 °C,5 parts Sodium Chloride and 95 parts water, then 720 hrs at 38%, D.I Water | Illuminator included last 440 hrs. | Yes |
| External Mechanical Impact (IK Code or Impact rating) IEC 62262:2002-02 | IK10- 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. | Fully functional after all impacts and cycling power. | Yes |
| Vibration sinusoidal operational IEC 60068-2-6:1995  Test Fc: Vibration (sinusoidal), 10m/s² (1.0G) | Freq. Range 10-150Hz, 10m/s², 3 axes, sweep rate 1 octave/m 20 sweeps/axis, (1.0g) | 0.5G on canted unit | 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 60068-2-27:4.0 2008-02 | Shock, Half Sine Impulse, 11ms, 45G, non- repetitive shocks (three shocks in each axis and in each direction) | Illuminator included. 20G on canted units | Yes |
| Vibration, Sinusoidal  NEMA TS-2-2003, Section 2.2.8 | Frequency range: 5 to 30 Hz, Number of axes: 3, Sweep rate: Resonant Search: 1 full sweep within a period of 12.5 min.  Endurance: 1 octave x min-1. Amplitude: Resonant Search: 0.015in. double amplitude (pk-pk) displacement  - Endurance: 0.5g (5 m/s2) | Illuminator included. | Yes |
| Wind speed (160mph wind tunnel test) | (MIC inteox 7100i - 2MP camera only, MIC sunshield, MIC 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 2A) | Cycles per min. (rpm) 285, Frequency 4,75Hz, Duration 50 minutes |  | Yes |
| Transportation Tests (ISTA 2A (modified)) | ISTA – 0.810 m free fall drop 10 faces/edge/corner of box |  | Yes |

**ADDITIONAL CERTIFICATIONS**

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| **Functional tests description** | **Description** | **Comments** | **Passed** |
| SMPTE 274M-2008 Standard  3840 x 2160 Image Sample Structure, Digital Representation and Digital Timing Reference Sequences for Multiple Picture Rates | Resolution: 3840x2160 Scan: Progressive Color representation:  complies with ITU-R BT.709 Aspect ratio: 16:9  Frame rate: 25 and 30 frames | For 4K cameras | Yes |
| 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, 30, 50 and 60 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 |  | For ITS models only | Yes |
| Conformant with Open Network Video Interface Forum (ONVIF) | Interoperability between network video products, regardless of manufacturer  Profile S, Profile G, Profile T |  | Yes |

**ADDITIONAL ENVIRONMENTAL – FUNCTIONAL BOSCH TESTS**

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| **Environmental test methods** | **Specific Test Description** | **Comments** | **Passed** |
| MTBF calculation of used components  Based on: for electronics, MIL-HDBK-217FN1, GB, GC, 25 °C. | MIC inteox 7100i - 2MP camera only (MIC-7602-Z30x): MTBF 95,327 hours  MIC inteox 7100i - 2MP camera only (MIC-7602-Z30x + illuminator: MTBF 87,738 hours  MIC inteox 7100i - 2MP camera only (MIC-7602-Z30xR): MTBF 90,600 hours  MIC inteox 7100i - 2MP camera only (MIC-7602-Z30xR + illuminator: MTBF 83,718 hours  MIC inteox 7100i - 8MP camera only (MIC-7604-Z12xR): MTBF 91,423 hours  MIC inteox 7100i - 8MP camera only (MIC-7604-Z12xR + illuminator: MTBF 84,420 hours |  | Yes |
| HALT (Highly Accelerated Life Test) | Ambient Operational Test: +25 °C Completed: 11/26/2013  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\* 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\*   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\*   1. - Step temperature up from +40 °C by 5 °C every 4 hours (minimum) until operational failure and/or destruct failure. | Illuminator included. | Yes |

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| **Environmental test methods** | **Specific Test Description** | **Comments** | **Passed** |
|  | Completed: 01/23/2014\*  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).  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 |  |  |
| NEMA TS-2 Traffic Controller Assemblies with NTCIP Requirements | TS 2 Section 2.2.7 Transients, Temperature, Voltage, and Humidity Tests (74 °C) |  | 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 |
| NEMA TS-2 Traffic Controller Assemblies with NTCIP Requirements | TS 2 Section 2.2.9 Shock (Impact) Test Half Sine Impulse, 11ms, 10g | Illuminator included. | Yes |
| Mil-Std-810-G, 510.5 | Sand and Dust |  | Yes |
| Mil-Std-810-G, 506.5 | Rain |  | Yes |
| Mil-Std-810-G, 505.5 | Solar Radiation |  | Yes |
| Mil-Std-810-G, 501.5 | High Temperature |  | Yes |
| Mil-Std-810-G, 502.5 | Low Temperature |  | Yes |
| Mil-Std-810-G, 503.5 | Temperature Shock |  | Yes |
| Mil-Std-810-G, 509.5 | Salt Fog |  | Yes |

**Approvals Safety, EMC and Environmental**

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| **Specific Approval** | **Description** | **Comments** | **Passed** |
| **EMC Europe** |  |  | **Passed** |
| Directive 2014/30/EU | EMC Directive- Electromagnetic compatibility (recast) Text with EEA relevance | 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 50121-4:2016 | Railway applications | Illuminator included. | Yes |
| EN 55032 | Radiated and Conducted Emissions | Illuminator included. | Yes |
| EN 61000-4-2 | ESD Susceptibility | Illuminator included. | Yes |
| EN 61000-4-3 | Radiated electromagnetic fields | Illuminator included. | Yes |
| EN 61000-4-4 | Electrical Fast Transient (EFT) Burst | Illuminator included. | Yes |
| EN 61000-4-6 | Conducted Immunity | Illuminator included. | Yes |
| **EMC India** |  |  | **Passed** |
| BIS: IS 13252 (Part 1):2010 | EMC certification for India |  | Yes |

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| **Specific Approval** | **Description** | **Comments** | **Passed** |
| **EMC USA** |  |  | **Passed** |
| CFR 47 FCC part 15 Class A | Conducted + Radiated Emission based on VERIFICATION procedure | Illuminator included. | 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 |
| **Safety Europe** |  |  | **Passed** |
|  | Low Voltage Directive (LVD) - Electrical equipment designed for use within certain voltage limits Text with EEA relevance | Illuminator included. | Yes |
| IEC 60950-1:2005 (2nd Edition) + A1:2009  EN 60950-1:2006/A11:2009/A1:2010/A12:2011 | Information technology equipment — Safety — Part 1: General requirements | Illuminator included. | Yes |
| IEC 62368-1 | Safety standard for Information Technology Equipment and Audio/Video Equipment. | Illuminator included | Yes |
| **Safety USA + Canada** |  |  | **Passed** |
| 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 |
| International CISPR 32 | Product market with BOSCH supplier code N663 | 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 |  | Yes |
| UL 60950-22  EN 60950-22 UL 50E |  |  | Yes |
| Condensation testing\* (inside glass) | 25 °C / 50 %RH for 1 hour, 5 ⁰C/50% RH for 1 hour, -30⁰C/50% RH for 1 hour. | Illuminator included. | Yes |
| Defrosting testing\* | 1/8” ice buildup defrosted |  | Yes |

\*Not on MIC-7602-Z30x cameras

**Functional and specification test**

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| **Functional tests description** |  | **Comments** |
| Camera Performance | Refer to datasheets: MIC inteox 7100i - 8MP, MIC inteox 7100i - 2MP, MIC inteox 7100i - 8MP OC, and MIC inteox 7100i - 2MP OC. |  |
| Illuminator Performance | Refer to MIC IP 7100i Illuminator datasheet. |  |

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