

HAZARDOUS AREA METAL DETECTORS

ATEX, IECEx & NFPA
INSPECTION SOLUTIONS

Hazardous materials,
classified locations, and
explosion-protected
system design.



INSPECT



Every product is
inspected.

DETECT



Metal contaminants
are identified.

REJECT



Contaminated products
are removed.

VERIFY



System performance
is confirmed.



ENGINEERED FOR HAZARDOUS AREAS.
DESIGNED TO PROTECT.

UNDERSTANDING HAZARDOUS LOCATION CLASSIFICATIONS

ATEX ZONES, IECEx MARKINGS & NFPA / CLASS-DIVISION AREAS

Hazardous locations are areas where flammable gases, vapors, mists or combustible dusts may be present in sufficient quantities to cause an explosion or fire. Correctly identifying the classification of your environment is essential to selecting inspection equipment engineered to perform safely and reliably. Always match the inspection system to both the area classification and the material hazard.



EUROPE / INTERNATIONAL (ATEX / IECEx)			NORTH AMERICA (NFPA / NEC)			
GAS / VAPOR AREAS			FLAMMABLE GAS / VAPOR		COMBUSTIBLE DUST	
ZONE 0 (20) Explosive atmosphere continuously or for long periods 	ZONE 1 (21) Explosive atmosphere likely in normal operation 	ZONE 2 (22) Explosive atmosphere not likely in normal operation 	CLASS I DIVISION 1 Hazardous under normal operating conditions 	CLASS I DIVISION 2 Hazardous under abnormal conditions 	CLASS II DIVISION 1 Hazardous under normal operating conditions 	CLASS II DIVISION 2 Hazardous under abnormal conditions 
DUST AREAS						
ZONE 20 (21) Combustible dust clouds continuously or for long periods 	ZONE 21 (22) Combustible dust clouds likely in normal operation 	ZONE 22 (23) Combustible dust clouds not likely in normal operation 				
 FLAMMABLE GAS Propane, Butane, Methane, Hydrogen, Natural Gas, etc.	 COMBUSTIBLE DUST Flour, Sugar, Starch, Spices, Plastics, Metals, etc.	 SOLVENT VAPOR Ethanol, IPA, Acetone, Hexane, Toluene, MEK, etc.	 POWDERS Protein, Milk Powder, Cocoa, Pesticides, Detergents, etc.	 IGNITION-RISK AREAS Where an ignition source could cause an explosion or fire.		

KEY SELECTION FACTORS

 AREA CLASSIFICATION Identify ATEX / IECEx Zones or NFPA Class-Division for each location.	 GAS GROUP / DUST GROUP Match equipment to the specific gas group (e.g., IIC) or dust group (e.g., IIC).	 TEMPERATURE CLASS Ensure equipment temperature class (T1-T6) meets the ignition temperature of the hazard.	 ENCLOSURE PROTECTION Select the correct protection type (e.g., Ex d, Ex ib, Ex p, Type 4X, IP rating).	 GROUNDING & BONDING Proper grounding prevents static discharge and ignition from electrical sparks.	 HYGIENE REQUIREMENTS Choose designs suitable for washdown, corrosion resistance, and product integrity.
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THE CLASSIFICATION DEFINES THE DESIGN.

CHOOSE THE RIGHT INSPECTION SYSTEM FOR A SAFER, COMPLIANT OPERATION.

INSPECTING HAZARDOUS MATERIALS

POWDERS, SOLVENTS, APIs, CHEMICALS & SPECIALTY PRODUCTS

Metal contamination can occur at any point in the manufacturing and packaging process. InspeX metal detection solutions help protect people, products, and equipment—while supporting compliance and brand integrity.



APPLICATIONS

COMBUSTIBLE POWDERS



Flours, starches, sugars, proteins, and other combustible powders.

SOLVENTS



Flammable liquids, solvents, and liquid chemical formulations.

ACTIVE PHARMACEUTICAL INGREDIENTS (APIs)



APIs and excipients in powder or granulated formulations.

AGROCHEMICALS



Herbicides, insecticides, fungicides, and agrochemical powders.

FINE CHEMICALS



Industrial chemicals, additives, and specialty chemical blends.

SPECIALTY MINERALS



Minerals, pigments, enhancers, and functional additives.

INSPECT



Every package is inspected.

DETECT



Metal contaminants are identified.

REJECT



Contaminated packages are automatically rejected.

VERIFY



System performance is confirmed.

TYPICAL CONTAMINATION SOURCES IN HAZARDOUS PACKAGING LINES



Pumps & Transfer Systems
Wear from impellers, seals, and fittings.



Blenders & Mixers
Abrasion from agitators, blades, and vessels.



Mills & Granulators
Wear from hammers, screens, knives, and liners.



Fasteners & Hardware
Loose or broken screws, bolts, nuts, and clamps.



Screens & Filters
Screen breakage or wear allowing fragments.



Maintenance Activity
Dropped tools, reassembly parts, and service debris.

MULTIPLE PACKAGE FORMATS. ONE INSPECTION STANDARD.



FOIL SACHETS



HDPE BOTTLES



CARTONS



PAILS



FIBER DRUMS



ANTI-STATIC BAGS

Consistent metal detection performance across a wide range of hazardous materials and packaging types.



THE PRODUCT HAZARD AND PACKAGE FORMAT MUST BOTH BE CONSIDERED.

ATEX, IECEx & NFPA DESIGN PRINCIPLES

HOW HAZARDOUS-AREA METAL DETECTORS ARE ENGINEERED

InspeX systems are engineered to prevent ignition of flammable gases, vapors, mists, and combustible dusts—while maintaining detection performance and ensuring personnel safety.

ANTI-STATIC / SUITABLE BELT

Low charge materials prevent build-up of static electricity.

BONDED COMPONENTS

All parts are electrically bonded to prevent electrostatic discharge.



DUST-TIGHT DETECTOR HEAD

Fully welded stainless steel construction. Designed to prevent ingress of dust and particulates.

STACK LIGHT

Local visual indication of system status.

PRESSURIZED / PURGED CONTROL ENCLOSURE

Maintains positive pressure to prevent ingress of flammable atmospheres.

SEALED CABLE GLANDS

Flamepath- and dust-tight glands maintain integrity of enclosure protection.

EX MARKING PLACARD

Equipment marked for intended hazardous area classification.

GROUNDING STAINLESS FRAME

Low-impedance ground path for the entire system.



ENGINEERED TO MEET ATEX, IECEx, AND NFPA HAZARDOUS-AREA REQUIREMENTS.

COMMON PROTECTION CONCEPTS



FLAMEPROOF / EXPLOSION-PROOF ENCLOSURE

Contains an internal explosion and prevents propagation to the external atmosphere via flameproof joints.



PRESSURIZATION / PURGE

Maintains a positive pressure of clean air or inert gas to prevent hazardous atmosphere from entering.



DUST PROTECTION (ENCLOSURE PROTECTION)

Prevents ingress of combustible dust with sealed joints and filtered vents.



SAFE AUXILIARY COMPONENTS

Only intrinsically safe or suitably certified components used for status, control, and auxiliary devices.

DESIGN CHECKLIST



1. ZONE / CLASS

Identify hazardous area classification (Zones / Classes & Divisions).



2. PRODUCT HAZARD

Identify potential hazards (gas, vapor, mist, or combustible dust) and sources of ignition.



3. WASHDOWN

Determine water ingress risk and select appropriate IP rating and materials.



4. TEMPERATURE CLASS

Match equipment temperature class to the atmosphere's ignition temperature.



5. UTILITIES

Confirm electrical supply, purge air requirements, and air quality (oil-free, dry, clean).



6. REJECT METHOD

Select reject type (pusher, diverter, air blast, flap, etc.) and verify safe operation.



7. DOCUMENTATION

Ensure certification, marking, instructions, drawings, and compliance documentation.



COMPLIANCE STARTS WITH ENGINEERING.

Proper design prevents ignition. Proper engineering protects people, facilities, and your brand.

HYGIENIC HAZARDOUS-AREA INTEGRATION

**WHEN CLEANABILITY AND
EXPLOSION PROTECTION
MUST WORK TOGETHER**

In critical pharmaceutical and high-purity chemical environments, metal detection systems must do more than perform—they must integrate seamlessly with hygienic process design and hazardous-area safety requirements.



HYGIENIC DESIGN



Smooth welds, sloped surfaces, and minimal horizontal ledges support easy cleaning and reduce residue build-up.

ENCLOSURE INTEGRITY



IP66/67 stainless enclosures and sealed components protect against moisture, dust, and cleaning chemicals.

GROUNDING & BONDING



Integrated grounding points and bonding connections help mitigate static and ensure electrical continuity.

PRODUCT PRESENTATION



Optimized aperture heights and reject systems maintain product flow and minimize contamination risks.

SAFE CABLE ROUTING



Continuous cable management with hygienic fittings keeps connections protected, organized, and washdown-ready.

OPERATOR SAFETY



Compliant with ATEX, IECEx, and NFPA standards to help protect personnel, processes, and facilities.

BUILT FOR HIGH-PURITY AND HAZARDOUS ENVIRONMENTS

SOLVENT-BASED PHARMACEUTICALS



Detects metal contaminants in solvent streams, API solutions, and finished liquid products.

NUTRACEUTICAL POWDERS



Protects blends and powders from metal contamination during mixing, filling, and packaging.

FINE CHEMICALS



Ensures purity in fine chemical processes and high-specification formulations.

AEROSOL INGREDIENTS



Safeguards valves, propellants, and formulations used in aerosol and pressurized systems.

HIGH-VALUE SPECIALTY INGREDIENTS



Maintains product integrity for premium ingredients with zero tolerance for contamination.



**ENGINEERED TO MEET HYGIENE STANDARDS.
SAFE, HYGIENIC, AND PRODUCTION-READY.**



REJECTION & FAIL-SAFE SYSTEM DESIGN

SAFE REMOVAL OF CONTAMINATED PRODUCT IN CLASSIFIED AREAS



Metal contaminants are detected.



Contaminated product is tracked.



Contaminated product is removed.



Reject is verified. System integrity maintained.

REJECT METHOD OPTIONS

AIR BLAST



High-speed air removes contaminated product off the conveyor.



PUSHER



Mechanical pusher diverts product into reject bin or chute.



RETRACTING BELT



Belt retracts to pull contaminated product into reject receptacle.



STOP-ON-DETECT



Conveyor stops and alerts operator for manual removal.



FAIL-SAFE LOGIC & CONDITION MONITORING



ALL CONDITIONS WITHIN LIMITS?

YES

SYSTEM ENABLED
CONTAMINATED PRODUCT
WILL BE REJECTED

NO

SYSTEM INHIBITED
REJECT PREVENTED
ALARM ACTIVATED



THE REJECT DEVICE IS
PART OF THE PROTECTION SYSTEM.

DESIGNED TO REMOVE.
BUILT TO PROTECT.

VALIDATION, TESTING & DOCUMENTATION

PROVING PERFORMANCE IN HAZARDOUS-AREA APPLICATIONS

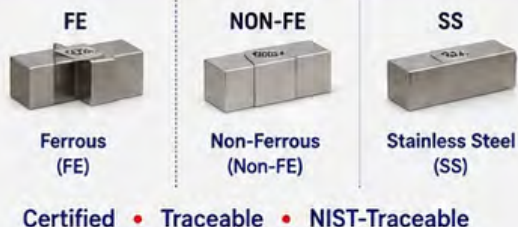
Proper validation and documented verification ensure your metal detection system performs as expected—every time, in every product, in every shift.



VALIDATION THROUGHOUT THE SYSTEM LIFECYCLE



TYPICAL TEST PIECES



TESTING POSITIONS ACROSS THE APERTURE



RECORDS & TRACEABILITY



VALIDATE THE COMPLETE SYSTEM,
NOT JUST THE HEAD.

- ✓ Protect Your Product
- ✓ Protect Your People
- ✓ Protect Your Brand

COMPLETE HAZARDOUS-AREA INSPECTION SOLUTIONS



ENGINEERED FOR CLASSIFIED LOCATIONS,
HAZARDOUS MATERIALS & HIGH-CONSEQUENCE PRODUCTS

PACKAGED GOODS LINE

BULK MATERIAL /
GRAVITY FALL

BAGGED PRODUCT
INSPECTION



SEAMLESS
INTEGRATION



RELIABLE
REJECTION



COMPLIANCE
& VALIDATION



DATA LOGGING
& REPORTING



EXPERT SUPPORT
& SERVICE

1 AREA CLASSIFICATION REVIEW



Assess hazards, zones,
and regulatory
requirements.

2 DETECTOR SELECTION



Match the right metal
detector to your
application and risks.

3 HYGIENIC DESIGN



Materials and construction
designed for safe,
cleanable operation.

4 REJECT ENGINEERING



Engineered reject systems
to safely remove
contaminated products.

5 LINE INTEGRATION



Seamless integration
with conveyors, controls,
and plant systems.

6 VALIDATION SUPPORT



Installation, testing,
and performance
validation support.

7 DOCUMENTATION & COMPLIANCE



Complete documentation
packages for audit
readiness.

8 LIFECYCLE SERVICE



Ongoing support,
training, and service
to protect performance.



**PARTNERS IN PROTECTION.
ENGINEERED FOR CONFIDENCE.**