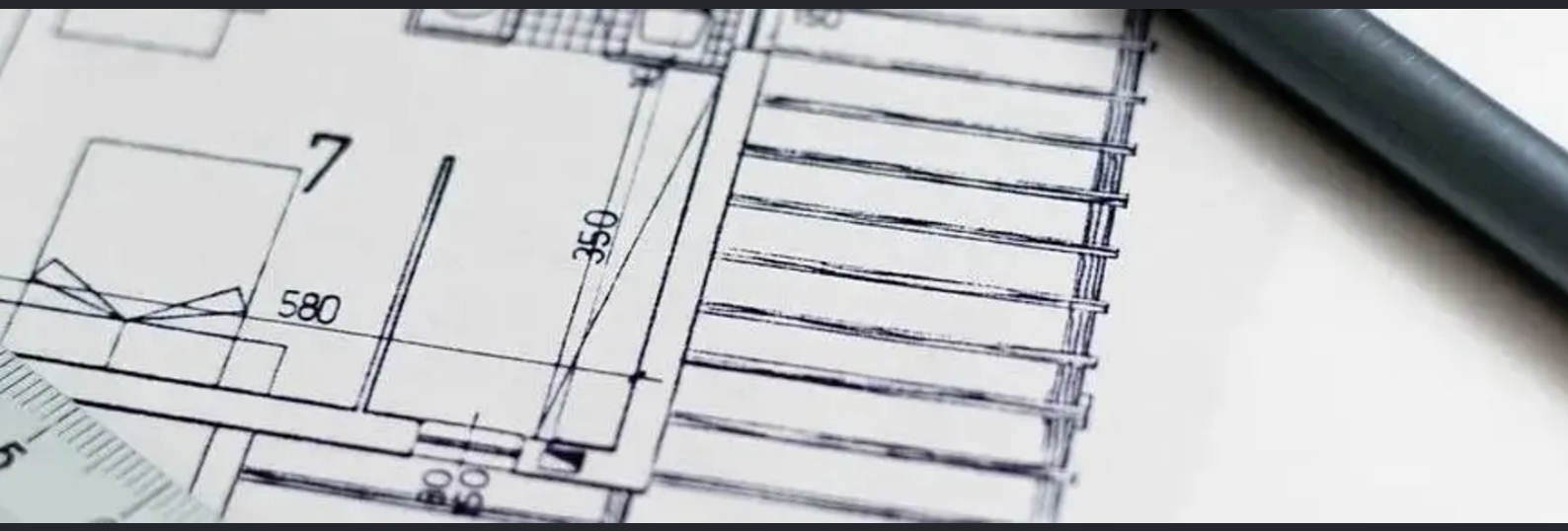
inorms

TECHNICAL COMPLIANCE

PRACTICAL GUIDE · 2026 EDITION

Ignition Hazard Assessment for EAC Ex The Handbook

A comprehensive handbook for manufacturers, exporters and product managers



SOURCES · PROTECTION · EVIDENCE · APPROVAL
TESTING · DOCUMENTATION · CHECKLISTS

As of 14 October 2026

ac-inorms.com

IGNITION HAZARDS · EAC EX HANDBOOK

How to use this handbook

From ignition source to evidenced protection concept.

This handbook addresses manufacturers, designers, quality managers, plant builders and exporters. Its focus is ignition hazard assessment for electrical and especially non-electrical equipment intended for explosive atmospheres. It connects the AC Inorms sector page with official regulatory and standards information and an original practical working method. Both language editions share the same structure. Terms, cases and worksheets facilitate technical cooperation. They do not assess a specific product or prescribe universal limits.

Structure and use

Pages 4-11 cover scope, conformity form, atmosphere, protection level and standards status. Pages 12-16 address roles, product boundaries and fault conditions. Pages 17-25 discuss ignition sources and special atmospheres. Pages 26-36 cover safeguards, evidence, reports, instructions and changes. Pages 37-40 provide annotated working templates. Four cases, typical errors and FAQs appear on pages 41-46. Page 47 supplies a release checklist; sources and contact close the handbook.

Edition 1.0 · As of 14 October 2026

Review standards status, list entry and actual eligibility separately. A technically approved assessment supports the certification dossier; the competent certification body makes the EAC Ex conformity decision.

Sources: [1]-[9]

IGNITION HAZARDS · EAC EX HANDBOOK

Contents

Linked chapters and printable working aids.

Chapter	Pages
Foundations, atmosphere and standards	4-11
Roles, workflow and assessment scope	12-16
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Cases, FAQs and release	41-47
Sources and contact	48-50

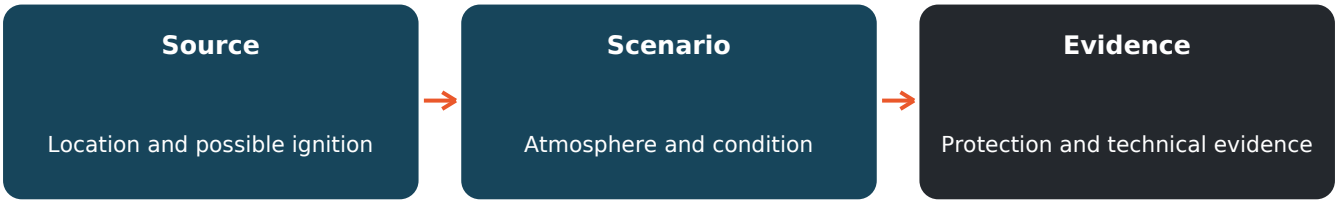
Suggested starting point

First determine product boundaries, actual atmosphere and required protection level. Then use the source register, scenario matrix and evidence list. Keep unresolved points visible until reliable technical inputs exist.

IGNITION HAZARDS · EAC EX HANDBOOK

What an ignition hazard assessment achieves

A technical argument supported by traceable evidence.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Identification	Search systematically for equipment-related possible ignition sources.
Scenario	Connect occurrence, location, atmosphere and operating state.
Effectiveness	Assess whether the source can ignite the relevant atmosphere.
Protection	Define technically suitable measures with evidenced limits.
Result	Document assessment, residual risks, conditions and revision.

The report makes the safety argument reviewable. A ticked list does not explain why a source is prevented or adequately protected. Describe actual design, relevant conditions and the sources supporting each statement. The assessment also helps reveal incomplete drawings, unclear process inputs or conflicting component conditions early. Non-electrical equipment can create hazards through movement, heat generation or material handling. Mechanical interactions need review even within an otherwise electrically protected assembly. Record missing data as open items rather than substituting generic assurances.

In practice

Every statement needs product linkage and an identifiable evidence route.

Sources: [6], [7]

IGNITION HAZARDS · EAC EX HANDBOOK

Assessment, certificate and operating release

Three decisions with different responsibilities.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Assessment	Manufacturer-side technical analysis and records.
Certification	Conformity decision by the competent body.
Operation	Suitable selection, installation and safe use at the site.
Records	Keep report, testing, certificate and instructions consistent.
Boundaries	Review additional national operator duties separately.

TR CU 012/2011 requires certification of covered Ex equipment. Ignition hazard assessment is a technical element of the evidence, not an independent substitute for a certificate. Product certification likewise does not approve every installation. The installation owner reconciles actual atmosphere and operating conditions with confirmed equipment limits. Schedule manufacturer technical approval, certification decision and installation review separately. A successful individual test does not automatically resolve an incomplete overall assessment.

In practice

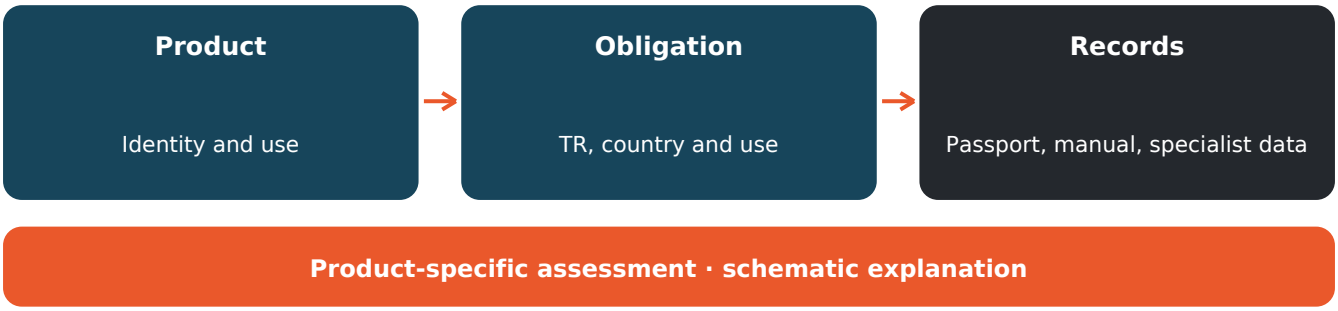
The report and certificate should describe the same revision, while serving distinct purposes.

Sources: [3], [4]

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TR 012 and adjacent requirements

Intended Ex use is the starting point.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Electrical	Review electrical equipment and Ex components.
Mechanical	Review non-electrical equipment with own ignition hazards.
Exclusions	Assess the actual Article 1 conditions.
Adjacent	Determine other TRs and national duties by product.
Assemblies	Clearly distinguish the overall product and separately supplied items.

Ex assessment does not begin with the HS code alone. Describe function, energy sources, engineered protection and actual intended use. The same trade name may cover Ex and standard versions. Justify exclusions through actual circumstances rather than industry labels. Other requirements still need review when a particular TR is inapplicable. For assemblies clarify interfaces and manufacturer roles before collecting component evidence. A technical description with an overview drawing is more useful for borderline cases than a zone designation alone.

In practice

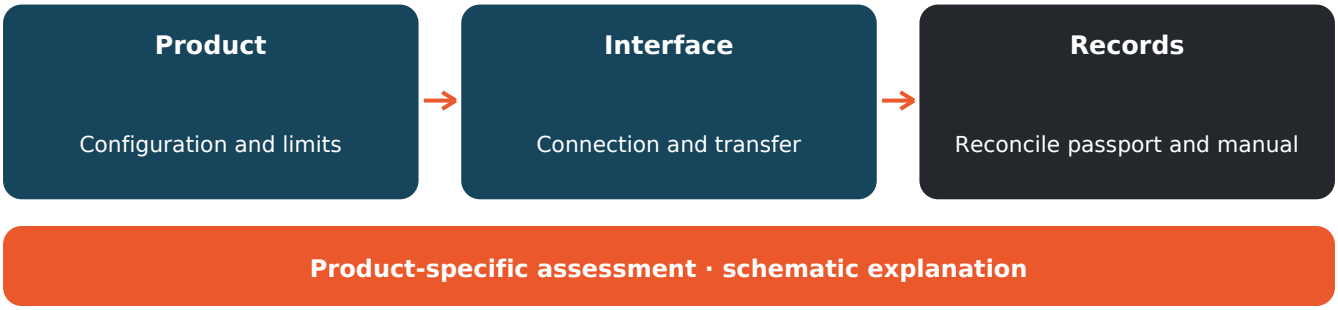
Record the scope decision with function, configuration and supply boundary.

Sources: [3], [4]

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Using ATEX and IECEx evidence effectively

Existing evidence provides technical input.



Assessment area	Project implementation
ATEX	EU product law; categories and marking within its own system.
IECEx	International scheme with reports and certificate conditions.
EAC Ex	Separate EAEU certification under TR 012.
Reconciliation	Compare model, variant, drawing, standards edition and factory.
Gaps	Agree eligibility and additions with the body.

Request complete records, including schedules, special conditions and relevant reports. A cover sheet may hide technical differences. Reconcile existing assessments with actual export configuration and the appropriate standards plan. Drawing changes, different materials or extended operating limits may require new evidence. The sector page cites ATEX 2014/34/EU; historically, TR 012 was adopted in 2011. Derivation from a directive adopted in 2014 is therefore chronologically incorrect. Comparable technical principles do not establish automatic mutual recognition.

In practice

Compare existing records in a gap matrix rather than merely translating them.

Sources: [3], [10], [11]

IGNITION HAZARDS · EAC EX HANDBOOK

Capturing atmosphere and use conditions

Describe gas, vapour, mist, dust and process separately.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Substance	Identity, composition and reliable safety data.
Location	Internal volume, surroundings and possible interfaces.
Condition	Temperature, pressure, oxygen and operating limits.
Duration	Atmosphere occurrence and operating phases.
Data quality	Confirm source, measurement conditions and currency.

Ignition capability depends on the actual atmosphere being assessed. A generic label such as solvent or dust is insufficient. Request reliable substance inputs and a use description. Safety data sheets may help, but do not necessarily contain every required explosion-protection parameter. Record mixtures, changing formulations and cleaning media separately. Conditions outside usual assessment envelopes need additional technical review. When inputs are missing, record the unresolved parameter, owner and due date. An unconfirmed substance assumption must not appear as the basis of release.

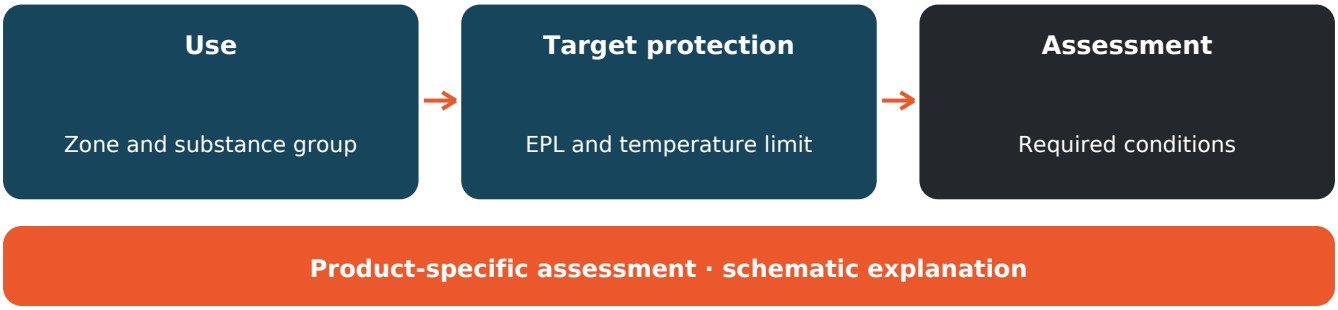
In practice

Show equipment and atmosphere boundaries together.

IGNITION HAZARDS · EAC EX HANDBOOK

Allocating group, zone and protection level

Define selection before detailed assessment.



Assessment area	Project implementation
Group	Mining, gas or dust with suitable subgroups.
Zone	Technically classify the site; not an equipment property.
EPL	Ga/Gb/Gc or Da/Db/Dc as technical protection levels.
Faults	Derive required conditions from protection level.
Additions	Review temperature, environment and special conditions.

The zone describes the site situation; protection level describes equipment performance. Typical minimum allocations are gas zone 0/Ga, 1/Gb and 2/Gc, and dust zone 20/Da, 21/Db and 22/Dc. This guidance is not a complete equipment selection. Higher protection does not remove substance-group, temperature or installation requirements. Compare EU categories only with their actual meaning. Mining needs its own group-I assessment. Do not choose target protection after seeing which evidence is easiest to provide. Determine it from intended use and confirm it in the project brief.

In practice

Keep zone, group, EPL and temperature as separate data fields.

Sources: [3], [6]

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Standards plan: relevant editions and dates

As of 14 October 2026: distinguish national adoption and TR listing.

Standard / reference	Project significance
GOST 31441.1/.2/.3/.5/.6/.8-2011	Older family on the sector page: check exact parts and list deadlines.
GOST 31441.5/.6/.8-2011	TR list use until 30 June 2023; national status is a separate issue.
GOST ISO/DIS 80079-37-2013	Listed reference for c, b and k; not automatically identical to ISO 2016.
GOST 32407-2013	Older part-36 reference: list use until 1 July 2028.
GOST 31610.36-2024	TR list use from 1 January 2027; national record permits early use.
GOST 31438.1/-2-2024	New fundamentals: list entries from 1 January 2027.
GOST 31438.1/-2-2011	Older fundamentals: list use until 1 July 2028.

The basis is Decision 158/2020 as amended, notably 20/2026, and official standards records. This selection is not a complete list. National permission for early use does not automatically override a later TR list start. Agree normative editions for each evidence item with the body.

No blanket replacement

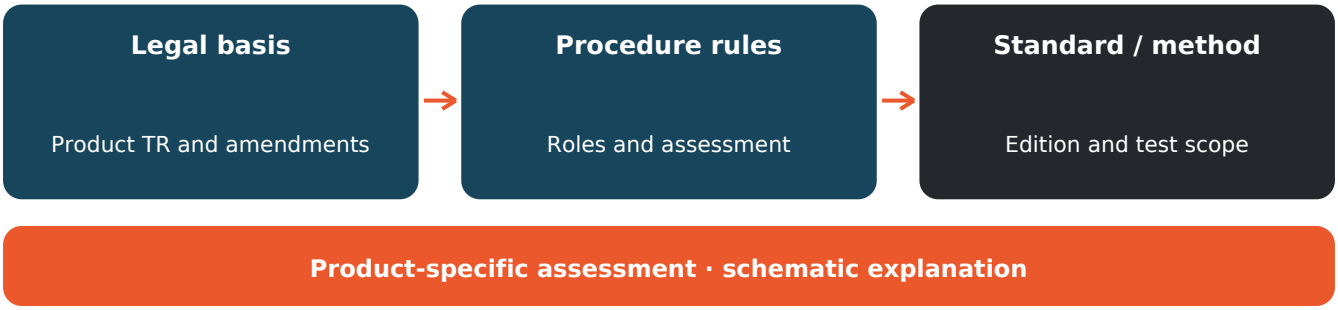
Older GOST parts are not all invalid in the same way. Country, list, test methods and actual date matter.

Sources: [5], [8], [9]

IGNITION HAZARDS · EAC EX HANDBOOK

Managing the standards plan as a gap matrix

A reliable allocation for every protective characteristic.



Assessment area	Project implementation
Requirement	Identify TR clause and affected product area.
Standard	Record complete GOST edition and international reference.
Date	Review start, end and destination.
Evidence	Link existing reports to actual assessment items.
Gap	Define additional work, owner and decision.

A catalogue of many standard numbers is not a test plan. Describe which actual evidence each standard supports. Different international and GOST editions may require additional assessment. Check safety and methods lists separately. A nationally active standard may have limited TR-list eligibility. Conversely, do not transfer a transition deadline automatically to national adoption. Archive the reviewed edition and review date. For projects crossing a cut-off, reconcile the plan with the body again before completion.

In practice

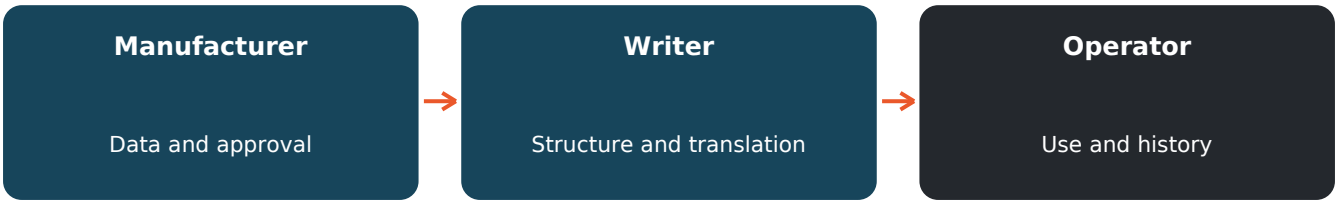
Treat standards changes, product changes and certificate decisions as separate events.

Sources: [5], [8], [9]

IGNITION HAZARDS · EAC EX HANDBOOK

Roles and technical responsibility

Allocate inputs, decisions and approvals clearly.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Manufacturer	Own configuration, limits and safety argument.
Design	Confirm drawings, materials, tolerances and faults.
Operator	Describe atmosphere, process and actual use.
Lab / body	Assess evidence and handle certification procedure.
Technical writer	Process sources consistently without inventing engineering.

An external provider can support structure, assessment coordination and documentation. Reliable product inputs must still come from accountable technical sources. Decide who confirms assumptions and who implements safeguards in the design. Reconcile purchasing records with actual component revisions. Multi-supplier assemblies need clear overall technical ownership. The applicant arranges the eligible conformity route; that does not replace manufacturer approval of a design change. Record approvals with name, role, date and product revision.

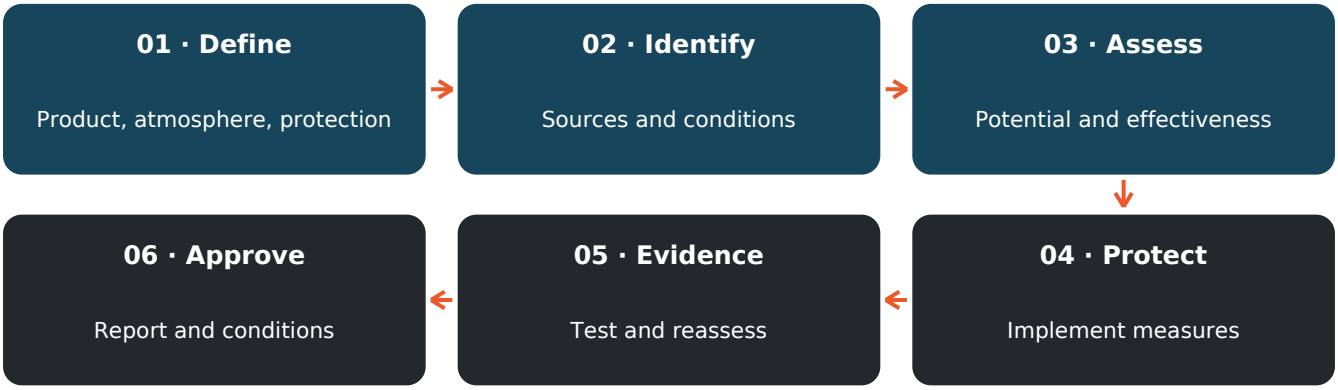
In practice

An unresolved item without an owner often delays completion longer than the analysis.

IGNITION HAZARDS · EAC EX HANDBOOK

The six-step assessment workflow

Set the required protection level at the outset.



Assessment area	Project implementation
1 · Define	Define product, atmosphere, target protection and inputs.
2 · Identify	Capture sources, conditions and interactions.
3 · Assess	Review potential and possible effectiveness by scenario.
4 · Protect	Define and implement engineered measures.
5 · Evidence	Reassess with calculations, testing and revised conditions.
6 · Approve	Complete report, conditions, instructions and revision.

The sector page describes an iterative process. In this practical method, its category-setting step is moved before detailed analysis: intended protection must not emerge accidentally from an incomplete assessment. New measures can create new sources or fault dependencies. Reassess affected scenarios after implementation. Final review confirms actual configuration and states remaining use conditions. These six steps are an editorial project structure, not a substitute for requirements of the agreed standards edition.

In practice

Defining protection does not yet prove it.

Sources: [1], [6]

IGNITION HAZARDS · EAC EX HANDBOOK

Product boundaries, variants and interfaces

The assessed product must be unambiguously identifiable.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Boundary	Distinguish complete equipment, component and external process.
Variant	Map rating, speed, material and geometry.
Inside / outside	Record internal and external atmospheres separately.
Interface	Link motor, coupling, supply and protective devices.
Worst case	Justify selection and applicability of evidence.

A family report is useful only where common features and safety-relevant differences are visible. The largest model is not always the thermal or mechanical worst case. Different bearings, materials, coatings and operating modes may need separate evidence. Record which variant covers each scenario. An Ex motor does not automatically evidence a coupling or pump. Allocation tables connect drawings, parts lists, models and reports. Do not silently include remote or optional assemblies in approval.

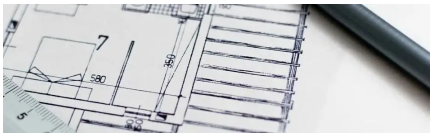
In practice

Justify variant approval with actual limits rather than the word comparable.

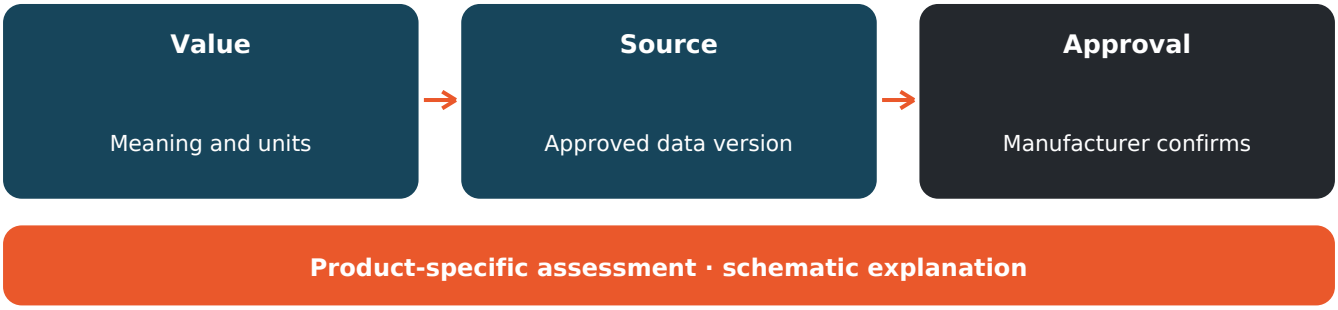
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Technical sources and assessment inputs

Confirmed inputs reduce later rework.



Technical sources and product revision · AC Inorms



Assessment area	Project implementation
Design	Overview, detail drawings, tolerances and parts list.
Operation	Speed, load, substance, temperatures and phases.
Safeguards	Describe sensors, interlocks and safe response.
Experience	Failures, repairs and confirmed field data.
Evidence	Reports, calculations and complete component records.

Collect sources with revision, origin and validity. Link supplier claims to the actual installed variant. A material designation without confirmed coating or manufacturing tolerance may be insufficient. Capture operating inputs including start, stop and restart. Failure history helps identify plausible faults, but does not alone prove adequate protection. Drawings and parts lists must show the same revision. Define testing needs where measurements are absent. Distinguish confirmed inputs, technically justified assumptions and unresolved fields.

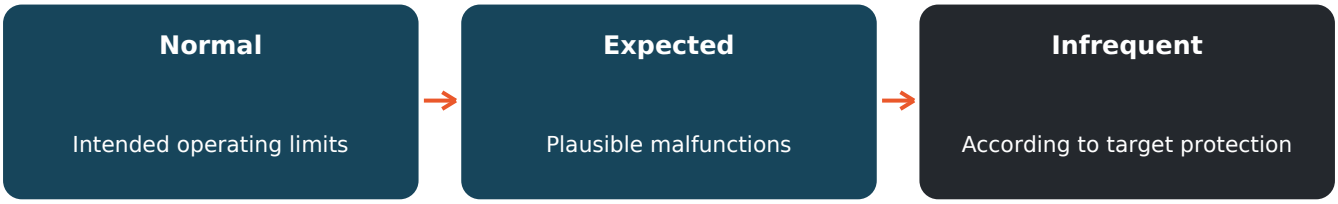
In practice

An open-input register is more professional than an apparently complete assessment with invented values.

IGNITION HAZARDS · EAC EX HANDBOOK

Assessing normal operation and fault conditions

Consider each source under the required conditions.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Normal	Intended loads, conditions and operating phases.
Expected	Plausible malfunctions of the equipment.
Rare	Additional fault assessment according to target protection.
Dependency	Review common causes and cascading failures.
Assumptions	Keep occurrence and technical rationale traceable.

Do not assign fault classes according to economic convenience. Examine wear, misalignment, blockage, lubrication loss and protective-function failure against actual design. An event labelled unlikely is not automatically an infrequent malfunction under the agreed standard. Maintenance can influence occurrence, but needs realistic intervals and clear ownership. Check whether several faults share one cause. Write an understandable cause-and-effect description for each scenario. Necessary technical depth depends on protection level, standard and equipment.

In practice

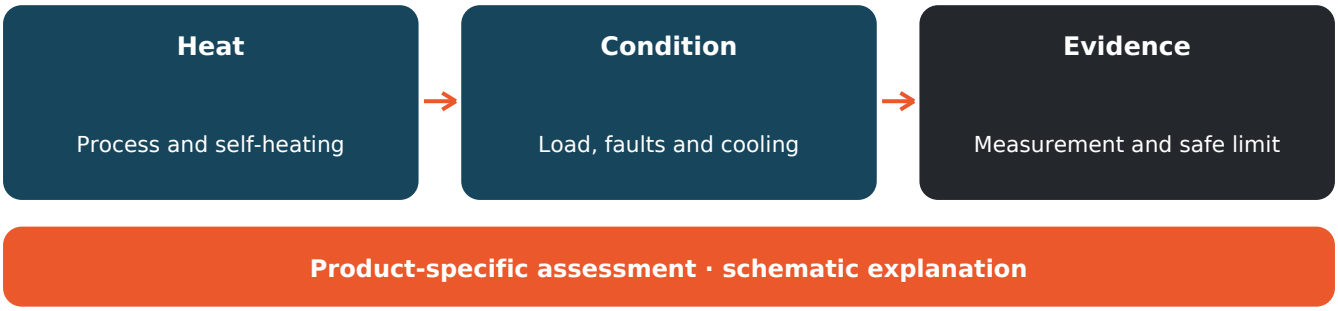
Assess fault scenario, protective response and remaining ignition effect together.

Sources: [6]

IGNITION HAZARDS · EAC EX HANDBOOK

Hot surfaces and heat input

Consider process heat and self-heating together.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Source	Bearing, seal, brake, drive and hot substance.
Condition	Continuous load, start, blockage and cooling loss.
Measurement	Record location, load, ambient conditions and method.
Protection	Design, cooling and confirmed monitoring.
Limit	Assess gas and dust including deposits separately.

Do not measure only the easiest accessible housing point. The hazardous surface may be concealed or internal. Heat transfer, orientation and run-down can influence temperatures. A room-temperature, partial-load result does not automatically cover the upper operating envelope. For dust, assess cloud and layer under actual conditions. A lower gas temperature class does not replace dust assessment. Derive and technically confirm margins or trip values through the suitable procedure. Explain measuring points, states and applicability to variants.

In practice

Ambient, substance and equipment surface temperatures are different quantities.

IGNITION HAZARDS · EAC EX HANDBOOK

Friction, impact and mechanical sparks

Capture contact points and possible abnormal movement.



Mechanical design · image: AC Inorms

Contact
Friction, impact and location

→

Design
Material and tolerances

→

Protection
Avoidance and evidence

Product-specific assessment · schematic explanation

Assessment area	Project implementation
Contact	Rotor/housing, coupling, brake and bearing.
Cause	Wear, tolerance, misalignment and foreign matter.
Material	Contact pair, surface and possible reactions.
Protection	Clearances, strength and engineered limits.
Evidence	Connect geometry, operating conditions and testing.

A catalogue material alone does not prove absence of ignition-capable sparks. Contact energy, speed, material pairing and actual surface may matter. Review tolerances, thermal expansion and permitted wear together. A guard may create new rubbing points. Assess foreign objects against the real process. Mechanical contacts are not all equally ignition-capable, but justification still needs actual inputs. When clearances provide protection, align manufacture, inspection and maintenance limits with them. Generic claims such as slow-running or low-sparking do not replace assessment.

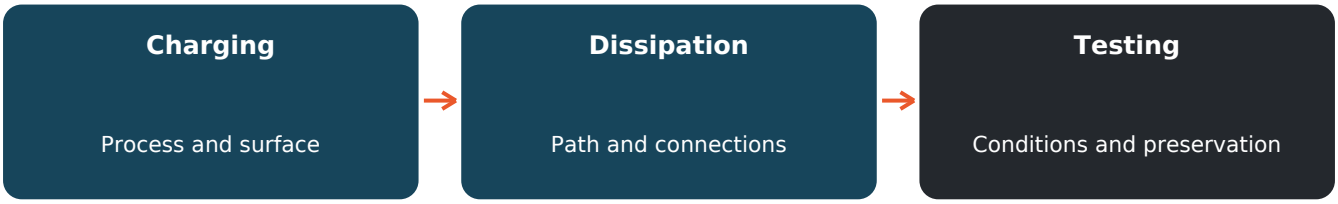
In practice

Mark the contact point in the drawing and link it clearly to the scenario.

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Electrostatic charging and discharge

Assess material, process and dissipation path together.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Generation	Capture flow, separation, movement and friction.
Surface	Plastic, coating, hose and isolated parts.
Connection	Conductivity, bonding and contact quality.
Testing	Suitable measurement method and actual conditioning.
Operation	Consider cleaning, replacement and changes.

An earthing point alone does not settle every electrostatic issue. Non-conductive surfaces and isolated conductive parts need their own review. Coatings, seals and contamination may affect dissipation paths. Check whether electrical continuity remains after installation and servicing. Connect material information with process conditions and necessary tests. Do not borrow limits from unrelated applications. Describe cleaning and replacement so confirmed properties remain. Bring evidence, test conditions and remaining use conditions together in the assessment.

In practice

Conductive, antistatic and earthed are not interchangeable statements.

Sources: [12], [13]

IGNITION HAZARDS · EAC EX HANDBOOK

Electrical sources and stray currents

Reconcile electrical evidence with the complete assembly.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Electrical	Contacts, switching, loss heat and fault energy.
Component	Review certificate scope and special conditions.
System	Allocate supply, wiring and protective devices.
Stray current	Consider current paths and corrosion protection where relevant.
Integration	Review mechanical and thermal interactions.

The ignition report does not replace specialised testing of electrical protection techniques. It shows whether such evidence matches actual installed configuration. A sensor may impose supply and connection conditions. A protective function is not accepted merely because one component is certified. Changed wiring, cooling or supply may affect the system. Clarify ownership and evidence for bonding and external connections. For stray currents, examine the actual installation without assigning identical scenarios indiscriminately to every machine.

In practice

Carry component certificate conditions into system assessment.

IGNITION HAZARDS · EAC EX HANDBOOK

Flames, hot gases and particles

Trace generation and transfer of ignition effects.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Source	Combustion, heating and process-related hot substances.
Path	Release, leakage, deposition and material transport.
Particles	Temperature, size, quantity and possible contacts.
Separation	Evidence suitable engineered separation.
Fault	Loss of cooling, sealing or monitoring.

A hot liquid is not automatically an effective source regardless of temperature and surroundings. Assess the actual scenario, such as surface heating or hot-particle transfer. Sources may arise inside equipment or enter through intended operation. Trace their possible path to the atmosphere. Filters or seals need their own limits and maintenance rules. For protective separation, record material, design and faults. External hot work also belongs to site organisation and is not universally authorised by equipment assessment.

In practice

Describe source, transfer path and possible ignition location as one scenario.

IGNITION HAZARDS · EAC EX HANDBOOK

Compression, shock waves and reactions

Technically assess special process conditions.

Assessment area	Project implementation
Compression	Rapid pressure change and possible local heating.
Shock wave	Generation and coupling into the assessed volume.
Reaction	Exothermic effects, self-ignition and compatibility.
Material contact	Reactive pairings including thermite scenarios.
Rationale	Evidence relevance or exclusion with technical inputs.

Do not treat chemical reactions and exothermic effects as duplicate independent ticks. Describe the actual cause and possible ignition effect. The sector page also mentions thermite reactions and shock waves; relevance depends on materials and process. Pressure and Ex hazards may overlap while requiring their own evidence routes. Normal pressure alone does not describe rapid local compression. Plan specialist support where chemical or dynamic inputs are missing. Non-relevant sources may be excluded with justification retained in the dossier.

In practice

A reasoned not relevant is acceptable; an unsupported not present is weak.

Sources: [1]

IGNITION HAZARDS · EAC EX HANDBOOK

Radiation and other possible sources

Extend the source register for the actual equipment.

Assessment area	Project implementation
Optical	Light, lasers and concentrated radiation by function.
Electromagnetic	Consider transmitters, induction and coupled energy.
Ultrasound	Review relevant energy input and local effects.
Ionising	Include where there is actual product or process linkage.
Lightning / external	Allocate environmental and installation measures separately.

The website list is a starting point, not a universal complete source register. Specialist equipment may contain additional energy forms. Start with function and energy paths, not only familiar mechanical faults. Laser or radio components require suitable technical assessment; an arbitrary rating does not replace it. Document external hazards as interfaces rather than falsely presenting them as equipment design properties. Completeness review identifies considered sources and explains their relevance. For unfamiliar technologies, create an assessment need rather than signing off an unchecked template.

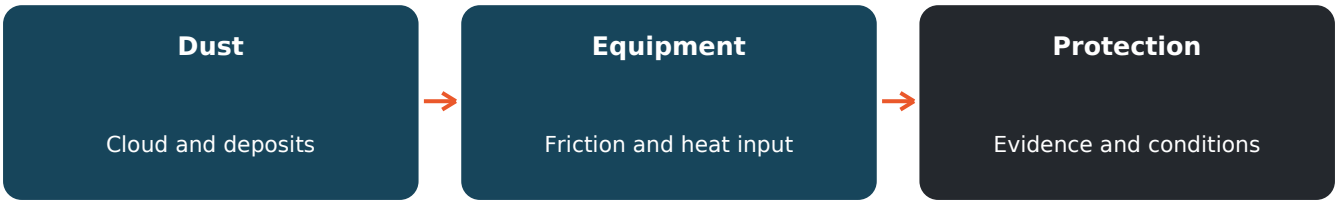
In practice

Expand the source register to fit the equipment.

IGNITION HAZARDS · EAC EX HANDBOOK

Combustible dust and deposits

Distinguish the atmosphere from possible ignition sources.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Substance	Dust type, conductivity and relevant test parameters.
Cloud	Dispersion and possible locations.
Layer	Capture thickness, insulation and cleaning.
Equipment	Bearings, rubbing points, surfaces and ingress paths.
Limit	Document dust-specific use conditions.

Combustible dust is initially fuel or part of the explosive atmosphere. A smouldering deposit or self-ignition can instead form a specific ignition scenario. Review the effects of layers on cooling and temperature. Gas approval does not automatically cover dust use. Actual layer thickness and cleaning belong in the safety argument. Formulation, moisture and particle size may affect existing data. Supplement a safety data sheet lacking necessary parameters with suitable substance testing. Instructions state confirmed cleaning conditions, not an unsupported universal frequency.

In practice

Treat gas temperature class and dust maximum surface temperature separately.

IGNITION HAZARDS · EAC EX HANDBOOK

Hybrid mixtures and internal atmospheres

Several hazards can act simultaneously.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Mixture	Capture gas/dust mixtures and changing substances.
Internal volume	Process chamber, lines, seals and dead spaces.
External space	Surroundings and possible leakage paths.
Interaction	Effects on temperature, charging and ignition capability.
Use limit	State confirmed coverage and unresolved inputs explicitly.

A gas marking and a dust marking do not together automatically establish suitability for every hybrid mixture. Combined conditions need technical review. A non-hazardous external area does not settle the internal space of material-handling equipment. Draw volumes, material paths and separation points. Cleaning or formulation changes may introduce extra states. Do not extend a single-substance report to every mixture without justification. State explicitly what was assessed and which use is excluded or remains unresolved.

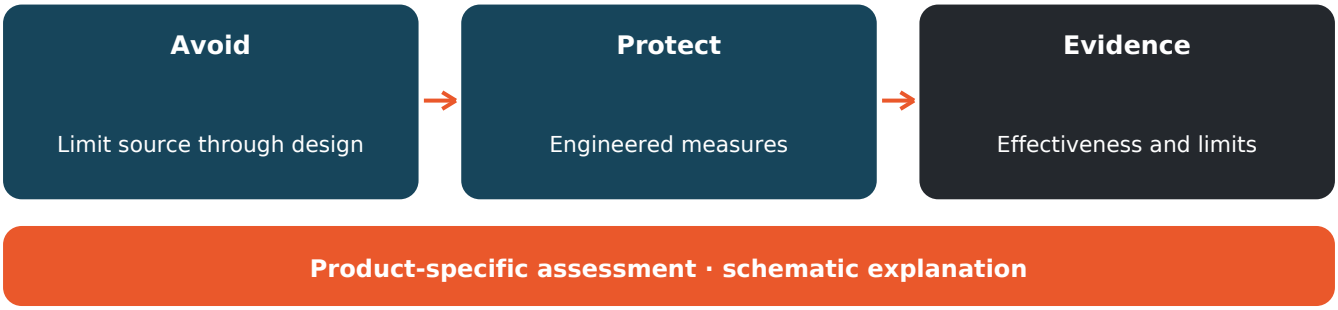
In practice

Show internal and external requirements in the same product overview.

IGNITION HAZARDS · EAC EX HANDBOOK

Selecting protective measures systematically

Align design, protective functions and information.



Assessment area	Project implementation
Avoidance	Remove the source by design or limit its generation.
Safeguard	Implement a suitable engineered safeguard.
Evidence	Prove effectiveness for conditions and variants.
Information	Explain remaining use conditions clearly.
Feedback	Reassess new sources and fault dependencies.

A measure must control the actual scenario. Generic warnings cannot arbitrarily compensate for missing engineering protection. First review technical opportunities to avoid the source. Where a protective function is necessary, define limits, response and failure behaviour. Maintenance and information support continued protection but need a reliable engineering basis. A new guard can reduce cooling; a different material can alter charging. Review each change for side effects. Completion means implementation and evidence agree.

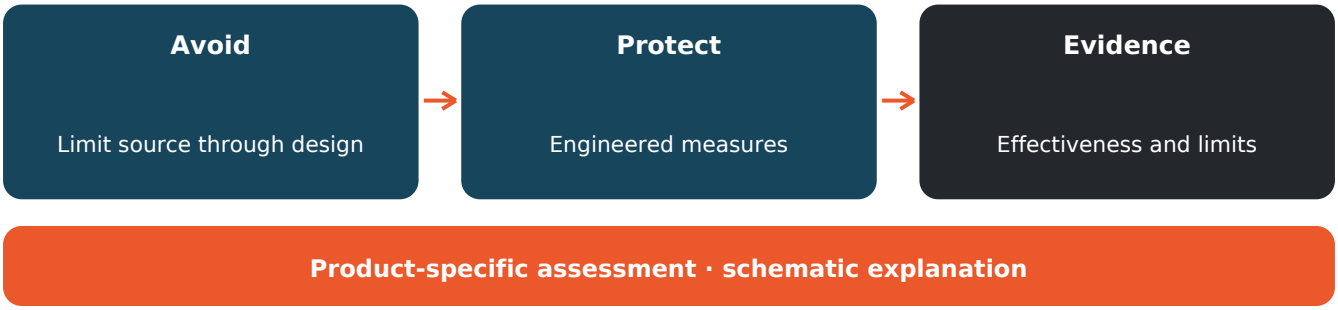
In practice

A measure with unknown effectiveness remains an unresolved evidence item.

IGNITION HAZARDS · EAC EX HANDBOOK

Non-electrical protection concepts c, b and k

Review concept, standards edition and marking together.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
c	Constructional safety with evidenced component and design features.
b	Ignition-source control through suitable monitoring and response.
k	Liquid immersion with confirmed protective conditions.
Combination	Review interactions and common causes.
Marking	Do not transfer older symbols uncritically to newer standards.

ISO 80079-37:2016 addresses concepts c, b and k. EAEU procedures nevertheless use the actual eligible GOST edition. A modern international title alone does not resolve that allocation. Constructional safety centres on confirmed design and its limits. Monitoring needs sensor, evaluation and response assessed as a complete function. Liquid protection requires attention to level, condition, temperature and loss scenarios. Full marking follows the agreed standards plan and certified concept. An invented Ex h designation has no place in approval.

In practice

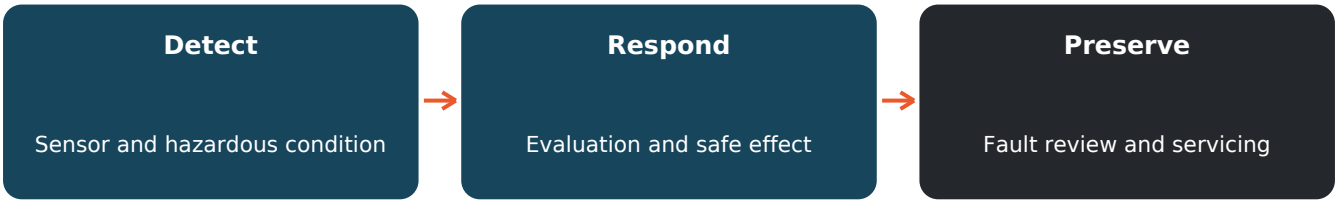
Confirm the technical protection description before deriving marking and instructions.

Sources: [5], [7]

IGNITION HAZARDS · EAC EX HANDBOOK

Monitoring and safety-related response

The complete protective chain must control the scenario.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Detection	Determine variable, location and relevant faults.
Evaluation	Explain threshold, tolerance and processing.
Response	Review timing, shutdown and safe remaining states.
Failure	Sensor break, power loss and common causes.
Preservation	Plan function checks, access control and servicing.

A temperature sensor alone is not effective ignition protection. The chain must detect the hazardous state in time and trigger a suitable response. Run-down or heat accumulation may continue after shutdown. Check whether one fault affects both machinery and monitoring. State the basis for required reliability and assessment depth. Do not invent a universal SIL or PL value for every Ex item. Control settings, software revision and bypass opportunities. Connect necessary periodic checks with instructions and ownership.

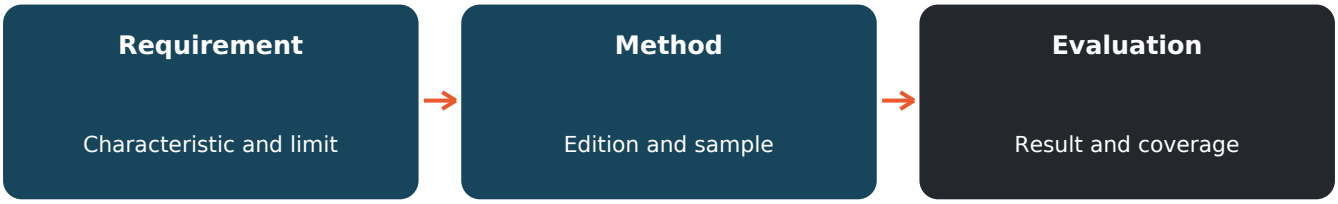
In practice

An alarm indication and effective protective shutdown are different functions.

IGNITION HAZARDS · EAC EX HANDBOOK

Evidence, calculations and test planning

Assign suitable evidence to every claim.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Drawing	Show materials, clearances and protective features clearly.
Calculation	Record model, assumptions, inputs and limits.
Test	Define representative configuration and conditions.
Supplier	Complete reports and actual component revision.
Gap	Keep unconfirmed claims as unresolved items.

Select evidence to match the claim. A drawing may show a clearance without proving every temperature effect. Calculations need reliable inputs and justified model boundaries. Plan tests with the laboratory to cover critical conditions and relevant variants. Field history may support an argument without replacing absent normative testing. Identify acceptance criteria, owners and required revisions. Record sample changes before extending results to production. This gives the technical report a reviewable argument rather than loosely attached files.

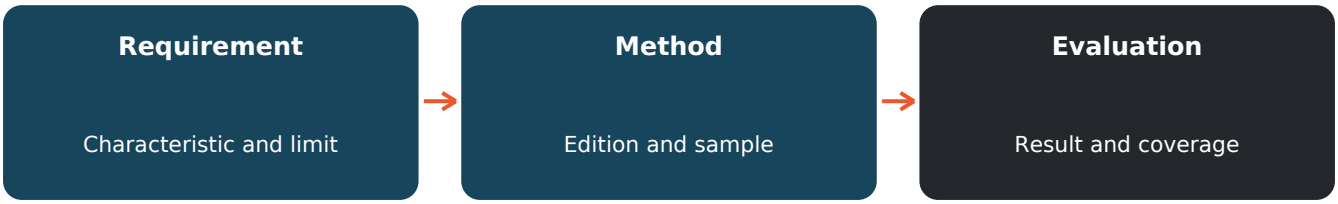
In practice

Record an evidence ID in every scenario row.

IGNITION HAZARDS · EAC EX HANDBOOK

Documenting testing correctly

Keep result, test condition and applicability connected.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Sample	Model, serial number, drawing and deviations.
Procedure	Standard reference, method and instruments.
Condition	Load, substance, environment and fault state.
Result	Value, uncertainty where relevant and criterion.
Coverage	Assessed variants and technical limitations.

An instrument photo without conditions is not a reliable report. Record configuration and setup so the result can be understood. Justify the selected adverse condition. Measurement duration and location may influence results. Assess sample deviations before approval. Where a setup represents only part of the product, justify applicability. Keep unsuccessful testing and engineering corrections visible in development history; an attractive final value alone gives an incomplete account.

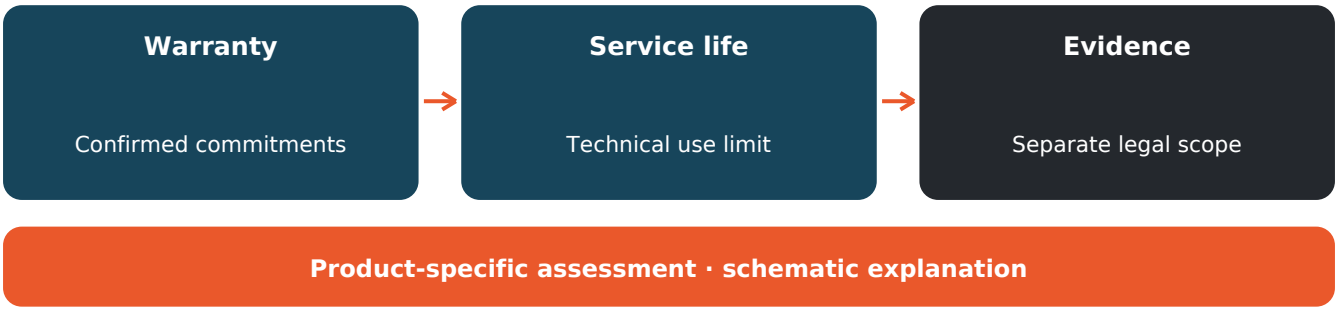
In practice

Compare the test report with actual supply configuration before completion.

IGNITION HAZARDS · EAC EX HANDBOOK

Structuring the assessment report

Readers should be able to trace every conclusion.



Assessment area	Project implementation
Cover	Product, scope, revision, author and approval.
Basis	Atmosphere, protection level, limits and standards plan.
Analysis	Source register and scenarios by operating condition.
Protection	Measures, evidence and reassessment.
Conclusion	Use conditions, open items and approval status.

Include the route to conclusions, not only results. Link scenario IDs, drawing locations, measure IDs and reports. List source revisions. A conclusion such as adequately protected needs linkage to target protection and actual configuration. Missing testing remains visible as a limitation. Appendices may hold calculations and supplier evidence; the main text explains their significance. Reconcile the German working version with the Russian procedure version. Translation must not alter technically approved content.

In practice

A report without clear approval status must not be presented as a completed assessment.

IGNITION HAZARDS · EAC EX HANDBOOK

Final assessment and remaining conditions

Implementation, evidence and result must agree.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Completeness	All relevant sources and conditions addressed.
Effectiveness	Measure evidenced for scenario and target protection.
Dependency	New sources and fault chains reassessed.
Condition	Carry limits into instructions and dossier.
Approval	Close open items or explicitly limit status.

Final review is more than a generic confirmation. Identify assessed variants, conditions and evidence. Do not hide an important unresolved item in a minor appendix footnote. Remaining conditions must be technically justified, clear and achievable in use. The certification body reviews the records needed for its procedure. Manufacturer and installation owner implement conditions within their responsibilities. Without necessary evidence, technical approval remains open. The conclusion should state what is complete and which decision remains necessary.

In practice

Documenting residual risk does not mean accepting inadequate protection.

IGNITION HAZARDS · EAC EX HANDBOOK

Instructions, passport and marking

Keep the safety argument consistent through delivery.



Assessment area	Project implementation
Instructions	Limits, assembly, operation, servicing and safe response.
Passport	Identity and relevant unit-specific information.
Marking	Confirmed protection scope and actual variant.
Conditions	Transmit specific conditions of use completely.
Languages	Meet procedure and supply duties by product.

A report relying on temperature monitoring does not match instructions that omit its connection. Marking must not promise broader coverage than evidence supports. Use consistent values, variants and revisions. Carry certificate conditions into technical integration. A passport does not replace safe work instructions. Review required Russian and additional destination-language editions against actual regulations. Connect report, drawings, certificate schedules and supply records in the product dossier. Assign someone to verify completeness before shipment.

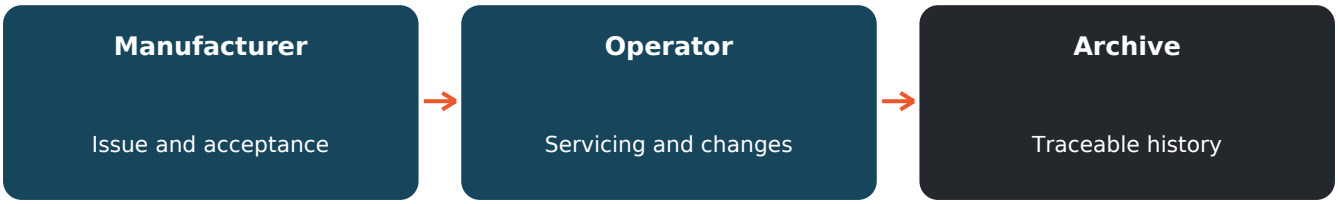
In practice

Derive safety-related information from a controlled technical data source.

IGNITION HAZARDS · EAC EX HANDBOOK

Servicing, inspection and repair

Preserve confirmed protection throughout service life.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Servicing	Product-specific intervals and safe execution.
Inspection	Clearances, wear, dissipation paths and protective function.
Parts	Approved materials and actual identifiers.
Repair	Permitted work and technical competence.
Return	Necessary checks before renewed use.

Servicing is reliable when permitted condition and safe methods are defined. An arbitrary calendar interval does not prove sufficient protection. Consider operating hours, process load and experience. Equal-size replacements may introduce different materials, coatings or hazards. Distinguish repair from design modification. Instructions separate operator tasks and specialist service. Inspection records capture actual results rather than a date alone. Where protection relies on recurring checks, specify scope, ownership and response to deviations.

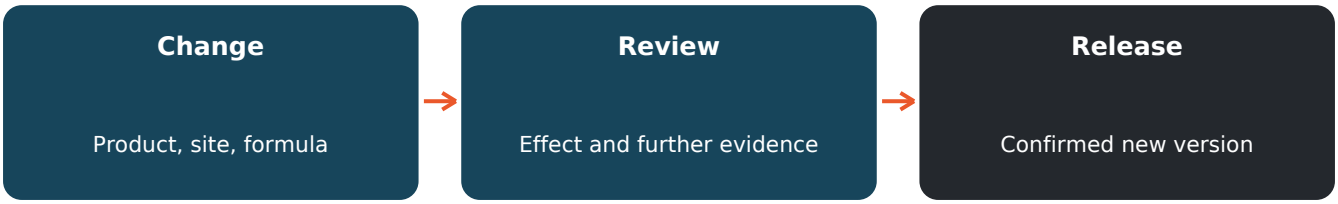
In practice

Keep operating maintenance separate from certification surveillance.

IGNITION HAZARDS · EAC EX HANDBOOK

Changes and reassessment

An unchanged model name does not guarantee unchanged safety.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Engineering	Material, geometry, bearings, software and protective function.
Process	Substance, speed, temperature and operating mode.
Knowledge	New failures, measurements and safety information.
Records	Effects on report, instructions and certificate.
Decision	Review affected scenarios and involve the body.

Change control starts before implementation. A coating can alter charging, a bearing temperature and software protective response. New safety knowledge may trigger review even without modification. Identify affected scenarios and evidence in the change log. For changes affecting explosion safety, involve the issuing body under the applicable procedure. Do not apply a certificate number to technically unreviewed variants. Archive old and new revisions with the decision and communication route. Justify reassessment scope technically.

In practice

Assess changes before manufacture, documentation and supply.

Sources: [4]

IGNITION HAZARDS · EAC EX HANDBOOK

Quality, production and archiving

Assessed characteristics must actually be manufactured.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Characteristic	Control safety-related dimensions and materials.
Supplier	Approve changes and alternative components.
Inspection	Production and final checks suited to protection concept.
Traceability	Link unit, batch, drawing and report.
Archive	Retain approvals, evidence and revisions systematically.

A good report loses value if production fails to reproduce safety-related features. Identify those requirements in drawings and control plans. Treat supplier changes technically, not only commercially. Instruments and personnel must suit necessary checks. Quarantine nonconforming parts and assess their effects. Records should make delivered configuration reconstructable later. Plan production and surveillance measures with the body for series certification. The technical assessment does not replace those measures, but supplies important characteristics for implementation.

In practice

Use the same approved revision for report, parts list and production checks.

Template 1: assessment report structure

Annotated structure for an equipment-specific dossier.

Section	Required linkage
1 · Cover / revision	Identity, scope, author, reviewer and approval status.
2 · Product description	Function, variants, drawings and supply boundary.
3 · Use conditions	Substances, atmosphere, process and permitted limits.
4 · Protection / standards	Level and agreed normative basis.
5 · Technical inputs	Source revisions, materials and components.
6 · Source register	Possible sources with relevance justification.
7 · Scenarios	Normal operation and required fault conditions.
8 · Safeguards	Design, function and limits by scenario.
9 · Evidence	Testing, calculations and coverage matrix.
10 · Final assessment	Result, conditions and open items.
11 · Implementation	Instructions, marking and quality assurance.
12 · Approval / annexes	Signatures, appendices and change log.

This is an editorial working aid. Necessary depth and sequence follow product, standards plan and procedure requirements. A simple item may need few scenarios; a complex assembly many more. An empty section is not a reasoned finding of inapplicability.

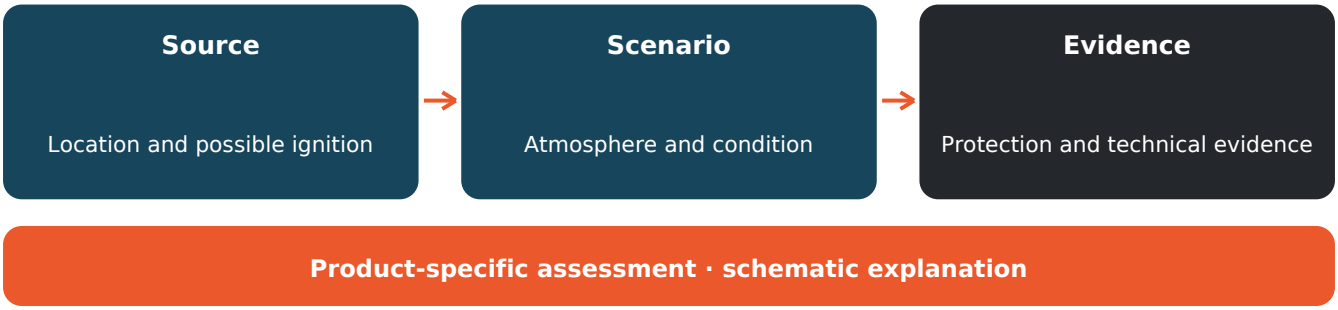
Use

Agree the structure with technical owners before analysis.

IGNITION HAZARDS · EAC EX HANDBOOK

Template 2: ignition source register

Record relevance and input quality for each source.



Field	Entry / evidence
Product / variant / revision	_____
Source ID / type of possible source	_____
Location / drawing reference	_____
Atmosphere / substance	_____
Generation in equipment / by operation	_____
Normal and fault conditions	_____
Potential / possible ignition capability	_____
Protection need / scenario ID	_____
Reasoned exclusion where applicable	_____
Source / revision / unresolved inputs	_____

First address all potentially applicable sources. Give equipment-specific reasons for non-relevance. A source may have several scenarios, such as normal heating and additional heating after lubrication loss. Keep status open where necessary inputs are missing.

Template, not evidence

Completed entries require technical review and reliable source linkage.

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Template 3: scenario and safeguard

Describe one complete scenario instead of merely counting hazards.

Field	Example structure / entry
Scenario ID	IH-___ / source S-___ / variant ___
Trigger / state	Actual fault or intended operating condition.
Effect / location	Possible ignition effect and affected area.
Before protection	Source assessment and required target protection.
Measure ID	Design / monitoring / other confirmed measure.
Technical limit	Value, tolerance or condition with evidence source.
Evidence ID	Drawing, calculation or test report with revision.
Reassessment	Remaining effectiveness / new sources / dependencies.
Implementation	Instructions, production, service or specific condition.
Result / approval	Complete / open / limited; accountable person.

Do not invent trip values. A plausible measure remains unresolved until effectiveness is evidenced. Separate status explicitly from a certification decision. For model families, also record actual coverage.

Review question

Can another competent reviewer follow the conclusion from the identified sources?

IGNITION HAZARDS · EAC EX HANDBOOK

Template 4: evidence and change register

Printable aid for open items and traceable revisions.

Evidence planning

ID / scenario	Required evidence	Owner / date	Status
____	_____	_____	_____
____	_____	_____	_____
____	_____	_____	_____
____	_____	_____	_____

Change control

Change / revision	Affected scenarios	Decision / evidence
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

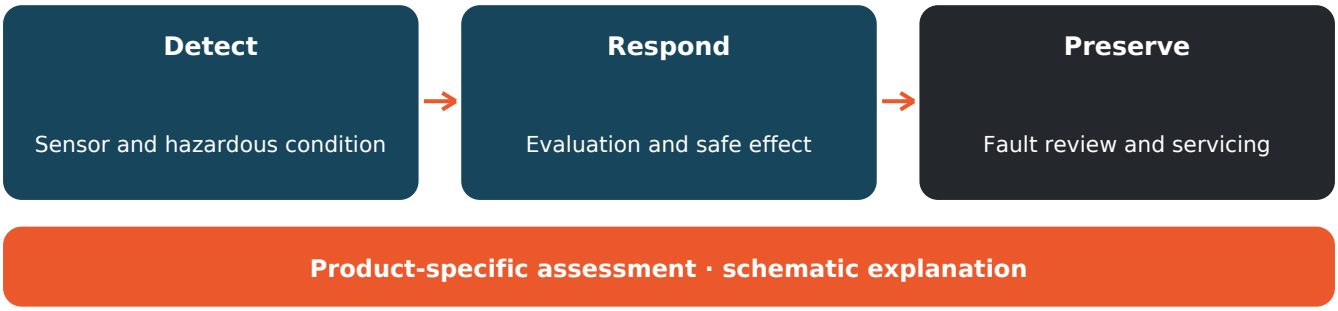
The evidence register manages missing measurements, calculations and approvals. Identify an owner and expected closing decision. The change log links technical modification, affected sources, extra evidence and record revision. A closed row needs traceable support.

Status rule

Distinguish open, in progress and technically closed. A due date alone does not close evidence.

Case 1: pump with an Ex motor

Motor evidence alone does not cover pump mechanics.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Starting point	Clarify substance and internal/external atmospheres.
Sources	Seal, bearings, coupling and hot pumped liquid.
Faults	Dry running, blockage, misalignment and lubrication loss.
Protection	Design and suitable confirmed monitoring.
Evidence	Evidence thermal effects, mechanical design and response.

Illustrative case without an operating approval: a pump unit has a certified motor. Intake reveals incomplete seal and dry-running data. State these gaps explicitly. Design and laboratory agree suitable evidence for critical conditions. Where shutdown is necessary, it must respond before possible ignition; an alarm alone is not automatically sufficient. After implementation assess run-down and heat accumulation. Only the evidenced overall argument supports final technical review. Limits come from the actual pump, not this case.

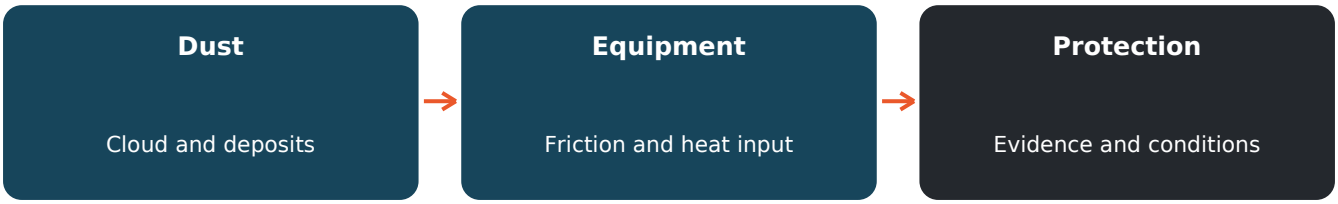
In practice

Valid motor evidence is important, but is not complete pump evidence.

IGNITION HAZARDS · EAC EX HANDBOOK

Case 2: fan in a dust atmosphere

Assess rotor, deposits and cleaning conditions together.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Starting point	Capture dust inputs, layer thickness and internal/external zones.
Mechanics	Rotor clearance, wear and possible foreign objects.
Thermal	Bearings, motor, cooling and deposits.
Electrostatics	Coatings, plastic parts and dissipation paths.
Implementation	Document testing, cleaning limits and maintenance.

Example: a fan is intended to convey dust-laden material. Do not adopt an existing gas assessment universally. The operator supplies process and dust inputs; investigate missing parameters. Assess rotor/housing tolerances and permitted wear. Layers may reduce heat removal. Rely on cleaning within the concept only where required conditions are realistic and clear. Review a different coating for electrostatic effects before use. State actual assessed dust use and justify variant coverage.

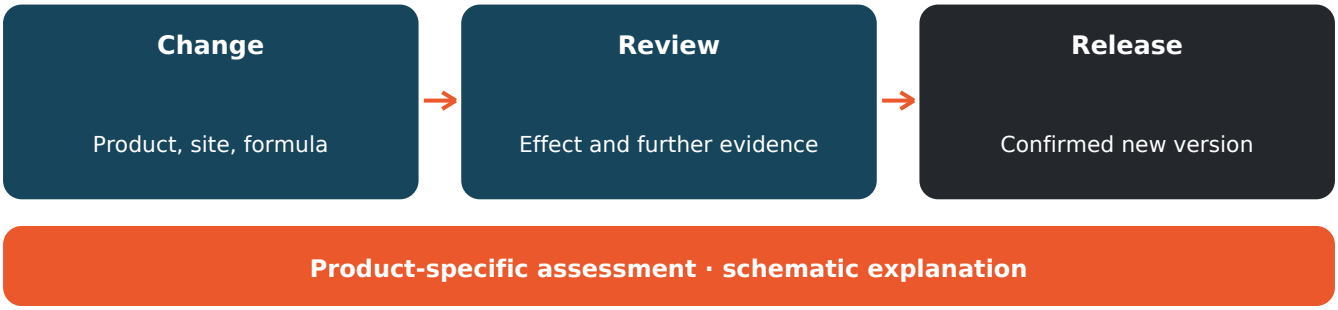
In practice

Dust forms the atmosphere; rotor rubbing and hot surfaces are possible sources.

IGNITION HAZARDS · EAC EX HANDBOOK

Case 3: mixer handling several formulations

A substance change can alter the assessment basis.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Starting point	Capture formulations, cleaning media and phases.
Mechanics	Review shaft, seal, bearings and product contact.
Process	Consider charging, reactions and heat input.
Variant	Compare speed, impeller, material and fill state.
Approval	State substance and use limits explicitly.

Example: a mixer handling one confirmed substance will process a different formulation. The model is unchanged, but substance properties and process heat may differ. Link the formulation to affected scenarios in change control. Technically review any possible gas/dust combination. Include cleaning and low-fill start-up. Record new inputs and additional evidence. Do not make a universal claim for all chemicals. The subsequent instructions describe only technically confirmed scope.

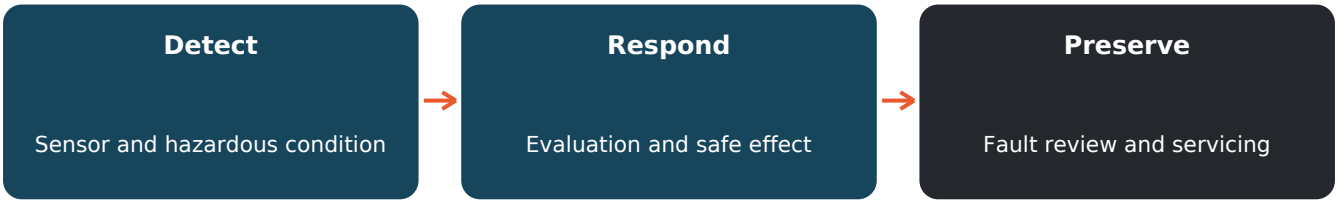
In practice

Unchanged hardware does not mean unchanged ignition hazard.

IGNITION HAZARDS · EAC EX HANDBOOK

Case 4: gearbox with temperature monitoring

Sensor, evaluation, response and servicing form a protective chain.



Product-specific assessment · schematic explanation

Assessment area	Project implementation
Starting point	Determine load, speed, lubrication and installation.
Faults	Bearing failure, lubrication loss and blocked drive.
Measurement	Hazardous point and actual response time.
Failure	Sensor fault, shutdown failure and post-stop heat.
Evidence	Confirm protective function and necessary test intervals.

Example: a gearbox receives a housing sensor. First establish whether it detects critical bearing heating in time. Confirmed housing temperature is not automatically actual bearing temperature. Assess shutdown delay and residual heat. Review behaviour on supply loss. Where periodic function checks are necessary, instructions specify scope and ownership. This case prescribes neither a temperature value nor a universal safety integrity rating. Those decisions follow actual engineering and evidence.

In practice

A retrofit sensor improves protection only where the complete function is evidenced.

IGNITION HAZARDS · EAC EX HANDBOOK

Ten common errors and their correction

Replace generic statements with traceable technical justification.

Error	Correction
Ex motor treated as complete machine evidence	Assess mechanics and interfaces additionally.
Target protection chosen at the end	Define use requirements before analysis.
Dust entered as the only ignition source	Distinguish atmosphere and actual source.
Old standards copied unchecked	Review list, edition, country and date.
2014 directive described as source of 2011 TR	Explain chronology and separate legal routes.
Partial-load measurement treated as full evidence	Justify critical conditions and applicability.
Earthing assumed to solve all static hazards	Review surfaces, isolation and process.
Sensor alone accepted as protection	Assess complete chain and failure behaviour.
All variants grouped universally	Map safety-related differences.
No update without hardware change	Consider new substances, knowledge and duties.

The main errors involve missing boundaries and unsupported extensions. A clearly documented gap can be addressed. A concealed gap may remain unnoticed until delivery or operation. Use these corrections as technical review questions.

Core rule

No conclusion without product linkage, condition linkage and reliable evidence.

FAQs, costs and scheduling

Work follows engineering scope and evidence gaps.

Is the report an EAC Ex certificate?

No. It records technical analysis and evidence. The competent body makes the conformity decision in certification.

Can an existing ATEX assessment be used?

As technical input where revision, scope and evidence match. Also reconcile standards editions and procedural requirements.

Does every variant need its own report?

Not necessarily. A shared assessment needs justified coverage of safety-related differences.

What determines cost and duration?

Complexity, variants, input quality, existing evidence and extra testing. The sector page states no universal prices or fixed turnaround.

Quotation element	Clarify scope before ordering
Analysis	Product boundary, source register and fault conditions.
Documentation	Report, appendices, translation and revisions.
Evidence	Laboratory, samples, calculations and repeat testing.
Procedure	Certification, production assessment and support separately.

Initial enquiry

Provide model list, datasheet, drawing, atmosphere and complete existing reports.

Sources: [1]

Checklist for technical approval

Complete for each model family and new assessment revision.

Review item	Status / owner
Clear product and assessed variants	_____
Confirmed atmosphere and substance inputs	_____
Agreed target protection and standards plan	_____
Consistent drawings / parts list / revision	_____
All sources recorded with relevance rationale	_____
Normal and required fault conditions assessed	_____
Mechanical / thermal / electrical interfaces reviewed	_____
Measures actually implemented	_____
Effectiveness supported by suitable evidence	_____
Protective function and failure behaviour reviewed	_____
Open items and limitations resolved	_____
Instructions / marking / passport reconciled	_____
Manufacturer approval and body involvement	_____
Archive / change control / handover arranged	_____

This list supports review without replacing technical assessment. Open remains open despite a pressing delivery date. Record evidence IDs and approval decisions in the dossier. Certification and installation-specific operating release have their own checks.

Approval field

Product / revision: _____ Date: _____

Technically reviewed / approved by: _____

IGNITION HAZARDS · EAC EX HANDBOOK

Sources and legal foundations

Linked foundations for product-specific assessment.

[1] AC Inorms: ignition hazard assessment

Open original source

[2] AC Inorms: regulations archive

Open original source

[3] EEC: TR CU 012/2011 and official foundations

Open original source

[4] Adilet: TR 012, articles and annexes

Open original source

[5] Adilet: Decision 158/2020, consolidated standards lists

Open original source

[6] ISO: 80079-36, non-electrical equipment methodology

Open original source

[7] ISO: 80079-37, protection concepts c, b and k

Open original source

[8] Rosstandart: TR 012 list and application deadlines

Open original source

[9] Rosstandart: GOST 31610.36-2024, adoption in 2027

Open original source

Official regulations and complete agreed standards editions are authoritative. Review list dates and national adoption separately. Source numbers show technical linkage; unnumbered procedures, tables and cases are original editorial working aids.

Sources: [1]-[9]

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Further sources and image credits

Linked foundations for product-specific assessment.

[10] EU: ATEX Directive 2014/34/EU

Open original source

[11] IECEx: international certification scheme

Open original source

[12] IEC: TS 60079-32-1, electrostatic hazards

Open original source

[13] IEC: 60079-32-2, electrostatic testing

Open original source

[14] Rosstandart: GOST 31438.1-2011 and corrections

Open original source

[15] ISO: public terms and content overview for part 36

Open original source

[16] EAEU: conformity assessment bodies registry

Open original source

[17] EAEU: certificates and declarations registry

Open original source

[18] EAEU: Decision 158/2020, official record

Open original source

As of 14 October 2026. Cover image: ignition hazard assessment, ac-inorms.com; additional technical images also AC Inorms. Diagrams, matrices, cases and worksheets are original work. No complete standards texts, specimen certificate or equipment approval.

Sources: [10]-[18]

IGNITION HAZARDS · EAC EX HANDBOOK

Your ignition hazard assessment with AC Inorms

Connect technical inputs, protection concept and EAC Ex procedure.



Ex equipment · image: AC Inorms

AC Inorms supports manufacturers and exporters in structuring technical records and coordinating Ex projects. Product boundaries, target protection, atmosphere and existing evidence determine scope. A traceable assessment connects sources, faults, measures and evidence. Align passports, safety assessments and instructions to the same product revision. Plan necessary testing and certification with competent bodies. For a reliable quotation identify missing inputs and additional services explicitly. Manufacturer technical approval remains a distinct step.

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Web: ac-inorms.com

For the initial enquiry

Provide datasheet, model list, drawing, atmosphere, destination and complete existing reports.

Sources: [1], [2]