



GUIDE BATTERY STORAGE · 6 MIN.

Acceptance of the thermal barrier in a battery energy storage system — 12 inspection points

This checklist takes you through the acceptance walkdown in twelve inspection points once the thermal barrier has been installed in a battery energy storage system. You check barrier layers, joints, penetrations, fixings and documentation before the installation is put into service.

1. Compile the proofs of fitness for use before the walkdown

Responsible: Site management, fire safety consultant · Timing: Before the acceptance date

Have the proof of fitness for use or applicability ready for every barrier and penetration seal system installed: general construction type approval (aBG), general building authority test certificate (abP), ETA or a classification report to EN 13501-2. Without these documents you cannot judge during the walkdown whether the installation matches the tested design. Check how long the approvals remain valid — expired construction type approvals are a frequent acceptance defect. Also compare whether the system installed is the system specified in the fire safety concept.

2. Compare as-built against the fire safety concept

Responsible: Fire safety consultant · Timing: At the start of acceptance

Work through the penetration seal drawing item by item and mark every barrier you find. Compare the required fire resistance period and classification — EI 60 or EI 90 to EN 13501-2, for example — with what has actually been installed. Check whether subsequent design changes exist as a revised issue and have been approved. Items with no counterpart in the drawing must be recorded as a defect until the designer confirms them.

3. Open sample areas to verify layer build-up and material thickness

Responsible: Installing specialist contractor, acceptance inspector · Timing: Acceptance walkdown, before closing up

With multi-layer build-ups the number of layers is no longer visible once installed. Agree sample openings that are opened in the presence of the acceptance party, or photographed before closing up. Measure the total thickness and compare it with the value in the proof of fitness for use — falling below the tested thickness voids the classification. Record the measuring point, the measured value and the target value in the report.

4. Check butt joints and gaps in the barrier layers

Responsible: Acceptance inspector · Timing: Acceptance walkdown

Butt joints are the typical weak point of any planar thermal barrier. Check whether joints in multi-layer build-ups are staggered and whether the overlap required by the approval has been maintained. Confirm that joints are tightly closed and have not been filled with untested material. Open, cracked or expanding-foam-filled joints are a defect and must be rectified before commissioning.

5. Inspect connections to adjoining components

Responsible: Acceptance inspector, site management · Timing: Acceptance walkdown

Check how the barrier terminates against floor, ceiling, walls and steelwork. The connection must match the detail described in the test certificate, including edge distance and connection material. Pay particular attention to areas behind cable trays, pipework and plinth panels, where connections are often left incomplete. A gap at the perimeter connection renders the insulating performance of the entire surface worthless.

6. Record and assess every penetration individually

Responsible: Installing specialist contractor, acceptance inspector · Timing: Acceptance walkdown

Record every cable, pipe and ventilation penetration through the barrier with its position, service, nominal size and the penetration seal system used. The test basis for penetration seals is EN 1366-3; the installed system must be tested for the actual combination of construction element, penetration type and fill level. Check the permissible fill level of cable trays and the minimum spacing between adjacent penetrations. Cables pulled in later without re-sealing are a classic acceptance defect.

7. Have residual and temporary openings closed

Responsible: Site management · Timing: Before release for commissioning

Search deliberately for openings that were kept clear for installation, equipment delivery or instrumentation. These include spare pipes, empty conduits, installation slots and openings behind cable trays. Every residual opening must be closed with a system tested for that purpose — a temporary closure is not a proof of fitness for use. List open items in a defects register with a deadline and a responsible person.

8. Check fixings, supporting structure and fasteners

Responsible: Acceptance inspector · Timing: Acceptance walkdown

Check the type, spacing and number of fixings against the requirements of the proof of fitness for use. Verify that the supporting structure is made of the material named in the approval and that anchors and screws are approved for the substrate. Look out for pulled-out fixings, missing washers and excessive centre distances. For container linings, additionally check that the fixings withstand transport and operational vibration.

9. Check the barrier between modules and racks for completeness

Responsible: Fire safety consultant, installer · Timing: Acceptance walkdown

Where the thermal barrier sits between cell blocks, modules or racks, check that it runs over the full planned height and width without interruption. Confirm that gaps around plug connectors, busbars and cooling lines are closed. Compare the arrangement with the assumptions underlying the propagation behaviour in the UL 9540A test report. Deviations from the tested build-up must be assessed by the designer and approved in writing.

10. Confirm separation from other occupancies and adjacent areas

Responsible: Fire safety consultant · Timing: Acceptance walkdown

Check the fire-separating elements between the storage area and adjoining occupancies against the fire resistance period set out in the concept. NFPA 855 requires walk-in storage rooms inside buildings to be separated by construction with a two-hour fire resistance rating; German building law sets its requirements through the state building code and, where applicable, the Industrial Building Directive. While you are there,

check doors, dampers and access openings in the separating surface. Record which regulatory requirement you applied in each case.

11. Check the labelling of every penetration seal

Responsible: Installing specialist contractor · Timing: Before the acceptance report

Every classified penetration seal must be labelled permanently and clearly visibly. Among other details, the label must state the system used, the fire resistance period, the number of the proof of fitness for use, the installing contractor and the installation date. Check that the labelling is still legible once cladding and cable trays have been fitted. Missing or illegible labels make any later repeat inspection impossible and must therefore be recorded as a defect.

12. Hand over the acceptance report, declaration of conformity and penetration seal register

Responsible: Installing specialist contractor, site management · Timing: Close of acceptance

Obtain the installing contractor's declaration of conformity for each construction type, confirming that the work was carried out in accordance with the proof of fitness for use. Take over the penetration seal register with one line per seal, item number, photograph and reference to the drawing — it is the basis for every later inspection. Document defects with photographs, deadline and responsible person, and later the rectification carried out, so that the chain of evidence remains complete. Add the documents to the plant's fire protection documentation, which the operator is required to keep.

Frequently asked questions

Who is allowed to accept the thermal barrier in a battery energy storage system?

There is no generally applicable rule — what counts is the fire safety concept, the building permit and the inspection ordinance of the relevant federal state. In practice the fire safety consultant, or a competent person appointed by them, accepts the penetration seals; for installations requiring a permit, acceptance by the building authority is added. The installing contractor cannot carry out the acceptance itself; it supplies the declaration of conformity. Clarify who does what before you award the contract, otherwise the responsible party is missing on the day of acceptance.

Is a UL 9540A report sufficient evidence for the installed barrier?

No. UL 9540A is a test method for evaluating fire propagation during thermal runaway and describes the behaviour of one specifically tested system build-up. The report says nothing about whether a component may be used under German building regulations — for that you need a classification to EN 13501-2 and a proof of fitness for use such as an aBG, abP or ETA. The two forms of evidence complement each other: the UL report justifies the protection objective, the proof of fitness for use justifies the construction.

What should you do if cables are pulled in after acceptance?

Every subsequent penetration voids the classification of the penetration seal until it has been properly closed again. Set out in the operating manual that work on penetration seals may only be carried out by a specialist contractor and only with the system specified in the approval. Afterwards, update the labelling and the penetration seal register with the date, the contractor and a photograph. Without this procedure you lose track over the operating years, and the next inspection starts from scratch.

Let us talk about your project

Reply within 24 hours on working days.

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