



Chapter 55 – Steel Hatch Covers

The steady increase in the size of ships, and particularly bulk carriers, has been accompanied by a steady increase in the cost of manning and running them.



Figure 55.1: Steel hatch covers.

As a partial counter to this escalation in costs, equipment such as steel hatch covers was developed and introduced on board ship, shortening the turnaround time in port and enabling larger ships to be manned by smaller crews.

This chapter is based on a UK P&I Club report that considered steel hatch covers in general and the MacGregor-Navire hatch covers in particular. It examined claims for seawater damage to cargo carried in ships fitted with steel hatch covers, to analyse the causes of leakage and to suggest solutions.

The fitting of steel hatch covers on the weather deck of seagoing ships is now the rule rather than the exception, and so it is essential to eliminate the underlying causes of cargo damage from ingress of seawater through these hatch covers. The additional weight of seawater in the tanks may also overload the ship and threaten stability.

55.1 Advantages of Steel Hatches

The advantages of steel hatch covers include:

- Greater strength than traditional hatch covers, which contributes to the safety of the vessel
- easier and quicker to open and close
- fewer crew are required to operate them compared to traditional hatch covers.

Against these advantages must be placed the high costs of initial purchase and routine maintenance.

55.2 Development of Automatic Steel Hatch Covers

The hatch openings of ships were traditionally covered with beams, wooden boards and tarpaulins. Metal was used for slab-type pontoons, but the MacGregor-Navire Organisation had the idea of using an eccentric wheel to lower and raise these pontoons and, in the raised position, to move them to one end of the coamings, lifting them at that point into a vertical position. In the lowered position, they would rest on a rubber gasket and, by the use of cleats, become weathertight. This revolutionary but simple modification was still in operation in the mid-1940s.

Subsequently, these simple individually moved panels were linked together and counterbalanced in such a way that one wire could be used to move them to one end of the hatch, where they would automatically assume a vertical position and stow in a small area. This principle became internationally known as the 'single pull hatch cover' and, on the weather deck, it is still the most widely used means of cargo protection. Refinements and modifications have been incorporated to include automation and folding hatch covers motivated by hydraulic or electrical means, piggy back covers, stacking covers, coiling covers and sequential or non-sequential multi-panel covers. However, for illustrative purposes, this chapter covers just the single pull type of operation.

55.2.1 Coamings

The sealing round the edge of the hatch, to prevent the ingress of water, consists of a hard rubber gasket strip retained on three sides in a channel bar within the hatch cover

framework and resting on the compression bar, which is a square section steel bar welded onto the coaming bars (see Figures 55.2 to 55.4). A double drainage trough is designed inboard of this compression bar to safeguard against minor localised sealing problems.

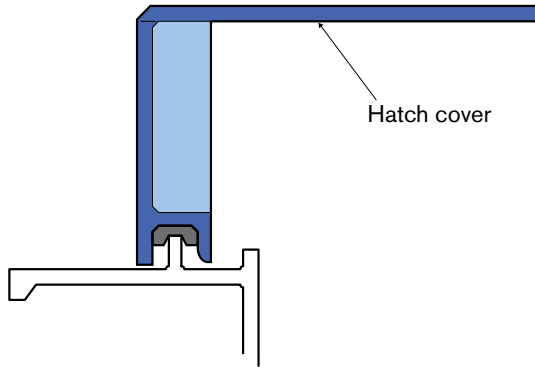


Figure 55.2: Section through side or end of hatch cover.

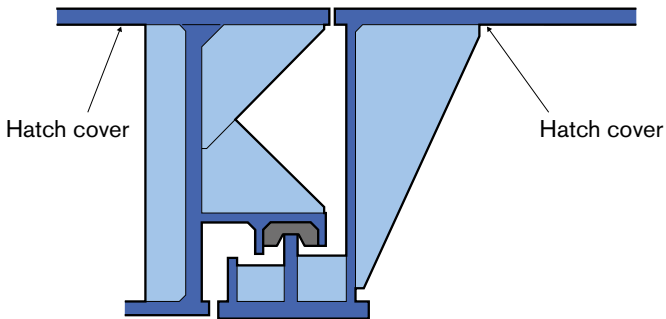


Figure 55.3: Section through cross joint.

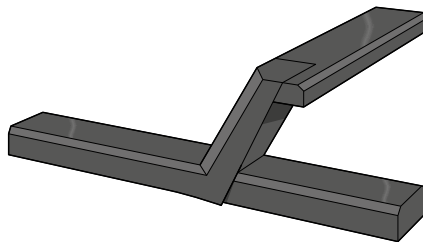


Figure 55.4: Details of cross joint rubber inserts.

Should anything be trapped on the coaming during the closing operation or a local deformation in the compression bar be caused by, for example, a derrick runner wire, then in this local area there is a small opening for the possible entry of water which, while not being dangerous, could damage a fairly large amount of cargo.

55.2.2 Moving Parts

Maintenance for the continuance of original weathertightness is essential and correct maintenance of moving parts, such as wheels, chains, gypsies, etc, will alleviate the possibility of the assembly being subjected unnecessarily to rough treatment because of undue wear on these parts.

55.3 Weakness in Hatch Covers

55.3.1 Strength

Each automated steel hatch cover panel, consisting of steel plate, sections, beams, etc, is designed and assembled to the strict requirements of a Classification Society and is expected to be immensely strong. However, this can be a disadvantage under certain circumstances, particularly when the vessel is labouring in a seaway. Although ships give the impression of great strength, when the weather is adverse any ship that does not yield to the force of the waves would quickly founder. In fact, the ship must ride those blows that cannot be avoided to absorb the greater part of the energy directed at it. In so doing, the ship 'works' along its length and across its width.

In these conditions, the strength and rigidity of the steel hatch covers can cause the weathertight joints between the vessel's structure (hatch) and the covers to move as the ship works in a seaway.

With the average freeboard of ships considered as being approximately 2.75 m, and with a combination of wave heights, a deadweight cargo and strong winds on passage, most ships will have the decks and hatches awash at frequent intervals.

In an analysis of claims for cargo damage when hatch covers had failed, bad weather had been experienced on every voyage, but in no case was it of such severity as to offer certain defence of 'perils of the sea' under the Hague-Visby Rules, neither was it severe enough to justify penetrations of the rubber seals of the hatch joints, provided that the seals were in good condition. However, in many cases, survey reports from the discharge port criticised the condition of the hatch covers and coamings, indicating a poor standard of maintenance.

The results on analysis of claims showed:

- Usually, the only vessels involved were those carrying bulk and deadweight cargoes
- their freeboard was not very large
- all voyages included a period of heavy weather
- hatch survey reports indicated that some hatches and coamings were in poor condition.

55.4 Suggested Remedies

55.4.1 Proper Securing

When hatches were secured with boards and tarpaulins, the need for care in their securing was very obvious. The ships were also much smaller and there were more seafarers to perform the tasks connected with leaving port, such as the lowering and

securing of derricks and the battening down of hatches. The crew had to work as a team because the various jobs could not be done by one or two seafarers alone and, with teamwork, there is less risk that the job will be improperly done. Lastly, a poorly secured hatch was immediately apparent to the ship's officers and steps could be taken to remedy the situation.

However, on modern bulk carriers, there are fewer crew members. For the one or two seafarers concerned, the prospect of securing a long line of hatch covers stretching away along the weather deck is not an inviting one, and when there are added discomforts of wind and rain it is not surprising if the securing is not always carried out as conscientiously as it ought to be. Steel cleats and wedges are not as interesting as canvas tarpaulins and wooden wedges, even if they are stronger and more efficient and, therefore, safer. There are also a great many of them; hatches of say 40 × 30 ft will probably have six panels secured around the edges by about 40 cleats and further secured by about 50 cross-seam wedges.

When securing hatch covers, the joints cannot be effective if insufficient pressure is applied and the pressure must be evenly distributed along the whole length of the joint.

Type of cargo stresses

The type and distribution of cargo carried can affect the stresses experienced by a ship in a seaway and the degree of bending and twisting suffered. In this respect, homogeneous cargoes of low density, such as bulk grain, are better than high density cargoes, such as ore concentrates or steel products. Bulk carriers are designed as single-deck vessels, which means that high density cargoes will be stowed at the bottom of the holds, causing severe racking strains of hogging and sagging.

These racking strains may well cause the hatch covers to leak if the cleats and wedges are not secured properly. In these conditions, it is important to ensure that the cleats remain tight.

Case Study – ‘Sabine Howaldt’

In severe weather, leakages can and will occur through steel hatch covers even if they are properly secured. This was illustrated by the decision of the US Court of Appeal in the case of the ‘*Sabine Howaldt*’, 1971 AMC539.

The ‘*Sabine Howaldt*’ was a vessel of 2,300 gross tons, 306 ft in length, a beam of 40 ft, her bridge amidships and her engines aft. The four cargo holds were served by two hatches only, one forward and one abaft the bridge. The fore deck hatch was about 60 × 18 ft and had the protection of solid bulwarks at the ship's side, while the after deck with open rails at the ship's side was 3 ft higher than the fore deck and had a hatch of about 68 × 18 ft. The holds were separated by bulkheads with the forward hatch serving Nos 1 and 2 and the after hatch serving Nos 3 and 4.

At the time, the ‘*Sabine Howaldt*’ was 7 years old and her classification, which was the highest in Germanischer Lloyd, had been maintained at her annual survey in April 1965. The charter voyage during the following December was from Europe to the USA with a full cargo of steel products, which were loaded in good condition but were rusted and

pitted from contact with seawater when discharged from No 4 hold and also, but to a lesser extent, from No 1 hold.

Before completion of loading, the surveyor for the charterer inspected the hatch covers and found them in good condition with no dents, bending or other damage and no staining on the inside of the coamings to indicate previous leakage. His report found the ship seaworthy. After the hatches had been closed and tightened down, they were inspected by the chief officer together with another officer and a log entry was made by the chief officer that the MacGregor-Navire hatch covers were 'closed and wedged'.

The '*Sabine Howaldt*' sailed from Antwerp on 15th December at a draught less than permitted as she was not down to her winter marks. By midnight on the third day, the wind had risen to force 9 on the Beaufort Scale. It increased to force 10 by 09:00 hrs on the 18th, blew with that force until about 17:00 hrs and then began to ease. During the whole of this period, the ship pitched and rolled heavily in the high seas and waves were continually breaking across the decks.

On the 20th, the wind reached force 9/10, but it abated the following day and did not exceed force 7/8. On the 23rd, the ship was hove-to for 12 hours trying to reduce the battering from hurricane force winds, heavy confused swells and huge seas breaking over her forecastle deck hatches and upper works; bending, twisting and vibrating her continuously.

The violence of the weather was severe enough to cause structural damage. After the worst of the storm was over, it was discovered that the pedestal holding the master switch control for the capstan had been torn loose leaving a hole in the deck, a galley port hole was smashed and the catwalk gangway from amidships to poop was torn loose and destroyed, denting a ventilator at the same time. Several parts of the ship's superstructure and fixtures were dented and the covers from two winches had been ripped off and lost.

When the weather first deteriorated at the beginning of the voyage, the chief officer, in the company of another officer, made a second inspection of the hatches from inside the cargo holds. He found no leakage through the hatchway although waves were washing across the covers. He also examined the covers on arrival in the USA on 3rd January and found hatches, covers and gaskets all in good condition, as did the surveyors for both the owners and the charterers. Nevertheless, seawater had entered the hold and it was decided that the severe stresses to which the ship had been subjected had momentarily deformed the rectangular opening of the hatch, thereby disturbing the seal between the gasket and the compression bar on the coaming, allowing seawater, which was pouring over the decks and hatches, to enter the hold.

After considering all the circumstances, including the fact that on both the previous and following voyages the hatch covers had not leaked in spite of heavy weather, the Court of Appeal decided that the violence of the wind and the confused cross swells that had wrenched and twisted the ship during the voyage were a 'peril of the sea' and that the owners were not liable for the damage to cargo resulting from the leaking of the hatch covers.

Had the '*Sabine Howaldt*' been equipped with wooden hatch boards and tarpaulins, the situation would have been far more dangerous. The collapsing of the amidships

catwalk would undoubtedly have torn the tarpaulins covering the hatch over Nos 3 and 4 holds, allowing a much larger volume of seawater to enter those holds to the certain detriment of the cargo and possibly to the ultimate danger of the ship itself.

55.4.2 Proper Maintenance

It is absolutely crucial for hatch covers to be maintained at the highest standard if cargo damage is to be avoided.

It is not easy to achieve this standard because the modern bulk carrier has a smaller crew for its size than the older type general cargo ship and spends little time in port. Adequate maintenance is difficult to carry out in port because of cargo being worked, or at sea because the hatches are then secured for the passage.



Figure 55.5: Folding hatch cover.

Systematic and well-documented inspection is an essential part of onboard maintenance and will aid identification of defects at an early stage. The ship's planned maintenance system should include ship/hatch-specific checklists that have been drawn up in accordance with the equipment manuals.

Working parts

The marine environment is extremely corrosive and every opportunity must be taken to minimise its effect, particularly in respect of the cleats that secure the pontoons. It is the shipowner's/operator's responsibility to undertake the required maintenance.



Courtesy of Danny Cornelissen/portpictures.nl

Figure 55.6: Hatch coaming and cleat arrangement on a container ship fitted with pontoons.

Hatch panels

Regular inspection and maintenance of hatch panels is essential because any defects, cracks, holes or corrosion will invariably lead to water leaking into the hold. Properly painted hatch top plating contributes only to cosmetic appearance and should not be taken as proof that the panels are in good condition.

Cracks and holes may be repaired with doublers, but these should be considered as a temporary repair and never a substitute for a proper insert repair. Doublers will cover the damage and prevent water ingress, but will not restore the original strength or stop corrosion. Welding on hatch covers should be carried out by trained and qualified personnel as excessive heat may cause distortion of the panel structure, which is very difficult to correct.



Figure 55.7: Multiple doubler plates on hatch top plating.

Care must be taken if sealing tape has been applied to the hatch cover. This adheres strongly to the surface and may lift off the paint when removed. This leaves the surface unprotected and exposed to the elements, with corrosive action setting in if not dealt with quickly and in the proper manner.

Hatch covers are type-approved equipment and repairs involving modifications or changes to the design can only be made with the approval of the Classification Society or the flag State.

Hatch cover repairs should be properly and promptly reported to the Classification Society or flag State. As well as being a Class requirement, this enables the ship to obtain correct repair information that is in line with Class rules.



Figure 55.8: Damaged hatch cover which cannot be repaired at sea.

Rubber seals

The most important factors determining the ability of the hatches to remain weathertight are the rubber seals on the underside of the panels and the compression bars with which the seals make contact when the hatches are in a closed and secured position.

The effectiveness of the rubber seals can be reduced in several ways:

- Accidents occurring while the hatches are being worked and during the opening and closing of them can physically deform the seals
- careless painting of channels can cause hard spots on the seals, locally reducing their resilience
- rust scale can form underneath the seals in an uneven thickness, causing high spots and resulting in non-uniform compression of the rubber
- particles of cargoes, such as grain or ore, can become compressed between the seals and the compression bars
- overcompression of the rubber will result in permanent damage in the form of a groove where the rubber meets the compression bar
- age will cause seals to perish or harden, with a tendency for them to crack and break.

Any of these can result in the covers leaking when under stress.



Figure 55.9: Permanent groove in packing rubber caused by overcompression.

Good management, careful inspection and routine maintenance at every opportunity will help to prevent all but the ageing of the rubber. This cannot be prevented but it can and ought to be recognised and remedied before it has progressed too far. The only remedy is the replacement of the old seals with new, and the opportunity should be taken at the time of renewal to remove all traces of rust scale from the channels before preparing them and reseating the new seals.

Any seals more than two years old should be inspected regularly for signs of deterioration due to ageing.

Whenever packing is to be renewed, whether because of damage or old age, it is essential that the whole strip is replaced, or there will be different compression strengths between the new and existing rubber. In hatch cover tightness, compression is the governing factor, not contact.

Last minute repairs should be avoided, particularly if they focus on passing a tightness test rather than the quality of repair. Improper repairs are unlikely to withstand ocean passage and overlook the important issue of due diligence.

Under the due diligence principle, owners are required to carry out a reasonable inspection to ensure that hatch covers are in good condition. If a defect is found during this inspection, repairs should be carried out in line with good industry practice to restore the condition of the hatch covers and their sealing and securing arrangements.

If a claim for wetting damage is filed against the ship, a well-prepared maintenance file will be of great value in defending the owner's interest and proving that due diligence was exercised.

Improperly maintained or adjusted hatch covers will generally cause accelerated wear and deep permanent imprint to the rubber seal. Replacing the rubber seal alone will not solve the problem and identifying the root cause of the problem is necessary to ensure that repairs will be efficient.

Compression bars

The compression bars along the top of the hatch coamings are solid steel and there is a tendency to assume that no harm can come to them and that they need no maintenance.

The most common cause of damage to these bars is impact from cargo moving into or out of the hold. This is particularly the case if the ship carries cargoes of constructional steel, when each lift will be awkward to handle and probably heavy as well. A load of this type striking the compression bar can easily dent, score or bend the bar.

The bars may also become damaged over a period of time by cargo wires continually passing across the same area, with the result that the original right-angled edge of the bar becomes rounded. If care is not taken to combat corrosion, the top surface of the bar will, in time, develop high and low spots that will prevent the proper seating of the rubbers.

This corrosion is particularly likely to affect the compression bars of the cross joints. Close attention should be paid to the cross joints between the panels as, in many instances, leakage has occurred at these joints or at some other position as a result of them being defective in some way. The cross joints must be pressed firmly and evenly together, and the cross wedges, whether manually or automatically operated, are of paramount importance as the tightness of the joint mainly depends on them. If the cross wedges do not provide an effective seal, either the seals have become too heavily compressed and require renewal, the compression bar on the adjacent panel has become bent or worn down, or there is a combination of both these defects. The situation is often rectified by welding a small plate onto the adjacent panel edge at a position where the manual wedge end rides up and over the panels to put pressure on the cross joint. If the wedges become strained or bent, new wedges should be fitted.

Bearing pads



Figure 55.10: Bearing pad.

Bearing pads have two parts, one attached to the side of the hatch cover and the other attached to the coaming. Their purpose is to:

- Assist with alignment/adjustment of the hatch cover
- transfer loads into the deck structure

- prevent the hatch cover sitting too low on the coaming
- prevent loads being transferred to other structural parts such as wheels and axles.

Bearing pads come in different sizes and materials and their wear will depend on their position and loads. This means that not all bearing pads will wear down to the same extent simultaneously and they require regular inspection to determine whether allowable wear limits have been exceeded.



Figure 55.11: A crack developing in the side plating due to advanced bearing pad wear.

Care must be taken when replacing bearing pads and it is not just a case of restoring them to their original height. Original spares of the correct size should be used and the two parts must be of compatible materials. Low-friction material is recommended to allow smooth movement between the panel and the coaming. Manufacturers or specialists should be called in for bearing pad adjustment.



Figure 54.12: Improper repair to a bearing pad.

Hatch covers fitted with bearing pads usually have an operational clearance of 10 to 15 mm between the panel side lower edge and the coaming. The exact distance should be checked in the manual and noted on inspection sheets as it is one of the first indicators of bearing pad wear.

Locators

Locators guide the panel into its correct closing position and ensure the panels are kept properly positioned during the voyage.

Locator wear should be regularly monitored because slight wear in one place may result in significant loss of compression or improper positioning in another place.



Figure 55.13: Properly maintained and adjusted locator.

Some locators have replaceable mating surfaces and allow for the use of shim plates to facilitate installation and adjustment in case of wear down.



Figure 55.14: Excessive wear on the locator.

Stoppers

Hatch panels may be subjected to heavy loads and accelerations when the ship is rolling and pitching in a seaway. Stoppers (restraints) are fitted to keep the panel in its correct position. Stopper wear must be closely monitored and the manual should be consulted for advice on allowable wear limits.



Figure 55.15: Stopper.

Draining system

The coamings and covers of steel hatches are designed to clear away moisture, but general cleanliness of drain holes, waterways and coamings is important because any accumulation of cargo residues or dirt may trap condensation and rainwater. This could result in sweat damage to the cargo and steady deterioration of the covers by corrosion.

Maintenance of the draining system should include regular cleaning of the drainage channels, drain holes, drain pipes and drain valves, particularly following cargo operations.

A wooden bung may be placed in the drainage system to prevent blockage during cargo operations. This is fine as long as removal of the bung is not overlooked on completion of operations.



Figure 55.16: Blocked drainage systems.

Securing mechanism

The primary function of the securing mechanism (cleats) is to hold the panels down when the ship is at sea. Whatever cleating system is used (eg manual, hydraulically operated), it is vital that it is structurally sound. This includes not only the cleat itself, but also the component parts to which the cleats are engaged (eg coaming table, crutches, snugs/panel side plating). The system should be checked regularly for wear and corrosion.



Figure 55.17: Corrosion of quick acting cleat crutch (left), thinned down snugs (right).

The cleats should never be overtightened to obtain a tighter seal. This would make the system too rigid and eventually result in damage to the cleats. In addition, steel to steel contact between the panels and the coaming would make it impossible to compress the rubber seal to achieve an adequate seal.

After completion of securing operations, a final check should be made to ensure that the cleats are all in place and correctly positioned. Crooked or poorly fitting cleats may be an indication of improper closing or alignment of the panel. This should be investigated and corrected before commencement of the voyage since faulty securing will affect the holding power of the system.

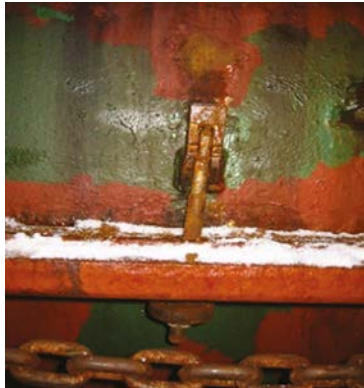


Figure 55.18: Improper vertical alignment of quick acting cleat.

Tape or foam

Sometimes, additional safeguards against leakage are applied. The usual method is the covering of cross joints with heavy adhesive tape. A more recent procedure is to use expanding foam, which when sprayed onto the joints produces a hardened barrier to water. The use of additional safeguards does not negate the need for hatch cover testing and inspection.

Some charterers, particularly in the steel trades, require the Master to apply tape to the hatch cover joints and may even supply the tape. However, the use of temporary sealants allows claimants to assume that the Master/shipowner was aware of a tightness problem, but disregarded due diligence by opting for the cheapest and quickest repair.

Maintenance manuals

Vessels fitted with steel hatch covers should carry manufacturer's manuals that provide detailed information relating to the construction, operation and maintenance of the covers, together with lists of spare parts that should be carried on board for remedial repairs. In addition, leading manufacturers may have representatives in major sea ports available both to advise and also to carry out repairs and maintenance as required.

It is strongly recommended that major overhauls and inspections are carried out by manufacturers' representatives, at the very least each time the vessel dry-docks, in order that the high original standard of the covers is maintained throughout the life of the ship. As the trend is for ships to spend less time in port and to carry a relatively small crew, it is reasonable to say that shore maintenance must be the standard, with crew maintenance being used as remedial, as and when necessary. In this way, claims on the shipowner for damage to cargo should be reduced to a minimum.

55.5 Testing Weathertight Integrity of Dry Cargo Vessels' Hatch Covers

Regulation 3.12 of the *International Convention on Load Lines, 1966* states:

"Weathertight. Weathertight means that in any sea conditions water will not penetrate into the ship".

Regulation 16 of the Convention concerns hatchways closed by weathertight covers. The *"means for securing weathertightness"* is defined in Regulation 16.4 of the Convention, which states:

"The means for securing and maintaining weathertightness shall be to the satisfaction of the Administration. The arrangements shall ensure that the tightness can be maintained in any sea conditions, and for this purpose tests for tightness shall be required at the initial survey, and may be required at periodical surveys and at annual inspections or at more frequent intervals."

55.5.1 Traditional Methods

The light test

This is the simplest means of establishing whether a defect exists and its location. The hatches are battened down fully and properly for seagoing, then the surveyor/observer enters the hold and views the underside of the covers from below. In strong sunlight, defects should be readily visible, with daylight shining through any gaps in the packing. If the test is undertaken during poor light conditions, strong torchlight properly directed from above will serve the same purpose.

The chalk test

Chalk is applied to the compression bars of the coamings and the individual panel cross seams. The hatches are then battened down fully and in the proper manner, after which they are immediately re-opened and the rubber packing (joints) carefully examined. Where a clean regular chalk mark is observed on the packaging, it is assumed that sufficient pressure exists between the joint and the adjacent compression bar. If the chalk mark is found to be intermittent or less pronounced at some points than at others, it is assumed that weathertight integrity does not exist over those

areas. This method can only be considered as indicative of a possible problem, with likely inconclusive results even after rectification of possible defects that may have been exposed by the test. The International Association of Classification Societies (IACS) advises in their Recommendation No. 14: Hatch cover securing and tightness (Reference 86) that:

“Upon completion of installation of hatch covers, a chalk test is to be carried out. This is to be followed by a hose test with a pressure of water not less than 200 kN/m².”

The hose test

In this test, a strong jet of pressurised water is directed at the seams and joints of the hatch covers. Hatch covers are battened down fully in the proper manner and with the surveyor stationed in the hold. A survey assistant must be stationed on deck/on top of the hatch covers to ensure that the water, usually supplied from the vessel's fire main, is directed at a constant and sufficient pressure in the proper direction. Ideally, the hose should be held at a distance of no more than 1 m from the joint under test with a pressure of not less than 200 kN/m². The disadvantages of this method include:

- It is time consuming
- it is difficult to ensure adequate water pressure
- excessive water may drain from the decks when the vessel may be alongside a wharf, pier or jetty
- the test cannot be safely carried out when the vessel is laden for fear of wet damage to the cargo
- two surveyors are required to conduct the test
- the test cannot be carried out if weather conditions/air temperatures are at or below 0°C.

A high-pressure jet of water may break apart on top of the panel rather than entering the interpanel void space, thus producing an unreliable test result. A second method would be to close the panel's side guttering and fill up the cross joint interpanel void space with water from a low-pressure hose. This allows hydrostatic pressure to build up on top of the packing rubber/compression bar interface. Any water that passes through the seal will be expelled on deck through the drain valve (note that perimeter joints will still require water jet testing). As a lot of water is generated during the test, it is recommended that a plastic bag is placed at the discharge end of the drain valve to collect water expelled during the test.

Ultrasonic test

There has been debate concerning the efficiency and acceptability of ultrasonic testing equipment but the technique is widely used throughout the industry to test and prove the weathertightness of hatch covers.

The advantages of this method include:

- The test identifies the exact location and extent of leakage
- it indicates the compression status of the rubber seal; if compression is good, the rubber will be able to compensate for movements at sea and maintain a tight seal
- the equipment is quick and easy to operate. One person operation is possible

- the test may be carried out in loaded or empty holds



Figure 55.19: Ultrasonic testing of hatch cover.

- there are no weather/temperature limitations and the test may be carried out during the day or night
- there is no pollution risk.

The procedure comprises placing a transmitter in the cargo hold, switching it on, and properly closing and securing the hatch covers (or other access equipment) to seaworthy requirements. The ultrasonic waves emitted by the transmitter within the enclosed space will leak through the smallest of apertures. Any leakage of sound may be detected by a receiver or detector between frequencies of 36.7 and 40.7 kHz and converted into aural frequencies or into digitally reproduced information. The location of leaks can be precisely detected from outside the hold by moving a hand-held detector along the periphery and cross seams of the covers. Evaluation of the extent of leakage can be established from reading a digital scale.

Class type approval and operator training is undertaken by some manufacturers of ultrasonic equipment used in the testing of hatch covers. The training courses include:

- Principles of the technique
- the ultrasonic equipment
- hatch cover types
- typical defects identified
- testing and reporting procedures.

It is impossible to say that hatch covers are weathertight merely by testing the seal. Although the condition of the seal plays a major part, it is also necessary to visually inspect all parts of the cover.

Records

A record should be kept of the location and extent of any leakages detected during testing. The hatches should then be opened, the causes of leakages, if any, identified, the defects rectified, covers resecured and further weathertight testing undertaken.

Hatch cover safety

Hatch covers are heavy, moving pieces of machinery and crew must be trained in their safe operation and maintenance.

Chapter 16 of the *Code of Safe Working Practices for Merchant Seafarers* (2015 Edition, amended 2022) identifies areas of operation that need particular attention to protect the health and safety of operators.

As there are many different types of hatch cover, shipowners should draft ship-specific operating guidelines based on the manufacturer's manuals. This should include the operational limits due to trim, heel, and transversal and longitudinal coaming deflection. The OOW/cargo officer should monitor these operational limitations closely because failure to do so may cause the hatch covers to derail.

Evidence to produce in the event of a claim

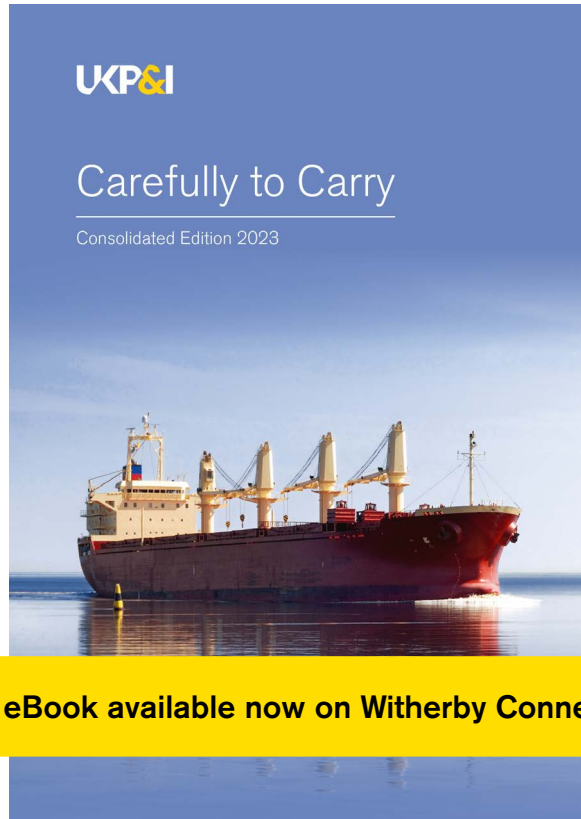
If a claim for wetting damage is filed against the ship, the following documentation should be produced as evidence of due diligence:

- Work schedules
- maintenance logs and test reports
- work specifications
- accounts
- standing instructions
- reports and correspondence
- logbook entries
- hatch patentee manual
- relevant certificates
- evidence of voyage planning and weather reports
- proof that the ship was operated in a seamanlike manner during the voyage.

A note of protest should also be prepared. A local P&I surveyor will be able to assist with further survey and test requirements.



Price: £95



This comprehensive publication, compiled by the UK P&I Club, details best practice for the carriage, loading and storage requirements of a wide range of cargoes. It also contains essential information on draught surveys and preparing cargo plans.

Outlining and expanding on all major international cargo regulations and guidelines, it also includes detailed checklists, information on draught surveys and guides to preparing cargo plans. Cargoes covered include timber, gas, grain, steel and other metals, bulk goods and refrigerated goods.