

EDVARD GRIEG SPEC – HANDLELISTE

Her er vår tolkning av Grieg-spec'en med våre produktforslag som linker og forklaringer.
Men ring 51944700 eller send oss en [e-post](#) hvis du er i tvil.

[Linker](#) til Produktkort I nettbutikk

-Merknader (n) med forklaring til spesifikasjonen

[Andre](#) produkter i gult

[-Produktforklaringer](#) nederst

2.3 INTERNAL PRESERVATION INSTRUCTIONS

Panels/cabinets, termination boxes, junction boxes, switchboards, instruments, precision equipment, etc. shall be internally protected by use of [Vapor Corrosion Inhibitor \(VCI\)](#) (1)  be [clearly marked](#) (1b)  accordingly on the outside surface. [Silica gel](#) (1c)  not be used without specific approval  from purchaser.

For equipment internally preserved and where removal of the preservative is required, a [warning label](#) (1d)  indicating what shall be removed prior to commissioning and start-up shall be attached on the outside surface.

When VCI is utilized, manufacturer's dosing recommendation shall be followed. Supplier may propose alternatives to the recommended preservation media, but any proposal shall be accompanied by product chemical and toxicological data sheets.

Rotating equipment, exchangers, tanks and vessels, piping and valves, including actuators, shall be thoroughly cleaned and dried after manufacturing and testing, prior to application of preservatives.

Unless protected by epoxy type coating or rubber lined, the inside of equipment and piping made of carbon steel, shall be sprayed, brushed or flushed with a [suitable corrosion inhibitor](#) (2)  which will not require removal before start-up.

The inside of stainless steel pipes shall be thoroughly cleaned and dried, but does not require corrosion inhibitor installed.

If nitrogen is used for internal preservation, pressure shall only be slightly above atmospheric pressure (maximum 0.3 bar above atmospheric pressure), and the relevant equipment shall be clearly marked with [yellow warning labels](#). All nitrogen pressurized equipment shall be supplied with pressure gauge installed.

Proper purging with nitrogen must be carried out to ensure oxygen content does not exceeds 3 %.

2.4 EXTERNAL PRESERVATION INSTRUCTIONS

All equipment skids shall be delivered with [fitted flameproof tarpaulin](#) (3)  with openings for inspection and hookup of pipes and cables trays. All openings shall be re-sealable with adhesive lock or zip  fastener. The tarpaulin shall be installed inside any transport protection to enable removal of this protection without damaging the tarpaulin.

All openings on all types of equipment shall be sealed off to prevent ingress of dust, debris or liquid. Flange facings shall be sealed with an [oil resistant rubber gasket](#) (4)  covered with a [steel cap](#) or [water resistant plywood blinding](#) (4) . Thickness of the plywood blinding shall be 10  and tightened with minimum 4 hot [dipped galvanized or SS316L bolts](#).

The sealing surface of carbon steel flanges shall be coated with approved soluble corrosion [rust preventive wax](#) (5) . Use of plywood blinding a [Rapid Soft Cover Flange](#) (6)  protector may be used. All such connections shall in addition be  with [waterproof adhesive tape](#) (6)  and the blinding  flange circumference as a protection against ingress of moisture etc.

Flange covers shall not be used for marking of equipment.

Panels/cabinets, termination boxes, junction boxes, switchboards, etc. shall be sealed off in such a way that they are splash-proof, however access shall be provided for inspection purposes. Panels/ cabinets shall be protected by wrapping with **aluminum-sheeted glass fibre cloth** (7) Additionally, any panels or cover surfaces containing instruments or controls shall be protected by fixing a **5mm marine plywood sheet** (8) the surface and under the aluminum/fiberglass sheeting.

All cover-fixing bolts shall be coated with **Preservation oil** (9) and the contact faces of the cover shall be coated with **acid-free Vaseline** (10) or similar product. All entry holes shall be sealed with **blanking** or, where connections are completed, the wrapping/packing shall be inserted utilizing **acid-free Vaseline** (11) .

Any damaged or deteriorated paintwork shall be repaired and repainted according to Specification.

All threaded connections, male or female, shall be coated with a suitable **soluble corrosion inhibitor** (12)

Threaded openings shall have **metal plugs or caps** of metallurgy equal to the component being capped or plugged.

All exposed surfaces of corrosion resistant alloys ("CRA" including: titanium, stainless steels, duplex steels, aluminum, etc.) shall be protected with **teflon based coating** (13) or similar. All instruments and other components with ATEX certification shall be covered and protected prior to application of this surface protection to ensure that it is not applied to the surfaces of the ATEX-certificated items if this can impinge upon the validity of the certification.

All machined surfaces without permanent coating shall be protected with **preservative oil or wax** (14) shall physically be protected in order to avoid damage or ingress of impurities. Data plates attached to the equipment shall be protected by a **clear wax** (14b)

Valve stems, actuator rods or other exposed shafts shall be sprayed with **Super Lube** (14c) wrapped in **VULK Tape** (15) containing instruments or controls shall be protected by fixing a **5mm marine plywood sheet** (8) the surface and under the **aluminum/fiberglass sheeting** (7)

2.5 ADDITIONAL PRESERVATION REQUIREMENTS FOR ELECTRICAL ITEMS

In this section, the purchaser's minimum requirements for various types of electrical equipment are given.

Further suppliers recommendations shall be followed. Equipment not specified below shall be linked to the nearest comparable type. For all equipment mentioned below the following apply:

- **VCI** (1) be placed inside all units.
- Flame arrestor on Exd equipment / motors / floodlights shall be lubricated with **Poly Butyl Cuprysil** (PBC) or similar product.

2.5.1 Motors and Generators

Bearing housings shall be filled completely with **preservative oil** (27) **mixture of VCI and oil** (17) pump housing/gear housing shall be utilized according to inhibitor manufacturer's recommendation to avoid corrosion. Bearing housing lubrication oil inlets and outlets shall be blanked. Bearing housing ventilation shall be sealed with **heavy-duty tape**.

- Shafts to be protected with **heavy duty preservative wax** (18)
- When a unit is installed on base plates, the exposed machined parts of the base plates shall be coated with **preservative oil or wax** (19) as they are coated, and wrapped in **aluminum fibre cloth** (7)
- Insulation test shall be performed (ref. attachment 8). The result shall not be more than 4 weeks old at equipment delivery.

2.5.2 Battery Chargers, Relay Panels, Distribution Boards, Switch Boards and Batteries

- Cable connection (bondings) exposed to open atmosphere shall be coated with **preservative oil** (20)
- UPS batteries shall be stored at the supplier's works or in dry storage prior to delivery.
- **Aluminum sheeted glass fibre cloth** (7) 0,3 kg per m2 shall be used to envelope Distribution Board, in such manner that no ingress of grit and dirt is possible.

2.5.3 Light fixtures, Junction Boxes and Socket Outlets

- Cable entry holes shall be sealed temporary with **threaded plugs**. Entry holes with glands installed shall be fitted with **standard dust blinds**.
- Flame path on covers for Exd equipment shall be treated with **PBC** or similar.
- Cover screws and gasket contact faces shall be treated with **acid-free Vaseline** (21)

2.6 ADDITIONAL PRESERVATION REQUIREMENTS FOR INSTRUMENT ITEMS

In this section, the purchaser's minimum requirements for various types of instrument equipment are given. The instrument section covers; instrument, telecom, fire & gas system. Equipment not specified below shall be linked to the nearest comparable type. For all equipment mentioned below the following apply:

- Any unit with flame arrestor shall be treated with **PBC** or similar.
- **VCI** (1) be placed inside the units.
- Cable entry holes shall be sealed temporarily with a **threaded plastic** or **metal blind plug**. Entry holes with glands installed shall be fitted with **standard dust blind**.

2.6.1 Instrument Panels and Cabinets

- All panels or cabinets, which have sensitive equipment installed inside or with termination racks, shall be preserved with **VCI** (1) .
- Units with sensitive equipment fitted or glass in front panel shall be protected with at least **5 mm water resistant plywood** (8) .
- Cable connections (bonding) exposed to open atmosphere shall be coated with **preservative oil** (20) .
- **Aluminum sheeted glass fibre cloth** (7) 0,3 kg per m2 shall be used to envelope pressure gauges, controllers, panels, junction boxes, temperature instruments, telecommunication equipment, detectors, transmitters, heaters and push-button stands.

2.6.2 Pressure, Temperature, Levels and Flow Indicators

- The glass on the indicators shall be protected with a **5 mm water resistant plywood** (8) and the unit shall be covered with **aluminum sheeted glass fibre cloth** (7) .

2.6.3 Safety Relief Valves and Control Valves

- Valves shall be preserved as for piping valves.

2.6.4 Pressure, Temperature, Levels and Flow Indicators

- Position box controllers and indicators which are not filled with glycerine shall have **VCI** (1) inside.
- Instrument air filter regulators shall have the threads on adjusting screw and bleed air screw lubricated. All inlets and outlets shall be sealed with **threaded metal plugs**.
- Solenoid vents shall be sealed with **threaded metal plugs**.
- Pneumatic piston actuator shall be oil filled with **preservative oil** (22) emptied and sealed with **metal plugs**. Piston rod shall be fully retracted. The exposed part of rod shall be sprayed with **preservative oil** (22) protected with **VULK tape** (15) .
- Pneumatic accumulators and back-up bottles in carbon steel materials shall be filled with **preservative oil** (23) , emptied and sealed with **metal plug**. Stainless steel accumulators shall be sealed with **metal plug** only.

2.6.5 Hydraulic Components

- All hydraulic hoses, circuits and chambers shall be sealed. All end points shall be capped or plugged to prevent ingress of foreign material.

2.7 ADDITIONAL PRESERVATION REQUIREMENTS FOR MECHANICAL ITEMS

In this section, the purchaser's minimum requirements for various types of mechanical equipment and items are given. The mechanical section covers; mechanical, piping, HVAC, safety, architectural, surface protection and insulation. Equipment not

specified below shall be linked to the nearest comparable type. Section 2.4 External Preservation Instruction applies for all skid mounted equipment.

2.7.1 Centrifugal Pumps

- Coupling hubs shall be coated with **preservation oil** (24)
- Exposed shafts shall be sprayed with **heavy duty preservative wax Tectyl** (25) milar.
- Bearing housings shall be filled completely with **preservation oil** (16) and vent nores sealed with **heavy duty tape** (26) . Oil level glasses shall be removed and separately shipped or stored, and inlets metal plugged.
- Pumps shall internally be flushed with **preservation oil** (27) **mixture of VCI and oil** (17) ording to inhibitor manufacturer’s recommendation, shall be utilized in pump housing / gear house to avoid corrosion.
- Inlet and outlet flanges on pumps shall be blinded as described in section 2.4

2.7.2 Reciprocating Pumps

- Any coupling, coupling hubs and exposed shafts shall be preserved as for centrifugal pumps.
- Pump casings, cylinders and lubrication systems shall be flushed with **preservation oil** (27)

2.7.3 Centrifugal Air Compressors / Gas Compressors

- Supplier shall specify preservation for this type of equipment. The preservation shall be based on the requirements in this document and supplier’s own recommendations.

2.7.4 Gas Turbine

- Supplier shall specify preservation for this type of equipment. The preservation shall be based on the requirements in this document and supplier’s own recommendations.

2.7.5 Gears and Couplings

- Any coupling, coupling hubs and exposed shafts shall be preserved as for centrifugal pumps.
- Gear box shall be flushed with **preservation oil** (27) **mixture of VCI and oil** (17) ording to inhibitor manufacturer’s recommendation, shall be utilized in pump housing / gear house to avoid corrosion.
- The vent holes on gear box shall be sealed completely.
- All inlets and outlets shall have blinds with gasket.
- Flexible couplings shall be coated with **heavy preservative oil** (28) apped in **VCI film** (29) packed separately in wooden boxes.

2.7.6 Pressure Vessels and Atmospheric tanks

- Units with bare carbon steel surfaces inside shall be preserved with **VCI which does not require removal** (30) before start up.
- Exposed surfaces of corrosion resistant alloys (“CRA” including: titanium, stainless steels, duplex steels, aluminium, etc.) shall be protected with **Teflon based coating** (31) milar. All instruments and other components with ATEX certification shall be covered and protected prior to application of this surface protection to ensure that it is not applied to the surfaces of the ATEX-certificated items if this can impinge upon the validity of the certification.
- Units with stainless steel surfaces inside need no internal preservation. The inside of such units shall be cleaned, dried and sealed off. 2.7.7 Shell and Tube Heat Exchangers. Such units shall be treated as for pressure vessels.

2.7.8 Plate Heat Exchangers

- Such units shall be treated as for pressure vessels.
- The supplier shall fit a **10 mm water resistant plywood** (32) on top and sides of the plate section and cover with **non-flammable tarpaulin** (3)
- The tensioning bolts shall be coated with **Preservation oil** (9) protected with **plastic or rubber hoses**.

2.7.9 Lifting and Pulling Equipment

- Winches shall be preserved as for pumps.
- Unless steel wire ropes are galvanised, they shall be preserved with **special wire grease** applied according to manufacturer’s recommendations. When stored on drums, the drums shall be covered with **VCI film** (29)

- Chain on chain blocks shall be coated with **heavy preservative oil** (28) wrapped in **VCI film** (29)
- All appliance wire/ wire rope shall have **suitable preservative** correctly applied.
- The wire / wire rope shall also be completely covered with **non-flammable material** and protected from sand and the elements

2.7.10 Workshop Machinery and Associated Equipment

- Internal preservation shall be as for pumps.

2.7.11 Pipe Connections

- All piping hook-up connections shall be blanked as described in section 2.4.
- Welded hook-up connections shall be sealed tight with a **heavy plastic cap** (33) fixed with **heavy duty tape** (34)
- Prepared carbon steel welding bevels shall be protected with **plastic tape**.

2.7.12 Piping

- All factory-prepared piping delivered from pipe supplier shall be capped at both ends with a **heavy plastic cap** (33) and fixed with **heavy duty tape** (34).
- Carbon steel pipes, which are internally sandblasted or chemically cleaned, shall internally be preserved with **VCI which does not require removal** (2) prior to installation.
- All stainless steel piping spools to be externally protected with **Teflon based film** (13)

2.7.13 Valves and Flanges

- When valves are not installed, all inlets and outlets shall be plugged or blinded as for pipe connections.
- Valves shall be coated internally with **preservative oil** (35) which does not require removal prior to installation.
- All ball and globe valves shall be secured in open position, with **plastic strips** (36) or acceptable mechanical lock.
- Gate valves shall be secured in the closed position using **plastic strips** (36) or acceptable mechanical lock.
- All valve spindles including all spindles with threads shall be sprayed with **lubrication oil** (37) covered with **VULK tape** (15) which also shall cover the stuffing box in order to prevent ingress of sand between gland and valve spindle.
- Grease nipples shall be coated with **heavy grease** and capped, to avoid paint adhesion and ingress of dirt.

2.7.14 HVAC

- Fan coupling transmissions, bearings and shafts shall be treated as for pumps.
- A **10 mm water resistant plywood** (32) shall protect the fan.
- **10 mm water resistant plywood** (32) shall protect the surfaces of radiator or fin-units.
- All other HVAC equipment shall be treated as for associated equipment.

2.7.15 Safety

- All safety equipment shall be treated as for associated equipment.

2.7.16 Architectural

- All types of doors, windows, lined walls or ceilings in stainless steel or aluminum shall be covered with a **protective foil**. The foil shall be applied properly onto the surface so it remains intact until installation is completed.
- All other architectural equipment shall be treated as for associated equipment.

2.8 PACKING AND MARKING INSTRUCTIONS

All equipment and skids shall be packed or boxed properly in order to prevent damage during handling, transportation and storage. The packing shall also protect against humidity, dust and mechanical strain, which may occur during outdoor storage, loading and unloading operations. All panels/cabinets, termination boxes, junction boxes, switchboards etc. shall be sealed off during transportation. At least two layers of **shrink wrapped heavy-duty film** (39) (0.5 mm) to be used to obtain a splash proof shipment. The following standard is part of this document and provides guidance for equipment protection:

- BS1133 Packing Code (Alternatively, use similar national standards that comply with the relevant ISO standard.)
- All marking shall be carried out in accordance with project requirements.

EDVARD GRIEG - PRODUKTFORKLARINGER

Vapor Corrosion Inhibitor (VCI) 1) Rustinhibitor, I dette tilfellet I form av en VCI-kapsel for bruk inne i elektroskap etc. Settes i midten av skapet. Påse at skapet ikke ventileres.

clearly marked (1b) Stickers, for å indikere at det sitter en VCI-kapsel inne I skapet

Silica gel (1c) Tørkemiddel. Hindrer korrosjon ved å holde relativ fuktighet under 50%

warning label (1d) Preserveringstag I vinylplast

suitable corrosion inhibitor (2) Til beskyttelse av karbonstål rør innvendig åpnes det for en rekke løsninger, så lenge de ikke trenger å fjernes før oppstart. Kan være forskjellige, men vær varsom og sjekk om den er kompatibel med systemet.

Fyll røret med 10% Dinitrol 202 og drenør.

Fogg røret med Activ 10F VCI pulver.

Spray røret med en VCI olje

fitted flameproof tarpaulin (3) Formsydd presenning. Flammehemmende og ca 600 g/m². Med mulighet for inspeksjon/åpning/lukking og maljer nederst for sikring. Skal brukes selv om enheten er pakket i sveiseduk.

oil resistant rubber gasket / **water resistant plywood blind** (4) Kombinasjonen oljebestandig pakning og vannfast kryssfiner lokk, ca 10mm brukes på flenser. Lokket bores med 4 hull. Pakningen går helt ut til ytterdiameteren.

rust preventive wax (5) Pakningsflaten på flensene smøres med rusthindrende voks før **flensebeskytteren monteres**.

Rapid Soft Cover Flange / **waterproof adhesive tape** (6) Som et alternativ til kryssfiner tillates kompositt-cover med en myk side og en hard side som flensebeskyttelse. Rapid Soft Coveret festes med medfølgende plastbolter. Spalten mellom flensen og beskytteren tapes med vannfast tape, vanligvis PC-667 lerretstape.

aluminum-sheeted glass fibre cloth (7) Glassfiberduk med en aluminium utvendig til packing av elektroskap. Festes med PC-667 tape. Brukes selv om enheten også er beskyttet med presenning. 200g/duk er ofte mer hensiktsmessig for mindre innpakking.

6mm marine plywood sheet (8) Til støtbeskyttelse av glass og instrumenter I forbindelse med innpakning I sveiseduk

Preservation oil (9) Bolter for deksler og lokk etc på vekslere og elektrokabinetter sprayes med olje, f.eks vci olje.

acid-free Vaseline (10) Lukepakninger på skap settes inn med syrefri vaselin før de lukkes sånn at den ikke tørker ut.

acid-free Vaseline (11) Innpakkede gjennomføringer fylles opp med vaselin. For å hindre at gjennomføringen tørker ut. Lite brukt

soluble corrosion inhibitor (12) Olje eller voks, typisk gjengepasta, gjerne med VCI på gjenger for tilsutning på skap etc. Brukt mest på midlertidige pluggen i det spec'en overstyrer dette på permanente gjenger.

Teflon based coating (13) Oljefilm tilsatt Teflon strykes med klut på alle rustfrie overflater for å hindre overflaterust pga sandblasting eller sliping etc.

preservative oil or wax (14) Umalte, maskinerte flater sprayes med olje eller voks, f.eks vci olje

clear wax (14b) Klar voks med ingen annen funksjon enn å holde maskinskillt rene og leselige.

Super Lube (14c) Olje som inneholder Teflon for spindler og ubeskyttede akslinger med. Mer vanlig brukt er Fin Lube.

VULK Tape (15) Selvsveisende tape for sprut- og støvtett forsegling av ventilspindler etc

preservation oil (16) Lagerhus fylles med egnet olje. I vårt eksempel en mineralisk baseolje tilsatt Axxanol 750 VCI olje. Vær varsom og sjekk hva lageret tåler.

mixture of VCI and oil (17) Mineralolje tilsatt 10% VCI fylles i gearkasser og motorsumper og lignende for å hindre at innvendige lager korroderer når de er tørre. Damp fra VCI-tilsatsene vil stige opp og hindre korrosjon. Vær varsom og sjekk hva fabrikanten tillater.

heavy duty preservative wax (18) Tykk voks som bygger godt og sprayes på. Gir også en viss mekanisk beskyttelse. Kan i noen tilfeller erstattes med tykk petrolatum tape.

preservative oil or wax (19) Oljecoating eller voks med en viss mekanisk beskyttelse

aluminum fibre cloth Se (7)

preservative oil (20) Olje til korrosjonsbeskyttelse på åpne kabelforbindelser i batterier og paneler.

Aluminum sheeted glass fibre cloth se (7)

acid-free Vaseline (21) Pakninger på koblingsbokser settes inn med syrefri vaselin før de lukkes sånn at den ikke tørker ut. Skruer for lokk settes også inn i den grad spec ikke sier noe annet

preservative oil (22) Olje som fylles i stempelaktuatorer og dreneres før aktuatoren forsegles. Sprayes også på akslingen selv. Kan være FinLube eller VCI olje, men vær varsom på fabrikantens anbefalinger.

preservative oil (23) Olje som fylles i akkumulatorflasker og dreneres før flaskene forsegles. Kan være VCI olje, men vær varsom på fabrikantens anbefalinger.

preservation oil (24) Olje som sprayes på sentrifugalpumpens koblinger hvis disse er eksponert. Bruk en vci olje som ikke er for tynn.

heavy duty preservative wax Tectyl (25) En litt solid, seig vokscoating som sprayes på akslinger. Skal gi korrosjonsbeskyttelse og en viss mekanisk beskyttelse

heavy duty tape (26) Kan være petrolatum tape, værfast tape eller vulk tape

preservation oil (27) Olje, f.eks VCI olje flushes gjennom pumpehus. Hvor det ikke lar seg gjøre å sirkulere sprayes pumpehuset innvendig.

heavy preservative oil (28) Tykk olje eller flytende grease til å spraye kjetting på taljer, åpne gir og koblinger

VCI film (29) Plastfolie tilsatt VCI inhibitor. Fås i alle varianter, poser, pallehetter, planfolie, krympefilm etc.

VCI, which does not require removal (30) Til beskyttelse av tanker innvendig åpnes det for en rekke løsninger, så lenge de ikke trenger å fjernes før oppstart. Kan være vci-pulver, vci-coatinger, dinitrol eller andre, men vær varsom og sjekk om den er kompatibel med systemet.

Teflon based coating (31) Oljefilm tilsatt Teflon strykes med klut på alle rustfrie tanker for å hindre overflaterust pga sandblasting eller sliping etc.

10 mm water resistant plywood (32) Vannfast kryssfiner ca 10mm for støtsikring av platekjølere samt ribber og vifter på platekjølere

heavy plastic cap (33) Rørhette for blending av sveisestusser og åpne rør ellers.

heavy duty tape (34) Tape for sikring av rørhette. I dette tilfellet en værfast lerretstape

preservative oil (35) Umalte, maskinerte flater sprayeres med olje, f.eks vci olje eller penetrerende olje med teflontilsats.

plastic strips (36) Ventiler låses i posisjonen som er spesifisert og sikres med solide, UV-bestandige nylonstrips.

preservation oil (37) Olje som inneholder Teflon for spindler og ubeskyttede akslinger.

shrink wrapped heavy-duty film (39) Vanligvis 200µ UV-bestendig krympefilm.

Disse **gule** er ikke i vårt preserveringssortiment:

- steel cap / metal plugs or caps / metal blind plug / threaded metal plugs
- dipped galvanized or SS316L bolts
- PBC / Poly Butyl Cuprysil
- heavy-duty tape/ plastic tape
- threaded plugs / threaded plastic / blinding
- standard dust blind
- plastic or rubber hoses
- special wire grease
- non-flammable material
- protective foil
- yellow warning labels