PAROC®
FIRE PROOF PANELS

Use and Maintenance Guide

PAROC® panel solutions

Panel System
5.00 INT
January 2008

PAROC PANEL SYSTEM HAS DRAWN UP THESE GUIDELINES FOR THE USE AND MAINTENANCE OF PAROC PANELS. MAINTENANCE IN LINE WITH THE INSTRUCTIONS WILL ENSURE THE FUNCTIONING AND A LONGER SERVICE LIFE OF THE PANEL STRUCTURES.

FOCUSING ON PRODUCT LIFE CYCLE

The objective of Paroc Group is to be a pioneer in environmental issues in the construction sector. Our business operations can be characterised as environmentally holistic. We follow our products throughout their life cycle and we also take into consideration the positive energy savings and environmental impact of our products during their use.

The energy balance of PAROC panels is positive. The energy consumed for manufacturing and installation of the panel is much less than the energy saving that can be obtained through the use of the panel throughout a building's lifetime.

STRENGTH ACCORDING TO THE AST® QUALITY

External wall structures have to maintain their strength, thermal insulation capacity and water-tightness during their expected lifetime. For industrial buildings a lifetime of 25 years may be sufficient, whereas in many cases the demand can be up to 50 years. PAROC panels are manufactured in accordance with the AST® quality standard (Advanced Structural Technology). This means that they are tested and fulfil the highest class according to the method presented in ECCS/CIB recommendations and the European product standard EN 14509 for sandwich panels.

Life cycle of PAROC® panels

Air pollution and corrosion

Near to industrial plants, major cities and coastlines impurities and air pollution accumulate on external walls in the form of sulphur dioxide, nitrogen oxides, chlorine gases, soot and other types of dirt. Air pollution together with air humidity generate acids, e.g. sulphur, nitrogen and hydrochloric acid, which have an adverse effect on coatings.

The corrosive effect of salts in the air is mainly based on their moisture binding capability. When forming layers on wall surfaces, salts often bind water and thus build up the moisture content in the surface. At the same time they extend the wet-time of the surface, which to a great extent determines the corrosive impact of the climate. Without water practically no corrosion takes place.

Rainwater and snow keep wall surfaces clean from dirt and pollution inland. However, cleaning at regular intervals ensures longer lifetime for the panels. Especially wall areas protected by eaves are in need of cleaning. In coastal areas special stress is caused by salt from the sea accumulating on the wall surfaces.

Regular service to ensure longer lifetime

Facings

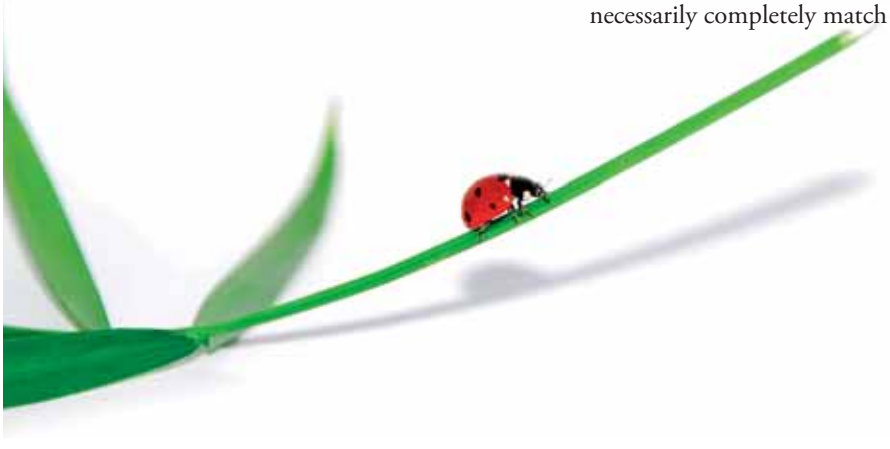
In the course of years surface appearances change due to dirt, loss of gloss or alterations in colour tones. The highest impact on these changes comes from air impurities, sun UV and heat radiation and outdoor temperature. Dark surfaces are subject to the highest stress. On walls facing south the surface temperature may with dark paint surfaces rise up to +80 °C, with light colours up to +55 °C.

The service life of an intact original paint coating is 25 - 40 years on an average depending on coating type, building method and climatic conditions. Due to higher thermal load the service life for dark colours is somewhat shorter than for light colours. When the protecting capability of a paint coating ceases to have effect, the panel is still protected by the zinc coating.

It is recommended that PVDF coatings are repainted for maintenance purpose after 20 - 30 years and polyester coatings after 15 - 20 years. This will restore the paint surface to almost the same level as when new and it can be repainted again after 10 - 25 years, which will give it a service life of over 50 years.

Scratches and dents

Scratches and dents left unrepaired have an adverse effect on the service life of the product and should therefore always be repaired. If the repair is made immediately, the damaged area often is only a scratch of some millimetre width, which makes the repair quick and easy. After some years it may be considerably more difficult to fix the same damage. It may also be difficult to make the damage unnoticeable as the colour of the patch-paint does not necessarily completely match the old coating.



Panels in use

MAINTENANCE IN LINE WITH THE INSTRUCTIONS WILL ENSURE THE FUNCTIONING AND A LONGER SERVICE LIFE OF THE WHOLE BUILDING.

Suspensions

Loads can be suspended in PAROC panels using fixing screws. If the suspensions cause dynamic loads, penetrating screws shall be used. The suspension loads have to be taken into account when fixing the panels, adding 1 fixing screw per 1 kN of load. The table below shows the number of fixing screws required for different types of suspensions. We recommend that fixings of type Bulb-Tite rivets (SFS intec) should be used.

Cut-outs and penetrations

Cut-outs in the panels may weaken the panel strength. If the cut-outs are larger than 200 mm separate dimensioning is required.

Cut-outs for penetrations are normally so small that no special measures are required due to their effect on the panel strength. If a penetration is made in a fire-partitioning wall, the penetration must fulfil the same fire-technical requirements as the wall.

Deflection

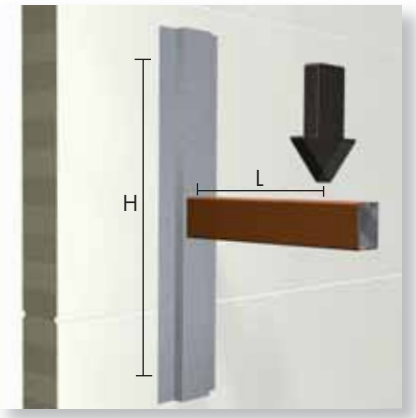
The panels deflect due to load actions (wind pressure and suction) as well as the effect of the temperature gradient between the panel internal and external surfaces. This deflection has to be considered when designing panel connections to other structures.

Protection of load-bearing ceiling

Normal, occasional foot traffic is not harmful to the panels. Panels subject to frequent foot traffic, for instance at entrance doors and where equipment

Number of fixings per 20 kg					
H, mm	Distance of load from panel surface L, mm				
	200	300	400	500	600
100	1	2	2	-	-
200	1	1	1	2	2
≥ 300	1	1	1	1	1

With increasing loads, the number of required fixings increases linearly, e.g.
Load = 40 kg, the number of fixings is 2 x the number given in the table above.
Load = 60 kg, the number of fixings is 3 x the number given in the table above.
Note! In the shaded area of the table, always use 2 fixings at the top end of the load-bearing unit.



is installed, have to be protected using 10 – 20 mm thick, rigid stone wool slabs and load-distributing building boards. For other passages and installation areas, protection with 15 mm plywood is sufficient. Loads caused by permanent foot traffic have to be steered to the load-bearing frame. Cut-outs may weaken the ceiling panels. Foot traffic near the cut-outs should be avoided. Heavy loads, for instance caused by heavy equipment, always have to be checked. Also point loads caused by ladders etc. require protection.

Annual checking

Annual checking and service are very important for the condition of the whole building. In order to obtain optimum service life for PAROC structures, annual checking is required with repairs in accordance with the table below. Annual checking performed and actions taken should be registered.

Annual checking of PAROC structures

To be checked	Actions to be taken
Dirt on painted surfaces	Visually assess, is the complete wall or only shaded parts in need of washing –> wash surfaces
Condition of painted surfaces (cracks, discoloured areas)	Evaluate is the wall in need of touch-up painting or repainting –> Paint if there are several defect areas or the wall is unevenly discoloured. It is recommended that an expert is consulted if repair is needed.
Scratches and dents	Check the panels for scratches and dents –> Touch-up paint, repair of dents
Panel fixing screws	Panel fixings have to be checked every 10th year. Pull out one screw and check its condition. If rusted, contact the screw manufacturer for consultation on the need of additional fixing.
Flashing fixing screws	Check the grip of the screws. If loose and not possible to tighten, replace it with a bigger one.
Corrosion of cut edges of flashings	Check the condition of cut edges. If the ends are rusted, remove the rust and clean them. Paint the area with paint of type Beckrypair EA685.
Flashing tightness	Check that the flashings are tight against the panel. If gap, add flashing screws.

1) Fixing screw code SFS: www.sfsintec.biz
Fixing screw code P or JP: www.ferrometal.fi
Fixing screw code J2 or J3: www.ejot.com

Cleaning of panels

CLEANING AT REGULAR INTERVALS ENSURES LONGER LIFETIME FOR THE PANELS. ESPECIALLY WALL AREAS PROTECTED BY EAVES ARE IN NEED OF CLEANING.

Colour coated steel sheets
Dirty or stained areas can be washed with a soft brush and water. Water pressure cleaning (max 50 bar) can also be used, but then the water-spray must not be applied too close or perpendicularly towards the coating. At panel joints the water-spray should be directed at a downwards angle to avoid spraying pressurised water directly into the joints. Old coatings should be handled with special care.

Difficult stains can be removed using the detergents shown in the table below. The pH value of the detergent should be between 5 – 10. Always wash the surfaces from below upwards and carefully rinse off the detergent with water after a few minutes, working from the top the to bottom. Finally, the rainwater systems should be rinsed with water. If detergents suitable for painted coatings are not available, car shampoos and a car-washing brush can be used. However, car shampoo is not recommended if the panel surface is to be painted. The shampoos often contain wax, which may weaken the adhesion of the new paint.

FoodSafe laminate
FoodSafe laminate can be washed daily with a soft brush. Water pressure cleaning (max 50 bar) can also be used. The pH value of detergents used for the washing of FoodSafe laminates should be between 5 and 8. The detergent must not contain solvents. The maximum water temperature is +60 °C. The FoodSafe laminate is allowed to be wet for 6 hours/day. After this the surface must be allowed to dry properly. For the drying, a soft cloth or air-blowing can be used. Special attention must be paid to drying panel joints and flashing edges. The allowed continuous moisture content of the air has to be lower than 80 % RH.

PAROC® acoustic panel
First vacuum loose dirt off the surface. Then wipe surface with damp cloth.

Detergents suitable for colour coated steel sheets

Detergent	Application	Manufactured by
Peltipesu™	Difficult dirt	Teknos Winter
Panssaripesu™	Difficult dirt	Tikkurila
Lakkabensiini™	Very difficult, local dirt	

Stainless steel
Stains and discoloured areas on stainless steel surfaces are cleaned as specified in the table below.

Cleaning methods for stainless steel	
Type of stain	**Cleaning agent and method**
Fingerprints	Wash with white spirit, thinner, trichloroethylene or acetone, then rinse with cold water and dry.
Oil and grease	Wash with organic solvent as above, then with water and soap, rinse with clean cold water and dry.
Difficult stains and discoloured areas	Wash with mild abrasive cleaning powder in the direction of possibly visible surface structure, then rinse with clean cold water and dry, or wash with 10 % phosphoric acid solution, rinse with diluted cold water and dry.
Heating colour and difficult stains	Wash with cleaning powder as above, or grind with abrasive pad in direction of possibly visible surface structure, rinse with cold water and dry.
Rust stains	Soak surface with oxalic acid solution, give it 15 – 20 minutes to act, then rinse with clean cold water and dry. If required, repeat the procedure using cleaning powder as above.
Paint stains	Wash with paint solvent using a soft nylon brush, then rinse with clean cold water and dry.
Scratches in ground or brushed surface	Polish in the direction of the structure using an iron-free grinding agent and abrasive pad, then wash with soap solution, rinse with clean cold water and dry. **Note!** This method must not be used on 2B surfaces.

Washing graffiti off PVDF surface
For the washing of graffiti, use detergent W-GRA. In addition you need protecting gloves, cloth and water. W-GRA is applied using a cloth or by spraying on the dry graffiti. Give the agent 0.5 – 5 minutes time to act, depending on the temperature.
A high temperature accelerates and correspondingly a low temperature slows down the effect of the detergent. The working temperature should be above 0 °C. Try the effect by wiping with a cloth. A too long acting time may be harmful to the PVDF coating. Wipe off the detergent and graffiti with a dry cloth and rinse the surface carefully with water or clean it with a damp cloth and dry it to remove the remaining paint.

Additional information
Tampereen Pesuainepalvelu Oy
www.tampereenpesuainepalvelu.fi

Painting and repair of panels

SCRATCHES AND DENTS LEFT UNREPAIRED HAVE AN ADVERSE EFFECT ON THE SERVICE LIFE OF THE PRODUCT AND SHOULD THEREFORE ALWAYS BE REPAIRED.

Preparatory work

Before painting, clean the old paint surface as described under "Cleaning of panels" and let dry properly.
Strip off peeling parts of the surface and grind off visible rust. Any dents are to be corrected as described under "Correcting dents". Apply primer on cleaned surfaces.

Touch-up painting

Scratches, impacts, abrasions or flaking may appear on the painted surface, for example from improper handling of installation tools, panel lifting or handling, or from package and transport damage. Small marks are of no significance unless the paint surface is visibly cracked. If the surface is broken, impurities tend to accumulate in the defect area and humidity may remain for a prolonged time in the scratch. A narrow scratch damage in the paint surface corrodes faster than a more extensive area peeled off the surface.

Small scratches are painted using a thin paintbrush (Repair Kit, Touch-up paint). More extensive scratches including surrounding areas are first roughened lightly using abrasive paper (320) or corresponding.

If the defect reaches only to the primer coat, one paint layer is sufficient. However, if the scratch reaches through the whole colour coating to the zinc layer, it is recommended that the surface be painted a second time after the first layer has dried. Before painting, always check the paint colour tone on a small test area.

For repair of FoodSafe laminate surfaces, in addition to the maintenance paints in the table below, foodstuff laminate stickers can also be

Maintenance paints suitable for touch-up painting

Colour coating	Touch-up paint	Manufactured by
PVDF	Repair Kit Repco, rust areas first to be painted with Rostex Super primer Plaston, rust areas first to be painted with Galvex primer	Paroc Panel System Tikkurila Paints Teknos Winter
Polyester	Repair Kit Repco, rust areas first to be painted with Rostex Super primer Plaston, rust areas first to be painted with Galvex primer	Paroc Panel System Tikkurila Paints Teknos Winter
FoodSafe laminate	Repair Kit Touch-up paint P5-526 *) Repco*), rust areas first to be painted with Rostex Super primer	Paroc Panel System Akzo Nobel Tikkurila Paints
Pural	Repair Kit Repco, rust areas first to be painted with Rostex Super primer Plaston, rust areas first to be painted with Galvex primer	Paroc Panel System Tikkurila Paints Teknos Winter

**) Paint does not have food safe approval.*

glued directly on the defect area. The stickers are made of the same laminate as used in the panels. They have food safe approval and can be ordered from Paroc Panel System.

Repainting of coating

Defects in the coating and significant changes in colour or gloss are the most common reasons for repainting of coatings. The number of coats required depends on the cover achieved with the first paint coat. If the original colour still is even slightly visible, a second coat has to be applied after the first has dried. When changing the colour of the coating, two repaint coats are usually needed. It is recommended that the surface of PVDF be roughened before repainting.

Repainting metallic colours

In the case of metallic colours, please contact Becker Industrifärg AB.

Repair of impacts

Old paint is stripped off the surface by grinding (abrasive paper 40-80) and the grinding dust is cleaned off. The dent is filled with Plastic Padding Super Spackel (product number 25), which is applied using a steel putty, first with a thin layer to make the compound penetrate into the grinding grooves. Immediately after, the dent is filled up to the desired thickness. After 15 minutes (at +20°C), start grinding (abrasive paper 80 - 180). The area is first painted with primer and then with a top coat. Impacts with diameter over 300 mm or across the panel require a control of the strength calculations.

Additional information for repainting

www.teknos.com
www.tikkurila.com
www.bifab.com (Becker Industrifärg AB)
www.akzonobel.com

Paints suitable for repainting

Colour coating	Maintenance paint	Manufactured by
PVDF	Temakeep + Repco, rust areas first to be painted with Rostex Super primer Plaston (no primer)	Tikkurila Paints Teknos Winter
Polyester	Temakeep *) + Repco, rust areas first to be painted with Rostex Super primer Plaston, rust areas first to be painted with Galvex primer	Tikkurila Paints Teknos Winter
Pural	Temakeep *) + Repco, rust areas first to be painted with Rostex Super primer Plaston, rust areas first to be painted with Galvex primer	Tikkurila Paints Teknos Winter

*) *To be used only if white or red rust on coating.*

IN CASE OF BIGGER DAMAGES PAROC PANELS CAN EASILY BE EXCHANGED ACCORDING TO THESE INSTRUCTIONS.

Preparation
Order in advance replacement panel(s), fixing screws needed and lifting equipment. Also assure that the replacement panel has the same strength properties as the damaged one.

Exchange of panel
Remove the flashings covering the fixing screws on panel C to be demounted as well as on panels A, B, D and E (fig.1).

Add one extra fixing screw to panel A and E (fig. 2).

Fix panels A and B to each other at both ends using thin steel strips which are fastened so that the screw holes are covered afterwards by the flashing. Find out the weight of the panel B; maximum allowed load per screw is 25 kg (fig. 3).

Remove the fixing screws in panel B. The panel is now suspended in the steel strips.

Fasten panels D and E together with small steel strips at both ends preventing panel D from falling when panel C is removed.

Mount safety strips (length = panel thickness +15 cm) on both ends of panel D so that when the panel is pulled out, its inner surface stops at appr. 5 cm from the wall surface. Remove the fixing screws from panel D (fig. 4 and 5).

Remove the fixing screws from panel C and pull out panel C using manual suction clutches. If the panel does not come out, use a knife to cut out the frame sealant from the panel (fig. 6).

Mount the LiftAid on panel C and take it down (fig. 7).

Add sealing compound to the female joint of panel B.

Lift a new panel with LiftAid and mount it into the joint of outwards bent panel D. Take off the LiftAid.

Mount the inside joint of the outwards bent panel B into the inside joint of the new panel. Press the panels against the frame and check that the joints are properly together. Fix the panels with new fixing screws.

Remount the flashings.

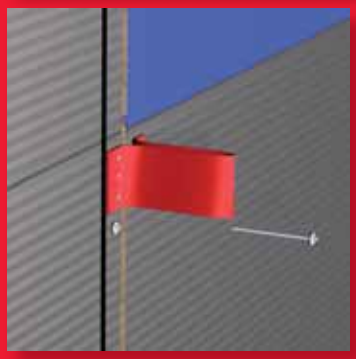
NOTE! These instructions are to be used for PAROC panels up to 150 mm. The method has been patented.

1

2

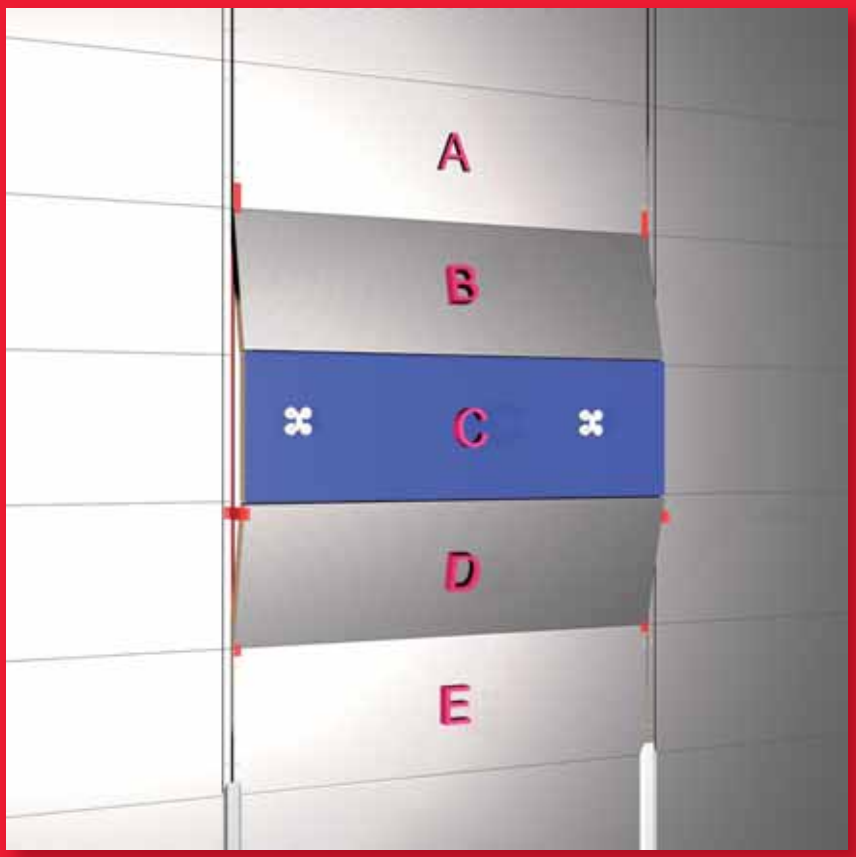
3

4

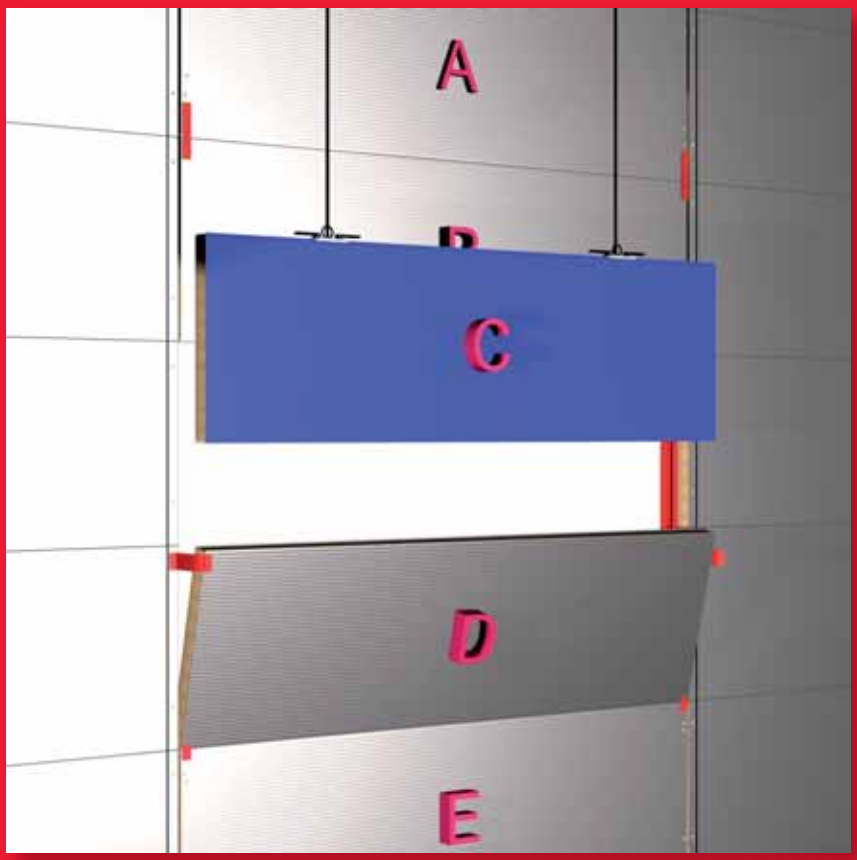


5

6



7



PAROC®
FIRE PROOF PANELS

CERTIFIED QUALITY

Paroc Panel System conforms to ISO 9001 Quality Standard. This means that the full chain from raw materials, through production and deliveries operates according to the standard resulting in certified and constantly high quality.

PAROC PANEL SYSTEM OY AB FI-21600 Parainen, Finland
Telephone +358 (0)46 876 8000, e-mail panelinfo@paroc.com
www.paroc.com

3005PPSEN0108

A MEMBER OF PAROC GROUP