

2024

fabric engineer



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CEO
Rubbhall AS / Rubb Polska
Erik Storhaug

Rubhall AS is once again grateful to be celebrating a successful year in 2023.

This latest edition of the Fabric Engineer is our biggest one to date, which reflects the continued growth of our group.

Our global projects are abundant with innovation and superb engineering, furthering Rubb's standing as the foremost experts in fabric buildings. I want to offer our warmest congratulations to both Rubb USA, our American counterpart (p. 46), and Zurhaar AS, our parent company (p. 50), on their 40th and 30th anniversaries, respectively.

As always, Rubbhall AS focusses on meeting the customers' demands and ensuring quality in all processes from sales, project management, and execution. This can be seen in each of our projects showcased in this issue of the Fabric Engineer.

Highlights this year include our huge production facility for Larvikittblokka AS (p. 18), a smart storage solution for Aaltvedt AS (p. 24), and our fully-custom Rubbhall for Findus AS (p. 28). All of these projects come from repeat custom—something that I am always proud to see as it demonstrates the quality, longevity, and ingenuity of our range of products.



Larvikittblokka AS. Read more on page 18.

This year also saw Rubbhall AS Eco-Lighthouse (Miljøfyrtårn) certified. This is visible proof of our commitment to responsible and sustainable operations, and gives us a concrete tool to work continuously towards our sustainability goals.

I am hugely proud of our hard-working, professional, and enthusiastic organisation, and very happy with the combination of both our experienced and new employees. As always, I am incredibly thankful to our employees and proud of the projects we have completed throughout the year.

The Rubbhall AS team will continue to work hard for the business and our clients to ensure we will always have the solutions to meet their needs. I look forward to the new projects 2024 will bring, and sitting down to write this foreword once again as we look back on another fantastic year for Rubbhall AS.

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Internal

Why Rubb?

We are proud to engineer the world's toughest fabric buildings, meeting our customers' requirements right down to the millimetre.

Built to last

Relocatable

Always code compliant

Low maintenance costs

Clear spans

Turnkey solutions

Worldwide service

Rapid construction

Learn more



Talking MRO Hangars Rubb UK's Aviation Specialist, Ryan Clarke

Founded in 1977, fabric-clad building experts Rubb Buildings Ltd have been in the business for 47 years.

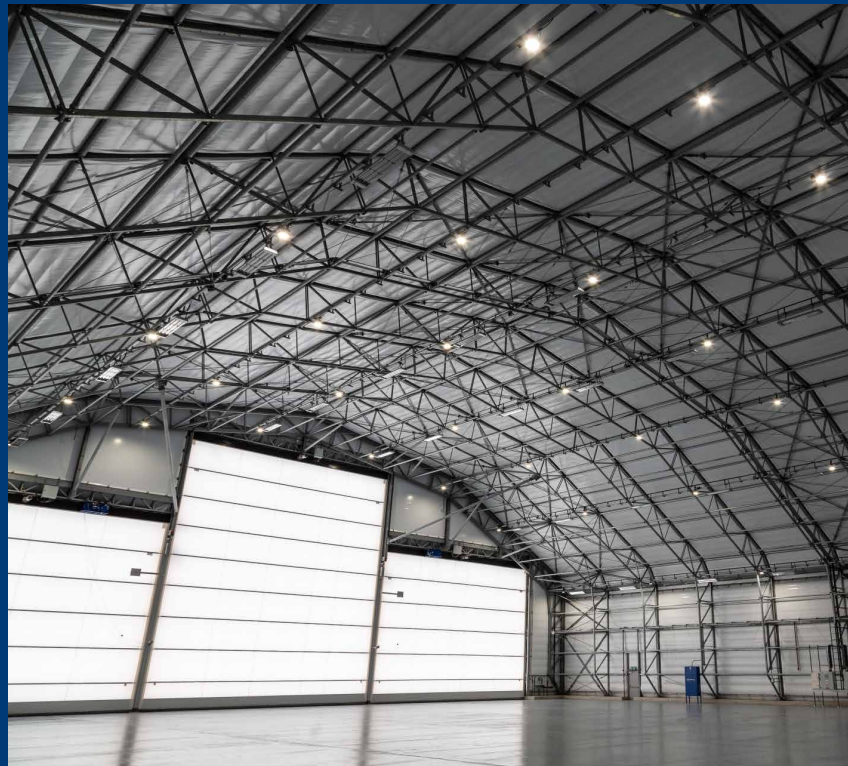
"You don't make it that long in this industry without knowing what you're doing," says Ryan Clarke, Rubb UK's Aviation Sales Specialist since 2018.

From deployable fighter jet hangars to wide body triple-span MRO facilities, Rubb has covered every corner of the aviation sector worldwide in its 47 years of business.

"Time served like that means we have an incredible amount of experience in our design, steel, and PVC production departments. Some of us have been here since the beginning."

Although Rubb has been manufacturing its fabric-clad buildings since the '70s, they still represent the next generation of hangars when compared to traditional steel-clad and concrete builds. Rubb's buildings are designed to British Building Standards or Euro Codes regarding wind speeds and snow loadings, so they are placed directly within the same market as these traditional hangars.

"We offer an alternative solution, but we come with a track record only an industry leader could have. Just look at our previous projects."



Seeing is believing

How can Rubb convince potential clients that their steel-framed, PVC-clad buildings are right for their multi-million-dollar MRO operations?

"All it takes is one visit," Ryan explains. "One visit to see that, yes, this is a completely viable, cost-effective option for their operations. Some companies can't do that."

Rubb's previous projects include MRO hangars for easyJet, British Airways, and Turkish Technic, but Ryan always has one in mind for client visits.

"It has to be Bro Tathan." Completed in 2021 for the Welsh Government's Bro Tathan Business Park in the Vale of Glamorgan, the 50m span by 50m long MRO hangar is capable of housing aircraft such as the Boeing B737-800 and Airbus A320-A321, and is complete with a 42m wide vertical lifting door.

"It's quite a drive from our Gateshead HQ, but the journey is well worth it," he continues. "The hangar has such a clean finish; it's a great example of what Rubb can accomplish."

"It's also a fantastic showcase of our Thermohall® insulation, as it's clad with 150mm of it."

"Our hangars are seriously impressive in person. Huge clear spans, amazing lighting. The hot-dip galvanized steel framework looks fantastic; you can feel the quality of it. When clients visit, they see that these hangars are built to last."



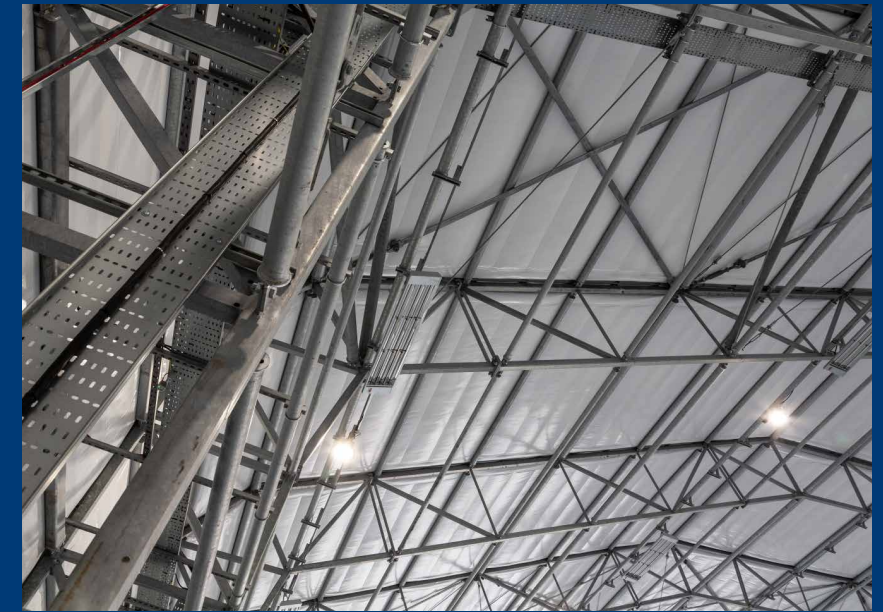


Game-changing insulation

Thermohall® insulation is the card up Rubb's sleeve when it comes to ensuring their competitiveness in the market. High-density, non-combustible glass wool is placed between Rubb's PVC cladding to create a climate-controlled environment inside the hangar, maintained by state-of-the-art HVAC installs.

Comfortable working environments are ensured by keeping the heat out in hot climates and fostering warm ambient temperatures in colder climes. Rubb's patented Thermohall® insulation also reduces sound transmission, which is hugely beneficial to MRO operations due to their airside locations.

"Thermohall® is a game changer," Ryan adds. "Our clients love it; the system is so efficient. It saves on heating and air conditioning costs while making sure their staff are comfortable all year round, no matter where the project is based. We even had a Thermohall® building in Greenland, where it drops below -70°C.



The energy-efficiency of the system is a great bonus for our clients, who now more often than not have sustainability goals to meet.



The green choice

Net Zero goals are becoming more and more prevalent across the aviation industry, and Rubb is uniquely positioned to meet these requirements.

"We're green," Ryan begins. "We always have been, it's in the DNA of the product.

"Our steel frames can be recycled, so can our PVC cladding. It doesn't often come to that, though. The hangars can be packed up, refurbished, then stored or sold. Clients can move them anywhere to meet changing logistical needs. If those needs change but the location doesn't, the buildings are modular so we can extend them."

Rubb did just this with their project for easyJet in London Gatwick Airport. The MRO hangar began as a 91.5m twin-span completed in 2016, but in 2020 operations needed to be expanded. They opted to extend the hangar with a third 47m span bay to meet this demand.

"There's no waste," he explained.

A traditional build doesn't have this flexibility. You'd be wasting time, materials, and funds.

What's next for Rubb UK?

"We have some exciting projects in the pipeline," Ryan begins. "As well as some interesting product innovations we're not quite ready to show yet."

Though tight-lipped when it comes to future plans, Ryan will be attending several aviation events throughout 2024.

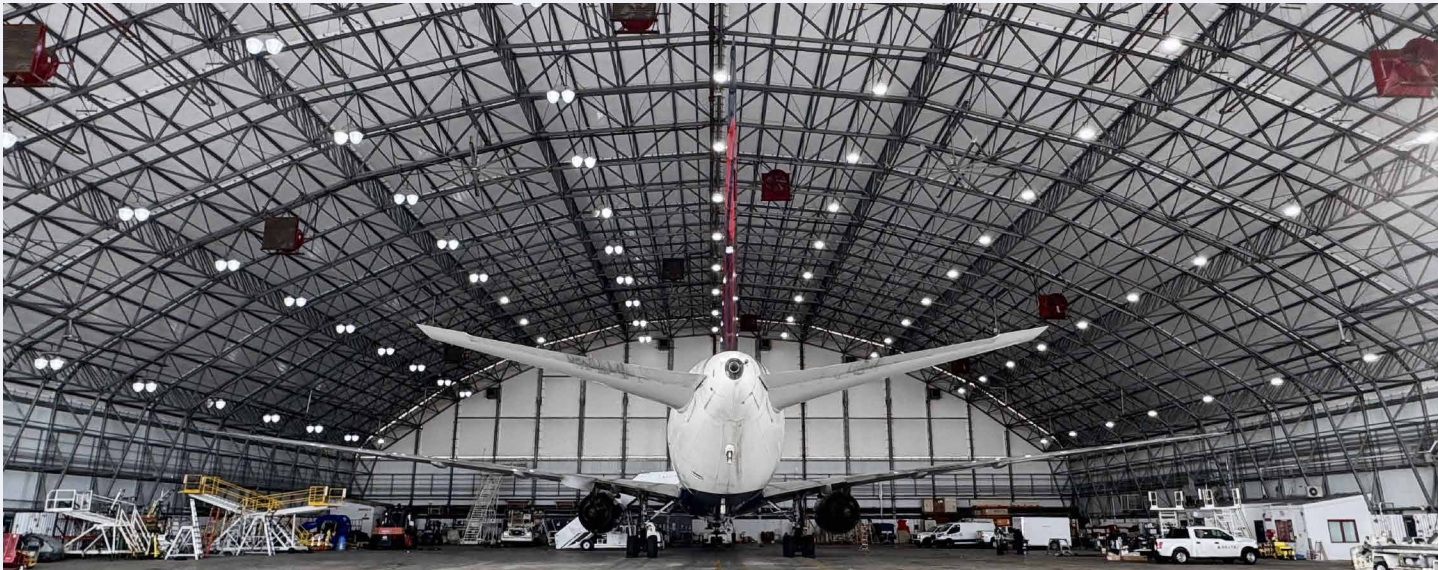
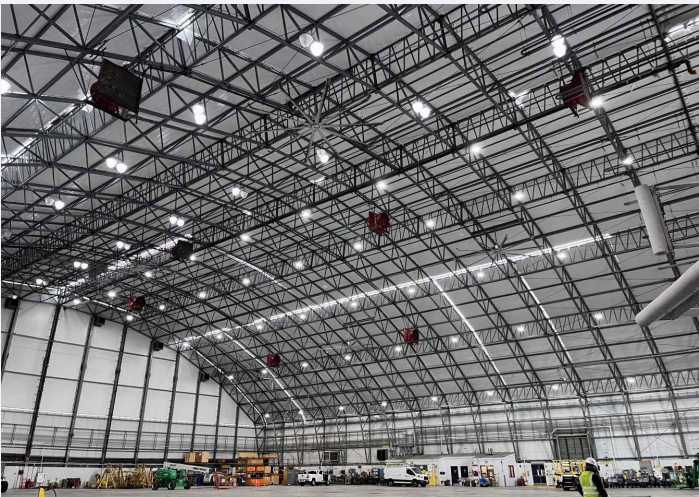
"We just got back from MRO Middle East, and have BEER and Europe left to attend this year. My colleague and US aviation specialist Sean Hickey and others at Rubb USA will be attending MRO Americas and other shows in the USA, so we have full coverage."





Delta MRO Hangar's Thermohall® Upgrade

Designed and constructed by Rubb USA in 2000 for United Airlines, the 255ft-span MRO hangar was taken over by Delta Airlines in 2008. The structure is a key feature of Boston's Logan International Airport to this day, where it used to maintain Delta's widebody fleet. Now it's received an energy-saving upgrade.



After almost 25 years, Rubb USA has returned to Logan International Airport to recover the MRO hangar with its industry-leading insulated fabric system, Thermohall®. The 50mm thick glass wool cladding will keep Delta's maintenance team warm in the winter and cool in the summer, providing a huge boost to the hangar's climate control efficiency.

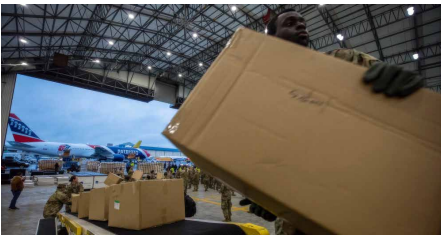
Rubb's hot-dip galvanized steel framework remained untouched in the process, still standing strong after decades of bitter winters and constant use.

The structure measures 78m wide x 82m long with 9m eaves, providing 6,396 m² of clear-span space for its maintenance, repair, and overhaul operations. With a working

environment this large, effective climate control is key—especially in Boston winters, which can drop as low as -16°C.

The structure is complete with a main hangar door, featuring an electrically operated Norco system that measures 73m wide x 15m high. This not only allows easy access for the aircraft, but works to save energy with its efficient seals.

An iconic fixture at Boston Logan, the hangar has hosted some notable events over the years, including being the drop off location for the New England Patriots' aircraft after Super Bowl victories (right, top) and its transformation into a distribution hub for medical supplies during the COVID crisis in 2020 (right, bottom).



With nearly 25 years of daily use this hangar still looks and performs as if it was made yesterday. With our modular design and expert engineering, Rubb USA's projects stand the test of time.

EVP Sales, Rubb USA
Coby Morin

Construction lift-off for twin 91m Ascent Aviation hangars

Ascent is expanding its Marana, Arizona facility to Pinal County Airpark, which will be home to its passenger-to-freighter conversions for Israel Aerospace Industries.

Rubb USA is excited to be a trusted partner on the project, which will provide a major boost to the local economy.

Ascent plans to hire over 300 employees in Marana, with the positions comprised of mechanics, assembly line workers, and other roles in logistics. Approximately 130 of the new positions have already been filled through industry partnerships with staffing agencies, local schools, and military branches. In total, Ascent's Marana workforce will grow to around 900 employees with this new facility.

"I'd say it's a booster shot into your career going from reclamation all the way to 777 conversion within a few hundred feet," says Scott Butler, Ascent's CCO.

"[Due to] the nature of our business—having storage, reclamation and back shops—we can start off people in many different areas to get their feet wet in order to get the training they need."

This is all welcome news for Marana's mayor, whose city is near the airpark.

"Those people are going to live here. They're going to go to our schools. They're going to go to our churches. They're going to shop in our centres. I'm so thankful that this is being built," said Ed Honea, the mayor of Marana.



The official ground-breaking ceremony.
© Ascent Aviation Services



Preparation is underway on the Marana, Arizona site.

Not only will this expansion grow Ascent's existing Arizona footprint; it represents a \$55 million capital investment into this community. It will create more than 300 new, good-paying jobs.

Governor of the State of Arizona
Katie Hobbs



Rubb's hot-dip galvanized steel frames.

Passenger to freighter

Israel Aerospace Industries selected Ascent as its North American site for Boeing 777-300ER passenger-to-freighter conversions last year. The 15-year contract has a minimum of 15 aircraft conversions, but Ascent expect to perform more than 60-70, accounting for around 25% of Israel Aerospace Industries' worldwide conversions.

To facilitate this, the new Rubb hangars will be built in Pinal County Airpark and are expected to be completed by the end of 2024. This new location will give Ascent the capability to run two lines of conversions simultaneously, efficiently transforming huge passenger aircraft into cargo planes for the businesses that need them.

This expansion reflects Ascent's long-standing commitment to Southern Arizona, joining its Marana Aerospace and Tucson International Airport operations.

"Ascent continues to execute on our aggressive and methodical expansion of capabilities for our global network of customers," said David Querio, Ascent's President/CEO.



Rubb's 2019 AVC project for Turkish Technic
82m x 87m x 10m MRO hangar, Istanbul Airport

State-of-the-art facility

The 91m (span) x 91m (length) x 12m (leg) hangar will house wide-body aircraft as large as the Airbus A380. Access is provided by the five-panel, vertical-lift ASSA ABLOY Megadoor system with pivoting mullions. These high-quality doors provide diffused natural lighting, excellent air tightness and wind resistance, and are self-contained within the main hangar structure.

The project will also feature several smaller access points: a 3.5m x 3.5m electrically operated roller shutter door, complimented by four 1m x 2m pedestrian doors fitted with panic hardware and vision windows.

The 10-span hot-dip galvanized steel frame is clad with specialized architectural PVC fabric from Serge Ferrari, which deflects light and heat—ideal for Arizona's climate.

The hangar is part of Rubb USA's AVC range, which has seen similarly mammoth MRO hangars such as AAR's twin-span project located at Chicago Rockford International Airport, completed in 2017. More recently, Rubb delivered an 82m x 87m x 10m AVC hangar to Turkish Technic's Istanbul Airport operation in 2019.

Ascent chose Rubb for their twin MRO hangar project after evaluating factors such as cost, schedule, and safety record. We're very proud of our safety and performance records and happy that our experience with other large hangar projects contributed to this decision. We're excited to welcome Ascent as a new customer and see two more 91m clear-span Rubb hangars completed.

VP Sales, Rubb USA
Sean Hickey

True Padel

20 year-old sports hall transformed

Soccarena, the five-a-side football venue constructed by Rubb UK in 2005, has been transformed into the North East’s first indoor padel centre.

Located at Belmont Business Park and operated by Infinite Durham, the 50m span x 130m long BVC facility was a mainstay in Durham’s football scene for almost two decades.

Now it’s welcoming padel enthusiasts from across the region. Padel, a sport combining elements of tennis and squash, has been gaining popularity worldwide and is proving a hit in the North East.

With the building being almost 20 years old, this impressive facility goes to show that Rubb’s projects are built to last.

Sales Manager, Rubb UK
Andrew Knox



Total transformation

In just a few months, the 32,579 sq ft interior has been revamped by True Padel Ltd, who has fitted nine steel-framed, glass-walled padel courts. The spacious interior easily accommodates the full-sized courts, and its 14.5m apex allows plenty of clearance for the highest of volleys.

As part of the refit, the original floors have been fully redone with a new high-spec concrete coating. Additionally, a shop and bar has been added for its visitors, and the changing room facilities have been refurbished to modern standards.



Built to last

After almost 20 years since it was originally designed, manufactured, and installed by Rubb UK, the building still features its original PVC cladding and steelwork. There’s a reason Rubb offers 25-year guarantees on our hot-dip galvanized steel frames: we know they’re built to last.

This project is a fantastic example of both the adaptability and longevity of Rubb’s structures, with this facility still proving to be a worthwhile investment 20 years later.



True Padel, United Kingdom
50m span by 130m long padel hall



Why are all our sports halls blue?

It may seem like an odd question until you notice the pattern.

Take a look at our Paignton Academy (above), University of York (right), and Acton School District (below) projects. Three examples of Rubb sports halls featuring blue flooring, blue rebound boards, and blue division nets—complete with smaller blue detailing, like basketball board trims or tennis net poles.

Just three examples, but you can look through our case studies if you need more evidence that we love blue for our sports projects.

Your first thought may be branding—light blue does go very well with Rubb’s logo. Though we appreciate some good colour coordination every now and again, we always choose the colour best fit for the project.



In this case, the answer is simple: Sport England’s guidelines.

In its ‘Sports Halls Design and Layouts’ guide from 2012, Sport England suggests either blue or green as the best interior colours for sports halls, noting that this is most important when badminton will be played to allow for contrast with shuttlecocks. The guidelines even detail the Dulux colour codes: blue, 86 BG 43/321; green, 30 GG 40/290.

These are just suggestions, and it notes that the most important thing is to avoid white. But if that’s the case, why is blue so prevalent?



1. Visibility and contrast

Blue provides good contrast with most sports equipment and uniforms, making it easier to track the movement of the ball and players. It also provides a contrasting background for court markings which are often white, yellow, red, and green.

2. Psychology

Blue is associated with calmness, concentration, and cooling. It’s thought to have a soothing effect on both the mind and body, which can be beneficial in high-stress sports.

3. Standardisation

In some sports, certain colours may be standardised. For example, in tennis, the colour of the courts in Grand Slam tournaments is usually blue because it provides good contrast with the yellow tennis balls and is friendly for TV broadcasts. Blue courts came in very handy for the University of York project (pictured above), which broadcasts its inter-university Roses competition.

4. Light reflection

Lighter shades of blue can reflect light very well, which can help to increase the overall brightness of the sports hall, especially during daytime. Sport England suggests colours with a reflectance value of 30-50%. This, in conjunction with Rubb’s translucent ceilings or LED lighting packages, can provide a very bright playing area.

Larvikittblokka AS

Rubb Norway's most complex industrial production facility

Assembled under harsh conditions and packed with functional solutions, this new building for stone mining outfit Larvikittblokka AS has become one of the most complex fabric buildings on the Scandinavian market.

“Its details are completely unique. Right from the start of the project, we’ve had a strong focus on the functional solutions this building should have. The structure is fully custom; there’s nothing like it.”

Sales Manager, Rubb Norway
Øyvind Kristiansen

Erected on top of the Klåstad quarry in Larvik, Norway, the Rubb building will handle the sawing and production of larvikite blocks.

Chosen specifically for its deep, dark colour that lends the stone an ‘organic, solid, and elegant feel,’ Larvikittblokka AS offers the stone in 0.4m to 1m falling lengths. Cut from blocks many times larger, they needed expansive facilities. After working with Rubb previously, they knew who to call.

Feature complete

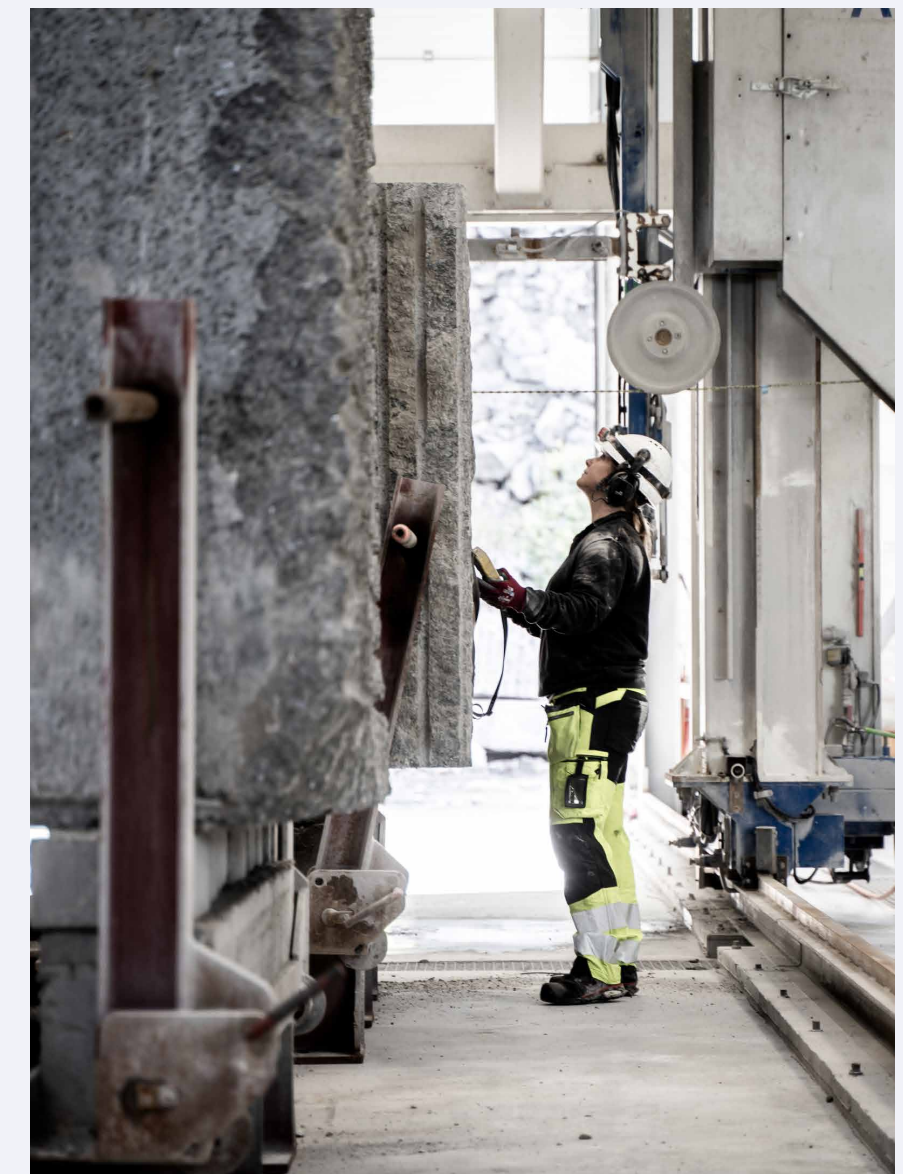
The 27m span, 65m long Rubbhall has a floor area of 1,770 m² and over 10m of free height under its roof, reaching an apex of 16.4m. A 40-tonne overhead crane is located inside the hall. It also contains three single wire saws, a multi wire saw, rock breaker, and a treatment plant.

The client emphasised the need to address noise reduction. A suitable solution would permit evening work operations without causing disruptions to the surrounding neighbours.

Rubb addressed this need by insulating the hall with 100mm Thermohall®. Not only does the glass wool technology maintain a stable temperature, but Rubb’s energy-efficient strategy also provides effective sound transmission reduction.

“An integrated water collection and gutter system has been installed in the floor. In addition, we have installed 250 lux LED lighting, which is both cost-saving and environmentally friendly,” says Kristiansen.

“The walls are clad with 100mm Thermohall® insulation; the hall has a total of ten roller shutter doors, four access doors, and six large windows.”





Larvikittblokka AS, Norway
27m span by 65m long stone production facility

Their second Rubb building

Construction began in February 2022 and was completed in December. All concrete tasks were managed by CC Betong AS, while the assembly was reliably executed by Plamek AS—both Rubb Industries AS companies.

This is not the first building supplied to Larvikittblokka over the past two years. In 2021, Rubb delivered a smaller 15m span x 25m long FH building to the Larvik quarry (pictured right).

“When we invested in new machines and equipment for the production of Larvikite block, there was a great need for new production halls. We are so satisfied with the previous hall from Rubb, so there was never any doubt about who would deliver hall number two,” says a satisfied General Manager at Larvikittblokka, Jan Henrik Hansen.



Larvikittblokka AS’ team and special guests gathered to celebrated the opening of the new facility



“ It’s a wonderful feeling to walk around the new facility and see how well it’s turned out. I’ve seen several similar halls in our market, and this hall is undoubtedly top of the range. The Thermohall® prevents reverberation as we’re working, while also regulating temperature. We’re lucky to have super ventilation, too. It’s important for us as we strongly value HSE and our work environment.

Operations Manager, Larvikittblokka AS
Jon Arild Hansen



Twin solution for Tuboscope

Tuboscope, a leading provider of oilfield tubular and accessory services for the energy industry contacted Renthall AS when they needed to boost their site's storage capacity. The solution was just as flexible as their financing.

Tuboscope's site is located in Mongstad, a coastal industrial site in Vestland county, Norway.

During the winter months this exposed location drops well below freezing, so when they asked to have the two buildings installed as close as possible a challenge became clear: what about the build-up of snow and ice between the two sidewalls?



Rubb's answer was simple: join the buildings together. The gap was eliminated by fabric-welding the two buildings together. A clean and efficient solution.

The buildings are complete with 50mm Thermohall® insulation and 500 lux lighting to provide a warm and bright working environment year-round.



Eco-brick expansion: Aaltvedt's third Rubb project

Norwegian concrete producer Aaltvedt has once again chosen Rubb to meet its growing warehousing requirements with a fully custom design. This 30m wide x 60m long Rubbhall marks their third order from Rubb, with their last 30 x 70m warehouse delivered in 2020.

For this project, Aaltvedt requires the space for its growing 'eco-brick' project. Aaltvedt has developed a method to reuse fine dust from metal alloy production, previously considered waste, by integrating it into the manufacturing of eco-bricks.

They can produce up to 250,000 tonnes per year, and have calculated that the production of 100,000 tonnes of eco-bricks correlates to a CO2 reduction of 80,000 tonnes.



Fully featured

The building's cladding is insulated with 100mm of Rubb's patented Thermohall®, and 50mm of the glass wool system is used on the internal partition wall which separates the workspaces. Thermohall® doesn't just insulate heat, but sound, too. Aaltvedt's operations can proceed without disturbing the rest of the site.

Two 6m wide x 5m high remote control, articulated lift gates give easy access to vehicles and maintain the building's security in each gable wall. There is a further motorised door measuring 4m x 4m in the sidewall, complete with a porch to protect against sliding snow. Two corridor doors complete the building's access points.



A separate annex was installed to handle raw materials.

Custom annex

Aaltvedt also required an additional production area attached to the main building to better handle raw materials.

To accommodate this, Rubb built a 12m wide x 9m long extension to the front of the main building, joined with PVC welding. This smaller structure is equipped with a large 8m x 5.5m opening with a canvas door to ensure easy depositing of the eco-brick's raw materials.

There is no better feedback than a returning customer. Aaltvedt's trust in Rubb has been earned over several projects and is testament to the quality solutions we deliver.

Surviving fire: Rubb hall prevents spread of blaze

In 2010, Rubb Sweden delivered a Thermohall® insulated building to a contractor within the Kiruna mining region. For nearly 15 years, this building stood the test of time, supporting operations in the bitter northern Swedish climate.

Until last summer, when a mining truck caught fire while stored inside.



Night and day, the fully recovered building, complete with original frame.



Fire safety performance

Rubb buildings offer significant fire safety advantages over other building types, including lower risk of combustion, flashover and structural failure, even in severe fires. The fabric will not propagate flame or sustain combustion when exposed to a severe fire.

The blaze was contained to the building, however, thanks to a quick response from emergency services and Rubb's robust Thermohall® insulation system: non-combustible glass wool sandwiched between PVC sheets, flame retardant and self-extinguishing to BS 5438 Test 2B, NFPA 701, and other international standards.

Rubb buildings do not support or propagate combustion as they are self-venting to reduce risk from heat and smoke, allowing them to survive the most severe fires. This also allows firefighters to more safely fight fires in a Rubb building.

The building's steel framework remained undamaged from the flames,

testament to its high-quality. Rubb were brought in to replace its cladding and doors, and now it's ready to support mining operations again.

The mining company, who has been extracting iron ore from the area for over 130 years, greatly appreciated the minimal disruption from the blaze.

Operating 1,000m underground, any disruptions in production could have enormous consequences to costs and deliveries.

Thermohall® is equipped to deal with severe fire. Compared to other building types, its lower risk of combustion, flashover, and structural failure can make all the difference.

It's clear that Rubb's insulated cladding can drastically reduce potential losses. Instead of facing extensive damage and operational interruptions, the structure's resilience resulted in minimal harm. Our buildings are properly designed with safety in mind, so you can purchase Rubb with confidence.

CEO, Rubb Sweden
Roger Jonsson



Town of Liberty gets winter ready with new Rubb sand shed

Recently Rubb USA was contracted by the Town of Liberty, Maine to furnish, deliver, and install an 18m span x 30m long x 4m leg BVE structure to serve as the Town's new sand shed.

The previous building used by the Town at their DOT facility had failed and needed to be replaced.

Rubb's engineering team worked with the Town's concrete foundation supplier to design a building with a high storage (volume) capacity.

The structure sits atop a 3m tall, poured concrete foundation, and can store 3,200 cubic yards of the salt and sand mixture.

As this structure has a large 6m wide x 7m high opening in the front gable with no door, it is considered to be a partially enclosed structure and was designed as such.

Design loads are as follows:

- 105 mph 3-second gust wind
- Exposure category C
- 60 psf ground snow load
- 1 psf collateral load



Shelter duo for AVL RACETECH

Renthall UK has supplied AVL RACETECH with two 12m span x 15m long fabric shelters to serve as additional storage as they support Red Bull Racing in Milton Keynes.

Though the two shelters are the exact same size, there's a key difference: one is refurbished, the other is newly manufactured.

The refurbished shelter was also previously rented by AVL RACETECH for nine months, after which it was returned to Renthall UK for refurbishment and repacking. When requirements changed, AVL got back in touch to reacquire the shelter, but this time with an additional request to make it a pair.

Both shelters were erected in three days and come complete with durable blue and white PVC cladding. The refurbished shelter provides access with a roller shutter door, while the newly manufactured one has a folding PVC door for personnel and goods access.



Renthall UK smashed it out the park and delivered for us. Next stop is to fill them up.

Lead Project Manager, AVL
Darren Markham

Findus orders up fully custom Rubbhall from Renthall AS

Norway's largest french fry factory is now home to a custom-designed Rubbhall.

Findus' Tønsberg facility processes 50,000 tonnes of food annually, so Renthall was brought in to tackle the site's logistic challenges.

Measuring 25m wide x 35m long and equipped with 100mm Thermohall® insulation, the building will serve as both vegetables sorting and delivery area for the before they go into production, divided by a partition wall.

Peeling back the details

Due to the complex nature of building's usage, Findus had several specific requirements.

As there will be a constant stream of delivery vehicles accessing the building, five tall roller shutter doors as well as 8m high walls were supplied to allow efficient access.

Health and safety is also a priority for Findus, so an awning has been installed over the access doors to prevent snow from falling onto workers. Inside the building, 250 lux lighting creates a bright and safe working environment.

Four vents have also been installed in the gable walls to ensure fresh air is circulated while all the doors are closed to maintain the desired interior temperature, set by a further four heating fans. The HVAC features are supported by 100mm of Rubb's Thermohall® insulated cladding, ensuring an optimal environment for both the staff and produce all year round.

Recipe for success

This project goes to show that there can never be too many cooks where Rubb Industries is concerned. It was overseen and financed by Renthall AS, designed and manufactured by Rubbhall AS, and installed by Plamek AS. This seamless cooperation within these Rubb Industries companies results in a smooth experience for our customers, handled start to finish by our expert teams.



- 1) Findus required a clear-span, high apex facility to accommodate huge vehicles.
- 2) Once delivered, the vegetables are sorted on-site with this machinery.
- 3) The awning is essential to ensure snow and ice doesn't fall on employees.
- 4) Rubb and Renthall have delivered several other buildings for Findus on this site.



RNAS Yeovilton receives top of the range 25m EFASS hangar

Rubb UK has recently supplied RNAS Yeovilton, a top naval air station in the UK, with an ultramodern EFASS structure specified to their exact requirements.





Exact requirements

The structure measures 25m wide x 40m long, with a 5.5m leg. Modular by design, the EFASS's length can be adjusted per operational requirements. Here, the client chose ten 4m long modules to accommodate their use case.

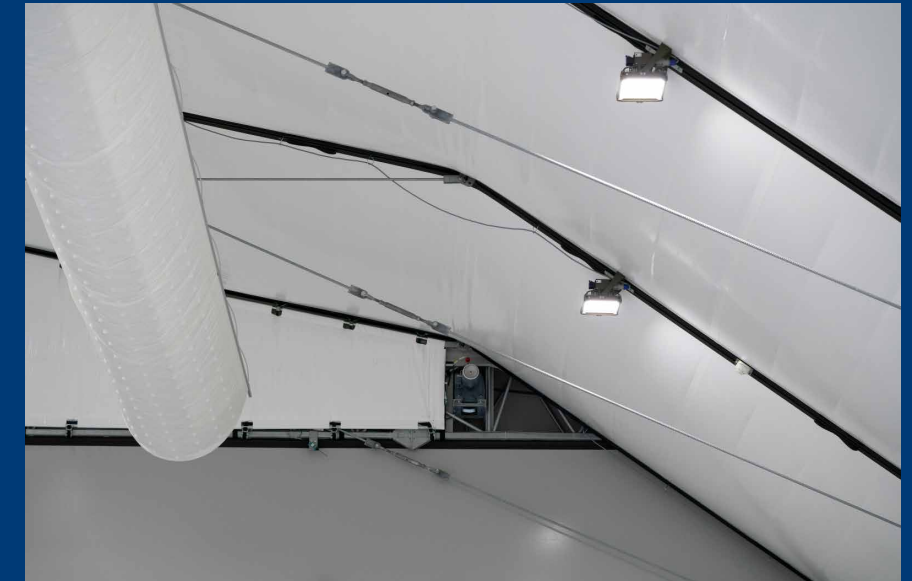
The hangar's durable fabric cladding was delivered in a goosewing grey exterior, with a white interior. Meanwhile, 150mm of Rubb's Thermohall® glass wool insulation is packed between the sheets, ensuring the interior stays energy-efficient and comfortable year-round.

Robust features

The 21.5m Heli-Door, designed and installed by Rubb UK, ensures easy access for vehicles and personnel. Meanwhile, the rear of the structure features an electrically operated 5m x 5m roller shutter door, supplied by fellow North East manufacturer, Hart Doors. Four additional porch doors are also included for personnel access.

The interior is well-lit with 500 lux LED lighting, and the environment is controlled with a modern HVAC heating and cooling system—stored externally in two 20ft ISO containers to the rear. The hangar is supplied with a power distribution panel to accommodate all electrical accessories, including a fire alarm system.

Rubb's EFASS system continues to be a popular choice among military organisations worldwide, with its adaptability, quality, and range of accessories proving best-in-class.



The client approached Rubb with a requirement for a new temporary hangar. It was agreed that the EFASS system was the most suitable solution due to its robust features. A great project to work on and one we are truly proud of.

Sales Executive, Rubb UK
Ryan Clarke



Equipping Edwards Air Force Base, USA

The past, present, and future of Rubb USA's and partner company Cocoon's mission to supply Edwards AFB with alternative, rapidly constructed solutions.



It all started with a deadline: Edwards Air Force Base, a 481 sq. mile aerospace testing facility in California, was the designated site for a 10-year development program but didn't have the hangar facilities or the time for a traditional construction process.

In their search for an alternative approach, they found Rubb USA, a company with a reputation for building huge steel-framed, fabric-clad, clear-span aircraft hangars worldwide—as our readers will well know.

Rubb connected the Edwards team with Cocoon, their partner for all things military. In turn, Cocoon tapped procurement specialists ADS.

Edwards now had a company that could engineer and manufacture the buildings, a company that could manage the project, and a company that could oversee the contract vehicle and financing.

Time to order.

The initial contract was for two 67m clear-span x 61m long hangars to house B-52 bombers, both with fabric roofs but metal sidewalls for noise abatement. In addition, there were two 15m x 30m full-fabric storage buildings, and a 30m x 21m full-metal SAPF (Special Access Program Facilities) building divided into two spaces.

The challenge was interfacing with the Edwards AFB infrastructure, particularly the water supply which needed to provide a specific amount of pressure for the fire suppression system to work. The upside of those challenges was the high level of communication, collaboration, and coordination between the project team and the Edwards AFB team.

Initial projects

- (2) 67m clear-span x 61m long hangars, w/ fabric roofs & metal sidewalls
- (2) 15m x 30m full fabric storage buildings
- (1) 30m x 21m full metal SAPF building, divided into two spaces
- (1) 104m x 25m two-bay drone hangar

Current and upcoming projects

- (1) 60m clear-span x 44m long, full metal SAPF hangar
- (1) 75m clear-span full fabric hangar
- (1) 12m x 23m building, w/ 15-ton stand-alone crane

Rubb USA & Cocoon's latest project 60m span by 44m long hangar, Edwards AFB.



The initial project took two and a half years to become operational, whereas the MILCON process typically takes seven to ten years. The time savings were crucial to Edwards Air Force Base being able to fulfil the requirements of the development program.

In addition, the cost to install the necessary facilities was approximately 75% lower than what had been estimated for traditional construction.

Since then, the Rubb and Cocoon team has been engaged to take on three more projects, starting with a 60m span by 44m long hangar, which will be a high-security Special Access Program Facility (SAPF), complete with special soundproof acoustical panels.

The structure itself has been completed and team member Adamo Security Group is now doing its work to make the building SAPF compliant, with expected completion in September of 2024.



B-52 over the Mojave Desert.
Air Force photo by Christian Turner.



B-52 pre-flight at Edwards AFB,
Air Force photo by Giancarlo Casem.

The next project is a 75m clear-span hangar which will begin in April/ May of 2024, followed by a 12m by 23m special purpose building which, while small, is a complex project involving a stand-alone, high-capacity 15-ton crane, fire suppression, and HVAC.

The Rubb and Cocoon work at Edwards Air Force base is notable because of the range of buildings being provided—all fabric clad with Thermohall®, a combination of Thermohall® roof and insulated metal walls, and all insulated metal roofs and walls. In addition, the site is exposed to some of the highest seismic load requirements in the USA.

As is the case with all Rubb and Cocoon projects, each building meets all applicable building codes.



Edwards Air Force Base, California, USA
60m span by 44m long hangar



Op Newcombe: EFASS deployed to combat terrorism

Throughout the last decade, the UK MOD has been involved in several military and humanitarian operations in Mali, aimed at countering terrorism, instability, and humanitarian crises.

The largest of these was the French Military's Operation Barkhane, which led counter-insurgency activities in the Sahel region of West Africa from 2014 to 2022. It was supported by a number of countries, including the UK MOD's Operation Newcombe, which focussed on logistical and airlift support, employing four CH-47 Chinooks and 100 support personnel to achieve this.

Based in Gao, eastern Mali, these RAF Chinooks were central to Operation Newcombe's activities. Arriving in July 2018 from Joint Helicopter Command, they provided essential air support and transportation to troops on the ground, transporting personnel, equipment, and supplies to and from remote locations throughout the region.

Invaluable support

When the operation ended in 2022, the Chinooks had lifted over 1,500 tonnes of freight, transported more than 18,000 troops, and recorded 3,000 hours of operational flight time. Their versatility and mobility made them an ideal solution for providing air support in the challenging terrain of Mali, where road infrastructure is often limited or non-existent. From air-lifting vehicles to exfiltrating crashed French fighter jet pilots, the Chinook team proved invaluable.

The helicopters were operated by 1310 Flight—provided by 18 (Bomber) Squadron based at RAF Odiham in Hampshire—supported by personnel from across the RAF, British Army, and Royal Navy drawn from Joint Helicopter Command.

To establish the Chinooks in Mali, the RAF needed hangars. For that, they utilised three Rubb 25m span x 40m long EFASS hangars from their stock.



Where Rubb comes in

Shipped to Mali in four 20ft ISO containers per hangar, Rubb's rapid erect EFASS system was essential in providing shelter and protection for the helicopters and their personnel.

Easy access was provided by 21.5 x 7m Rubb-manufactured Heli-Doors, as well as four personnel doors. The hangars were complete with electrics and lighting packages, and 2000kg roof-mounted gantry crane systems.

Additionally, a 25m span x 60m long Rubb sunshade was also deployed to protect aircraft from the searing West African sun.

The shelter provided by Rubb's EFASS hangars were essential to the Chinook operations in Mali's arid environment where corrosion is a significant risk. The high temperatures and dry, dusty conditions, coupled with exposure to sand, gravel, and other debris, can greatly accelerate the corrosion of metal components, which must be avoided to maintain operational readiness.

At the end of Operation Newcombe in November 2022, the three 25m EFASS hangars were scheduled to be returned to Rubb UK's Gateshead HQ for refurbishment, commencing in May 2023. This is part of Operation Regain, an MOD effort to

consolidate its assets which are spread across the globe. Rubb will return the hangars to A1 (new) condition and bring them up to 2023 specifications before returning them to MOD stock where they will await deployment.

The contributions of the RAF Chinooks highlight the important role specialised equipment and infrastructure play in aiding military and humanitarian operations in inhospitable climates such as West Africa. Countless hours of manpower, travelling time, and perhaps even lives have been saved by efforts of 1310 Flight, who have demonstrated the tangible benefits of international cooperation.

Working with other countries so closely is fascinating, it gives you the opportunity to look at yourselves from a totally different perspective. We have learnt a huge amount from the way they operate and I hope they'd say the same thing about us.

RAF Wing Commander
Matt Roberts



Rubb's 18.2m x 18m sunshade has been protecting the unmanned MQ-9A Reaper RPAS as part of the Royal Air Force's Op SHADER, combating Daesh in Syria and Iraq.

Adapted from Rubb's deployable EFASS hangar range, the sunshade protects personnel and assets from the high temperatures and powerful UV rays of RAF's Akrotiri base, Cyprus.

Rubb's sunshades are supplied in 18.2m spans and 4.5m modules. The standard setup is comprised of four 4.5m modules, but this can be extended or reduced to meet operational requirements and loadings, so they are placed directly within the same market as these traditional hangars.

RAF Akrotiri: Keeping Op SHADER in the shade



Ten years of operations

Supplied in 2016, the sunshade will continue to protect the RAF's Reapers until they are replaced by the new MQ-9B Protector aircraft in 2024.

These will also be remotely operated by the RAF's XIII Squadron, who have controlled the advanced 'medium altitude long endurance' aircraft since 2013, and are celebrating this anniversary.

This sunshade is just one of the Rubb solutions deployed in RAF Akrotiri, with several 20.4m and 25m EFASS hangars supporting essential operations in the Cyprus base.



MOD © Crown copyright 2024

Rubb UK & Cocoon to supply trio of EFASS hangars to U.S. DoD

Rubb UK has secured an order for one 20.4m and two 25m-span EFASS deployable hangars.

The 20.4m-span EFASS measures 28m long, and features two 5m x 5m roller shutter doors for easy access.

Meanwhile, the two 25m-span hangars are 36m long and are each equipped with two Heli-Doors—one to each gable.

This unique configuration will allow uninterrupted access through the hangars and onto the runway for when every second counts.

They will come with US Standard Safe-Area Electrical Kits, packed in four 20ft containers for each of the three EFASS ordered.

Cocoon, Inc., Rubb USA's long-standing partner for all things military, has facilitated this order from Rubb UK. Cocoon specialise in products and services that protect military assets from the elements and reduce corrosion for the purpose of increasing readiness, decreasing costs, and extending asset life cycles.

This project represents an important milestone in Rubb's relationship with Cocoon, and we are delighted to supply three additional EFASS hangars to the US DoD.

Military Lead, Rubb UK
Adam Bowery



EFASS in Brunei: Supporting jungle warfare training

Rubb UK has supplied a 25m span x 40m long EFASS to Joint Helicopter Command in Brunei, providing critical aviation infrastructure for the RAF's Jungle Aviation Operations.

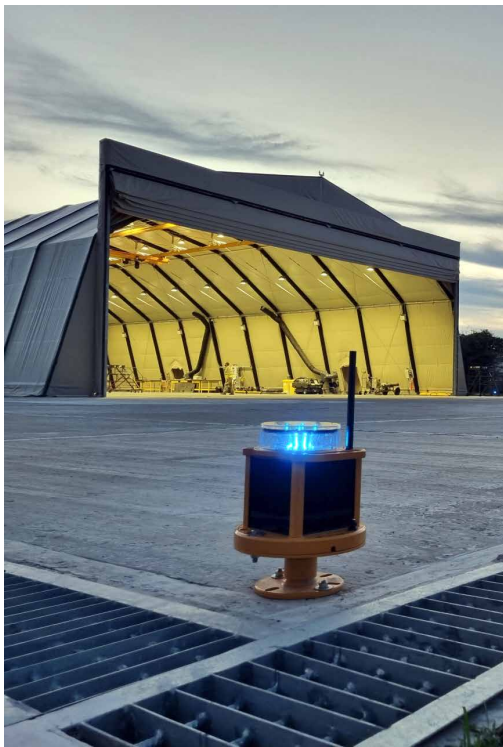
Long-time experts of Rubb's EFASS range, 5001 Spq RAF, erected the hangar with the project being overseen by 20 Wks Gp RE.

The 25m EFASS will serve as a home for several 1563 Ft RAF Puma helicopters, which will have easy access through the hangar's 21.5m Heli-Door.

Inside, 750 lux Part 145 compliant lighting will facilitate a bright and safe work area for performing maintenance on the helicopters transporting personnel, equipment, and supplies to and from remote locations throughout the jungle region.

Utilising the trusted 25m EFASS, used extensively by the RAF, we are delighted to have supplied our first hangar directly to Joint Helicopter Command. We have also supplied significant upgrades, enhancing the working environment and counteracting the hot, humid conditions experienced in Brunei.

Military Lead, Rubb UK
Adam Bowery



Pumas in the jungle

The Puma aircraft have been stationed in Brunei since late 2022 and provide Medevac and transport support for the British Army's Jungle Warfare Division, comprised of an infantry battalion of Gurkhas and a small British Garrison.

The Jungle Warfare Division runs courses for both soldiers and Royal Marines, focussing on mastering infantry skills ranging from basic field craft to advanced survival techniques.

Brunei is an ideal location for such training, as navigating its jungles is hugely challenging. It can take 20 minutes to travel just 100m, hacking at the undergrowth while visibility is limited to just a few metres. That's not to mention the swarms of insects, poisonous plants and animals, and the sun-blocking canopy—topped off with intense heat and humidity.

Combating humidity

Brunei's intense temperature can reach upwards of 35°, while its humidity averages 80% year-round. It's no surprise that climate control was a top priority for the project—for the sake of both personnel and equipment.

To this end, Rubb supplied a full HVAC kit and a dehumidification unit to combat the humid conditions of Brunei.



Celebrating 40 years of Rubb USA

40 years ago, industry innovator Finn Haldorsen expanded Rubb into the USA following success in both his Norwegian homeland and the UK.

Est. 1983
40
YEARS of EXCELLENCE



Sanford, Maine was chosen to establish Rubb USA in 1983 due to the region's history of expert metal fabrication, shipbuilding, and strong work ethic.

Haldorsen hired a young Cornell engineering graduate to set up Rubb USA on the New England coast. David Nickerson was 23 years old when he walked through the doors. Now he's in his 41st year at Rubb and has been Rubb USA's President/CEO for almost 20 years.

When I started off here as a kid I loved to design and build things. I still get to do that every day.

Built rugged, built right

David and Chief Engineer Gary Sutryn, PE who also started with Rubb 40 years ago, established Rubb USA as a leader in the design, manufacturing, and construction of fabric-clad buildings throughout North America. Thanks to their and the Rubb team's stewardship, the company has experienced an ever-increasing demand for clear-span, code-compliant, relocatable buildings which today are built in clear spans up to 91m and clad with fabric, metal, and other materials to suit customer needs.

Rubb's products have evolved from durable coastal solutions to highly sought-after and affordable building technology. Used by the US military and renowned companies worldwide, Rubb has a flawless track record and a reputation for excellence in engineering.

Engineering is something that's really important to us as a company. We stand for building things correctly, following the codes, and making sure our customers and their products are safe.

Adhering to these core values has earned Rubb USA record sales in 2023. Rubb's aviation sector is a major contributor to this, with several leading companies in the industry trusting Rubb with their projects.

When you're putting a \$100 million aircraft inside a hangar you want to make sure that when the wind blows, the ground shakes, or the snow falls that the building will be there.

Born in Norway, made in USA

Rubb's Sanford, Maine location is home to its design, steel, and PVC production facilities, providing local jobs for over 75 experienced engineers, drafters, fabricators, site installers and business professionals. Everyone works towards one goal: delivering the world's toughest fabric-clad structures.

This matters to the people that come to work here every day.



When I see one of our buildings, you instantly know it's Rubb. You always get that sense of family.

Machine Operator, Rubb USA
Steve Gagnon

Steve Gagnon has also been with Rubb USA since the start. This year marks his 40th at Rubb where he has served a number of roles in fabrication and on site. Steve's son, Matt, joined Rubb in 2008 as a drafting intern and became Rubb USA's General Manager in 2022.

Rubb USA is full of generation-spanning success stories. The secret to the company's expertise and experience is its family business ethos and low staff turnover. The hard work and dedication of the men and women of Rubb has delivered outstanding results for each of its 40 years.

I get to work with great people. People here in the company, customers, and partner companies and suppliers. People that have become friends. Why would I want to do anything else?

President/CEO, Rubb USA
David Nickerson



Renthall's rebrand

Our sustainability commitment

Renthall is proud to launch our new logo and branding in line with our core values of providing quality-built, environmentally friendly, and sustainable structures.



At Renthall, we are constantly working to reduce our environmental footprint, and as we look toward a greener future we feel the products and services we provide are perfectly aligned with this vision.

Renting a facility already provides the client with great flexibility. You can choose to extend both the facility size or the rental term where necessary. You can relocate the building if required but, ultimately, at the end of the rental period the building is returned to Renthall where the facility will be refurbished, recycled, and even upgraded ready for the next customer.

This element is extremely important to us. We have skilled, competent, and passionate employees who are keen to reuse all elements of the facility reducing

waste and environmental impact providing you a more sustainable approach to enhancing your facilities for future growth.

We are excited to be discussing this part of our business and we look forward to working with customers to create a better and greener future.



This is an exciting change for Renthall, highlighting the many sustainable advantages of our business model. It really shows what we're all about.

Managing Director, Renthall UK
Andrew Knox



Andrew Knox heads up Renthall UK.



Renthall's new signage is already installed on several buildings across Norway.



Erik Storhaug appointed new O.B.Wiik AS CEO

Since 2019 Erik has been an integral part of Rubb, heading up both the Norwegian and Polish operations as CEO.

From complex facilities like the recently-completed Larvikttblokk project to the many Rubbhalls dotted across Norway, Erik has plenty of experience in delivering fabric buildings in all shapes and sizes.

Now, in addition to his responsibilities at Rubbhall AS and Rubb Polska Sp. z o.o., Erik will be taking on the role of CEO for O.B.Wiik AS. He officially started the position on the 1st of January, 2024.



I am grateful and humble for this opportunity and the tasks ahead. Both O.B.Wiik AS and Rubb Industries AS have unique qualities and I look forward to using our shared knowledge to continue our growth. I am very happy that I have already got to know many knowledgeable and experienced employees in OBW and look forward to meeting the rest to continue building a strong team together.

CEO, O.B.Wiik AS/Rubbhall AS/Rubb PL
Erik Storhaug



We want to donate the fabric to a local aid organisation or another good cause. Our goal is that no resources should be lost in projects like this.

CEO, Renthall AS
Terje Hals

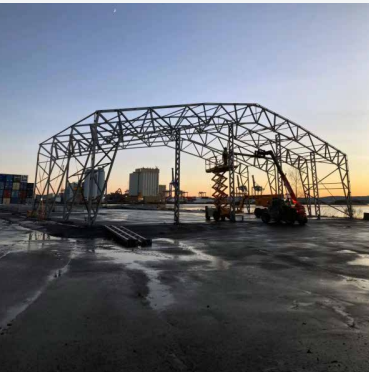
Renthall AS donating 5,500 square metres of canvas to charity

After being in use for ten years, the Port of Oslo decided to sell their fabric building as it was no longer needed. Instead of throwing it away, the solution was to reuse the building.

Renthall AS purchased the structure, dismantled the hall, and took it into their warehouse. Here, they upgraded and adapted the hall, before it was sent to Boliden and Odda in Western Norway.

In this project, there were parts of the hall that could no longer be used. The PVC cladding on the building had been exposed to harsh weather over the years in use, so couldn't be reused for the new customer, so Renthall AS replaced the fabric cladding on the building.

A total of 5,500 square metres of fabric has now been washed and prepared for further use. With a strong focus on sustainability and recycling, the fabric is now being donated to a charitable cause.



Renthall AS CEO, Terje Hals and Port Director, Ingvar M. Mathisen



Renthall's initiative fits perfectly with Oslo Harbour's environmental profile. We are investing heavily in the circular economy, so it's very good that Renthall takes responsibility for recycling the canvas ensuring that materials are not lost.

Port Director, Port of Oslo
Ingvar M. Mathisen

Zurhaar AS' 30th anniversary

From just a NOK 2 million turnover in 1993, to an international group in 30 years. Group CEO Rune Birkeland shares the 30 year story of Rubb Industries parent company, Zurhaar.



Zurhaar Academy opens doors

In line with Zurhaar Group's training policy, Zurhaar Academy has been launched as a platform to invest in Zurhaar's employees across all its companies.

The Zurhaar Leadership Programme will kick off the initiative, with key managers from across the group invited to take part in the course. Aiming to bolster management and leadership skills, the course will be led by Tommy Nordang, an organisational development expert and university lecturer at BI Business School and Oslo Met.

Currently the initiative is being trialled in Zurhaar's Norwegian companies, but plans to expand internationally are underway. Similarly this first course is focussed on management and leadership, but Zurhaar Academy's goal is to offer opportunities for all employees across a variety of subjects.

Investing in our workforce is essential to meeting both company and employee goals. This is just one facet of the Zurhaar Group's commitment to sustainability and taking our responsibilities as an ethical employer seriously.



Zurhaar Academy's goal is to ensure employees have the knowledge, skills, and competencies to meet the organisation's strategic goals.

CEO, Zurhaar
Rune Birkeland

Zurhaar Group achieves green goals in Norway

We are humbled and proud to be able to say that both Zurhaar AS and all its Norwegian subsidiaries have been Eco-Lighthouse certified.

This is visible proof of our commitment to responsible and sustainable operations, and gives us a concrete tool to work continuously with our green transition.

Eco-Lighthouse (Miljøfyrtårn in Norwegian) is Norway's most widely used certificate for businesses that want to document their environmental efforts and demonstrate social responsibility.

Eco-Lighthouse certification is more than just a symbol. It also involves strong links to the UN's sustainability goals. As members of Eco-Lighthouse, we are obliged to contribute to the fulfilment of several of these goals. This includes reducing our environmental impact, promoting equality and human rights, utilising responsible procurement practices, and reducing energy consumption and waste management.



Our Eco-Lighthouse certification is an important part of our overall sustainability strategy, which includes a holistic perspective on the environment, society, and economy. We are keen to integrate sustainability into all aspects of our business, and the Eco-Lighthouse certification gives us a structured approach to improving our sustainability work and ensuring that we follow relevant laws and regulations in the area.

Group achievement

O.B.Wiik is already certified, and in December 2023 Hallmaker, Rubbhall, Plamek, Arqdesign Norge, CC Betong, Haagensen Plast, and Renthall have all joined it in certification.

We encourage our suppliers and partners to take the step towards a sustainable future by becoming Eco-Lighthouse certified! This is a concrete and targeted way to improve our environmental footprint and contribute to a more sustainable social development. Through Eco-Lighthouse companies get access to tools, resources, and expertise that help them identify and implement concrete measures, as well as follow up and report on progress.

This is just the start, and we look forward to continuing our sustainability work in 2024 and beyond.

New opportunities

In 2020, the opportunity arose for us to take over the entire Rubb business, which was then called Hallmaker Group AS, head-quartered in Oslo. It was our first industrial investment. Since then, another opportunity appeared: O.B.Wiik AS, the fabric hall company. We took over this company in its entirety in January 2022. We quickly took action and renamed Hallmaker Group AS to Rubb Industries AS. Furthermore, we made several strategic decisions to turn the company with all its subsidiaries into a now solid supplier in its fields.

This summer saw our industrial division's largest ever orders, with Rubb USA securing the delivery of major aircraft hangars in the USA—totalling an order value of over NOK 300 million.

Winning this work has clearly defined our position as the world leader in fabric building solutions in the aviation sector.

With our acquisition of O.B.Wiik AS, we are now well underway with strategic moves that will establish us as a progressive company, consistently producing excellent results that will further solidify our strong position in Scandinavia.

A decisive factor in our success has been the banks that have shown great faith in us throughout all these years. Our main bank has always been Nordea, with Handelsbanken as an excellent backup. Thank you both for the wonderful collaboration.

From barely a NOK 2 million turnover in 1993, to approximately NOK 1.79 billion 30 years later. This has been an amazing journey. Without skilled, loyal, and self-sacrificing employees and our faithful tenants, this would not have been possible. A huge thank you to you all.

We have put 30 exciting and productive years behind us with the fantastic cooperation between our two owner families, with Finn Atle Haldorsen and yours truly in the main seat.

It all started when my wife, Mette Zurhaar, inherited a couple of properties in the centre of Nesttun from her parents in the early '90s. Finn Haldorsen, who owned and had developed the Rubb concept, contacted me in 1993 wanting to collaborate. Together we started the company Zurhaar & Rubb AS in 1993, which today is called Zurhaar AS.

It became the start of a 30-year long and wonderful collaboration, which today is a group with 430 employees in six countries, a free equity of approximately NOK 440 million, and a turnover of approximately NOK 1.79 billion.

In all these years, we have focused on conservative financing with a large degree of fixed interest, which has given us financial security and predictability.

We have built shopping centres, cultural centres, offices, and industrial buildings to the delight of the countless tenants and visitors who do their daily work in our properties.

Our most prestigious building—the Telenor building in Bergen—was bought in December 2020. The building was voted the world's best office building in 2003 (Prix de Excellence, France) with strong competition from over 100 beautiful buildings worldwide. Needless to say, we are proud to be the owners of this building.

Our properties today count around 170,000 m² of floor space, which is distributed over the Norway's Bergen and Oslo areas, Sweden, England, Poland, and the USA.

At Nesttun, we have developed and acquired all the properties in Østre Nesttunvei between the two light rail stops we have here.

Furthermore, we have signed a long lease with Sparebank 1 SR-Bank for the construction of a new building in the centre of Nesttun with completion set for summer 2025. This will be a financial centre in Bergen South. The building and adjacent properties will receive an upgrade with a high classification within BREEAM. The project's budget is NOK 140 million.

Zurhaar
CEO
Rune
Birkeland





excellence in engineering