

STEEL STORIES

Amazing Coated Steel by BlueScope

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Strong bonds can overcome anything.

STEEL STORIES Feature

KYB-UMW MALAYSIA PLANT: LIVING PROOF OF COLORBOND® DURABILITY

By now, you may already know that COLORBOND® steel stands for strength, beauty and durability. Its beautiful colours, architectural versatility and design possibilities have been demonstrated in many past issues of Steel Stories.

Recently, the NS BlueScope team paid a visit to renowned automotive component manufacturer, KYB-UMW Malaysia. Its manufacturing plant has been built with COLORBOND® steel since 1997.

In this exclusive feature, we show you the team's authentic documentation of COLORBOND® steel's performance against time, humid weather and punishing conditions. This is a real case study that not only shows COLORBOND® steel's genuine durability but proves that it is the better steel to build with even in terms of long-term cost-efficiency.



STANDING TOUGH AMIDST HARSH CONDITIONS



Along the dusty roads of Kawasan Perindustrian Telok Panglima Garang, a huge container truck rolls by. It drives onward without hesitation, passing by other trucks commuting up and down the same stretch – each on a schedule to the many factories and industrial plants located here.

A palm oil plantation lies on the other side of the road. It is a sea of green but does little to cool down the scorching heat and intense humidity here. An atmosphere likely intensified by fumes and smoke emitted from regular factory operations over the years.

At the edge of this daily bustle, lies the manufacturing plant of KYB-UMW Malaysia. A name known in the Malaysian and international automotive landscape as a provider of reliable shock absorbers, motorcycle suspension units and power steering pumps.

KYB-UMW Malaysia has been a part of the industrial community in Telok Panglima Garang since 1997. In line with the company's long-term expansion plan, it took four construction phases for the plant to be expanded to its optimal capacity – with the last phase having completed only recently in 2019.

While each phase has been built with COLORBOND® steel, the NS BlueScope team zooms in on two different phases for the purpose of this case study: Phase 1 and Phase 3.



- Phase 1** Completed in November 1997 (*the first and oldest building of KYB-UMW Malaysia's plant*); built with COLORBOND® steel Almond Beige colour with roof profile of KAWA R600.
- Phase 2** Completed in August 2003
- Phase 3** Completed in March 2014; built with COLORBOND® steel Almond Beige colour with roof profile of KAWA R760.
- Phase 4** Completed in October 2019

★ Indicates the phases of focus for this case study.

CORROSION-FREE, 22 YEARS ON



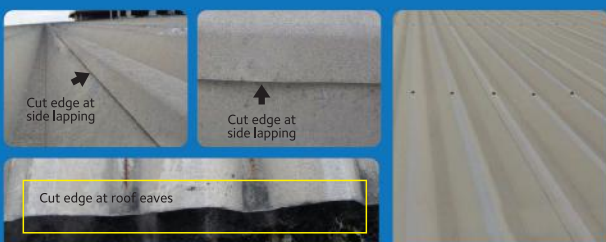
There's no denying that corrosion is an unwelcomed imperfection on any steel-clad building. It leads to the eventual deterioration of structural integrity, it compromises safety and it defaces a building's original beauty.

Given the harsh conditions that KYB-UMW Malaysia's steel-clad plant is exposed to daily over the years, one would expect corrosion to be an unavoidable outcome.

When the NS BlueScope team visited Phase 1 (built 22 years ago), dark stains were spotted on certain areas of the roof. However, this was far from being a sign of corrosion. Like many other factories, smoke is an inevitable by-product of the manufacturing process. The dark stains spotted on the roof were actually caused by unavoidable dark powder deposition from the plant's chimneys – not from corrosion or any form of product defect.

Moreover, the black deposition did not affect the integrity of the roof. The only 'damage' done was a rather unsightly appearance. The most corrosion-prone areas such as the side lapping and roof eaves were spared from the consequences of the smoke.

Meanwhile for Phase 3 – which had been exposed to harsh industrial conditions for 5 years – no corrosive deformities or spots were observed at all. This validated NS BlueScope team's expectations of COLORBOND® steel's performance in being a material that solidly withstands punishing environments.



>22 Years Later – Phase 1:
No sign of corrosion at the cut edges are observed



>5 Years of Exposure – Phase 3:
No sign of corrosion is observed

EVIDENTLY BEAUTIFUL FOR LONGER



The next yardstick of COLORBOND® steel's performance is its ability to retain colour. As COLORBOND® is coated with BlueScope's proprietary Super Polyester Paint system, builders have always been able to enjoy a beautiful variety of colours.

Apart from that, the unique paint formulation (which contains superior pigments and resin) also provides an extra protection layer against corrosion. This further enhances COLORBOND® steel's resistance against corrosion, especially for buildings like KYB-UMW Malaysia.

When the NS BlueScope team studied COLORBOND® steel's colour retention on Phase 3 of the KYB-UMW Malaysia plant, its performance was just as expected: even after a 5-year exposure to harsh conditions, the roofs on Phase 3 showed only minor or negligible signs of colour fading.



Minor fading on roof flashing



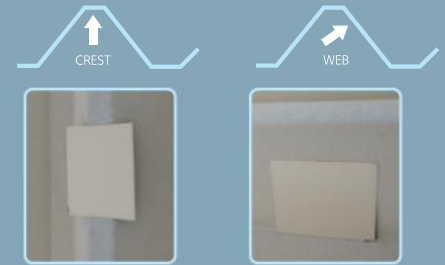
Negligible fading on wall cladding

PHASE 3:

On the other hand, Phase 1 did exhibit signs of colour fading. This is understandable of course, as Phase 1's exposure period lasted over 22 years. The fading was more evident on its elevated profile (the crest area) where it was more

exposed directly to the sun. Nevertheless, the rate of Phase 1's colour fading was acceptable and still within the team's expected performance* of COLORBOND®.

More importantly, the colour fading did not severely affect the appearance of KYB-UMW Malaysia. It was only apparent when the team studied the roof profiles up close.



PHASE 1:

The crest area observed more colour-fading due to direct exposure to the sun compared to the web area of the same roof

*COLORBOND® steel produced in year 2015 and below is coated with previous paint technology. Its expected performance varies from COLORBOND® steel produced in 2016 onwards, of which is coated with next generation paint technology.

OPTIMUM PERFORMANCE THROUGH BEST INSTALLATION PRACTICES



While COLORBOND® steel excels in strength and durability by design, its endurance can go even further with a little effort from its end users.

Builders can optimise COLORBOND® steel's performance and extend its life span – by simply keeping in mind the best building practices. Besides that, knowing what building materials best complement COLORBOND® steel can also make a difference in the long run.

Some of the best practices employed by the KYB-UMW Malaysia building are as shown:

Best Practices



1. Highlight CAUTION AREA such as the locations of fragile fibre reinforced plastic (FRP) on the roof for worker's safety.



Caution area on the roof of KYB-UMW Malaysia was highlighted with red lines

2. 'Turn-up' Method

The valleys of the roof edges were 'turned-up'. This created a stop-ending which prevented water from entering in between the steel sheets / water leakages. This also helped to prevent darkening on its cut edges.

Tips for Turn-Up Method:

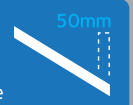
All roofing on slopes with less than 25° should be turned-up



Steel sheets can be turned-up before or after installation on the roof



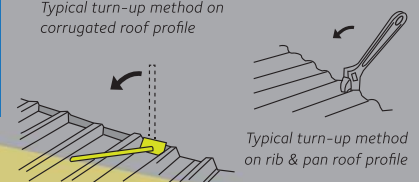
For after installation, clearance space of about 50mm should be made available to accommodate the tool for turn-up



Different types of roofing profile requires different tools for turn-up



Typical turn-up method on corrugated roof profile



Typical turn-up method on rib & pan roof profile



PROVEN DURABILITY, WORTH EVERY PENNY

The KYB-UMW Malaysia case study has no doubt presented us with stronger affirmation of COLORBOND® steel's strength and durability. Apart from that, it is also interesting to see how COLORBOND® steel installed at two different times fared after years of exposure to harsh industrial environments with barely any major deformation.

Like unearthing a time capsule, of 22 years and 5 years, COLORBOND® steel has demonstrated how it withstands the effects of time, while maintaining form and high colour retention at the same time.

Safe to say, COLORBOND® steel offers PROVEN durability. Because of that, it is a material that is

cost-efficient to build with in the long run and worth every single cent paid. COLORBOND® steel is also backed by 25-year warranty# against perforation by corrosion, 15-year warranty# against peeling and 12-year warranty# against excessive colour fading.

For more info about COLORBOND® steel, visit bluescope.com.my!

Behind every building, there is a story waiting to be told. Be it of its reason for existence, the journey of its creation, how it looks or even its physical size – ask its architect and you will surely be entertained with plenty of tales.

In this edition of Beauties with Purpose, we uncover the 'stories' behind some of Malaysia's large architectures. Raised to be an icon, a symbol of advancement and a representation of business success – the three featured architectures are not just big in size, but built to realise visions larger than life.

Beauties with Purpose: Buildings with A Huge Presence

Central i-City, Shah Alam

A Progressive City's Centre of Life

Officially opened in early 2019, Central i-City is Shah Alam's LARGEST shopping mall. It spans across 940,000 sq. ft. and houses 350 retail shops. Designed to serve more than 1.6 mil residents in its surrounding area, Central i-City is truly Shah Alam's centre of life.

As a part of Shah Alam's progressive vision, Central i-City is built to provide mall patrons with a comfortable shopping experience. Its futuristic-like architectural concept integrates a synergised design with natural light. COLORBOND® steel complements this concept with its clean, sophisticated profile that further amplifies its futuristic image.



SkyArena Sports Complex, Kuala Lumpur

KL's Largest Multi-Sports Complex

With a variety of facilities available, SkyArena Sports Complex is poised to be the LARGEST multi-level, multi-function sports complex in Kuala Lumpur. Being built on 3.8ha of land, it is easy to see why SkyArena will hold such a title. It houses an indoor rock-climbing gym, an Olympic-sized swimming pool, a diving pool, a football field with a running track around it and a hostel.

Besides serving as a hub for sports, SkyArena envisions to be a place for people from all walks of life to unite over a shared passion. This vision is conceptually transferred to the architecture via its large prismatic COLORBOND® steel roof. With COLORBOND® steel's flexibility, the roof wraps around the complex as if it were a singular piece, sculpted and carved at different bends. Coupled with its massive size, SkyArena definitely exudes a vibe that all can gather and unite – literally under one roof.



Federal Oats Mill Factory, Penang

An Expansion of Growth

Nestled in Mak Mandin Industrial Park, the Federal Oats Mill (FOM) factory stands out among others within the vicinity – not just for its sheer size but also because of what it stands for. Home to Captain Oats oatmeal products; FOM is also Southeast Asia's only production and distribution facility for the brand. Hence, you can see why its large sprawling size is practically mandatory.

Operating since 1965, the massive factory was built with COLORBOND® steel which has ensured durability throughout the years of heavy industrial operation. Considering the harsh environment that the factory has also been exposed to, signs of wear on its façade are really minimal. Today, as FOM's business continues to grow, they celebrate a new expansion with a 2.71ha facility at the Halal Food Zone, Penang Science Park.