

# CW

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Architect BV Doshi

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## COVER STORY GREEN LIGHT!

What makes a building green? **CW** explores trends in building blocks, glazing, insulation, HVAC, elevators, lighting, and building management systems.

Cover Photo Courtesy: Embassy  
Cover Photo: Embassy Manyata Business Park, Bengaluru  
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Photo Courtesy: Mahindra Lifespace Developers

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"Solutions for roofing, façades and cladding is continuing to evolve with new-age materials."

- Vinay Kumar, Managing Director,  
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Photo courtesy: Sujmura Roofing India

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- ₹20 billion eco-tourism circuit to come up in Uttarakhand.
- GVK appoints Zaha Hadid Architects to design Navi Mumbai International Airport.
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## EDITOR'S NOTE

### THE SUSTAINABILITY CHALLENGE

Indian architecture has been decorated with its crown jewel BV Doshi being honoured with the Pritzker Prize, making him the first Indian ever to have received this honour.



**Architect Balkrishna V Doshi**

Charles-Édouard Jeanneret, known as Le Corbusier, was a Swiss-French architect, designer, painter, urban planner and writer, and a pioneer of what is now called modern architecture. In 1950, Le Corbusier laid the master plan for Chandigarh. Balkrishna Doshi (BV Doshi), born in Pune on 26 August 1927, is one of the last living architects to have apprenticed with Le Corbusier, and has built low-cost housing and public institutions, such as the Centre for Environmental Planning and Technology (CEPT), IIM-Bangalore, the Aranya Low-Cost Housing, and Tagore Memorial Hall. In fact, the Aranya Low-Cost Housing project, located 6 km from Indore, was built at Rs 100 million way back in 1989, which also won Doshi the Aga Khan Award for Architecture in 1996. The master plan for this had taken several aspects of sustainable living into consideration in a balanced manner; several considerations taken into account are extremely unique to the design and relevant to the concerned income group.

For instance, the building's height-to-street width ratio ensures shade to streets at all times except when the sun is overhead. Concepts like these remain alien to several planners even today. Further, Doshi was significantly involved in the design and planning of the city of Chandigarh.

For his part, Doshi has said he owed the prestigious prize to his guru, Le Corbusier. "My works are an extension of my life, philosophy and dreams trying to create a treasury of architectural spirit. I owe this prestigious prize to my guru, Le Corbusier," he said in a statement thanking the Pritzker jury.

Indeed, planning a sustainable habitat is the challenge urban local bodies face as they grapple with developing smart cities. While the progress on projects may be slow, the brilliance of some of the torchbearers of this mission is sure to inspire and revive this profession. Despite our rich heritage and knowledge, why has India remained poor in offering the best to architecture in the context of modern urbanism? Why are we not learning from the examples of our own past? Nearly a hundred years ago, Jamshedpur was created as India's first planned smart industrial city; recently, at a function, Tata Group Chairman N Chandrasekaran promised to turn the city smarter.

All considered, as our nation builds, the construction community must tread carefully. While we provide livelihood, we must train, administer and manage efficiently. Project management, skill training and use of technology are truly the guiding principles today. Cheers to tomorrow!

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# Popular Sheathes

**CW** explores what's hot in roofing, façades and cladding: Metallic or non-metallic, sheet or tile, with or without underlay, straight or curved, small or large, with or without solar panels, and more.

Galvanised roofing sheets took over from asbestos for offering better resistance against corrosion, galvalume took over galvanised sheets for the same reason and, today, aluminium sheets have become more popular than galvalume, according to **Vikram Sharma, Deputy General Manager-Marketing, Jindal Aluminium.**

Galvalume is the preferred (roofing) metal nowadays for being structurally light and cost-effective, according to **Dinesh Nataraj, Director and Head, Sales & Marketing, Pionnier Roofing Group.**

"But aluminium sheets last a minimum of 25-30 years against the eight to ten-year life of galvalume, besides being lightweight and available in a variety of colours," opines Sharma. He says that industrial roofing applications tend to make use of thicker aluminium corrugated sheets (0.71 mm to 1.2 mm) than residential users (0.40 mm to 0.56 mm); the corrugation design can be trapezoidal, circular or tile.

For inland construction, **Jawahar Lal Das, COO, Safintra Roofing India,** recommends 150 gm per sq m

(AZ 150) aluminium and zinc coating for a durable service life of 10-15 years. In extremely corrosive environments, and within 1-2 km of the coast or similar humid conditions, he recommends steel with a minimum 200 gm per sq m (AZ 200) coating to endure the harsh environment.

Alternatively, aluminium is a good substitute to AZ 200 coated steel, says Das. However, as aluminium is both lighter and softer than mild-coated steel, it is generally used in thicker gauges



Photo courtesy: Pionnier Roofing Group

than steel for optimum results. These metal coils are coated with various paint options like regular-modified polyester (RMP), silicon-modified polyester (SMP), poly vinyl di fluoride (PVDF), and super-durable polyester (SDP) to enhance the life of the material and protect against corrosion.

Tata Bluescope Steel's Lysaght's Trimdek 1015 offers superior performance in corrosive and marine environments owing to its specialised paint system and increased coating thickness.

### Tiles and tile lookalikes

Of the two primary roofing options – tiles and sheets – tiles are more aesthetically appealing than roofing sheets and, hence, used more often in residential projects, observes **Sameer Deshpande, Country Head & Business Development Manager, India, Malaysia, Thailand, South Asia, Onduline India.**

## QUICK BYTES

- Aluminium sheets have become more popular than galvalume.
- Toughened glass, stone, ACP from international players are top cladding options.
- Coloured metal sheet roofing and concrete roof tiles are widely preferred coloured roofing options.



Photo courtesy: Safintra Roofing India

Cladding systems made of metal can be easily combined with thermal insulation and acoustic boards for better thermal control and sound proofing.

"While roof tiles are used only for pitched roofs where the minimum pitch required is 20-22° and are best suited to coastal regions or hill stations where the monsoon is aggressive, nowadays, tiles are widely used in other zones as well for their aesthetic appeal, strength and low water permeability (vis-à-vis clay tiles)," notes Nataraj.

Deshpande cites concrete tiles and imported products like Onduline, shingles and ceramic tiles as the newer entrants in the roofing market.

"Onduline is a lightweight roofing system comprising a layer of bitumen reinforced with cellulosic fibres and thermosetting resin," he explains. "Monolayer technology guards against de-lamination over time."

There are real tiles and then there are lookalikes.

Today, metal sheets come in different colours and textures to mimic the tiled look, says Das. These sheets are obviously easier and faster to install, safer and roughly 20 per cent cheaper than conventional non-metal roofs.



**"Metal cladding systems are about 20 per cent less expensive than conventional non-metal solutions."**

**- Jawahar Lal Das, COO, Safintra Roofing India**

Over time, metal roofs perform better and last longer.

### Tile underlay: Option or compulsion?

The jury is still out on whether tiles should be used with an underlay.

Traditionally, people used roof tiles effectively without an underlay, notes Nataraj. Nowadays, however, underlays made of a kind of aluminium foil added to a secondary layer are finding use owing to climatic change to improve thermal comfort and protect the roof from leakages.

"We recommend using tiles with an underlay because it ensures

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protection from water leakage and improves thermal comfort," says Deshpande. That said, some new products like Onduline sheets and tiles are waterproof and do not require any underlay.

Our verdict: An underlay is optional.

### Coloured tops

Coloured metal sheet roofing and coloured concrete roof tiles are the widely preferred coloured roofing options in India today, especially for places facing aggressive weather conditions, according to Nataraj. "Less effective options are painted clay roof tiles, asphalt roofing shingles and slates. Glazed clay roof tiles are imported, hence a secondary option."

Unlike concrete tiles that are coloured during the manufacturing process with a single or dual tone, clay roof tiles need to be painted externally, which is a time-consuming process, he explains. Besides, the colour lasts only about three to four years

as against 20+ years for concrete tiles. Asphalt shingles are prone to curling and blackening, a weather effect that starts happening in a few years.

Lysaght from Tata BlueScope Steel offers roof and wall profiles roll-formed from colorbond steel and zincalume steel in a range of aesthetically appealing colours with high solar reflectance index values, says **Ajay Rattan, General Manager, Sales, Construction & Engineering (Lysaght Business), Tata Bluescope Steel**. Additionally, these are durable and offer design flexibility and thermal comfort.

### Large-sized roofs

To cater to large roofs, Lysaght offers the Varydek profile available in multiple widths and offering superior load resistance. "Also, profiles can be roll-formed on site to achieve extreme long lengths to suit project requirements," says Rattan. In Kolkata, Tata Bluescope supplied 24,000 sq m



**"Aluminium roofing sheets work best for fixing solar panels as they have a long life-cycle and high resale value."**

- **Vikram Sharma**, Dy General Manager, Marketing, Jindal Aluminium



**"It is pertinent to deploy roofing that comes with solar panel compatibility."**

- **Ajay Rattan**, General Manager, Sales, Construction & Engineering (Lysaght Business), Tata Bluescope Steel

### Ideal Cladding

Toughened glass, stone, aluminium composite panels (ACP) and new products from international players are top cladding options, according to **Sameer Deshpande, Country Head & Business Development Manager, India, Malaysia, Thailand, South Asia, Onduline India**.

The ideal cladding material has a judicious mix of decorative and structural stability or protective properties, says **Anuj Sangal, Country Head, Laminates and Allied Verticals, Greenlam Industries**. For instance, Greenlam Clads is versatile enough to be used for brownfield and greenfield façade installations, to enhance the look as well as protect the structure from direct sun, rain and other weather exposure.

"Cladding systems made of metal can be easily combined with thermal insulation and acoustic boards for better thermal control and sound proofing," notes **Jawahar Lal Das, COO, Safintra Roofing India**. "These are about 20 per cent less expensive than conventional non-metal solutions (stone and ACP) and come in a wider range of shapes, sizes and colours."

of KLIPOK 700 roofing profiles for the Kolkata Metro, and offered onsite crimping to ensure immediate installation, protect the profiles from damage or stress cracks, and to ensure faster project completion.

Safintra's Safzip profile coils can also be roll-formed for roofs or walls onsite, more or less eliminating any limitation of size imposed by transport restrictions.

### Add a curve

Some roofing and wall systems are conducive to creating interesting designs, including curves.

Curved roofs are aesthetically pleasing and can create subtle shapes inside the building, observes Deshpande. "The curve also provides a practical solution to the problem of wasted or 'dead' space within a building."

Roofing materials like metal sheets, Onduline sheets and polycarbonate are flexible and

## FEATURE-ROOFING, CLADDING & FAÇADES



**"The (roof) curve provides a practical solution to the problem of wasted or 'dead' space within a building."**

**- Sameer Deshpande, Country Head & Business Development Manager, India, Malaysia, Thailand, South Asia, Onduline India**

can be used easily for curved roofs with no substantial increase in the price, he adds.

According to Das, "Safintra's Safzip profile is a concealed halter-fix, zipping standing-seam system, which can be smooth, crimped, concave, convex, tapered and wave-formed."

Lysaght offers the Flex-Lok 400 roofing profile to cater to challenging designs involving different geometrical shapes and concave and convex curves, says Rattan.



### Façades: What's In?

"Ventilated façades are in vogue nowadays," says Anuj Sangal, Country Head, Laminates and Allied Verticals, Greenlam Industries.

Stone, tile, artificial marble, composite marble, high-pressure compact laminate, and metals like copper are options in ventilated façades. Of all these, Sangal says, high-pressure compact laminate has become popular, as have CNC cut designs on the base material for creating bright, decorative façades. As an example, CNC cut designs on red Greenlam Clads adorn metro stations of the Lucknow Metro.

Non-ventilated façades like texture-painted façades or aluminium composite panel (ACP) clad façades are not on the priority list of architects and designers nowadays, in Sangal's view.

### Best bases for solar

With an ever increasing focus on renewable energy, it is pertinent to deploy roofing that comes with solar panel compatibility, suggests Rattan.

Essentially, solar panels need a sturdy, un-shaded base facing the sun, observes Deshpande. "While solar panels are designed

to be easily and durably mounted to different kinds of roofs, installation practices vary by roof material and roof pitch," he explains. "The ideal angle for a solar installation is between 10° and 20°. On a flat roof, panels can be mounted on a special frame, which can be tilted to the right angle to maximise their efficiency."



Aluminium sheets last a minimum of 25-30 years against the eight to ten-year life of galvalume, besides being lightweight and available in a variety of colours.



For large roofs, profiles can be roll-formed on site to achieve extreme long lengths to suit project requirements.



**"Tile underlays are finding use due to climatic change to improve thermal comfort**

**and protect the roof from leakages."**

**- Dinesh Nataraj, Director and Head, Sales & Marketing, Pionnier Roofing Group**

## Transparent Profiles

Transparent sheets come in FRP (fibreglass), which are primarily used in industrial sheds to allow natural light to permeate during daytime, says **Vikram Sharma, Deputy General Manager-Marketing, Jindal Aluminium.** "However, the custom is to mix fibreglass with some other roofing material, not to use it alone."

Safintra can provide a variety of transparent lightweight roof sheets and wall sheets made of polycarbonate, with or without matching polycarbonate louvers to serve ventilation and light requirement, says **Jawahar Lal Das, COO, Safintra Roofing India.**

Most Lysaght profiles are capable of fitting solar panels using specially designed clamps, says Rattan. "However, the Lysaght KLIP-LOK 700 is one of the most preferred profiles for the installation of PV panels on rooftops."

After successfully installing Lysaght profiles and PV panels at its Andheri WEH metro station, Mumbai Metro has recently announced the installation of solar panels on the Versova-Andheri-Ghatkopar metro corridor.

Aluminium roofing sheets work best for fixing solar panels as they both have a similar long (25-30 year) life-cycle, and high resale value, opines Sharma.

Generally, solar panels cannot be fixed over the roof tiles; a gap is left on specified areas of the roof to fix the pipes or poles of the solar panels, says Nataraj. "Alternatively, solar-panelled roof tiles are an option but these are not manufactured in India."

Besides solar panels, rooftop applications extend to walkways, piperack or cable trays, HVAC panels, hoardings and a lightning arrestor, observes Das. To accommodate these, Safintra offers non-pierce fix aluminium clamps with accessories for its Safzip and Saflok profiles, and pierce fix universal aluminium clamps with accessories for its Comax, Trimflute and Versatile profiles.

**- CHARU BAHRI | CW |**

To share your views, on the market for Roofing, Cladding and Façades in India, write in at [feedback@ConstructionWorld.in](mailto:feedback@ConstructionWorld.in)