METCON STEEL update
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TMT steel anchors in Kerala market

Customers receive better quality product with open arms

The good news is this: steel consumers in Kerala are increasingly becoming quality conscious. More people are willing to pay the extra buck for the best available product, when it comes to buying construction material, especially steel. The sales graph of thermo-mechanically treated (TMT) steel bars has been on an upward journey in recent times. This is a turnaround of sorts when compared with the cold reception awaited it when TMT steel was introduced in the state about 12 years back. The climate has slowly changed, and it has now become the choice of the discerning customer.

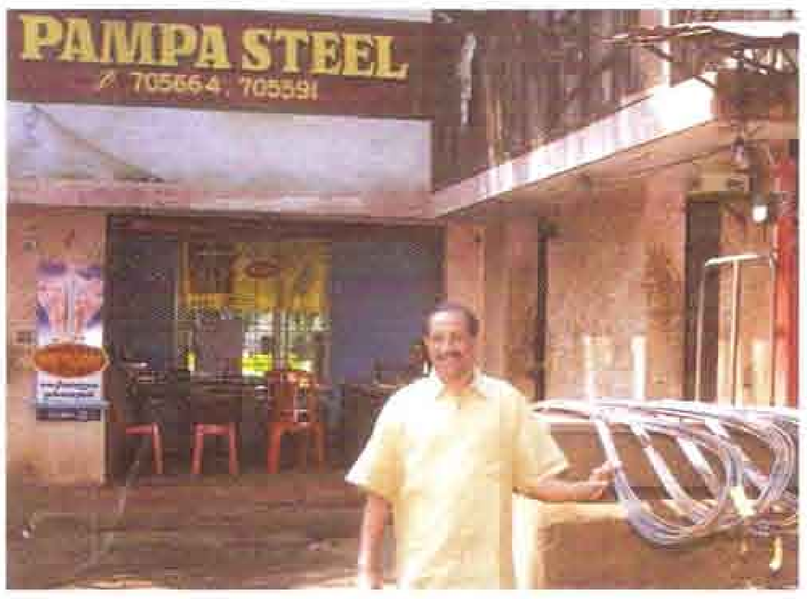
"I had to sell them in one or two pieces," said K.P. Joy of Pampa Steel at Kundanoor, Kochi, about the first load of TMT steel, "because people refuse to pay more for steel which anyway has been being used for decades." That was in the early nineties. "Now as much as 30-35 per cent of my total sale is TMT bars."

Syed Masood, president of the Kerala Steel Traders Associa tion says educated customers recog nise the need for quality steel, and are cho ing TMT steel. "I recommend TMT steel to my customer, who trust me."

Massod, however, cautions people on the otherside of the bar. "Spurious TMT bars are flooding the market," he says. "One has to ensure that one gets the right material.It would be wiser to use ordinary steel than going in for fake TMT material."

Joy says customers now do not mind spending a little more for better quality steel. A mason whoworked at place would suggest the same steel for the next work. "People also want to ensure that they use the best of material available for their homes."

More architects and engineers now prefer TMT steel. Mathew John of Techno Constructions in Cherthala uses and recom mends only TMT bars.



There were no takers for TMT bars when K P Joy of Pampa Steels at Kundanoor in Ernakulam first introduced it 10 years back. 'Now 35per cent of my total sales is TMT bars', he says.

"I have stopped using other varieties as TMT is the best available option today. It is perhaps a little costly, but is worth the money."More architects and engineers now prefer TMT steel. Mathew John of Techno Constructions in Cherthala uses and recommends only

Joy agrees that the TMT market has not grown the way it should have. "I have seen people trying to economise on steel. They might be spending Rs 30-40 lakh on a house but try to cut costs on steel, which is actually the backbone of the structure." Joy says it could perhaps be because of lack of roper planning. "Till the first phase of the construction, where the first phase of concreting, is over, people are apprehensive of cost overruns. So they try to cut costs. Once this phase is complete, they become spendthrifts, and compensate for their miserliness. They don't mind spending huge sums on ornamental stuff such as marble or granite. But the damage would have already been done." It will be a slow process for people to move to a new costly product, with better quality, though. "In another five to six years, there will be only TMT; people will settle for nothing less," predicts Joy.

In fact, steel's share comes to less than 10 per cent of total cost of residential constructions, according to builders. "The ratio is in the region of 2 kg per square ft, giving space for minor change as per the nature of the land. Or of a metre-cube of material, about 80 kg will be steel. Mathew says his customers do not cringe about the cost of steel. "Good customers do not want to compromise on the quality of steel."

Good times ahead for quality-conscious customers. And quality steel.

"Good customers do not want to compromise on the quality of steel," says Mathew John of Techno Constructions, Cherthala. "They do not cringe about the cost."

Towards quality consciousness

Metrolla Steels Ltd is committed to making the best steel available to the construction industry by introducing state-of-the-art technology and by sticking to its uncompromising quality standards.

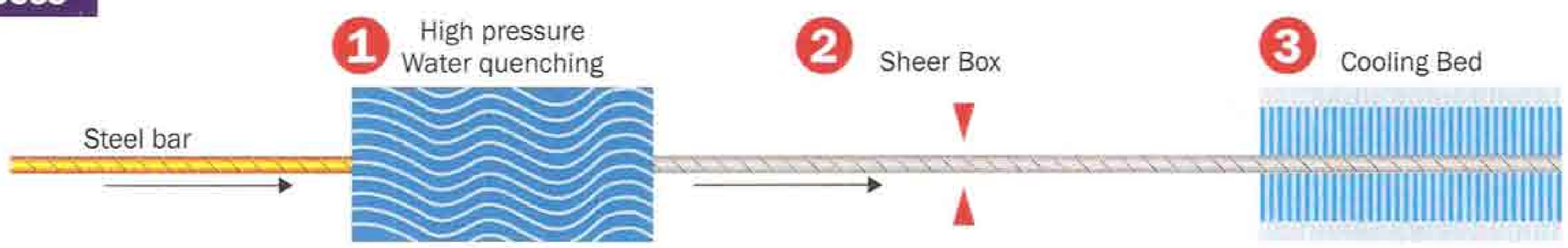
Metrolla Steels is looking forward to the expansion of the thermo-mechanically treated (TMT) steel market. Apart from our own growth aspirations, what prompts us to take this position is our belief that the fruits of technology should reach even the last customer. We would like to have more customers know about TMT steel. We, as the pioneers in TMT steel production in Kerala, have a numero uno position and Metcon, our product, is the best available brand in its category. We believe that when more customers graduate to TMTsteel from ordinary products, we will get our fare share.

Steel Update is part of our efforts to communicate with the community of architects, builders, engineers, academics, officials and communicators. SU will try and update you at regular intervals with relevant and contemporary information on the developments in the world of steel.

Birth of a bar

Production of TMT steel bar is a process where the ribbed bar is heat-treated in three stages.

The Process



Stage I: Water quenching

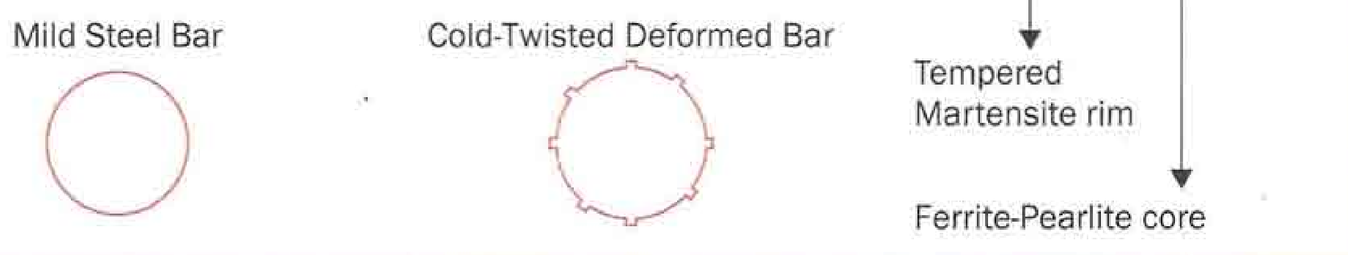
Process: The steel bar that comes out of the hot rolling process is rapidly cooled or quenched in a high pressure jacket/spray system. In this controlled quenching, the rebars that were heated up to 900 °C are passed through quenching tubes where the volume and temperature of the cooling water is controlled get quenched to 450 °C in a few seconds.

Effect: *The surface layer of the bar gets converted in to a hardened structure called martensite while the core remains austenite, which is stable at high temperature. This enhances the strength of level of the rebars subject to precise control of all parameters.*

Stage II: Tempering

Process: Tempering begins as the bar leaves the water cooling station. In this stage, the heat flows from the core to the surface layer.

Effect: *Tempering transforms the outer layer of the bar into a structure called tempered martensite while the core continues to be austenite.*



Stage III: Slow cooling

Process: This happens on the cooling bed, which is kept at atmospheric temperature. During the course of the slow cooling the heat released from the core tempers the hardened surface while the core is turned into ferrite-pearlite aggregate composition.

Effect: *During the process, the structure of the material is changed to a composite structure of ductile ferrite-peralite composition with tough surface rim of tempered martensite.*

A combination of these microstructural features in the cross-section of the bar gives it excellent yield strength. Since this is achieved by heat treatment and not by increasing carbon content, it offers excellent weldability, ductility and earthquake resistance. Due to the stability of the microstructure at high temperature they exhibit good fire resistance too.

Why TMT steel quake-resistant?

It's ductility, stupid

The need for using quality steel for building residential structures struck many immediately after the Gujarat quake of 2001 in which thousands perished under their collapsing roofs. Reports suggested that the ill-fated buildings had substandard steel bars for their backbone.

The Gujarat Institute of Civil Engineers & Architects said the effect of devastation would not have been as bad had better quality steel been used in construction. Engineers and architects suggested that TMT steel alone be used for recons- truction of the structures. Many top brand steel producers such as Steel Authority of India Limited came forward, promising to make available the necessary quantity of TMT bars.

The rush for TMT bars is because it is more ductile than the ordinary Tor steel. Ductility, in simpler terms, is the ability to be stretched. For the initiated, it refers to the ability of dissipating energy and large deformation. The physical property of a rebar, which is responsible for ductility, is elongation. Some materials such as steel, wood and wrought iron are ductile while some others such as concrete, masonry and cast iron are brittle. Buildings made with brittle material like concrete, which has remarkable load-bearing capacity, lack ductility making it vulnerable to quakes. Such structures can be strengthened by the addition of small amounts of ductile materials. When these ductile materials are placed at points of tensile stresses, they bear the tension, stretch themselves and save the structure in the wake of a quake. Thus ductility becomes the most essential quality if a building has to survive an earthquake.

The Institute for Steel Development and Growth says steel is the safest and most effective alternative for building earthquake-resistant houses.

The TMT score card

- *Better ductility and weldability due to the low carbon content. They can be lap-welded or butt-welded. Weldability is important, because sometimes engineers suggest welding of high diameter rebars to reduce congestion. It is also essential for fixing embedded parts in the concrete before pouring.*
- *Better yield strength, tensile strength and percentage elongation when compared to CTD bars*
- *Easy bendability and superior reverse bending properties. Bendability is important in that it gives the requisite shape to the rebar to suit the demand of the structure.*
- *In built-ability to resist loss of strength at higher temperatures*
- *Better corrosion resistance due to absence of cold-twisting stresses of CTD bars.*
- *Yield strength, Tensile strength, Ductility , Weldability, Bendability, Earthquake resistance, Fire resistance Fatigue resistance and more bonding with concrete.*

For those intelligent customers

It costs more. But less !

It may be a paradox but is also the beauty of technology and precision engineering.

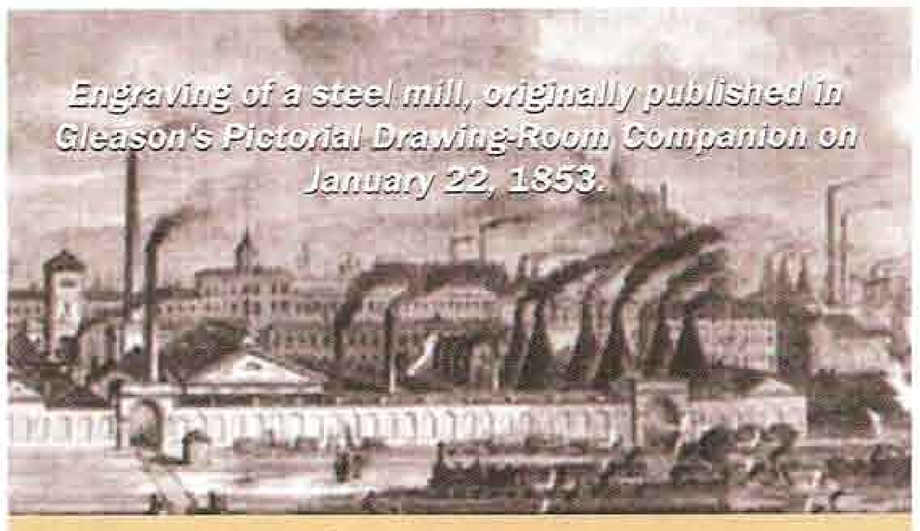
TMT steel bars come with superior engineering qualities. But its price is always higher than that of the ordinary steels bars. How can one forego the higher cost incurred by a price-conscious builder or a house-owner?

One doesn't have to forego the cost implication. Rather, one should actually concerned with it after checking the facts.

In fact, TMT, which is priced higher than ordinary steel, comes cheap when one does the total sums. This is because of a simple quality: TMT steel comes in uniform weight all along while the others do not.

Says Mathew John of Techno Constructions: "We calculate the amount of steel required based on the length, but the customer buys it not measuring the length but weight. Herein lies the crux: ordinary steel with its non-uniform thickness would weigh more for the same length than TMT bars which come in uniform size. In fact, we have to buy 110 kg of ordinary steel for a work which can be done with 100 kg of TMT steel. This weight difference will more than make up for the price difference." Some architects says the savings is about 15 per cent.

Wastage will also be less for the TMT steel. "TMT bars come in regular size, so we use them precisely. Ordinary bars come with varying lengths, and naturally, there will be more wastage." says John



Engraving of a steel mill, originally published in Gleason's Pictorial Drawing-Room Companion on January 22, 1853.

THE STEEL PATH

1850

Jean Louis Lambot initiates the concept of reinforced concrete

1853

The first RC roof, built by Francois Coignet

1854

William B. Wilkinson, a plasterer, patents reinforcement of concrete with iron bars and wire rope. He is credited with constructing the first reinforced concrete building.

1867

Joseph Monier, a French gardener, takes a patent on reinforced garden tubs and reinforced beams and posts used for guardrails for roads and railways.

1875

Hyatt suggests deformations on rebars through identations or projections

1884

Ernest L. Ransome patents a system using twisted square rods to help the development of bond between the concrete and reinforcing.

1884

Francis Hennebique moots the concept of stirrups

1945

Deformed high strength rebars come into use. Cold twisted and hot rolled deformed bars gain currency.

1955

Tor Isteg Stel Corporation of Luxemburg introduces cold twisted deformed circular bars. They were later known as Tor 40 bars

1980

TMT bars with better qualities make their presence.

Architectural Excellence

Malayali architect B.S. Bhooshan bags national award for residential architecture

Let's go inside this house. And see what is so magnificent about it to fetch the Indian Institute of Architects' national award for residential architecture to Karnataka-based Malayali architect Dr B Shashi Bhooshan this year.

Dr Bhooshan created this stunningly beautiful residential excellence at Indiranagar in Bangalore mainly of hollow blocks; he used precast steel channels as a skeleton and plastered it, giving an arched look in the vaulted roof for certain parts of the ceiling.

The windows are huge allowing a lot of natural light and air. A den at the basement has French windows which open out to a small sit-out.

The trendy open kitchen with an informal dining in white and yellow is simple and elegant. Next to it is a laundry room which opens out into a small backyard. The main formal dining area over looks this backyard which has a well manicured lawn and a small tree.

The drawing room has huge windows overlooking the road and a patch of garden in the front. The staircase which leads to the upper floors divides the living and the dinning area. The railings are brightly coloured in red and black to break the monotony of the pastle shades used on the walls.

The main entrance faces the road. Along the stairs to the main door are bright[l]y coloured rails in navy blue for the wat[er] plants and the combination looks mind blowing. Next to it is a small sit-out facing the road.

Dr Bhooshan says low cost architecture is all about construction involving strategies intended at optimising resources, technologies, material utilisation and maximising the efficiency of the structure.

"The present day Kerala housing trend is slowly adapting to modern design and technology," says Dr Bhooshan.

Dr Bhooshan, a native of Thiruvananthapuram, did his B. Arch from Kerala University in 1968, Master of Town Planning from Madras University in 1973 and a Ph. D from Mysore University in 1989. He started his career with the School of Architecture a[nd] Planning, Chennai and later joined the Institute of Development Studies in the University of Mysore in 1974 where he carried out research and teaching. He was a consultant to UN at Nagoya and Nairobi. Since 1987, Dr. Bhooshan has been a practicing architecture in Mysore and Bangalore.

Yashoda Tandon