

Steelium VOICE

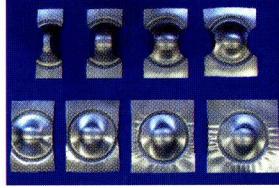
TATA STEEL

Quarterly Newsletter from TATA Steel (FP - Marketing & Sales) • Issue 1 • June 2004



Globalisation of the Steel Industry

The global economic scenario is influencing the Indian economy more than it ever has in the past
Page 2



From the PAG Desk

The new D-Grade from
TATA Steelium
Page 6

Message from the MD

Dear Customer,

Around a year ago, we launched the first branded CR product in India - 'TATA Steelium'. This name was co-created by many of you.

All brands need constant nurturing and inputs at different levels to increase its value and thereby a higher level of satisfaction amongst its patrons.

As part of our continuing efforts to connect with customers of 'TATA Steelium', I am very happy to present the first edition of 'Steelium Voice', a quarterly newsletter from Flat Products (Marketing & Sales) that will capture interesting stories, news, events and articles that will benefit you.

This technical newsletter has been designed to value add to your knowledge and create a forum where you can exchange ideas, share best practices and thereby raise the levels of performance both at your end and at ours.

We are hopeful that you will enjoy reading this newsletter and send us contributions that we can all learn from and make this partnership of ours more beneficial.

Do send your suggestions and comments to the editorial team, who will be happy to hear from you on this inaugural issue and subsequent ones as well.

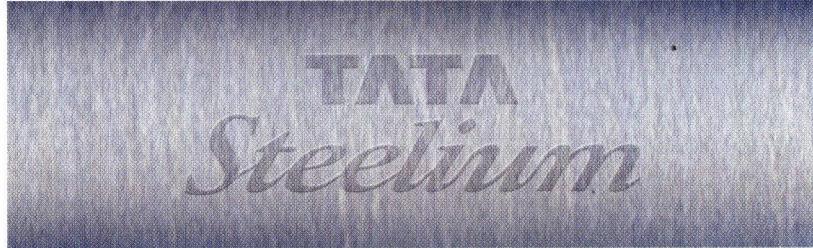
Let us together make 'Steelium Voice' a success.

Regards

B. Muthuraman
Managing Director
TATA Steel

THE BIRTH OF THE FIRST BRANDED CRCA

On the 27th of February 2003, history was created in the Indian steel industry. This was the day when TATA Steel launched India's first branded Cold Rolled Steel - TATA Steelium. But why was Cold Rolled Steel branded? What purpose does this serve? Who does this benefit? Read along for the answers.



TATA Steelium serves you – You are the real owners of this brand. You are the people who shape the TATA Steelium sheet into different products and reach it to the end consumers:

- We realised that while being spread throughout India each of you had specific tailor made needs.
- There was no reliable source for your raw materials and little support from your suppliers.
- You were not sure of the product that you were buying and there was always a nagging thought in your mind "Have I been cheated?"

As our customer, you are very important to us and that is the reason why we cater to you, to suit your needs.

We realised that branding of CRCA coupled with a capable and distinct distribution network to reach it to you will prove to be a unique tailor-made solution that will give you peace of mind and help you take clear purchasing decisions.

While the advantage stated earlier cannot be more emphasised, let's look at the situation that prevailed prior to the birth of TATA Steelium.

- You as a customer had no source authenticity and hence were not certain of the products you were buying
- There were variations in the raw materials, which affected the quality of your products and lowered your line efficiency
- It was difficult for you to command a premium over others for your products
- You had to shop around for various steels and were not sure what will suit your requirements
- You could not give feedback / suggestions to the company in case you had any
- There were a lot of middlemen and brokers who raised costs and created uncertainties

We knew the solution was to give you source authenticity and a mark, for you to relate to and be sure of your purchase. Now all you need to do to be sure that the material is the best, is to ensure that the TATA Steelium mark on the steel sheet that you buy the next time.

How will branding help TATA Steel and our Distributors serve you better?

We know that with your help it will:

- Widen product awareness and help in understanding your requirements better – This will help us in reaching you better with value added products and services.

- Forge relationships – This will help establish a long term winning relationship amongst TATA Steel, its authorised distributor and you.

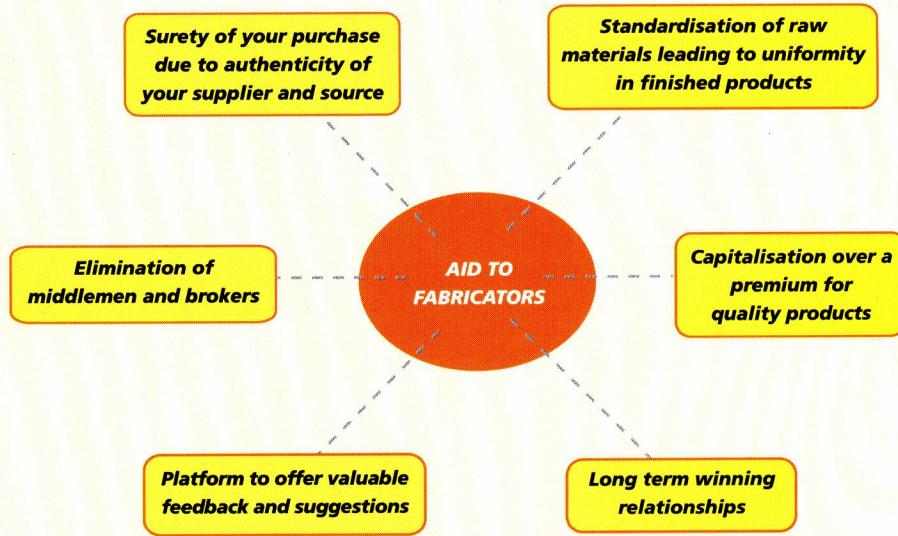
- Create Customer pull for the product – Create loyalty amongst users of Cold Rolled Steel, thereby increasing our sales and margins, which in turn can be channeled into better value added services aimed at you.

- Obtain a premium for quality products – Help you to correlate the benefits offered by TATA Steelium with the product and extract value for money from the steel supplies.

- We and our distributors would be able to plan stocks better and carry correct inventory to crash supply lead times

We are sure that having realised the benefits of TATA Steelium, as a team we will nurture this brand

and strive towards making TATA Steelium the brand of choice. We assure you that we will demonstrate the values that the brand stands for, viz. trust, value-based customised service and long term friendly partnership.



GLOBALISATION OF THE STEEL INDUSTRY

The global economic scenario is influencing the Indian economy more than it ever has in the past. Amongst the industries that are feeling the influence, the steel industry is at the forefront.

The year 1992 saw the deregulation of the Indian steel industry. The control of the government on addition of capacity, imports and exports, price and distribution by steel producers was discontinued, enabling steel industry to be driven by the market forces. This was a major part of the government policy towards liberalisation and reforms initiated in the early 90s. This process was aimed at creating a new steel industry which was open to competition and was largely dependent on the forces of the market. The price was left to be determined by the demand and supply scenario not only within India but also globally.

The decade following the deregulation of the Indian steel sector saw the largest additions to capacity. These additions coincided with the Asian economic crisis of 1997. During this period, the global steel industry, especially the Asian steel industry, experienced turbulent times and continuing downturn. The demand for steel declined both in India and across the globe and the slowdown in the global economy

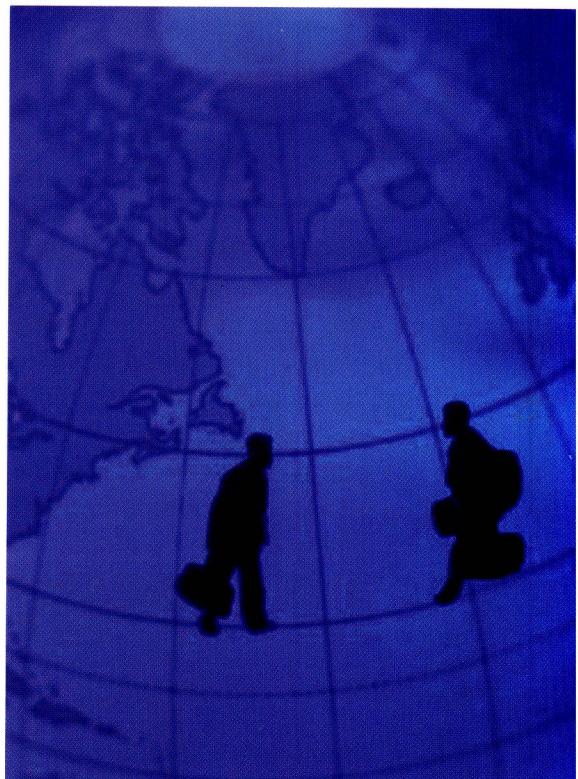
made matters worse. This led to serious rethinking of strategies and across the globe, the steel industry resorted to capacity rationalisation.

2002 saw resurgence in the growing Asian economies, leading to demand for steel, increasing rapidly. With the Indian economy being closely linked to the global economy, the demand for steel in the Indian market was also revived.

Many economists are increasingly looking at the world as one economy. This means that the impact of any major variation in the demand and supply of any product / sector in any of the major economies will be felt across the world. The best example for this would be the textile and tea industries in India, which were highly influenced by the increasing supplies from China. This globalisation of demand and supply is truer in the case of the steel sector. The domestic production of steel for any country is largely related to the availability of raw materials. Countries that have relatively lower steel making raw material capacities, have relied to a large extent on imports to meet their requirements.

The demand for steel across the globe has seen unprecedented growth over the last two years.

Taking specific examples of countries like China, USA, Japan and even some



EU countries, one could see that the demand has outgrown supply to a large extent. Countries like China have limited availability of raw materials to produce steel, and thus depend, to a large extent, on imports. The Chinese economy, growing by more than 8% per annum, has a great influence on the global demand and thus on prices of items like steel. This demand for steel and its lower availability across the world has meant that prices have seen an upward movement.

What about the situation in the domestic demand for steel?

If one would look at the growth data for the major steel consuming sectors (Shown in Charts 1.1 to 1.5) like Auto Appliances and General Engineering,

the growth has been phenomenal, something that none of us in India had predicted.

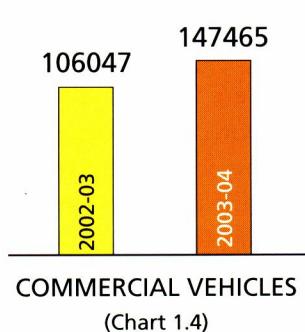
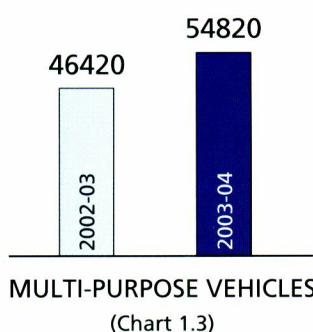
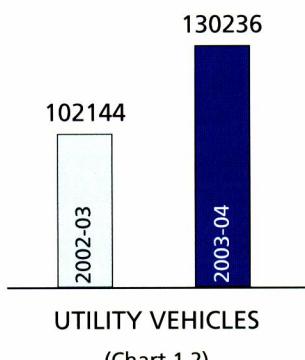
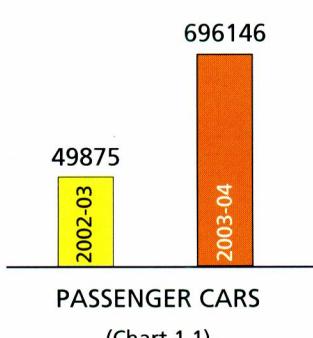
This increase in demand from the consumers made many of the majors in these segments upwardly revise their production and procurement plans.

This has resulted in an unexpected

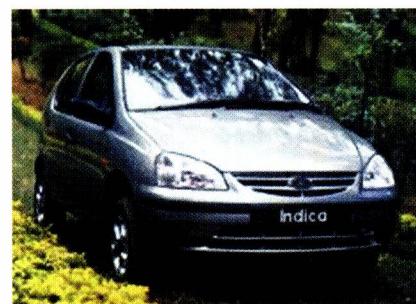
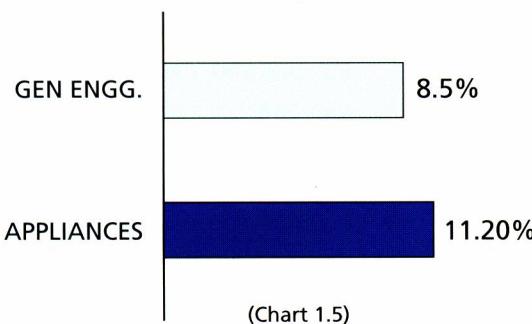
increase in the demand for steel in the domestic market.



CUMMULATIVE NOS. SOLD (Period Apr 2003 - Feb 2004)



GROWTH % (Period Apr 2003 - Feb 2004)



Thus, the Indian economy too has followed the International trend, in that it has grown at a healthy rate and is expected to be one of the fastest growing economies in the world for the next few years. Many International majors are setting up shop in India and many Indian manufacturing companies have become major international suppliers, be it in auto components, consumer durables or for that matter in furniture. This unexpected high growth in the economy and the fact that India will become a major source point internationally, is something that the steel industry and more importantly, all manufacturing sectors can look forward to.

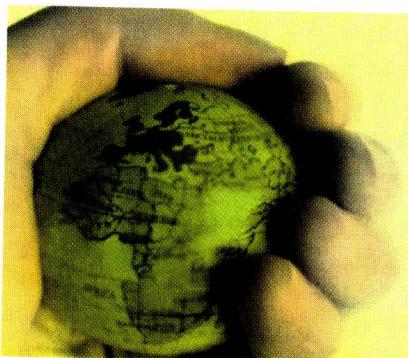
But are the demand and the resultant high prices in the Indian economy being witnessed only by the steel sector? Actually, no. Over the last two years the growth rate in many related sectors like cement, paints and metals like aluminium etc, has been good. This means that the prices of many of these items, like that of steel, have also increased considerably over the last one and a half years. Table 1.6

Sector	% Change in price
Aluminium	40 – 45 %
Cement	25 – 30 %
Paints	5 – 6 %

(Table 1.6)

gives the increase in prices over the last one to one and a half years in some of these industries. The demand for steel in India has also increased the demand for raw materials for steel making. There is a constraint in the availability of such raw materials and this has opened up its share of problems for the players in the steel Industry. All the important raw materials needed to make steel have seen phenomenal increase in their prices. To be specific, the prices of coal and iron ore, the two most important raw materials, have more than doubled in the last one year. There is also a shortfall of coal in the Indian market, and the steel companies are trying to meet their requirements through imports,

at prohibitive prices. There are steel companies in India who are still making losses inspite of rising steel prices. This can only be attributed to the fact that the impact of price increase of raw material is higher than the impact of increased realisations from higher steel prices. A comparison of the domestic and the international prices of steel shows that the prices in the domestic market have been Rs. 1500 to Rs. 2000 lower over the last eight months to one year. While this may be the situation, steel companies like TATA Steel have always given priority to domestic supplies over exports. TATA Steel's export quantity has always been at 15% levels, be it during good or bad times. This is possible as we use export for strategic reasons and not necessarily for monetary reasons by catering to specific high-end customers in the international market.



strong demand from China and the recoveries elsewhere in the world would rationalise the situation in producing a healthier steel industry. According to many, the sheer scale of infrastructure development taking place in China should result in a strong demand for steel and many other related segments, at least until the Beijing Olympics in 2008 and the Shanghai Expo in 2010.

The other major factor for the increase in demand for steel in both China and India, as explained by analysts, is that inspite of being amongst the fastest growing economies with growth rates higher than many developed countries, the per capita consumption of steel continues to be very low as compared to the developed nations. (See Table 1.7 for per capita consumption of steel in different countries).

Country	Per capita consumption of steel
South Korea	930 kg
Japan	554 kg
China	194 kg
India	38 kg

(Table 1.7)

What does the future hold?

The situation is not likely to change at least for the next one year according to many analysts both in the domestic as well as the international markets. In the international scenario, China is likely to lead the demand for Steel. Many



in the Indian economy, leading to an increased demand in many steel consuming industries.

We at TATA Steel, expect the situation prevalent today to continue throughout next year. The growth in the auto and related segments will fuel this demand since many Auto majors have firmed up plans to increase their working shifts, thereby planning to increase both their domestic and export sales. The Auto segment is expected to grow at a healthy 15-20% during the next year, which is good news for both the auto ancillary segment and the steel manufacturers.



What is TATA Steel planning to do?

While steel demand is rising in the domestic market, we at TATA Steel have, as per policy, consciously taken a decision that the priority for the company, as always, is the domestic market comprising the customers in India. This is more important and profitable in the long run than the short term gains that one would

make by selling overseas. Contrary to popular belief, as stated earlier, our export volumes have not grown, as have those of other steel manufacturers in India. We at TATA Steel have taken a position that irrespective of the situation prevailing in the international market, and notwithstanding the fact that one can make higher margins by selling globally, our export volumes would not be more than the traditional 15–20% of our total turnover. Looking at TATA Steel's volumes sold in the domestic segment, one can see that volumes have increased as compared to those in the last financial year.

TATA Steel, being aware of this demand gap, is taking all possible steps within its control to satisfy the demand. We are taking the following steps:

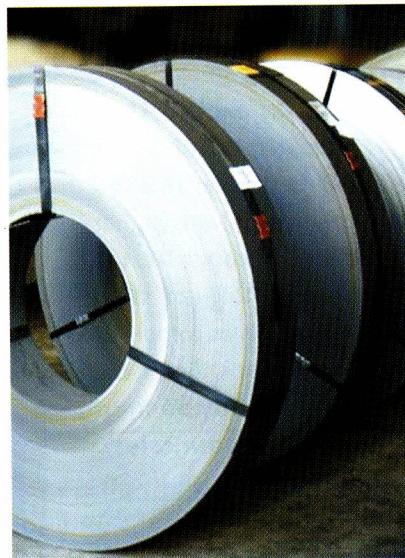
- Carry out many internal process improvements aimed at debottlenecking some of the facilities so that the output increases.
- The result of these efforts would mean that the material available for distribution would increase by nearly 18–20% as compared to this financial year.
- We plan to play a larger role in the way distributors stock and sell materials to their customers. The initiatives that would be carried out towards this end, would result in the transformation of distributors from mere de-bulking to value added service providers. These initiatives that will be rolled out over the next one year, would include:
 - Launch of focus group discussion program (Pilot carried out in Pune) will help us understand the needs of the customers better, and to ensure that our distributors' service levels are improved.
 - Training programmes for distributors and their sales forces are aimed at bringing about a major change in their customer

service orientation.

- Distributors tying up with service centres, or owning their own, is another initiative being planned, which will have a major impact on the service levels offered by our distributors.

In a situation of rising prices, we need to deliver better value to the customers we serve. We hope that you will be able to see a major change in the service level output from our distributors and ourselves and be able to justify that you have made the right choice of raw material and service provider in these trying times.

- We have a set of dedicated people called the Application Engineers located in Mumbai, Delhi, Kolkata, Pune and Chennai. These people are part of the Product Application



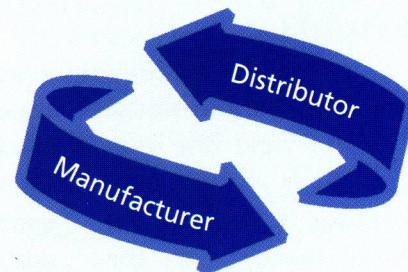
Group and would be available to provide any kind of technical help that the customers or distributors would require. Their work includes:

- Resolving customer complaints
- Helping customers select the right steel for the right application
- Conducting trials for new applications / grades
- Helping improve line yields, Reduce costs etc. through value engineering efforts in customer premises

What should the manufacturers do?

With the economy looking up, falling interest rates, high economic growth rate, increasing Government spending on infrastructure and above all, good monsoons across India, one can look forward to happy times ahead for everyone. Steel prices will continue to be governed by the demand and supply gaps in the global market, both for steel and for the raw materials for producing it. The manufacturers need to look inwards, towards improving their internal efficiencies, reducing wastage, cutting costs etc. as steel companies are going to remain competitive in the rising raw material prices. The manufacturers should also function as the drivers of change in improving the service and customer focus orientation of our distributors. They should demand value for money service levels from our distributors, be it in packaging of materials, documentation needs, testing of materials, complaint handling, inventory holding etc.

The manufacturers are also urged to give feedback to the distributors and TATA Steel with respect to the ways that they would be able to leverage the brand of TATA Steelium towards their advantage. The resources of Customer Account Managers and Application Engineers of TATA Steel are available to provide any kind of assistance related to steel that the manufacturers would need towards improving their internal efficiencies.



FROM THE PRODUCT APPLICATION GROUP DESK

The new D-Grade from TATA Steelium

Abstract

Steel containing boron provides properties comparable to low carbon soft grades (DD, EDD) at reduced cost. In line with this, boron-treated low carbon Cold Rolled Steel was developed by TATA Steel for drawing

The CR material produced out of boron-treated HR steel is quite soft, with the YS, UTS and elongation values matching those of low carbon EDD grade of steel.

While this was the case, the R bar values were closer to 1.0, indicating that the boron-treated steel had isotropic properties. The mechanical properties were almost similar to those of softer low 'C'- EDD grade.

Hence this grade can be used for the applications which do not require deep forming but require softer material and is a better 'D' grade material, than supplied by most cold rollers. This development is a simple and cost effective method of producing a value added product.

Introduction

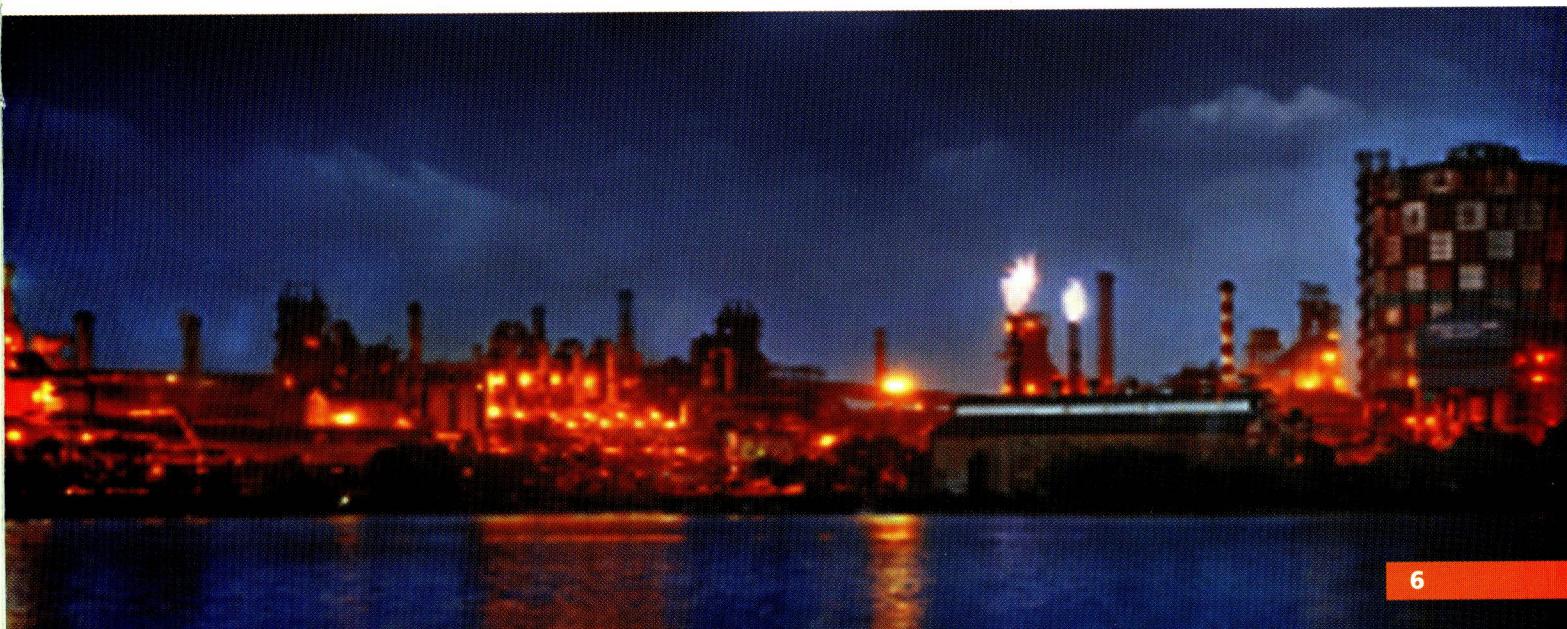
About two years ago, Boron treated low carbon HR steel was developed by TATA Steel for compressor shell application as an alternative to Cold Rolled Steel. Commercial production is now on, after several trial productions through which the process parameters were optimised. This paper describes the experience of producing the cold rolled boron



treated steel in our CRM complex. Carbon and nitrogen are generally held responsible for strain aging in steel. Low carbon steel normally exhibits a considerable degree of susceptibility to strain aging. This room temperature aging is due to the presence of nitrogen. With the addition of boron that forms nitride, the aging susceptibility in steels can be considerably reduced.

The decrease in yield strength associated with the addition of boron significantly decreases the Yield Strength to Tensile Strength ratio. This is one of the most important parameters for forming operation. While the Ultimate Tensile Strength is more or less unaffected, the Yield Strength drops.

applications. The mechanism of boron in retarding the nucleation of ferrite in hot rolling and subsequent grain coarsening in the coil was used to produce softer HR and thus softer CR materials. The HR coils produced with boron addition are relatively softer as compared to plain C-Mn grade (D quality) material.





Hence the elastic ratio, YS / TS also drops, which is desired in cold forming operation. The marked decrease in Luder strain would result in a significant decrease in the stretcher strain, which could develop in lightly formed areas. The effect of boron is optimum when the ratio of boron to nitrogen is around 0.7. These concepts were exploited in developing steel for soft grade CR.

Boron retards the formation of ferrite at the grain boundaries as it precipitates at the austenite grain boundaries as fine boron carbide. These carbides, which are coherent with the next grain as long as they are of a small grain size, reduce the interface energy of the joint, and therefore, the probability of ferrite growth at the grain boundaries. The reverse happens when a large quantity of boron is available, in which case coarse boron carbides are formed which are not coherent with the next grain and actually increase ferrite nucleation and thus reduce hardenability.

The hardenability mechanism of ferrite grain nucleation retardation was employed for producing softer grade HR material. By using a higher coiling temperature, ferrite grains grow and coarsen compared to plain C-Mn steels, thus giving a lower yield strength.

Cold Rolling

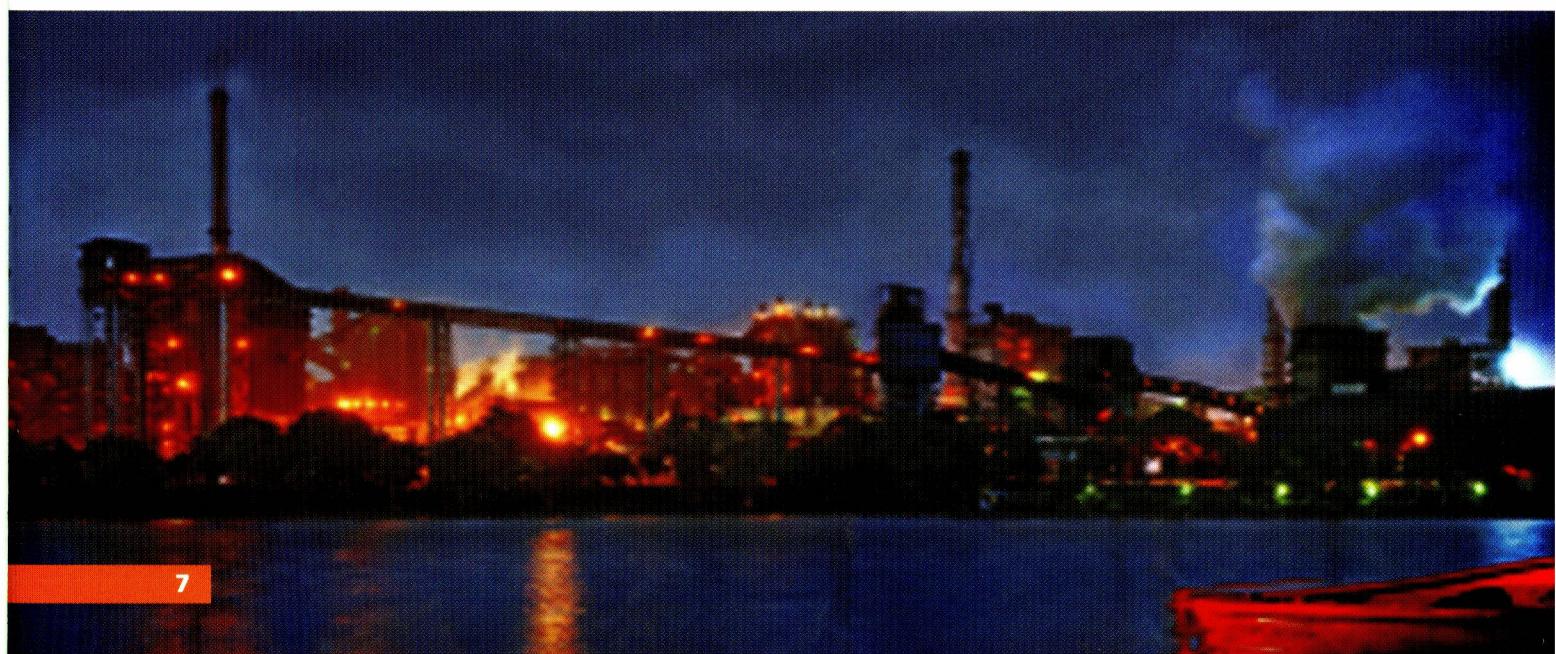


The HR coil was pickled and cold rolled with 78-80 % reduction. The steel was then batch annealed in BA furnace, employing the heat treatment cycle used for thin grade EDD material. LOI of Germany has supplied the annealing facility.

The CR steel was successfully used in applications involving simple forming without any drawing. However, one important point observed was that its drawability ratio was not comparable to EDD. The CR material had an r-value of 1.0 - 1.1 only. This is because BN had precipitated in the HR coil. There was no cold recrystallisation texture due to the precipitation of Aluminium Nitride, as in the case of plain D or EDD steels.

Results

Typical Mechanical properties of boron-treated CR coils show YS and UTS in the range of 145-180 MPa and 290-315 MPa respectively. The elongation is in the range of 45- 50% on 50 mm Gauge length. Hardness is about 35-50 HRB. All the above properties indicate that the steel is as soft as low carbon 'EDD' grade. In spite of having such good properties, the steel is suggested for only mild drawing application because of R bar being close to one. In case of EDD grade, R bar measures about 1.6 to 2.0, which makes it suitable for critical draw with high drawing ratio. It was established that boron-treated steel has better properties than the 'D' grade produced so far for distribution, as part of TATA Steel's policy of providing value added products to the customers. Immediate steps were taken to change the process parameters to produce only such steels for the distribution segment. Thus, all AU03 TDC materials being supplied through our distributors are of boron treated steel.



ADVANTAGE OF 'D' GRADE TATA STEELIUM

Controlled dimensional tolerance will lead to

- Good Shape
- Better Yield
- Higher No. of Components per Tonne

Lower levels of Phosphorus and Sulphur means

- Good Drawability
- Good Formability

Controlled Carbon means

- Controlled and Consistent Mechanical properties. Thus, the customer need not go for frequent die and other setting changes
- Good Weldability

Lower levels of Surface carbon and Iron means

- Lower Degreasing time for the customer
- Lower amounts of degreasing chemical
- Better Phosphating leading to better Paintability

Good and controlled Surface Roughness means

- Good Paintability

Mention of Erikson cupping value in the TC

- Customer will be able to know the extent of draw the material will undergo

Technical delivery condition of 'D' grade - AU03

TDC No Grade		AU03 D	
Dimentional Tolerance	Unit	Min	Min
Thickness Tolerance		0.5% of Centre Line Thickness	
Width Tolerance	mm	0	12
Mode of forming		Drawing	Bending
Chemical Properties		Lower Limit	Upper Limit
Carbon	%	0.02	0.07
Manganese	%	0.10	0.40
Silicon	%		0.04
Sulphur	%		0.02
Phosphorus	%		0.02
Aluminium	%	0.02	
Nitrogen	PPM		60
Mechanical Properties		Lower Limit	Upper Limit
YS	MPa	140	220
UTS	MPa	280	
Surface Carbon	gm/m ²		5
Surface Iron	gm/m ²		15
Bend test	2T (360° bend)	OK	
Elongation	%	35	
Hardness	Rockwell B (HRB)		55
Surface Roughness	Ra	0.80	1.60
Erichsen Cupping Value	mm	9.10	

Note: Specifications listed above are subject to change without notice

Close tolerance on mutual agreement

Did you know?

- * Every year some 50million cars are added to the world's roads. Car making is now the largest manufacturing industry in the world.
- * The automobile is the most recycled consumer product in the world today.
- * The number of registered vehicles in Delhi is more than the sum total of registered vehicles in Mumbai, Kolkata, and Chennai.
- * Steel food and beverage cans are recycled into a variety of products including new cans, bicycle frames, and even new cars.

Quiz yourself

- * Which car company uses the baseline ' the art of performance'?
- * Which car company has acquired 90% stake in Ferrari?
- * How many parts are there in a modern automobile?
- * Which model of car has no options? Not even of colour. "You can have any colour as long as it's black" said the owner.
- * How did the name 'jeep' originate?
- * For which car did Adolf Hitler supervise the engineering of the 'People's car' and personally approve the blueprints before it went into production?

Answers:

the Army's name of G.P. or General purpose vehicle. * Volkswagen
* Jaguar * Fiat * 14,000 * Model T Ford * From saying aloud

Editorial Team : Mr. Anup Sahay, Mr. Sumit Ray, Mr. J. Govindswamy, Mr. Ram Kishore.

Send your comments and suggestions to Mr. J Govindswamy, Marketing & Sales (Flat Products),
The Tata Iron and Steel Company Limited, Tata Centre, 43 Jawaharlal Nehru Road, Kolkata 700071,
Ph: (91)(033) 2288 7051 / 8251, Fax: (91)(033) 2288 5926, Email: jgovindswamy@tatasteel.com