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BFW UPDATE

If You Can Dream

Ravi Raghavan, BFW, Bangalore

"IF YOU CAN DREAM IT, you can do it," said Walt Disney. He ended up creating a dream world.

Closer home, Mr R Gopalakrishnan, Director, Tata Sons, shared some very interesting thoughts at the 5th Machine Tool Industry Summit in May this year. He observed that human motivation was coming down worldwide, urging machine tool builders to focus on an unusual HMC - Human Motivation Creation.

Obviously, if we are not motivated, we will not try to convert our dreams into reality. Our dreams will remain just dreams.

No amount of elevations, monitory benefits, or worldly comforts are enough for sustained motivation. While these fail, the sense of a larger purpose does the trick. Multi-religion, multi-lingual citizens of India fought together when they looked at the larger purpose of independence.

We at BFW see a larger purpose in coming closer to our customers, in making it easier to do business with us. Though the thought emanates from BFW, it is applicable to the entire machine tool industry, and across all industries in India.

In the last issue I had mentioned about a BFW app and spare parts stocking facility in the Northern Region. Both are operational now. Launching a fresh-look website is the next step.

However, our most important endeavour is cultivating human resources. We are breaking plans and goals into simpler and shorter segments, ensuring employee involvement, creating conditions for them to succeed and be happy. Happiness from within is the biggest motivator.

Happy employees make a happy organisation. A happy organisation is much easier to do business with. We are on the way to dream, and do it.

For us.

For you.

From the Chairman's Desk

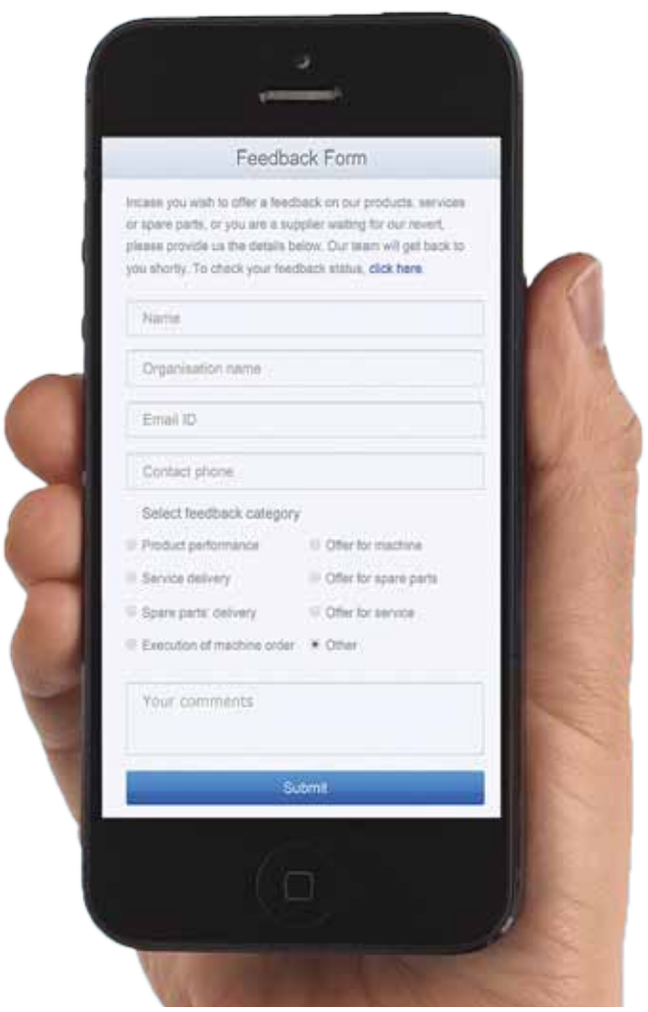
AS I WRITE THESE LINES, the broad national agenda for the next five years has been spelt out in the presidential address in the Parliament. Of course, finer details will be available only when the budget is presented; but the economic rejuvenation plans are comforting.

The revival of manufacturing through development of globally competitive manufacturing hubs, the proposed single-window system of clearance both at Centre and states, the talk of simplified procedures, the promise of world-class investment and industrial regions, apart from other measures, should help the economy bounce back. No doubt, the world looks forward to the fulfilment of these promises with speed and efficiency.

May the festivals of *Id-ul-Fitr, Janmashtami,* and *Ganesh Chaturthi* bring happiness and prosperity to all.

My best wishes on the Independence Day.

AK Kothari
Chairman



Mail

I WENT THROUGH THE ARTICLE 'Delighting Customers Through Effective Communication' in the May issue of the MMI magazine. My congratulations to Mr Praful Shende and his team on accomplishing the great task. BFW continues to prove that innovation does not happen by demanding the conventional; it is achieved by challenging the conventional. All the best!

A S Murty

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AMTEX 2014
D46, Hall 11, Pragati Maidan, New Delhi
July 25-28, 2014

HIMTEX 2014
B01, HITEX Exhibition Center, Hyderabad
September 04-06, 2014

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The Basics of Machining Composite Material

T Subramanian, BFW, Bangalore

PARTS MADE OF COMPOSITE MATERIALS are being increasingly used in diverse fields such as the chemical industry, power plants, aerospace, etc., due to the advantages of high specific stiffness and low thermal expansion characteristics. Manufacturing these parts may include turning, milling, slitting, drilling, routing, or some other machining operation.

The knowledge of machining conventional materials like aluminium, steel, or cast iron cannot be directly applied to composite material; the basics of machining action and machineability of composites are different from the usual. For successfully machining composite parts, the associated critical aspects must be carefully examined and the machine tool should be chosen accordingly.

Composites are combination of two or more non-homogenous materials. One material in the form of strong fibres is distributed as 'reinforcement' in the other material called 'matrix', which transmits the load to the fibres. Glass, carbon, boron, aramid or kevlar, and silicon carbide are some typical fibres.

The matrix may be of thermo-set or thermoplastic material. These polymer matrix composites (PMC) are also called fibre reinforced polymers (FRP).

Metal matrix composites (MMC) are being increasingly used in the automotive industry, where a metal matrix, for example aluminium, is reinforced with silicon carbide fibres.

The word 'composite' thus refers to a much broader range of material combinations than the word 'metal' does.

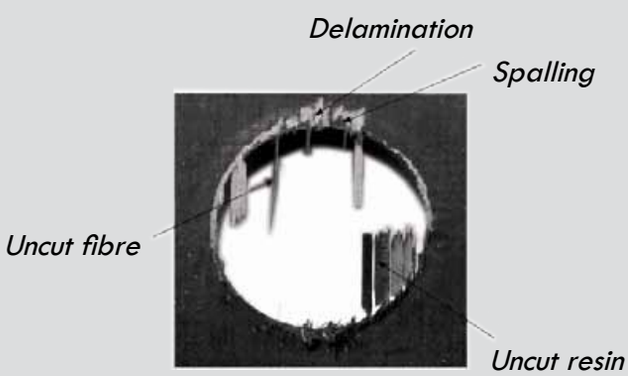
Composite parts normally require only a small amount of machining in comparison to equivalent metallic parts. The value of the part at this stage, however, is usually higher. Scrapping a composite part at the machining stage is expensive. Repairing is generally not feasible. With the varieties of combinations of two dissimilar materials being really huge, one can imagine the complexity and challenges involved in machining composite materials or CM.

Because of the non-homogeneity, the 'cutting' action at the tool tip is completely different from that on metallic materials. Machining of CM is in every case an experiment. Tools and the actual machining conditions have to be tailored to each specific CM. For example, in machining glass fibre vs carbon fibre, glass being more abrasive than carbon, causes tools to wear faster. Carbon being more brittle than glass makes a finer dust, raising larger cleanliness issues.

The main hurdles in machining composites are the melting of matrix, fracturing of fibres, and splintering of layers. Maintaining extra sharp cutting edge is a typical solution. Depending upon the type of fibre, winding angles, and resin formulas, often dedicated tool sets are finalised for each component. The variables influencing machining are fibre type, resin type, fibre orientation, part thickness, matrix hardness, heat sensitivity, and laminate or sandwich construction.

The tool materials opted for machining composites are carbide, coated carbide, diamond coated CVD (chemical vapour deposition), PCD (polycrystalline diamond) coating, diamond-like coating (DLC), diamond film coating (DFC), zirconium nitride Coating (ZNC), and crystalline diamond coating (CDC).

The machine tool must be equipped with appropriate tool conditions monitoring and dust management facilities, such as those provided on matec machining centers. The figure shows a 500 mm diameter power sector component undergoing operations like turning, milling, slitting, drilling, etc., on a matec machining centre.



Typical defects: composite machining

Glimpses

(Clockwise from top) BFW exhibits VMC TCV300, VTL BVL550H and milling machine UVF1 at the ACMEE 2014 exhibition in Chennai in June 2014; Mr Ramesh Babu (BFW) at the BFW stall at the ITM 2014 exhibition in Poland in June 2014; II Year engineering students from Advanced Technical Training Centre, Sikkim, visit BFW in April 2014; Presidents Mr NN Upadhyay and Mr HK Birla (seated third and fourth from left) demit office in April 2014.

THK Helps India Build High Accuracy Machines

Pradeep S, THK India Pvt Ltd, Bangalore

THK DEVELOPED ITS PIONEERING LINEAR motion systems, now used across a wide spectrum of industries and regarded essential in the field of mechatronics, through creative thinking and original technology. The linear motion system performs a task once considered virtually impossible; it converts linear motion into rolling motion.

The conversion from linear motion to rolling motion results in greater precision, faster movement, and saving on resources. Naturally, efficiency increases, paving way for development of energy saving machinery. No wonder, THK linear motion guide devices constitute an indispensable element of many mechanical and electronic systems.

The smooth and silent movement of the linear motion system finds its origins in THK's original technology. The rotating movement of rolling involves bearings which were known to the world for at least 100 years, but were put to this kind of use only in 1972 for the first time on the THK linear motion systems. Since then, all THK technologies are devoted to the only purpose of providing smoothness and accuracy to the movement of all mechanisms.

THK's many other innovative products such as ball spline, ball screws, and link balls are supplied worldwide. With its own technology and top-quality products, THK plays a useful and important role in helping the Indian machine makers to develop high accuracy machines.

THK will keep working to anticipate future trends and applying its original technology and unique expertise in the pursuit of innovation in line with its corporate philosophy: providing innovative products to the world and generating new trends to contribute to the creation of an affluent society.

(Clockwise from top) LM guideways, ball-screws, the Yamaguchi plant from where most LM guideways come to India. THK has more than 40 plants worldwide.

Gray Matter Corner

BFW UPDATE HAS A LOT of *parantha* lovers, and many of them are exceptionally intelligent and quick! I drew this conclusion from the manner in which responses were received to the question published in the previous issue of the BFW Update. We had asked the minimum number of *paranthas* to be carried by a person if he must offer the *paranthas* to seven persons one after the other. Each of these persons has a habit of keeping half of the *paranthas* offered, returning the balance after adding one as a token of goodwill. At the end the person must have at least two *paranthas* to eat.

Mr SK Jhunjhunwala, Dy General Manager, Angelique International; *Mr Naveen,* Engineer, BFW, Bangalore; *Mr MP Manjunatha,* Asst Manager, L&T, Bangalore; *Mr Avinash Bendre,* Managing Director, Nagpur Motors; *Ms Roopashree,* Secretary, Francis Klein, Bangalore; *Mr Chetan Desai,* Fancy Fittings, Mumbai; *Mr Ram Chadha,* Aryan Aerospace Fasteners, Nashik; *Mr A Suryanarayana Murty,* Hyderabad; *Mr Ramakant Pai,* Kirloskar Brothers, Pune; and *Mr Radhakrishnan R,* Kar Mobiles Limited, Bangalore were the first ones to send the correct answer – two *paranthas.*

This happened many decades ago. Bon started a shop. One fine morning, he had a customer, Con. Con purchased a kilogram of Basmati rice for ₹25, and gave Bon a ₹100 note. Bon went to the next shop, run by Hon, got the ₹100 note exchanged for smaller denomination notes, and gave a kilogram of Basmati and ₹75 to Con.

Con went away, smiling. Bon smiled, too – he had purchased the rice at the wholesale rate of ₹20 per kilogram. Hon did not smile. He called Bon, informing that the ₹100 note was a fake one. Bon had no option but to compensate Hon with ₹100. Hon smiled. Bon did not. He was worried. He knew he had incurred a loss in the entire deal, but for how much?

Can you help Bon in finding his exact loss? Please send your response to amitabh@bfw.co.in.

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Coulter Blade Machining Made Easy

Sneh Deep Pandey and Kiran Urs, BFW, Bangalore

"GO THE EXTRA MILE FOR your customer," one hears often. BFW has a rich tradition of going that extra mile time and again. Take the recent example of BFW serving the need of Bellota Agrisolutions.

Bellota Agrisolutions is a leading Spanish manufacturer of spare parts for agricultural machinery since 1908. The company has offices in Brazil, China, Denmark, India, Russia, Ukraine and the USA.

It was in the later-half of 2013 that Bellota Agrisolutions' India office felt the need to shrink the production time of the coulter blade. A coulter is a flat rotating disc used in combination with a plough for various purposes such as smooth cutting of the bank, slicing plant debris to the width of the furrow, softening the soil, etc.

Thinking out of box, Mr Dutta Jadhav, the Head of Production, aimed at bringing about 30% to 40% improvement in cycle time. Obviously, the existing retrofit machinery would not support such an improvement. He visited BFW, explaining his aim.

The boron steel coulter raw material was less than 10 mm thick, 350 mm to 750 mm wide, and required peripheral machining on both sides. Sans preventive measures, the risk of component distortion ran high. It was evident that standard vertical turning solutions would not do; Bellota Agrisolutions required a special vertical turning solution.

BFW engineers visited Bellota Agrisloutions' Nashik plant. The understanding improved. And finally emerged the solution in the form of a VTL with single tool turret and a tailstock. The machine was christened Sudarshan BVL 800S, S signifying the single tool.

The supply was completed in March 2014. The machine, the first of its kind manufactured in India, never gave a tough moment. The cycle time of less than a minute per component matches the aim of Mr Jadhav, who is happy at the wise decision. He writes, "We are totally satisfied with the quality of the machine. The design of the clamping cylinder is excellent. During the trials at BFW Bangalore the entire BFW team worked with us. The performance of the machine is very good. We are getting the required efficiency on the machine, which works round-the-clock. The service is very good".

1. A coulter blade, 2. the raw material, 3. the finished blade, 4. the machining requirement, 5. (right to left) the Bellota Agrisolutions Director Human Resources Mr Juanjo Salegui, Director Operations Mr Jesus Garona, Deputy Managing Director Mrs Itsasne Onatiba, General Manager India Plant Mr Olivier Guibourg, Production Manager Mr Sachin Shahir, 6. Head of Production Mr Dutta Jadhav.

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