Polymeric Composites in ASIA - Past, Present and Future
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# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertiser’s Index</td>
<td>04</td>
</tr>
<tr>
<td>From the Editor’s desk</td>
<td>06</td>
</tr>
<tr>
<td>Industry Digest</td>
<td>08</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>* Owens Corning Continues Environmental Footprint Reduction with Upgrades to More Energy Efficient, Lower Emitting Technology</td>
<td></td>
</tr>
<tr>
<td>Feature</td>
<td>10</td>
</tr>
<tr>
<td>Application Trends</td>
<td>16</td>
</tr>
<tr>
<td>Tech-know</td>
<td>17</td>
</tr>
<tr>
<td>Material Matters</td>
<td>18</td>
</tr>
<tr>
<td>Events</td>
<td>19</td>
</tr>
<tr>
<td>Business Guide</td>
<td>21</td>
</tr>
</tbody>
</table>

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FASTERS PROCESSING OF
COMPOSITES; A NECESSITY

One of the limitations that do really affect the wider use of composites in automobiles is that the manufacturing processes currently being followed are not fast enough to make the composites and to make them compete with the metal forming operations. Metal forming operations can be done at a time as low as 15 seconds. Among the 35 manufacturing processes of thermoset and thermoplastic composites, compression moulding of SMC and the thermoforming and reinforced reaction injection moulding (RRIM) of FRTP are the three processes that have the potential for fast production cycles and can compete with the metal forming processes. Many innovative developments have made these methods still more attractive.

There are still a few technological hurdles to be overcome, but with the use of new bio-processed resin systems, composites have also become environment friendly. Reinforced Reaction Injection Moulding (RRIM) particularly with polyurethane and caprolactum (for Nylon 6) are fast processing methods. While SMC has matured to give components with class A finish, similar finish could not yet be achieved in FRTP components. Such components are now being used for under bonnet applications.

In India, sufficient attention has not yet been given to these methods. The development of these methods need several associated developments including machinery for SMC making, hydraulic and thermoforming presses, process machinery for making glass mat and natural fibre mat thermoplastic sheets, moulds and forming dies etc. There is scope for several units to come up in these processing routes.

Along with the development of these materials, their recycling options have also to be developed so that environment protection regulations can be maintained.
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Before its recent acquisition of Saint-Gobain’s reinforcements and composite fabrics businesses, Owens Corning had already converted nearly 80 percent of its composite plants to Advantex® technology, and in this new phase, is extending the conversion program to the additional facilities that came with the purchase. Facilities in Hangzhou, China; Alcala, Spain; Thimmapur, India; and Anderson, South Carolina, in the United States have recently been converted. Plant conversions in Doudian, China, and Vado, Italy, will be completed by the end of 2009.

“These conversions allow us to truly deliver on the full promise of realizing the synergies of the acquisition by not only reducing our environmental footprint, but also ensuring we have a more global manufacturing platform to better service our customers with a high-performing product,” added Chuck Dana, group president of Owens Corning Composite Solutions.

With the acquired Saint-Gobain reinforcements and composite fabrics businesses, the Owens Corning Composite Solutions business now has 42 production facilities in 16 countries and more than 9,000 employees.
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Polymeric Composites in Asia - Past, Present and Future

Mr. S. Sundaram, former Vice President of erstwhile, Saint Gobain Vetrotex/FGP India reviews the market growth of composites industry in Asia and concludes that the future of polymeric composites, without a shred of doubt, lies in ASIA!! The author can be contacted by E mail ssundaram50@yahoo.com

With more than 60% of the world's population and 25% of global (polymeric) composites usage, it was no surprise that Asia, in the mid-90s was hailed as the industry's emerging Tiger!

After more than a decade, Asia currently accounts for almost 36-38% of global polymeric composites usage and it shows the rapid strides made by this region. In fact, the year 2008 has been forecast by industry pundits as the year in which Asia will be the world's largest market for glass fibre based composites.

And, what is the projected forecast for Asia? A staggering 50% of global polymeric composites usage by 2015! That not only signifies progress, but also indicates a predominant shift towards global domination by Asia in the composites business.

If Asia was the Tiger on the prowl in the not-so-distant past (a decade and a half ago); it presently has the power in its muscles to leap into the future.

North America was the bastion of the polymeric composites industry for several decades. With most of the industrial activities (not only glass fibre manufacture but also downstream industrial production) moving to Asian locations because of cost economics, there is no option for North America but to hand over the baton to Asia “by default”. Ultimately, the bottom line needs to be black and this can be achieved if production (including labour) and energy costs are controlled. While the latter can definitely be achieved by technological advances, the former depends on regional economic trends.
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KOREA  ❖  THAILAND  ❖  TAIWAN  ❖  JAPAN  ❖  GERMANY  ❖  TURKEY
Filament Winding Machine (Picture Source : CNC Technics P Ltd.)

In the past, Japan was always considered the powerhouse of the Asian polymeric composites industry. In the early 90s, Japan alone accounted for almost 50% of the Asian composites market with building and residential applications (sanitary ware products, septic tanks and water tanks) being the principal market sector. Over the years, however, there has been a steady decline in Japan’s share; only 38% in 1999 and around 22% in 2006. With many production plants getting relocated to China, Japan is struggling to reach the composites production levels of the late 90s. The composites market, in fact, witnessed a drop in 2006 compared to 2005. The decline in the housing sector still continues with tightening of building standards coupled with weak residential investments and household spending.

GDP grew at an annualized rate of 3.5% in 2007. The growth momentum in 2008 has slowed down with deteriorating business and consumer confidence and export showing signs of moderating as emerging Asian economies remain a key support (almost 50%) for Japanese exports. GDP growth is projected at 1.4% in 2008 and 1.5% in 2009 according to an IMF report. The composites market is expected to grow at the same rate as GDP. As far as the future is concerned, the contraction in residential markets is slowly being compensated by an expansion in the automotive and rolling stock sector. The composites market is slowly veering to being more technical with the continued focus on SMC and BMC, not to mention the fibre reinforced thermoplastics (FRTP) market which continues to ride on high temperature resistant engineering plastics.

No doubt, the carbon fibre business is the current mainstay and the future of the Japanese composites business. The extensive use of carbon fibre composites in aerospace applications owes a lot to Toray, Toho and other Japanese carbon fibre manufacturers and processors. Boeing’s Dreamliner would not have become a reality, but for the tremendous development work on carbon fibre production carried out by Japanese carbon fibre producers, chiefly Toray. When it comes to cutting-edge technological advances in fibrous reinforcements for composites, the Japanese have few peers. Their commitment to the global automotive sector and relentless pursuit in working towards manufacture of fuel efficient cars has prompted Toray and Mitsubishi (in August 2008) to team up in the development of a new carbon fibre material for cars that also has Nissan and Honda participating in the program. The D-day for mass production of the material is mid-2010 that would result in vehicles being 40% lighter than steel-body cars! It just goes to prove (in general) that when the Japanese think of developing products that are sleek, light and versatile, they really think BIG!!

It took some time for Taiwan to emerge from the 1997 recession following the boom period of the 80s. The Printed circuit board (PCB) industry was the mainstay in the late 90s and fibre reinforced thermoplastics (FRTP) was on the cusp of the growth curve. Today, PCBs still dominate the Taiwanese composites industry accounting for more than 60%. One significant factor over the years has seen the gradual shift from hand lay-up (now only 29%) to automated processing techniques (pultrusion, RTM, filament winding, SMC/BMC) consequent to high labor costs. Another significant factor has been the growth in FRTP since 2003, with growth rates in the 18-20% range that includes both commodity plastics (PP, PET/PBT, PA) and engineering plastics (PC, PPO, ABS). The development and commercialization of special epoxy resins (by Swancor) for wind turbine blades and suitable for molding by VARTM has been a success story worthy of mention as far as the Taiwan composites industry is concerned.

South Korea’s economy is forecast to grow at 3.5% in 2008 (down from 5.3% in 2007) with its GDP surpassing trillion dollars. While export activity remains robust; it is the internal economy which is on slippery ground with plunging consumer confidence, reduced investments and difficulties in the housing market. The composites industry is expected to grow at a rate matching its GDP.

ASEAN continues to plough a lonely furrow and its economy in the region is nothing much to rave about. Ditto for it’s composites industry growth, which can best be described as sedate?

The Indian polymeric composites industry has had a dream run since 2004 with growth rates exceeding 20% on the trot largely driven by infrastructure, in general and wind energy in particular. The chemical sector has always been the mainstay for composites usage in the past. It still continues to be a major outlet though, in recent times, transportation (road, rail and marine) applications and wind energy have made major inroads resulting a quantum leap in the use of composites. India now ranks...
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as the fourth largest wind-power producer in the world having installed close to 1600MW in 2007 out of the total 20GW installed globally in 2007. With major blade manufacturers such as LM, Suzlon and Enercon having production base in India, the country is admirably poised to sustain the momentum in composites usage in the coming years around the 20-25% mark. India has been achieving a GDP averaging close to 8-9% during the past few years. In keeping with the composites growth trend of 2-2.5% GDP of emerging economies, 20-25% growth rates seems realistic enough. Of significance is the increasing use of composites in automotive applications through SMC/BMC-India has definitely come of age on use of composites in this sector. With resin majors such as Ashland and Reichhold announcing plans to set up plants in India for unsaturated polyester resins; quality specialty resins should trigger a spate of new applications along with wider extension of existing applications. The pipe and underground gasoline storage tank markets got a real fillip with the advent of Amiantit Pipes setting up pipe manufacturing facility in Goa, a few years ago. The pultrusion sector continues to make great gains for onshore and offshore applications. The indigenous production of phenolic resins for composites has proved to be an ideal foil for offshore and other fire retardant applications (rail transport, defense etc.).

And finally, we come to Asia’s principal growth driver of polymeric composites, China. China’s economy has been growing at a scorching double-digit pace for the past 3-4 years. Consequently, the composites industry has also been registering growth rates between 15 and 20% annually. China’s phenomenal composites influence in the Region can be gleaned from statistics that say it all—in 1999, China generated around 29% of Asian composites production (by volume) and 44% in 2005. Globally, China accounted for 17% of worldwide composites usage in 2005 compared to 7% in 1999. Readers must have come across any number of statistics on multiple aspects of China’s phenomenal growth. But a few mind boggling statistics do merit mention. Wind energy is the current buzzword in the global composites industry and China has been a relatively late entrant in this field. Between 2000 and 2006, the wind turbine business in China grew at 40% per year. In 2006, it grew at 105% compared to a global increase of 25% per year! China’s spiraling growth in wind energy production is further fueled by the Government’s desire to work towards a cleaner environment. At the 2008 Global Wind Energy Conference in Brussels, the Council concluded that Asia would overtake Europe as the biggest wind energy market with as much as 12.5GW of new capacity installed during 2012, up from 5.4GW in 2007. China is expected to lead this growth. By 2010, China is expected to be the biggest annual market globally! The number of domestic turbine manufacturers has been growing rapidly. In 2007, 40 domestic suppliers supplied 56% of the new installations in China, up from 41% in 2006. As far as glass fibre production in China is concerned, the numbers are legion and the global composites industry is aware of the significant inroads made by China in markets across all continents. With the aforesaid demand for wind energy, one can safely hazard a guess as to the extent to which installed capacity for glass fibres would increase multifold in the next three years to meet local demand, let alone global requirements!

Between 2003 and 2008, the Asian polymeric composites business grew around 20% annually compared to around 5% by North America and Europe. Apart from wind energy, the other principal driver of composites in Asia is the automotive market which grew at 8% annually between 1999 and 2005, compared to the region’s composites industry growth of 6% during the same period. With lighter, fuel efficient vehicles being the order of the day, and China set to take over from the U.S. as the world’s leading automaker (thanks to high production costs in the U.S.); the prospects for Asian composites growth can best be described as awesome. This is not wishful thinking, but ground reality. Of course, the need to focus on an accelerated shift to automated processing techniques needs no overemphasis. Keeping in mind the availability of skilled labour in Asia, this acceleration is easier said than done. However, this aspect should always be on Asia’s composites radar if the region is to achieve greater growth.

The bottom line?
Between 2003 and 2008, the Asian polymeric composites business grew around 20% annually compared to around 5% by North American and Europe. The script has been written:- the coronation of Asia as the new global polymeric composites leader is presently in the making.

Let the world watch the inevitable as the Asian composites juggernaut rolls onto the future of polymeric composites, without a shred of doubt, lies in ASIA!!
With an intention to make the country's missiles lighter, cost-effective and possess greater hit power, the Defence Research & Development Organisation, India (DRDO) is augmenting its composite materials facilities and capabilities.

An independent centre for composite testing and evaluation is being set up at the Hyderabad-based Advanced Systems Laboratory (ASL), the premier lab guiding the long range missile Agni programme and providing key technology inputs to other missiles.

ASL already has composites production centre (Comproc), which fabricates the lightweight material for Agni and other missiles. At present, the payload and a small portion (nose tip) of Agni is made of composites, while the rest is metallic. Progressively, we will make the airframe, the upper stages and payload completely composite. There is lot of interest from the private sector in the composites arena and no dearth of raw materials, he added. Composite material, which can withstand very high temperatures and are robust, finds application in aerospace, the light combat aircraft and satellites.
MVP Conducts LRTM training in Malaysia

Magnum Venus Plastech, with Malaysian Distributor Castmech Technologies Conducts First LRTM Training in Malaysia

Kent, WA — Magnum Venus Plastech's comprehensive three-day Light RTM training course has become one of the Composites Industry's leading sources for manufacturers to learn how to bring LRTM to their production. Since its introduction last year, the MVP Light RTM training course has been conducted in several countries including Germany, Australia, South Africa, Spain, and now for the first time in Malaysia.

The purpose of this course, conducted by industry expert Charles Tur, is to provide customers, who are considering the move to closed mould technology, with the tools and training they need to make the changeover successful. To that end, the three day training course includes extensive classroom lectures on the technology and techniques behind the process, the real costs and benefits of using Light RTM, and then moves to hands-on training from tooling the mould and counter mould, and finishes with the injection of a finished part.

The full training course is set up to be a strong transfer of the technology of mould building, and allow each attendee to gain a good basis of knowledge to take back to their company, and easily put into practice. Each person who attends the course receives the comprehensive training course manual, which discusses in detail the practices they learn during the class, as well as other training materials to use as reference once they are back at work. With these tools, our attendees have the knowledge base they need to get their Light RTM operation up and running. Castmech Technologies hosted 10 students for this hands-on course in July at their facility in Ipoh Perak. Chan Yl, owner of Castmech Technologies said, “I enjoy seeing the participants' involvement and discussion. I appreciate Charles's input and useful advice.” He continued.

"With this sharing and transferring of knowledge of the LRTM technology, we hope it will educate and assist clients in bringing higher quality and skill into their production," Joan Tracy, Vice-President of International Sales for MVP said, “We are very excited about the success of our first Malaysian LRTM Training, and look forward to watching the growth in this market. This comprehensive three-day training has proven to be a valuable asset to our global customers, and there are already courses scheduled around the world throughout 2009."

For more information on the comprehensive Light RTM Training Course offered by MVP, please visit the M.V.P. Web site at www.mvpind.com.
New Menzolit compounding plant in China

The new Menzolit compounding plant, which opened September 16, 2008 in Shanghai, will be dedicated to production of materials for domestic Chinese and other Asian market’s manufacturers, as well as for international automobile, transportation and electrical manufacturers who are or will be in production in China in the near future.

The arrival of this new plant, which represents a major commitment to the industry in China, creates a new local opportunity for cooperation between Menzolit and long-time industry partner DSM Composite Resins, which has resin production facilities in nearby Nanjing.

SMC-BMC materials have been used in automotive industry for over 50 years, for exterior body panels and other parts. They offer the advantages of weight reduction, stiffness and temperature performance, superior paint-ability, design flexibility and cost competitiveness, as compared to more traditional products. DSM Composite Resins already supplies resins and other ingredient products used in the SMC-BMC compounding process to Menzolit’s four production facilities in Europe. With the opening of the new Shanghai plant, this relationship will expand to China.

Together, the two companies will work to support and educate the local market, with the aim of developing high standards for production quality as they previously have done for the industry in Europe. “Our global customers are truly global, and expect the same level of quality standards in every market. They want a supplier they can trust.” said Peter Stachel, Director of Technology at Menzolit.

He believes the potential benefits for the SMC-BMC industry will flow in both directions between the emerging market in China and the more established SMC-BMC European market. “There is the possibility for the development of new applications in China that may be of great benefit to the European market” Stachel added.

According to Fons Harbers, Business Manager Automotive at DSM Composite Resins, “The arrival of Menzolit in Shanghai brings an important piece to the local SMC industry and its value chain in China. Mutual support from DSM and Menzolit will help professionalise the complete value chain, creating new opportunities for everyone involved.”

DSM Composite Resins, a subsidiary of Dutch multinational DSM, received the environment prize of the AVK innovation award for its new resin system Palapreg® Premium. The award was presented at the AVK Conference for reinforced plastics and thermosetting materials that took place on September 22 & 23 in Essen, Germany.

Jushi (India) FRP Accessories plans Rs 600 cr glass fibre unit in India

Jushi (India) FRP Accessories Pvt Ltd, a joint venture company between Chinese player Jushi group and FRP Accessories India is planning to pump in Rs 600 crore for setting up a greenfield glass fibre unit at Jhagadia.

The company officials visited the site few months ago and have zeroed in about 50 acres of Gujarat Industrial Development Corporation (GIDC) land in Jhagadia which the state government is in the process of alloting, according to sources in state government.

China-based Jushi Group specializes in manufacturing of fiberglass products and fabrics, with over 200 types and varieties. The company is a leading producer of fiberglass reinforcements in China.

The Indian JV partner FRP Accessories is one of the largest dealers of fibreglass reinforcement products and has its operations spread across the country.

Jhagadia which is fast emerging as a favourable industrial destination has seen a lot of movement lately.

Ashland India Private Ltd, the Indian arm of US based Fortune 500 company Ashland Inc has been allotted about 25 acres of land in Jhagadia Industrial Estate, sources said. The company plans to invest Rs 200 crore for setting up a resin manufacturing unit.

Ceat Ltd is also in the process of setting up a radial tyres manufacturing unit in Jhagadia GIDC for an estimated investment of Rs 500 crore. The company has earmarked about 100 acres for the unit, according to government sources.

Also US-based Kohler, a global heavyweight in kitchen and bathroom products is setting up a ceramic unit in Jhagadia for an estimated investment of Rs 900 crore in a phased manner.

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### Events

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<th>Date</th>
<th>Location</th>
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<tr>
<td><strong>Exoplast 2008</strong></td>
<td>October 20-21, 2008</td>
<td>Montreal, Canada</td>
<td><a href="http://www.exoplast.org">www.exoplast.org</a></td>
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<tr>
<td><strong>Compositech</strong></td>
<td>October 20 - 24, 2008</td>
<td>Barcelona, Spain</td>
<td><a href="http://www.expocimia.com">www.expocimia.com</a></td>
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<tr>
<td><strong>19th International conferences on composite materials</strong></td>
<td>October 22 - 23, 2008</td>
<td>Fira Barcelona, Barcelona, Spain</td>
<td><a href="http://www.cpe-inform.es">www.cpe-inform.es</a></td>
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<tr>
<td><strong>Dynamics of Composites Manufacturing</strong></td>
<td>October 27 - 29, 2008</td>
<td>Seattle, Washington, USA</td>
<td><a href="http://www.acmanet.org/meetings/seattle.cfm">http://www.acmanet.org/meetings/seattle.cfm</a></td>
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<tr>
<td><strong>Compotec</strong></td>
<td>October 29 - 31, 2008</td>
<td>Italy</td>
<td><a href="http://www.compotec.it">www.compotec.it</a></td>
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<tr>
<td><strong>Airshow China</strong></td>
<td>November 4 - 9, 2008</td>
<td>Zuhai, Guangdong, China</td>
<td><a href="http://www.airshow.com.cn">www.airshow.com.cn</a></td>
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<td><strong>3rd European bioplastics conference</strong></td>
<td>November 5-6, 2008</td>
<td>Berlin, Germany</td>
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<td><strong>9th Pacific Rim Bio-Based Composites Symposium</strong></td>
<td>November 5-8, 2008</td>
<td>Rotorua, New Zealand</td>
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<td><strong>Feiplar Composites + Feipur</strong></td>
<td>November 11 - 13, 2008</td>
<td>Brazil</td>
<td><a href="http://www.feiplar.com.br">www.feiplar.com.br</a></td>
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<td><strong>Airtex 2008 - International Aerospace supply Fair</strong></td>
<td>November 11-14, 2008</td>
<td>Exhibition centre of Frankfurt, Germany</td>
<td><a href="http://www.airtex.aero">www.airtex.aero</a></td>
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<td><strong>China SAMPE conference &amp; exhibition 2008</strong></td>
<td>November 12-14, 2008</td>
<td>Shanghai Everbright Convention &amp; Exhibition Center, China</td>
<td><a href="http://www.sampe.org.cn">www.sampe.org.cn</a></td>
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<td><strong>Commercial Aircraft Forum</strong></td>
<td>November 19-21, 2008</td>
<td>Crowne Plaza Century Park Shanghai, China</td>
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November 27th 2008, Pullman Brussels Airport Hotel, Brussels, Belgium
Website: www.amiplastics.com/ami/AMIConference.asp?EventID=173

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Website: www.polimerik-kompozit.com

Raw Material Shift & Biomaterials
December 3-4, 2008, Maritim Hotel Cologne, Germany.
Website: www.raw-material-shift.info

ISAMPE National Conference On Composites: INCCOM 7
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E-mail: inccom7@css.nal.res.in

Fire Resistance in Plastics 2008 - Trends and technical developments in the international flame retardant industry
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Website: www.amiplastics.com/ami/AMIConference.asp?EventID=142

Carbon Fiber 2008
December 8-10, 2008, Charleston, South Carolina, USA
Website: www.compositesworld.com/conferences/carbon-fiber-20082.aspx

1st International Conference on Composites: Characterization, Fabrication, and Application (CCFA-1)
December 15 - 18, 2008, Kish, Iran
Website: www.netcomposites.com/calendar_details.asp?756

Composites & Polycon
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Website: www.acmanet.org

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January 26 - 28, 2009, Vienna, Austria
Website: www.amiplastics.com/ami/AMIConference.asp?EventID=151

Composites RTM 2009
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Website: www.ppe.asso.fr

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February 25 - 27, 2009, Moscow, Russia
Website: www.mirexpo.ru/eng/exhibition s/composite09.shtml

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WINDING MACHINES

From
CNC TECHNICS PRIVATE LIMITED. INDIA

SPECIFICATIONS:

- Dia 10mm to Dia 5000mm
- Lengths up to 15m.
- 2 axes to 6 axes
- Multi-spindle

OUR CLIENTELE INCLUDES CUSTOMERS from:

- United Kingdom
- Saudi Arabia
- Vietnam
- Thailand
- Russia
- Dubai

With a population of over 75 machines

ACCESSORIES / ATTACHMENTS:

- Resin Bath System
- Bookshelf Creels
- External Unwinding Creels
- Mandrel Rotating Station
- Component Extractors
- Hybrid AL / Ceramic Eyelets
- Tape Winding Attachment
- Filament Winding Software
- Hydro Testers

High standards of engineering coupled with sourcing of critical components from world renowned companies like Siemens, Rittal, Igus, Bonfiglioli, Atlanta Skf, etc. contribute to the high reliability of the machine.

CNC TECHNOICS PVT.LTD.
3A, Type - 1, Kukatpally, Industrial Estate, Hyderabad-500072, INDIA.
Tel: 91+40-23078000, 23079414, Fax: 91+40-23075498
E-mail: cnc@cnctechnics.com, Website: www.cnctechnics.com

WINDING SOLUTIONS
OFFERS

PULTRUSION MACHINES - 4T, 6T, 12T CAPACITY

OUR PRODUCTS FOR GRP INDUSTRY

1. GRP PIPE EXTRACTOR UP TO DIA 1500mm
2. GRP PIPE CALIBRATION MACHINE UP TO DIA 1500mm
3. GRP PIPE HYDRO TESTER UP TO DIA 1700mm@ 32 BAR
   UP TO DIA 2000mm@ 22 BAR
4. GRP PIPE BEAM STRENGTH TESTING MACHINE
5. DIES FOR MOULDED GRATING.
6. PULTRUSION DIES.
7. HYDRAULIC PRESSES UP TO 1000 MT.

ANY OTHER PRODUCTS AS PER CUSTOMER REQUIREMENTS

Office & Works: Shed No. 2, A.P. Agro Workshop Complex, HMT Town Ship, Chintal,
Hyderabad - 500 054, A.P. Telefax : 040 - 2308 1377,
email : info@svsydraulics.com, www.svsvhydraulics.com