

FREEFLOW

THE DYNAMICS OF A GLOBAL ACRYLICS BUSINESS

No.15

WELCOME TO THE SEPTEMBER 2014 EDITION OF FREEFLOW



Peter Snodgrass
Sales Director, EMEA

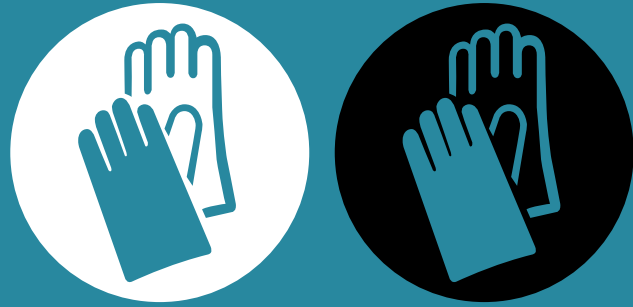
I'd like to begin my welcome to this issue of FreeFlow by extending a personal message of thanks and appreciation to our customers for their loyalty and understanding during a time where it has been unusually difficult for us to deliver supply certainty for you. Focusing on our customers, satisfying your needs and deepening our relationships with you so that we can support your growth aspirations through excellent supply continues to be at the heart of all that we do. Rest assured that our experienced manufacturing team at Cassel is making very good progress in this respect and we continue to benefit from the excellent supply support from our colleagues globally.

With our global MRC/Lucite International (LI) manufacturing colleagues in mind, I am delighted to share a feature (see page 08) on our asset investment programme, which is driving capacity increases and improvements across the world. This additional capacity gives us added supply flexibility and enables us to more closely respond to opportunities that arise as our customers grow and as LI looks to develop sustainable new markets and business opportunities.

In this issue of FreeFlow we also celebrate ongoing partnerships with our customers Plazit-Polygal and Kolpa. We were especially grateful for the wonderful images that they shared with us and that have significantly brightened our issue!

We're also excited to share the first in a series of articles that demonstrate how we are focusing our work in areas where we believe we can add value to you. One of these areas was for us to be a 'Promoter of acrylic systems', and if you take a look at page 14, you will see what our teams in China and the US are doing to stimulate interest in acrylic. We'd love to hear your thoughts on this – is it something that we can pursue together in the EMEA region?

Once again, thank you for your ongoing loyalty. We really do value our special relationships with you and look forward to discussing new ideas for working even better together in the future.



SAFETY IS OUR NUMBER ONE PRIORITY

CEFIC Methacrylates Sector Group has launched a new version of the Methacrylate Monomers Safe Use of Gloves guide. The document is available to download from our website at: <http://bit.ly/QEhn8u>. Please do take a look at these useful guidelines and consider a review of your current practices for handling Methacrylate Monomers. If you need help or advice in interpreting or applying any of the new recommendations, we would be very happy to talk to you. Please contact: lyn.hatch@lucite.com



KEEPING IN TOUCH WITH US

In addition to hearing our news through FreeFlow magazine, which you can also read and refer to online at <http://goo.gl/R4wnSj> we are also continuing to publish regular updates about our business via our blog: blog.methacrylate-monomers.com. If you have not already done so, do visit the blog and subscribe, that way you will receive notification via your email or RSS feed that there's something new to read about us.

NEWS OF FURTHER ALPHA TECHNOLOGY MMA PLANTS IN SAUDI ARABIA AND THE USA



Further to our earlier announcement of a joint venture to manufacture MMA and pMMA, our parent company, MRC, and SABIC have confirmed the formation of The Saudi Methacrylates Company (SAMAC) and the appointment of CTCI Corporation as the EPC construction partner for the plants being built in Al-Jubail, Saudi Arabia. MRC and SABIC each have a 50% stake in the JV. CTCI Corporation (Taiwan) will begin construction of the plants in October 2014 with operations expected to start up in 2017.

MMA will be manufactured using Alpha technology developed and patented by LI - capacity will be the world's largest at 250kte/annum, while the pMMA plant will produce 40kte/annum. The JV will benefit from very competitive feedstock in Saudi Arabia.

LI's CEO and MRC Board Director, Ian Lambert, said: "This announcement confirms another key step in the commercial roll-out of Alpha in line with our vision for the industry. With construction due to begin we are advancing the next Alpha project. I'm also pleased to announce that MRC, has signed a memorandum of understanding with Mitsui & Co for the establishment of a JV in the USA to use Alpha technology for another world-scale unit. MRC will be the majority shareholder."

METHACRYLIC ACID IN THE USA

Following the successful start up of the HCN plant in Beaumont, Texas earlier this year, our colleagues in the USA had further cause for celebration! In July, a brand new, fully integrated Methacrylic Acid (MAA) plant was brought on line to serve customers across the region. Integration of the new plant into the existing MMA facility provides the manufacturing flexibility to optimise production rates of both MAA and MMA to match demand while maintaining maximum overall throughput. The Beaumont location, along with the MAA terminal assets that were constructed as part of the project, provides excellent flexibility and will ensure that we deliver the very best service to our customers.



TAKING A CLOSER LOOK AT THE MARKETS



LUCITE INTERNATIONAL'S (LI) METHACRYLATE MONOMERS TEAM, WHICH SERVES THE EMEA REGION, IS PASSIONATE ABOUT DELIVERING ADDED VALUE TO ITS CUSTOMERS AND INDUSTRY PARTNERS IN THE MERCHANT MARKET. TO BE EFFECTIVE IN WHAT WE DO REQUIRES US TO CONTINUALLY INVEST TIME AND ENERGY INTO UNDERSTANDING THE MARKETPLACE AND ITS DYNAMICS. OUR LOCAL REPRESENTATIVES IN THE FIELD TOGETHER WITH OUR WORLD-CLASS BUSINESS SYSTEMS MEAN WE HAVE THE BEST POSSIBLE ACCESS TO RELIABLE INFORMATION TO DO JUST THAT. AS PART OF OUR REGULAR REVIEW, PUBLISHED BOTH ONLINE AT WWW.LUCITEINTERNATIONAL.COM/MONOMERS/EAME AND HERE IN FREEFLOW, WE SHARE WITH YOU THE VIEWS OF MALCOLM KIDD, BUSINESS DIRECTOR FOR METHACRYLATE MONOMERS IN EMEA.

“DEMAND FROM THE CONSTRUCTION SECTOR HAS RETURNED IN SOME OF THE HEALTHIER ECONOMIES AND THIS, PLUS STRONGER AUTOMOTIVE PRODUCTION HAS RESULTED IN IMPROVED DEMAND LEVELS.”



Image: Malcolm Kidd is LI's Business Director for Methacrylate Monomers in the EMEA region.

DOWNSTREAM MMA USE IN A MATURE MARKET

23%	Cast acrylic sheet for glazing, signs, lighting, fabrication and sanitary ware.
32%	PMMA for auto, medical, optical, point of sale, light transmission, sound barriers.
25%	Surface coatings, acrylic latex, lacquers and enamels.
12%	Resin for glass interleavants, coatings and medical.
7%	Impact modifiers and processing aids for rigid PVC window and other profiles.
1%	Composite sinks, solid surface.

Demand continues to be good

MMA demand has been good over the last six months; a combined effect of the two main application segments. Seasonal demand for the manufacture of coatings has been largely at, or in some cases, ahead of forecast this year. At the time of writing, it looks as though the season will be prolonged into September and October. Demand from the coatings segment is slightly up on last year, but there has been a definite uplift in certain speciality applications and specific geographic areas. Demand from the pMMA segment experienced an upturn in Q2, which has been sustained through Q3. Demand from the construction sector has returned in some of the healthier economies and this, plus stronger automotive production has resulted in improved demand levels.

Supply chains are being stretched

There have been a large number of planned overhauls globally thus far in 2014, with more to come over the next few months. These overhauls, combined with several unplanned events (including those at our own facilities) have at times tested both local supply chains and the capabilities of global supply. Global supply chains have responded, however, the market has continued to feel tight and to operate with lower than normal inventory levels; and will continue to do so for a period of time. As EMEA continues to be a net importer of MMA, the supply / demand dynamics in the other regions will continue to have an impact on product availability in the region.

MRC / LI continue to invest for the future

Since the last issue of FreeFlow, LI's new synthetic HCN / ACH production assets in Beaumont, Texas have continued to operate well. The Company has also brought its new MAA asset at the Beaumont site successfully on line. In recent months MRC has made two significant announcements about the roll out of Alpha, the patented technology originally developed and commercialised by LI. The contract for the construction of the second Alpha MMA plant in Saudi Arabia has now been awarded with work on site due to begin in October 2014. MRC has also signed a Memorandum of Understanding with Mitsui & Co. for the establishment of a joint venture in the US that will utilise Alpha technology.

Outlook

The forecast continues to be for slow but steady demand growth for MMA on average across the EMEA region. The continuing healthy performance of some of the more robust economies in Europe plus the ongoing buoyancy in the Middle East are sustaining demand at good levels and giving hope. The supply side has managed to keep pace with this demand, however, with little new capacity coming on line globally over the next couple of years, it will be an ongoing challenge, particularly if demand from the pMMA segment continues its recent upward trend.

GOING BEYOND CUSTOMER EXPECTATIONS

KOLPA D. D. OF METLIKA IN SOUTHERN SLOVENIA IS AN AWARD-WINNING MANUFACTURER OF INNOVATIVE, ACRYLIC-BASED BATHROOM PRODUCTS. TODAY, AFTER MORE THAN 35 YEARS OF BUILDING A SOLID REPUTATION FOR HIGH QUALITY PRODUCTS, TAILORED CUSTOMER SERVICES, AND DEEP INDUSTRY KNOWLEDGE, THE COMPANY IS SUCCESSFULLY SELLING INTO MORE THAN 37 COUNTRIES WORLDWIDE. FOR MORE THAN 30 OF THOSE YEARS, KOLPA HAS BEEN BUYING METHACRYLATE MONOMERS AND ACRYLIC SHEET FROM LUCITE INTERNATIONAL (LI). WE ARE DELIGHTED TO SHARE KOLPA’S IMPRESSIVE SUCCESS STORY.

Kolpa san® – the new bathroom experience
Kolpa sells its bathroom products under two main brands: Kolpa san® and Kerrock®. Kolpa san® is all about creating bathroom spaces designed for pleasure and relaxation. The range combines classic functionality with beautiful design and includes an impressive range of bathtubs, shower trays and cabins, outdoor pools with massage options as well as accessories to complete the perfect bathing experience.

Kerrock® – the infinite power of imagination
Kerrock® is Kolpa’s solid surface brand, which is defined by originality and distinction, and is aimed at designers and users who want to make a bold style statement with their environment. It is used in commercial and domestic spaces both for exterior applications, such as facades, and for interior applications, such as washbasins, countertops and furniture.
Kerrock® is made from simple ingredients using clean chemistries and can be shaped into the most imaginative forms. It is available in a range of colours and sizes, resists stains and scratches and can be maintained easily due to its non-porous, smooth surface.
Both the Kolpa san® and Kerrock® brands have become synonymous with advanced materials and design innovation, which meet the needs of today’s discerning consumer.

Partnership based on a shared goal – striving for excellence
With such a well-established product portfolio based on acrylic materials supplied by LI, we asked Mr Kulovec, CEO of Kolpa d.d., why he chooses to work with our Company. He said: “We are aligned in so many ways and both sides have nurtured a strong working relationship over the years. Today, Kolpa sells around 200,000 acrylic products per annum but it is continually looking to create and introduce innovative new solutions for all kinds of built environments. We know that Lucite International (LI) is also developing continually, as a company and as a brand, and it is also dedicated to good social responsibility. In addition, our prime concern is guaranteed product quality and LI offers the best of the best in the marketplace.”

Satisfying a customer’s sense of creativity
Interesting for a manufacturing business, Kolpa’s philosophy is that customers should be able to satisfy their own sense of creativity through embracing the Kolpa san® and Kerrock® branded products into their living and working spaces. It is about bringing original ideas and imagination into reality. Mr Kulovec continued: “Good co-operation with LI and a shared sense of diligent care for customers help us to really live this philosophy and we will continue to strive for this together in the future.”



Environmental responsibility is part of the company’s DNA
We were also interested to learn about Kolpa’s thoughts on sustainability. Mr Kulovec told us: “We are committed to ‘clean production’, which means careful selection and use of raw materials and energy sources, a focus on high productivity and achieving the best product quality. We were awarded environmental quality standard ISO 14001 certification as early as May 2002 as proof of our progress in this respect. Kolpa has also set the highest targets in terms of cutting its negative impact on the world. Our targets include strict waste management

and a constant increase of raw material efficiency, which has led to the introduction of ReKerrock (made from recycled Kerrock® material). We will continue to look for new and better ways of operating and bring products to market to boost the positive and reduce the negative impact we make in the world today.”

Images: [1] Kolpa san® shaped bath and useful shelf surface combine with a clear shower enclosure to form an elegant single unit in this piece from Kolpa’s Grazia range. [2] Beautiful clean lines, ultra white, simplicity itself! Kerrock® bathtub with shower wall with a 3-function mixer outflow/overflow set.

RED DOT RECOGNITION
In recent years, Kolpa’s dedication to design innovation has been recognised by many awards. One of the most prestigious was the Red Dot 2007 award for product design excellence, which was dedicated to the U form bathroom collection made from Kerrock®. An international jury chose the U collection from 2548 entries submitted by companies in 43 countries and highlighted the reasons for their choice as: creativity, innovation, functionality, and high quality standards. The story of that success was repeated in 2010, with CHER, a range of Kerrock® bathroom furniture.





USA, BEAUMONT, TEXAS
Restoration of full MMA capacity plus a new MAA plant

Earlier in 2014, LI restored its ACH MMA capacity and added a brand new MAA plant on site at Beaumont. The site is now operating efficiently to boost robust supply, adding to the global strength of the Group.



USA, GULF COAST REGION
Announcing news of a third Alpha technology plant due for construction

In July 2014, LI confirmed that MRC has announced a Memorandum of Understanding with Mitsui & Co for a JV to build a further world-scale Alpha technology unit. MRC will be the majority shareholder.



UK, CASSEL, TEESSIDE
Focusing on efficiency improvements and sustainability programmes

LI is fully committed to investing to continuously improve the reliability and efficiency of the plants on Cassel site while driving down energy and water consumption and reducing CO₂ emissions.



CHINA, CAOJING
Robust ACH-based MMA plant undergoes significant capacity expansion

LI's original MMA plant has been fully operational since 2005. In 2014, a programme of work began to expand capacity to increase supply flexibility and further support the growth plans of our local and global customers. The new capacity will be available in 2015.



SAUDI ARABIA, AL JUBAIL
New, world-scale 250kte MMA plant based on LI's original, patented Alpha technology

The Saudi Arabia Methacrylates Company (SAMAC), a JV between SABIC/MRC, will commence construction of the Alpha II plant later in 2014. Based on competitive feedstock, production is due to start in 2017.



SINGAPORE, JURONG ISLAND
Original Alpha technology plant receives continuing investment

LI's first Alpha plant was commissioned in 2008 and delivered nameplate capacity from start up. On-going investment in manufacturing excellence is continuing to extract the maximum potential from the plant.

FOCUSING ON OPPORTUNITY

AS THE WORLD'S LARGEST MANUFACTURER OF METHYL METHACRYLATE (MMA), THE COMBINED MRC/LUCITE INTERNATIONAL (LI) ORGANISATIONS CONTINUE TO INVEST INTO CONTINUOUSLY IMPROVING SERVICES TO OUR VALUED MERCHANT CUSTOMERS. THIS ON-GOING COMMITMENT WILL SEE US DELIVER SIGNIFICANT NEW CAPACITY TO SUPPORT THE GROWTH PLANS OF OUR CUSTOMERS AROUND THE GLOBE. IN THIS ISSUE OF FREEFLOW WE BRING YOU UP TO DATE ON SOME OF THESE KEY AREAS OF INVESTMENT INCLUDING THE MOST RECENT ANNOUNCEMENT OF OUR PROGRESS TOWARDS THE NEXT WORLD SCALE ALPHA TECHNOLOGY MMA PLANT, WHICH WILL BE LOCATED IN SAUDI ARABIA.

RESEARCH INTO BIO METHACRYLATES

In addition to investing in its ACH, C4 and Alpha technology based assets for MMA production, MRC/LI continues to commit substantial resources to drive progress in its research and development programmes. Encouraging results are emerging from the work to develop bio methacrylates.



SUSTAINABILITY AT CASSEL SITE UPDATE

ENVIRONMENTAL, ECONOMIC, SOCIAL AND CULTURAL CONSIDERATIONS ARE AT THE HEART OF LUCITE INTERNATIONAL (LI). THEY COME TOGETHER AS DEFINING FACTORS IN OUR STRATEGIC PLANNING PROCESS AND IN THE WAY WE OPERATE GLOBALLY. IN LINE WITH THIS THINKING, LI HAS DETERMINED A SERIES OF 2020 SUSTAINABILITY COMMITMENTS. THESE ARE BACKED BY DETAILED PLANS THAT OUTLINE EXACTLY HOW WE WILL DELIVER AGAINST OUR COMMITMENTS; FROM REDUCING OUR IMPACT ON THE ENVIRONMENT TO MAKING A MORE POSITIVE CONTRIBUTION TO OUR LOCAL COMMUNITIES AND TO THE WIDER WORLD.



Each of LI's global sites is working to progress the Company's corporate sustainability plan by focusing on individual, local projects with their own targets. In the September 2013 issue of FreeFlow we shared the progress that LI's Cassel site had made on its sustainability plan and of course much has happened since then. Amanda Buck, Cassel site's Environment, Energy & Sustainability Manager brings us up to date.

EXTENSIVE ENERGY AUDIT UNDERWAY AT LI'S GLOBAL SITES
Amanda began: "Our certification to ISO50001, the international standard for energy management, continues to progress and we hope to have this in place in early 2015. Leading engineering and environmental consultancy, URS, has carried out an extensive energy audit of the Cassel site and is performing similar audits at our other global ACH-methacrylate production plants in the USA, China and Taiwan. The results of these

audits will be used to identify and prioritise projects that will deliver the greatest energy saving potential. Interestingly, the auditing process looks at our manufacturing operations and assesses the 'environmental culture', as this is an important factor in defining improvements that will deliver progress most effectively.

IMPORTANCE OF UNDERSTANDING BEHAVIOURAL ASPECTS OF ENERGY MANAGEMENT
"URS' energy audit at Cassel produced a list of energy reduction and efficiency improvement projects. Although we had already identified a large number of ideas internally, URS was able to come up with some new ideas and, more importantly, they were able to estimate the cost and benefit of each improvement opportunity, which made it easier to compare the relative merits of each project by looking at the payback periods. We were pleased that URS had also looked at the cultural and

behavioural aspects of energy management. Improving employee engagement through better, more informative communication can lead to significant benefits without the need to invest heavily. The report has now been reviewed and an improvement plan put in place that will allow us to deliver a 20% reduction in energy consumption and CO₂ production from 2010 levels by 2020."

ADDED BENEFIT OF GREATER, MORE OPEN COMMUNICATION
LI colleagues from the US, China and Taiwan also took part in the audit at Cassel. Amanda continued: "Having everyone together allowed the site team to share their thoughts on best practices and improvement ideas with each other and with colleagues from around the world. It helped to generate better, shared understanding of the differences but also the many similarities, and potential gains to be had from making improvements across our processes. Since the audit there has been



even better communication between the sites and we are continuing to share information that could help everyone work together to meet LI's targets."

CASSEL'S WILDFLOWER AREA IS A BLOOMING SUCCESS!
Cassel's Biodiversity Action Plan continues to progress well. This summer the wildflower meadow was in full bloom, enabling wildlife of all kinds to thrive amid our busy site, even in production locations. The wildflower meadow and other initiatives on and around the site are made possible by the hard work of a small group of LI employees who have been supporting INCA (Industry Nature Conservation Association) in delivering the action plan. We look forward to sharing further developments of this great work with you in future editions of FreeFlow and via our blog – sign up now to receive automatic email updates at: blog.methacrylate-monomers.com.

MAKING A DIFFERENCE LOCALLY
Amanda concluded the update with some thoughts on the Company's commitment to being a good neighbour. She said: "It is really important to us that we make a positive difference in the communities where our plants are based and where our people live and work so we are always looking for ways to deliver on this promise. Some of our Cassel employees make weekly visits to local schools where they help children to practice their reading skills. In addition, we provide support to many different charities that our employees are linked to for one reason or another. As an example, in May of this year, 35 people from Cassel volunteered their time and practical skills to help renovate a large property used by the Girl Guides and local community groups, which run various clubs and activities."



Images: [1] Some of the 35 people from Cassel site who happily helped with the renovations at this lovely property used by the Girl Guides and local community. [2] Amanda Buck is Lucite International's dedicated Environmental, Energy and Sustainability Manager for Cassel site.



1



2



3



4



Images: [1] Sound barrier created for the Australian Grand Prix 2012. [2] Lasting high optical clarity, durability and strength are among the key performance factors in these safety panels. [3] Spectators at the F1 race benefit from a safe, clear view. [4] Mr Tito Asher, Plazit-Polygal Group CEO.

PLAZIT-POLYGAL

THE PLAZIT-POLYGAL GROUP IS A LEADING GLOBAL MANUFACTURER AND SUPPLIER OF A COMPREHENSIVE RANGE OF PLASTIC SHEET PRODUCTS. IT HAS BEEN BUYING METHACRYLATES FROM LUCITE INTERNATIONAL (LI) FOR ITS OPERATIONS FOR ALMOST 15 YEARS. IN THIS ISSUE OF FREEFLOW, WE ARE DELIGHTED TO SHARE WITH YOU THE STORY THAT BEGAN 40 YEARS AGO IN SOME SMALL RURAL COMMUNITY WORKSHOPS SURROUNDED BY OLIVE TREES AND CITRUS GROVES IN ISRAEL, AND HAS SINCE BECOME A WORLDWIDE INTERNATIONAL GROUP (OLIVE TREES AND CITRUS GROVES STILL IN SITU). WE HEAR FROM MR TITO ASHER, PLAZIT-POLYGAL GROUP CEO.

Both Plazit and Polygal began manufacture of extruded plastic sheets in 1973. Plazit was established in Kibbutz Gazit, located in Israel's beautiful and pastoral Galilee area and Polygal was established in Kibbutz Ramat Hashofet, not far away, in the Megiddo area. Plazit started as a producer of extruded solid sheets, mainly polymethyl methacrylate (pMMA)-based, while Polygal was the world pioneer in the manufacture of polycarbonate multi-wall sheets. From modest beginnings, both companies expanded their operations worldwide and grew to become a global player in the plastic sheet market. In 2011 Plazit and Polygal merged forming the Plazit-Polygal Group. Today, the Group's production facilities are located in Israel, USA, Chile, Bulgaria, Russia and Spain and there are more than 750 employees spread globally.

We asked Mr Asher to tell us more about the exciting product range the Plazit-Polygal Group has to offer its customers. Mr Asher said: "The Group produces more than 55,000 tons of products per year with more

than 50% of sales coming from pMMA-based sheets that are branded Plazcryn (extruded) and Plazcast (cast). We use LI's MMA for manufacturing products under our Plazcast brand."

We were keen to hear in more detail about the products, particularly about how the Group's R&D team has developed innovative additions to the range. Mr Asher continued: "We have developed innovative products such as 'Plazcryn Super', a broad range of impact modified pMMA sheets for different requirements; 'Plazcryn Top', top optical quality, thin pMMA sheets for flat panel displays applications; 'Acryled' pMMA sheets for LED illumination, and 'Plazcryn UV Block' and 'Plazcryn IR Solar' that have special UV and IR blocking qualities engineered into the pMMA sheets. Our latest developments include 'Plazcast SMR', which is a patented metal reinforced sheet for sound barriers and a new on-line coating technology. Plazcast SMR cast acrylic sheets are reinforced with embedded metal wires to provide the extra strength required for the sheets to conform

to the most stringent mechanical and impact tests for sound barriers. This is particularly important for sound barriers where safety is a critical consideration such as alongside bridges."

Plazit-Polygal Group's ambition is to become one of the largest and most visionary pMMA producers in the world. Mr Asher explained the Group's brand promise, 'It's all about commitment'. He said: "It means commitment to our customers, to our workers and also to our suppliers. The Plazit-Polygal Group has established long-term, special relationships with leading raw material suppliers like LI and LI's distributor/agent, Quimidroga, in Spain in order to optimise, supply and provide best value for everyone in the chain."

"At Plazit-Polygal Group we are aware that pMMA is not just a commodity plastic but a highly technical engineering thermoplastic that is continuously penetrating new markets and replacing traditional materials. As the technical challenges increase, we are investing in and developing a team of

engineers and R&D professionals. We are aware that we have to be there for our customers and support their increasing demands and needs."

Sustainability is crucial to every business nowadays and Plazit-Polygal is no exception. Mr Asher concluded: "We are committed to developing new innovative products and applications by integrating our pMMA sheets in new emerging technologies. Sustainability is very important for us. The Plazit-Polygal Group is highly conscious of its environmental responsibilities and we are fully committed to drive progress in this respect. We are currently performing LCA (Life Cycle Assessment) studies and are also involved in solar energy, biodegradables and recycling R&D projects."



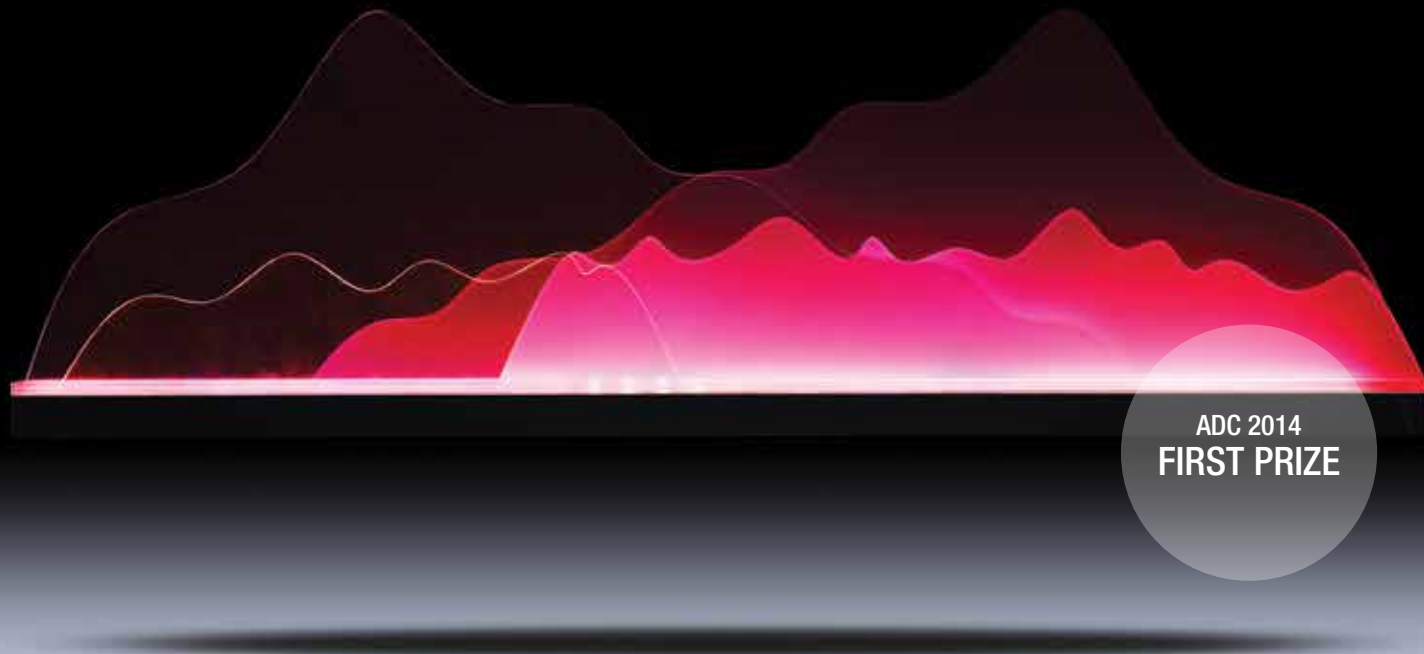
ADC2014

ADC 2014 FIRST PRIZE

Iceberg

Designed by Mei Yaquan of National Cheng Kung University.

Concept: LED lights are located above a matte acrylic surface, which diffuses light so that it shines softly below while the sheet edge provides a more vibrant, linear lighting effect that defines the structure of an iceberg. Using colour changing LEDs creates different moods in a space; ideal for use in the hospitality industry.



IN OUR LAST ISSUE OF FREEFLOW WE SHARED WITH READERS A SHORT ARTICLE THAT DEFINED OUR SIX-POINT APPROACH TO THE WAYS IN WHICH WE BELIEVE WE CAN WORK TO DELIVER EVEN MORE VALUE TO OUR CUSTOMERS' BUSINESSES. PROMOTING METHACRYLATE SYSTEMS AND INVESTING IN INNOVATION WERE TWO OF THOSE KEY POINTS. IN THIS ISSUE WE DEMONSTRATE THE PROGRESS THAT IS BEING MADE BY OUR COLLEAGUES IN ASIA AND THE AMERICAS WORKING WITH THEIR CUSTOMERS TO BRING THOSE CONCEPTS TO LIFE AND HOPE THAT IT STIMULATES IDEAS FOR US TO TAKE FORWARD TOGETHER HERE IN EMEA.

It is now six years since Lucite International in China (LIC) launched the Acrylic Design Competition (ADC) to students at some of China's most prestigious fine arts universities. The goal was to build awareness and understanding of acrylic and encourage young people to use it as part of their studies and to consider continuing to do so in their future careers.

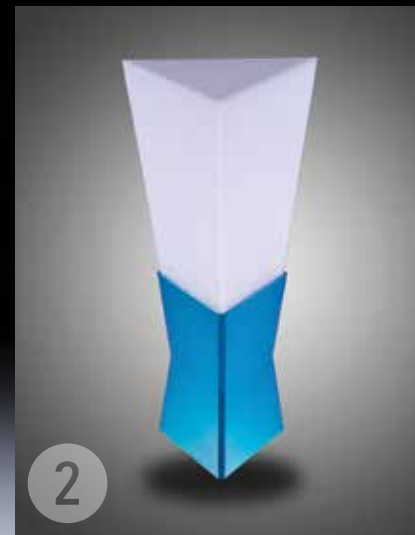
This year's competition attracted 175 entries from young designers studying at the Guangzhou Academy of Fine Arts, Nanjing University of Arts, Tsinghua

University, Sichuan Academy of Fine Art, Tongji University, the China Academy of Art as well as from the National Cheng Kung University in Taiwan. The high quality and variety of concepts that resulted as students turned their design ideas into reality clearly demonstrated the sheer flexibility offered by acrylic as one of today's most versatile modern materials.

Chris Cowell, LIC General Manager, commented: "The ADC gives us an opportunity to talk directly with the people who will help shape our future through

design - through buildings, through products, and in environments where communities live and work together. Giving young designers in the early stages of their studies a great experience of acrylic in terms of its qualities and the benefits they can bring is a powerful way of inspiring them to use it in their future work.

"An important part of the ADC is teaching students how to process acrylic into finished products. This has been made possible because of the fantastic, close working relationships that we have



ADC 2014 SECOND PRIZE (joint) Crystal soapbox

Designed by Zhu Tingting of Tongji University

Concept: Combining the use of natural light with the exceptional optical clarity and the high light transmission qualities of acrylic make this small soapbox a beautifully simple, yet elegant washroom piece.

ADC 2014 SECOND PRIZE (joint) Spotlight

Designed by Liu Tingyu of National Cheng Kung University

Concept: Using the diffusion qualities of frosted acrylic sheet, and strong angular lines of the metal base to link through, the designer has achieved an intense, yet soft directional light that combines beautiful form with efficient functionality.

ADC 2014 LUXEON LED PRIZE Flow hanging lamp

Designed by Xie Yu of China Academy of Art

Concept: Different thicknesses of transparent acrylic sheet have been moulded to create the gentle curves of this unique hanging lamp concept. Called 'Flow' to reflect a natural form, it introduces a sense of charm and intrigue to the practical side of lighting an environment.

with our manufacturing partners and their fabricator partners too. With this collaborative approach, students are able to gain first hand experience of processing acrylic in a commercial environment, which has proved invaluable."

In 2013, collaboration also extended to Philips Lumileds, which sponsored LUXEON LED, a new award introduced to encourage students to combine LEDs with acrylic in their work. From the 2013 and 2014 entries, it is clear that combining LED light with acrylic is firmly established as a winning combination.

Looking forward to 2015, Chris commented: "The ADC has been incredibly important in spreading the word to designers and fabricators so that acrylic is on their list of materials that can bring value to their work. Now that acrylic is firmly lodged in the minds of this design community we need to evolve the competition to bring in the element of commercialisation at scale without losing the freshness of pure design thought and this will be our focus in 2015."

The LuciteLux® JUST IMAGINE Awards, USA

At LI in the USA, the LuciteLux® cast acrylic sheet team has been running the JUST IMAGINE Awards for two years. Again, the purpose is to both educate and inspire the design community so that they consider using the material more frequently. With a judging panel that includes Jamer Hunt, of the world-famous Parsons The New School for Design and Ron Labaco, Marcia Docter Curator for the Museum of Arts & Design in NYC, the Awards have already delivered great results. Last year's winner, technology collective, Light At Play, created the Radiance Dome, which incorporates LED lights that are activated by music and illuminate more than 200 LuciteLux® Light Guide Panels. The structure was created for the 2013 Burning Man festival, where it provided cover for a huge dance floor. More at: <http://bit.ly/Y14wSo>

Chris Robinson, Business Manager at LI Inc said: "Last year we had some incredible entries from designers who embraced the possibilities of creating with LuciteLux®. We have been overwhelmed by the opportunities the Awards have given us to open doors and start conversations with designers. Their creative minds are bringing a whole new dimension to the future for acrylic."





TALENTED YOUNG PEOPLE ARE OUR FUTURE

LUCITE INTERNATIONAL (LI) HAS LONG BEEN COMMITTED TO INVESTING IN THE FUTURE SUSTAINABILITY OF ITS OPERATIONS THROUGH ATTRACTING AND RETAINING TALENTED PEOPLE. OUR SITES IN CASSEL AND NEWTON AYCLIFFE, UK ARE NOW BENEFITING FROM A GROUP OF YOUNG PEOPLE WHO HAVE TAKEN UP PERMANENT POSITIONS AFTER SUCCESSFULLY COMPLETING THEIR APPRENTICESHIPS AND TRAINING PROGRAMMES. THEY BRING A FRESH SET OF ENERGIES AND NEW IDEAS INTO THE BUSINESS OF MANUFACTURING AT LI. FREEFLOW FINDS OUT MORE.

Images: Pictured with Laboratory Analyst Natasha Connor (centre) at the Cassel site are Production Technicians (left to right) Dean Blakemore, Tom Swan, Tom Walker, and Cameron Appleyard. Not in the picture are Laboratory Analyst Stuart Arkle, based at Newton Aycliffe and Production Technicians Daniel Liddle and Liam Rutherford.

A quarter of LI's 300-strong workforce in northeast England is now made up of people under the age of 30 and the latest new employees follow in the footsteps of many other former sponsored apprentices, who have been taken on in recent years to both protect and further enhance the Company's knowledge and skills base.

Six production technicians (Cameron Appleyard, Dean Blakemore, Daniel Liddle, Liam Rutherford, Tom Swan and Tom Walker) have joined the Cassel site team after completing their Technical Apprenticeships, sponsored for the full 3-4 year term by LI. Demonstrating the exceptionally high standards reached by our 2014 apprenticeship recruits, Cameron Appleyard received a City & Guilds national award for his Process Operations studies.

In addition, the Company has engaged two laboratory analysts who successfully completed a 2-year sponsored Young Scientist programme. Natasha Connor has joined our Cassel laboratories while Stuart Arkle joins our polymers and resins business in Newton Aycliffe. LI will continue to support Natasha and Stuart while they continue their part-time studies for a BSc in Chemistry.

Melanie Jury, Cassel Site Director said: "We are delighted with the young people we've recruited this year. All demonstrated the high levels of motivation and achievement we were looking for during their apprenticeships and were given permanent jobs totally on merit. We're very proud of our track record of recruiting people as part of our educational sponsorship programmes. Apprenticeships coupled with on-going staff training and development are an essential part of our succession planning as we look to a sustainable future."



WE VALUE YOUR OPINION

We would very much like to know what you think of FREEFLOW. If you have a particular area of interest or would like to see a particular issue covered next time, please do let us know by emailing comments to: lyn.hatch@lucite.com

All information or advice provided in this Magazine is intended to be general in nature and you should not rely on it in connection with the making of any decisions. Mitsubishi Rayon Lucite Group Limited and the companies within the Mitsubishi Rayon Lucite Group Limited group of companies try to ensure that all information provided in this Magazine is correct at the time of inclusion but does not guarantee the accuracy of such information. Mitsubishi Rayon Lucite Group Limited and the companies within the Mitsubishi Rayon Lucite Group Limited group of companies are not liable for any action you may take as a result of relying on the information or advice within the Magazine nor for any loss or damage suffered by you arising therefrom.

FREEFLOW/15-V14

FREEFLOW

THE DYNAMICS OF A GLOBAL ACRYLICS BUSINESS

No.5



Lucite
International

FREEFLOW'S AIM IS TO SHARE INFORMATION AND MARKET INTELLIGENCE TO HELP OUR CUSTOMERS IN THE MMA INDUSTRY GROW AND PROSPER.

WELCOME TO THE FIFTH EDITION OF FREEFLOW, OUR PUBLICATION AIMED AT THE METHACRYLATE MONOMERS INDUSTRY IN EUROPE.



Peter Snodgrass
Sales Director, Europe

Lucite International (LI) is committed to providing active support to its partners in the methacrylates sector. We always aim to share our thoughts, address issues and, through being pro-active in the marketplace, try to ensure that we all benefit from the opportunities that exist in our industry.

In this issue of FreeFlow, the main focus is our new organisation and the positive news that we are now part of the Mitsubishi Rayon Group of companies (MRC). The article on pages 6 and 7 provides a brief introduction to MRC and aims to address some of the immediate questions that our customers and partners might have. At LI we are all very optimistic about the new venture. We are confident that our combined talents and core capabilities will strengthen our lead position in the methacrylates industry, giving us an even better opportunity to add value to our customers' operations.

Last September we reported on our brand new Alpha technology plant in Singapore, which is now up to full capacity. Alpha 1 represents a remarkable achievement. Taking proprietary technology from the laboratory to a world-scale plant and on to full capacity as we have done is a credit to those who have worked so diligently to make it happen. Now MRC and Saudi Basic Industries Corporation (SABIC) have agreed a Letter of Intent to investigate investment opportunities in MMA and PMMA. The immediate focus will be the opportunity for Alpha 2 in Saudi Arabia at a scale of 250kte. However, other locations and investment options are still being reviewed.

Looking at the industry generally, we share with you our current analysis of the MMA market. After a year of unprecedented turmoil, our Monomers Commercial Director, Malcolm Kidd presents his views. There are some definite signs of an upturn, and we are cautiously optimistic about where things will lead during the remainder of 2009 and into next year. Fiona Smith, our REACH Manager also provides some latest information on end-use descriptors.

As always, we are keen to ensure FreeFlow provides you with useful input. Please do let me know if there are any specific issues that you would like us to address in our next issue by emailing me direct at: peter.snodgrass@lucite.com



BETTER TOGETHER

At the beginning of 2008, I said in FreeFlow that it was going to be an exciting year for Lucite International (LI). And we were not disappointed. Our brand new Alpha 1 plant in Singapore came on stream safely, ahead of time, and has been operating at full flowsheet capacity since early 2009. In November we announced our acquisition by Mitsubishi Rayon Company (MRC), a deal that was completed in May of this year and one that strengthens our position as the leading global supplier of methacrylates.

MRC and LI have a long and successful history in acrylics, which dates back to the 1930s. Our organisations have a rich heritage of growth and innovation and complement each other very well with strengths in different areas and across a unique range of technologies and geographic locations. We are delighted to be part of a new and progressive company, which is passionate about acrylic and has the ambition and drive to go even further as an innovative and reliable supply partner in our global industry. The process of integration is now well underway,

and the progress that we make over the coming months will underpin our ongoing commitment to deliver our promises to customers, as we emerge from a tough 12-months of business.

The difficult times that we have all experienced over the past year have given us many opportunities to learn lessons, which will stand us in good stead as we look to the positive signs of recovery. Today, many of our customers are seeking record levels of product from us as they re-stock their supply chains. Our business is in good shape, production is running well and we are supporting the upturn as it develops. The remainder of 2009 looks promising, the outlook for 2010 is difficult to call but likely to be better than 2009 and we are excited about our future with MRC and unearthing the positive benefits that we can share with you.

Neil Sayers
VP Europe, Africa, Middle East,
Americas & Technology

TAKING A CLOSER LOOK AT THE MARKETS

DELIVERING HIGH QUALITY, RELIABLE PRODUCTS AND SERVICES TO OUR CUSTOMERS IN THE MMA MERCHANT MARKET IS PARAMOUNT TO LUCITE INTERNATIONAL (LI). ACHIEVING THIS CONSISTENT ON TIME, IN-FULL SUPPLY REQUIRES US TO HAVE A COMPREHENSIVE UNDERSTANDING OF THE MARKET DYNAMICS. WITH OUR WORLD-CLASS BUSINESS SUPPORT SYSTEMS AND LOCAL MARKET KNOWLEDGE WE ARE UNIQUELY PLACED TO ACCESS RELIABLE AND UP-TO-DATE MARKET DATA. AS PART OF A REGULAR REVIEW THAT IS PUBLISHED BOTH ON LINE (VISIT WWW.LUCITEINTERNATIONAL.COM/FREEFLOWMARKET) AND HERE IN FREEFLOW, WE SHARE WITH YOU THE VIEWS OF MALCOLM KIDD, LI'S COMMERCIAL DIRECTOR FOR MONOMERS IN EUROPE, AFRICA AND THE MIDDLE EAST.



Image: Malcolm Kidd is LI's Commercial Director for Monomers in the EAME region. To access his regular three monthly review of the MMA market, please visit: www.luciteinternational.com/freeflowmarket

DOWNSTREAM MMA USE IN A MATURE MARKET

35%	Acrylic sheet for glazing, fabrication, signs, lighting and sanitary ware
19%	Moulding/extrusion compounds automotive, medical and optical
20%	Surface coatings, acrylic latexex, lacquers and enamels
7%	Emulsion polymers, adhesives and polishes
12%	Impact modifiers and processing aids for rigid PVC window and other profiles
5%	Mineral filled sheet, Corian (DuPont trade mark)
2%	Other polyesters and transesterification

“AT THE TIME OF WRITING IN Q3’09, DEMAND FOR MMA HAS REBOUNDED TO 2007 LEVELS; THE RESULT OF SOME IMPROVEMENT IN UNDERLYING DEMAND AS CONFIDENCE IS RESTORED, AND ALSO AS A RESULT OF RE-STOCKING THROUGHOUT THE DOWNSTREAM CHAIN.”

Since the last issue of FreeFlow in September 2008, the world of MMA has experienced unparalleled change, as has the market for almost every other industrial chemical. As we emerge from that particularly turbulent period, Lucite International (LI) is assessing the state of the ‘new’ marketplace and looking ahead to see what the future will bring.

DIFFICULT TIMES CALL FOR TOUGH DECISIONS

Within the last four months, two MMA manufacturers in Europe have made announcements that will result in a combined reduction of 17% in the installed MMA capacity in Europe. This is on top of the closure of both Russian MMA plants in Q2 2008, and represents a significant re-structuring of the industry in a relatively short period of time.

DEMAND HAS BOUNCED BACK

Early signs of a downturn came midway through 2008 and by Q1’09, demand for MMA in Europe, Africa and the Middle East fell to about 65% of the record levels experienced 12 months earlier. However, by Q2’09 that statistic had improved to about 85%. At the time of writing in Q3’09, demand for MMA has rebounded to 2007 levels; the result of some improvement in underlying demand as confidence is restored, and also as a result of re-stocking throughout the downstream chain.

The up-turn in demand from the coatings segment was first observed in early Q2’09 and was due to the traditional seasonal increase in demand for coatings applications through the summer months. This has been primarily for architectural coatings and for wood and metal, but demand from the automotive sector has also picked up as a

result of the various stimulus packages being implemented by countries around Europe.

Today, there are also signs that demand from the cast and extruded sheet markets is improving. This is possibly the most welcoming sign, as it is these segments that are most highly aligned with the domestic construction industry, which suffered the biggest downturn during the first half of this year.

Demand in the Asian market had already started to increase by early Q2’09, driven by PMMA demand for LCD screens. This level of demand is continuing as we enter Q4. Demand in the Americas is still subdued, although the market is balanced with demand being in line with available capacity.

FLEXIBILITY IS KEY

Despite the recovering demand levels in Europe, few players are able to give confident predictions on the outlook for Q4’09, or 2010. It is clear therefore that there will be a requirement for manufacturers to be flexible and be able to adapt to whatever market environment materialises over the coming period.

NEW PROJECTS COMING TO MARKET – BUT WHAT NEXT?

Over the past year, the majority of new plants that were scheduled to start operating have been brought on-line more or less to plan. From LI’s perspective, the pinnacle was the safe and successful start-up of the Alpha 1 plant in Singapore, which is operating at flowsheet rates. The Daesan MMA plant became operational in Q2 this year and Evonik intends to bring its plant in China on-line later this year. MRC will bring its new plant in Thailand on-line in 2010, but after that, the arrival of new capacity is much less certain. Some smaller uprate projects are also

being completed in this time scale.

However, major projects planned for completion post 2010 would have to have been sanctioned during the last 12 months, which would have been difficult in an environment where chemical companies have been struggling to return the margins required to support new investment. The longer that this period of economic uncertainty lasts, the greater will be the delay to all but the most financially attractive and robust of new-build projects.

COST BASE

Feedstock costs remain a concern. While the current elevated demand for MMA is welcomed, the general increased level of demand for base chemicals is a concern for the cost base of manufacturers. The trend of increasing acetone costs through Q1 and Q2 this year against a backdrop of falling MMA prices was unsustainable and meant that the trend had to be reversed; hence MMA prices increased in Q3. However, the relentless rise in acetone costs is continuing through Q3 and methacrylates prices must now be moved upwards again to ensure that manufacture remains profitable.

SUMMARY AND OUTLOOK

The landscape in Europe is going through a period of significant change, to which we will all have to adapt. The MRC/LI group continues to invest in new, cost-effective capacity, and to bring that capacity to market for its customers via reliable supply chains. The outlook on demand is still unclear and the ongoing challenge for LI will be to remain as flexible and responsive as possible to customer needs in what will inevitably continue to be a dynamic market.

MITSUBISHI RAYON CO LTD

BRINGING YOU SOME OF THE KEY FACTS TO HELP YOU UNDERSTAND A LITTLE MORE ABOUT MRC AND HOW, DESPITE BEING A GLOBAL COMPANY, ITS OPERATIONS ARE VERY MUCH LOCALLY FOCUSED AND SECTOR SPECIFIC.

MRC is an independent Japanese company that forms part of the Mitsubishi community. Mitsubishi is perhaps better known by its three red diamond logo and for cars and electrical goods, but the organisation also has interests in many other sectors, such as food and drinks, mining and steel, hotels and travel, business services, and textiles to name just a few. Some use the Mitsubishi name, but many do not; usually because there is significant inherent value within their own company name when then join the Group. MRC began in 1933 and now employs around 7500 people all over the world. By far the largest part of its operations is within Asia. In 2007, MRC’s turnover was

more than ¥400bn/£2.5bn/\$4bn, which was achieved through four core operational segments:

- Chemicals and Plastics – 45%
- Acetate Fibres, Membranes and others – 26%
- Acrylic Fibres, AN Monomers and Derivatives – 18%
- Carbon Fibres and Composites – 11%

Lucite International (LI) will integrate with MRC’s Chemicals and Plastics business, which accounts for almost 45% of its total operations by turnover. The shape of the MRC’s Chemicals and Plastics business is shown in the following chart.

Products	Quantity (kte)	Primary applications	Production facilities
MMA monomer	400+	Acrylic resin pellets, methacrylic esters	Japan (50%), China (25%), Thailand (25%)
PMMA polymer	100	Automotive components, liquid crystal display parts, office equipment, lenses	Japan (50%), China (40%), Thailand (10%)
Acrylic sheet	66	Signage, LCD displays, large aquaria, illuminated directional signage	Japan (70%), Thailand (30%)
Coating resins, modifiers	51	Coatings, automotive undercoating, inks, adhesives	Japan (60%, Thailand (20%), China (7%), North America (13%)



Masanao Kambara, President, Mitsubishi Rayon Co Ltd.



Ian Lambert, CEO, Lucite International

IN THIS ISSUE OF FREEFLOW WE HEAR FROM IAN LAMBERT, CEO OF LUCITE INTERNATIONAL, AND MR MASANAO KAMBARA, PRESIDENT OF MITSUBISHI RAYON CO LTD, ON THE JOINING UP OF TWO IMPORTANT COMPANIES WITHIN THE MMA INDUSTRY. THEY SHARE THEIR THOUGHTS ON THE FUTURE AND WHY THE TWO BUSINESSES WILL BE BETTER TOGETHER.

“We are delighted to welcome Lucite International’s (LI) loyal customers to the Mitsubishi Rayon Corporation (MRC Group). Combining our corporate cultures, our strengths and talents and unifying our businesses with a set of common goals is another important step in us being an even stronger and supportive partner within the methacrylates industry. It is our fundamental belief that by being together, we have the best possible chance of making a tangible difference to our customers and their businesses, to our employees and our own operations and to the communities we serve all over the world.

MRC’s philosophy is captured in the motto; ‘Best Quality for a Better Life’, which centres on helping to bring about a brighter future for people all over the world. LI’s philosophy is embodied in the words, ‘Going Further’, which symbolises our own single-minded determination to achieve excellence in all that we do to provide outstanding value and performance for our customers and stakeholders. These sentiments share a lot of common ground and show that we have the same set of corporate values as we pursue our vision.

Now, the MRC Group and LI will share business resources as we move forward. The new enterprise will create opportunities for significant cross leaning which we expect to lead to productivity, innovation and efficiency gains that will be beneficial to our customers. Our goals in the first stage of joining together must be achieved rapidly so that we can fully support our valued customers as we emerge from a difficult economic environment. It is a little early to describe exactly how the combined group will be organised, however, we assure you of absolute continuity of service and open communication. Now is an excellent time for us to make real progress and we look forward to working with you to achieve even more together.

Masanao Kambara

Ian Lambert

Timeline

MRC and Lucite International share a rich heritage of growth and innovation, which began on opposite sides of the world and dates back to the 1930s. Our timeline illustrates some of the key dates and events from almost 80 years of historic development.

Lucite International Activities

1930s

ICI invents the first technology process for MMA and begins prduction of MMA and Perspex sheet at Cassel, UK. DuPont begins production of MMA and Lucite sheet at Belle, USA.

1940s

ICI establishes Darwen plant as the main production site for Perspex in the UK.

1960s

ICI expands into continental Europe with Rozenburg site in Holland. DuPont expands in the US establishing Memphis and Parkersburg facilities.

1970s

ICI establishes joint venture with CPDC in Taiwan to produce MMA. First continuous cast sheet line is established in Memphis, USA.

1980s

ICI Acrylics established within ICI.

1990s

DuPont and ICI invest \$500m in new MMA facilities in USA, UK, Taiwan. ICI invests in Ibaraki, Japan.

1993

ICI acquires DuPont's acrylics business.

1994

Thai Poly Acrylic, Thailand is acquired.

1999

Charterhouse Development Capital acquires ICI Acrylics and forms Ineos Acrylics.

2000

Acquisition of Acrylic Products, South Africa and Bonar Polymers, UK.

2002

Alpha technology proven and patented.

Mid

2000s

New MMA plant in China becomes operational. Construction of world's first Alpha plant begins.

2008

Alpha plant, Singapore becomes operational.

MRC Activities

1933

The forerunner to Mitsubishi Rayon, Shinko Jinken Co Ltd was established. The Company commercialised rayon staple fibres as an alternative to wool and cotton.

Mid

1930s

Asahi Glass Co Ltd and Nippon Chemical Industries produced early acrylic resins in Japan. To meet growing demand Shinko Jinken began MMA production at Otake.

Mid

1930s

Factory established at Otake in Hiroshima Prefecture to produce rayon spun fibre.

1937

Shinko Jinken became a member of the Mitsubish group.

1940s

Shinko Jinken merged with Nippon Chemical Industries and Asahi Glass to create Mitsubishi Chemical Industries Co Ltd.

1952

As part of post-war restructuring, Mitsubishi Rayon was launched as a new business to manufacture and sell synthetics fibres.

1950s

Acrylic staple fibres produced at Otake and diacetate filaments produced at Toyama.

1960s

Triacetate fibres are launched. New Toyohashi plant enables polypropylene and polyester fibre production, making the Company a major synthetic fibre manufacturer.

1970s

Economic shifts led the Company to develop new materials and technologies as it withdrew from the rayon staple business.

1980s

Based on its long experience in synthetic fibres, the Company established a whole new range of advanced materials as drivers for next generation growth.

1990s

High-speed growth led to MMA business expanding to acrylic sheet and molding/ information materials manufacture.

Mid

1990s

New production bases in China and Thailand are part of groundwork for future growth.

2000

Increased focus on CSR. Polymer synthesis, precision molecule design technologies, advanced carbon fibres and water treatment technologies are key to establishing the Company as a high-earnings, strong-growth group.

2009

MRC acquires Lucite International.

REACH

UPDATE – NEXT STEP

AS REACH MILESTONES ARE PASSED AND WE DEVELOP REGISTRATION DOSSIERS WITHIN CONSORTIA AND SUBSTANCE INFORMATION EXCHANGE FORA, LUCITE INTERNATIONAL’S (LI) REACH MANAGER, FIONA SMITH, PROVIDES AN UPDATE ON THE PROGRESS OF THE METHACRYLATE MONOMER REGISTRATIONS AND HIGHLIGHTS THE NEXT KEY COMMUNICATIONS WITHIN THE SUPPLY CHAIN.

1

REACH RECAP

All qualifying substances manufactured or imported into the EU should now be registered or pre-registered with a phase-in deadline. The next key obligations within the supply chain are:

REGISTRANT	• Participate in Pre-SIEF/SIEF to develop registration dossier
	• Evaluate use scenarios either with downstream users or through consortia
	• Complete registration ahead of phase-in deadline
	• Communicate appropriate Risk Management Measures through eSDS
DOWNSTREAM USER	• Communicate use and exposure scenarios (through trade association) to registrant up to 12 months ahead of phase-in registration deadline
	• Implement appropriate Risk Management Measures within 12 months of receiving eSDS

2

DEVELOPMENT OF METHACRYLATE USE AND EXPOSURE SCENARIOS

LI is developing a generic approach to describing exposure scenarios under REACH to simplify communications. These are being developed within the Methacrylate trade associations with the input of Downstream User groups including ERMA, CEPE and others linked through the CEFIC task force.

3

DESCRIBING USES UNDER REACH

Assessment of safe use requires confirmation of use as per the ECHA use descriptor system and the level of exposure determined by the application of standard risk management measures. We are developing these descriptors in-line with the ECHA guidance and will be confirming the exposure predictions and risk management measures with Downstream User groups in due course.

Guidance on a use descriptor system to assist communication within the supply chain is available in chapter R12 of the ECHA guidance document, which can be found at: http://guidance.echa.europa.eu/docs/guidance_document/information_requirements_en.htm?time=1252329902



Fiona Smith, REACH Manager

4

COMMUNICATION OF USE DESCRIPTORS WITHIN THE SUPPLY CHAIN

Downstream Users should be communicating their use descriptors to all suppliers to ensure on-going support for their operations. Wherever possible this should be achieved via trade associations to ensure consistency in use descriptors and to simplify supply chain communication networks. The following should be considered:

- Which substances remain in products?
- How are products used?
- How are raw materials used?
- Are suppliers aware of raw material uses and, if the substance remains in products, downstream uses of those products?

The use descriptor codes are detailed in chapter R12 of the ECHA guidance document

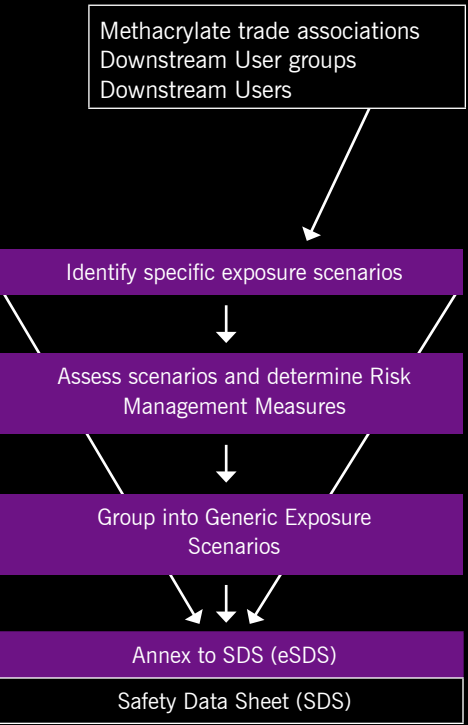
5

NEXT STEPS

LI will make available the full list of the use descriptors and the mapping to Generic Exposure Scenarios on our blog at: www.reach_and_you/info when the assessments have been completed. These will be added in the Annex to the extended Safety Data Sheet.

For more information, please contact Fiona Smith at: reach.info@lucite.com

THE DEVELOPMENT OF THE METHACRYLATE GENERIC EXPOSURE SCENARIOS



Q&A

IN THE FOLLOWING Q&A LISTING WE AIM TO ANSWER SOME OF THE QUESTIONS THAT YOU MAY HAVE ABOUT THE NEW ORGANISATION. HOWEVER, FOR ANY SPECIFIC CONCERNS, PLEASE FEEL FREE TO CONTACT YOUR LOCAL LUCITE INTERNATIONAL (LI) REPRESENTATIVE OR EMAIL ME AT: [PETER.SNODGRASS@LUCITE.COM](mailto:peter.snodgrass@lucite.com) AND WE WILL RESPOND PROMPTLY.

1. WHAT IS MRC'S STRATEGY FOR EUROPE?
MRC's stated objective is to strengthen its leading position in the global acrylics industry. This acquisition now gives them a substantial presence in Europe and North America as well as Asia. We believe MRC's core competencies will be additive to our existing strategy, which will continue to focus our actions on supporting our customers and their businesses.

2. WHAT CUSTOMER BENEFITS WILL THERE BE FROM THE MERGER OF MRC AND LI?
The acquisition will make the combined MRC and LI group one of the world's leading acrylics manufacturers with a wide range of production technologies. This will enable us to serve our customers even more effectively and to adapt more flexibly to raw material trends. The new enterprise will also create opportunities for improved efficiencies, which will enable us to re-invest in the business to ensure that methacrylates continue to be highly competitive with other materials and available to satisfy demand.

3. WILL THERE BE A CHANGE OF COMPANY NAME FOR LI?
We will continue to trade as Lucite International, a wholly owned subsidiary of MRC. The existing senior management team

will remain in place and Ian Lambert, our CEO, will continue to report to the Lucite International Board.

4. WILL THERE BE ANY CHANGE TO THE WAY EXISTING CUSTOMERS DEAL WITH LI IN EUROPE, AFRICA AND THE MIDDLE EAST?

We will continue to operate and trade as Lucite International. All employees that you deal with regularly will remain in place so we do not anticipate any significant changes in the way in which you do business with us.

5. WILL YOU CONTINUE TO MANUFACTURE IN EUROPE?

We have a highly effective and competitive portfolio of European operations, which continue to be a leading supply to our customers.

6. WILL YOU BE OFFERING A WIDER PRODUCT RANGE TO CUSTOMERS?
It is too soon to talk in detail about a combined product offering but we believe the new combined enterprise will create the opportunity for significant cross learning and other gains that will benefit both stakeholders and customers

7. IS THE SAME LEVEL OF CUSTOMER SERVICE STILL AVAILABLE?
Our focus has always been to provide

customers with the highest quality products and services at a price that represents value for money to them. This commitment to provide excellence in both products and services to our customers remains unchanged.

8. WILL CONTRACT AND PRICING DECISIONS BE APPROVED BY MRC IN TOKYO?

No, Lucite International will remain under the operational control of its existing management subject only to the normal delegations of authority established in the companies' constitutions.

9. DO YOU ENVISAGE CHANGES TO THE CURRENT INVOICING/BANKING ARRANGEMENTS?

We believe that all arrangements will remain the same in the foreseeable future. If changes become necessary, we will notify you in plenty of time.

10. WILL THERE BE CHANGES TO YOUR STANDARD TERMS AND CONDITIONS OF SALE?

All our contracts and terms and conditions of sale will continue in full force and are not affected by the sale of shares in the holding company.

WE VALUE YOUR OPINION

We would very much like to know what you think of FREEFLOW. If you have a particular area of interest or would like to see a particular issue covered next time, please do let us know by emailing comments to: peter.snodgrass@lucite.com

All information or advice provided in this Magazine is intended to be general in nature and you should not rely on it in connection with the making of any decisions. Lucite International Limited and the companies within the Lucite International group of companies try to ensure that all information provided in this Magazine is correct at the time of inclusion but does not guarantee the accuracy of such information. Lucite International Limited and the companies within the Lucite International Limited group of companies are not liable for any action you may take as a result of relying on the information or advice within the Magazine nor for any loss or damage suffered by you arising therefrom.

FREEFLOW/09-V5



Profession, Devotion and Concentrate!

www.huashuaite.com

Material Application Solution of Polymethyl Methacrylate

亚克力材料应用方案



Enjoy sunshine, enjoy nature...

www.huashuaite.com

塑料皇后 - 聚甲基丙烯酸甲酯 (亚克力)

聚甲基丙烯酸甲酯, 简称PMMA(Polymethyl Methacrylate), 又称之为压克力 (Acrylic), 英文缩写PMMA, 具有高透明度, 低价格, 易于机械加工等优点, 是平常经常使用的玻璃替代材料。有突出的耐老化性; 它的比重不到普通玻璃的一半, 抗碎裂能力却高出几倍; 它有良好的绝缘性和机械强度; 对酸、碱、盐有较强的耐腐蚀性能; 且又易加工; 可进行粘接、锯、刨、钻、刻、磨、丝网印刷、喷砂等手工和机械加工, 加热后可弯曲压模成各种压克力制品。

出色的物理特性

- 1、承受力强, 抗冲击力强, 是普通玻璃的十六倍。
- 2、透光性佳, 可达93%以上, 具有水晶一样晶莹的品质。
- 3、耐候及耐酸碱性能好, 常年使用也不会产生泛黄及水解的现象。
- 4、自重轻, 比普通玻璃轻一半, 建筑物及支架承受的负荷小。
- 5、色彩艳丽, 高亮度, 是其他材料不能比美的。
- 6、可塑性强, 造型变化大, 加工成型容易。
- 7、维护方便, 易清洁, 用肥皂和软布擦洗即可。
- 8、绝缘性能优良, 适合各种电器设备。
- 9、无色透明可以自由着色, 表面光泽亮丽。对人体无毒性。

Polymethyl Methacrylate--(PMMA) (Acrylic)

Polymethyl Methacrylate (PMMA), or Acrylic, has high transparency, low price and is easily machined. It is usually used as a substitute for glass. It has good function of bearing aging; its specific gravity is less than half of that of common glass, but crack resistance is much higher; it has excellent insulation and mechanical strength; corrosion-resistant to acid, alkali and salt; easy to process; it can be machined by hand and machine such as adhesion, sawing, planing, drilling, carving, grinding, screen printing and sand blasting etc. It can be molded into acrylic products through bending when heated.

Excellent physical properties

1. Strong adaptive capability and impact resistance, which is 16 times than that of common glass.
2. Good light transmission, reached more than 93%, just like crystal.
3. Weatherproof, acidproof and alkaliproof, won't yellow or hydrolyze even though be used for many years.
4. Light-weight, lighter than common glass, buildings and brackets are low loaded.
5. Colorful, high brightness, other materials can not compare with it.
6. Impressionable, easy to shaping.
7. Easy in maintenance and cleaning, can be cleaned with soap and soft cloth.
8. Excellent insulation, suitable for various electric devices.
9. Colorless, transparent, can be colored freely, lustrous, non-toxic.



亚克力具有高透明度,透光率达93%,有"塑胶水晶"之美誉。且有极佳的耐候性,尤其应用于室外,居其他塑胶之冠,并兼具良好的表面硬度与光泽,加工可塑性大,可制成各种所需要的形状与产品。亚克力的隔音性能优异,是隔音屏障的首选材料。另外板材的种类繁多色彩丰富(含半透明的色板),另一特点是厚板仍能维持高透明度。

Acrylic has high transparency, with its light transmittance of 93%, enjoying reputation as "plastic crystal". It is weatherproof, especially in outdoors, ranking the first among other plastics. What's more, it has good surface hardness and luster, impressionable, which can be shaped into all kinds of products. With superb sound insulating performance, acrylic is the first choice of noise barriers. In addition, the sheets are various and colorful (including translucent color sheet), and thick sheets can still maintain high transparency.



亚克力材料典型应用 - - 采光 / 隔音

Material application solution of polymethylmethacrylate--

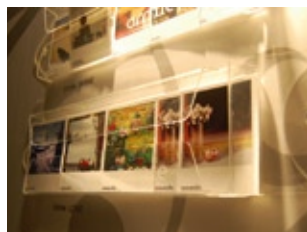
Lighting / Noise Barrier



亚克力材料典型应用--加工制品

Material application solution of polymethylmethacrylate--

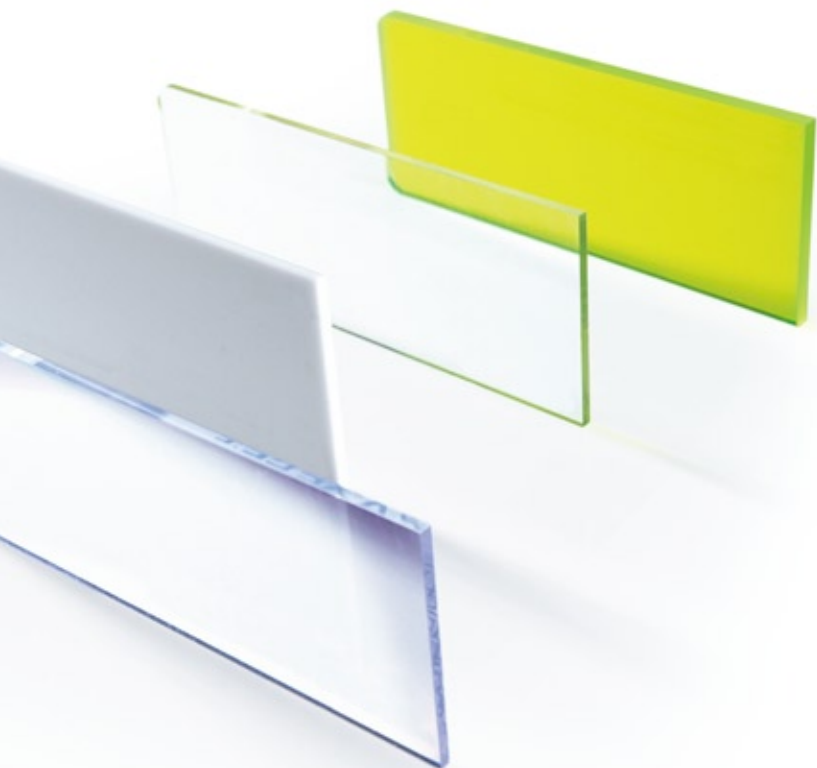
Processing



与传统的陶瓷材料相比,亚克力除了无与伦比的高光亮度外,还有下列优点:韧性好,不易破损;修复性强,只要用简单方法就可以将其擦拭一新;质地柔和,冬季没有冰凉刺骨之感;色彩鲜艳,可满足不同品位的个性追求。用亚克力制作的各类用具、工艺产品,不仅款式精美,经久耐用,而且具有环保作用,其辐射线与人体自身骨骼的辐射程度相差无几。

Compared with the traditional ceramic materials, besides incomparable intense brightness, acrylic has the following advantages: outstanding toughness, not easily damaged; easy to restore, it can be refreshed by simple methods; soft texture, without the feeling of chill in winter; bright color, catering to different personalized pursuits. Appliances and craft products made from acrylic are not only exquisite and durable, but also with the function of environmental protection, because of the similar radiation level between its ray and human bones.





亚克力在广告行业中的应用是其非常重要的用途之一。亚克力板材外表光泽度高，色泽鲜艳，颜色持久性十年以上，有着极其良好的透光性，并且可以轻易热成型，物理性能稳定，抗高温低温变形能力强。经过漫反射工艺处理的板材，明亮均匀、光线柔和，可完美配合LED等节能光源，是理想的广告用板材。



One of its very important applications is in the advertising industry. Acrylic, with high gloss, bright luster, and over ten years' color durability, is of good light transmission and can easily be hot formed, which possesses stable physical performance and powerful resistance to high and low temperature. After diffuse reflection, the sheet is of well-distributed brightness and soft light, which can perfectly match LED lights, therefore it is the ideal sheet in advertising.

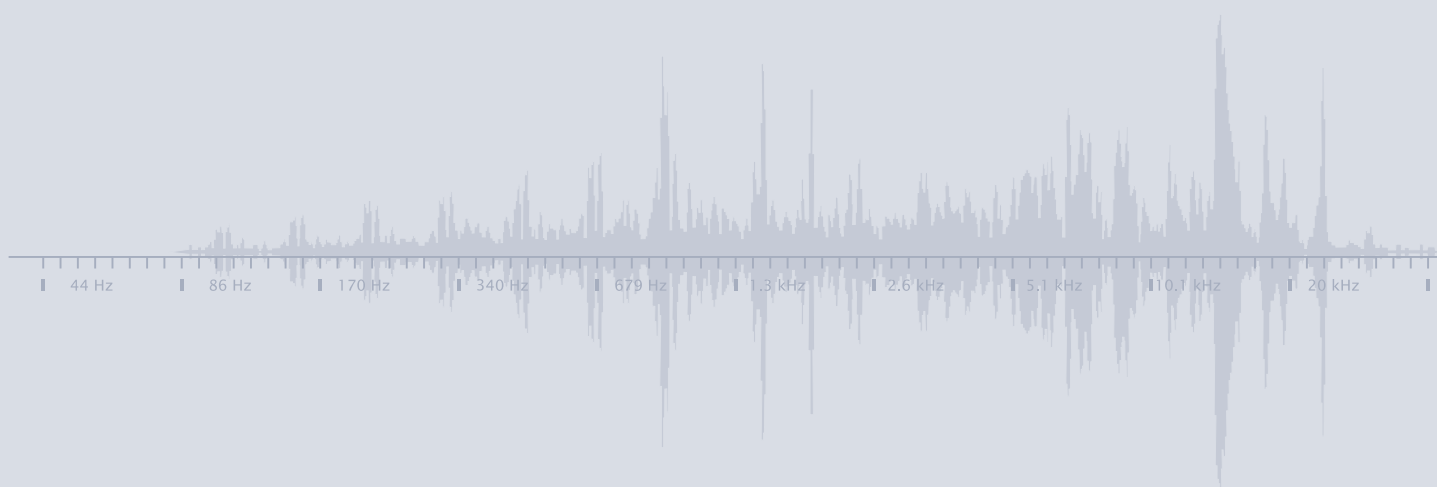
亚克力材料典型应用 - - 广告业

Material application solution of polymethylmethacrylate--
Advertising





亚克力声屏障
解决方案



噪音与环境

亚克力板材在声屏障中的应用

Application in Noise barriers—huashuaite Polymethyl Methacrylate sheet

Noise and the Environment

Noise is a complex phenomenon in our modern, mobile society.

在变化万千的现代社会，噪音已不再是一个简单的社会现象。

The growing noise level of rail and road traffic is detrimental to our health in the long term!


铁路及道路交通噪音日益升级，长期危害着我们的健康！

Noise is the term we give to a Sound we subjectively feel to be a nuisance. A good example is music, which may be "pleasant" or "obtrusive", depending on the listener. On the other hand, noise is also a physical factor that can be precisely measured in the form of sound pressure, sound frequency and sound level. The effects of noise on society and the physical burden imposed by noise have been the focus of numerous scientific studies in the recent past. Noise and its consequences are also the subject of a special report by the German experts' council on environmental issues "Umwelt und Gesundheit" (Health and the Environment). Noise on our roads, for example, continues to rise and has long become one of the gravest problems in industrialized countries.

我们把主观上我们觉得讨厌的声音叫做噪音。音乐就是一个很好的例子，在不同的听众听起来，它可以是使令人愉快的，也可以是吵闹的。另一方面，噪音也是一种可以通过声压、音频及音量等形式精确测量的物理量。

近些年来，噪音对社会的影响及噪音给身体施加的负担已经成为众多科学研究的焦点问题。噪音及其影响已经成为德国“健康与环境”专家委员会针对环境问题的特别报告的主题。例如，道路噪音持续上升，长期成为工业化国家亟待解决的最严重的问题之一。





In densely populated industrialized countries, more people are affected by noise than by any other form of environmental pollution.

在人口稠密的工业化城市, 与其他形式的环境污染相比, 更多的人承受的是噪音带来的影响。

Road traffic is clearly responsible for most noise in cities, before air and road traffic.

显然, 城市里大多噪音是由道路交通带来的, 名列于航空和轨道交通之前。

An estimated 20% of the population in the European Union (some 80 million people) are exposed to daily traffic noise of more than 65 dB(A). The main source of noise is road traffic (approx. 70%), followed by air traffic (50%) and rail traffic (20%*).

According to a field study by HAINES et al (1998) on whether people become accustomed to traffic noise, our perception of noise remains the same at constant noise levels. The study gives no indication that the human ear gets used to noise.

If exposure to noise endures for a prolonged period, this is classified as negative stress that is often accompanied by physical reactions. One result of stress through noise are hormone reactions, including the release of adrenaline, noradrenaline and cortisone. These hormones act on the cardiovascular system, the metabolism, the blood fat level and blood pressure. A long-term increase in cortisone levels may lead to arteriosclerosis and higher cholesterol levels. Sleeping disorders may be one of the secondary results.

据估计, 在欧盟国家 (约8千万人口), 20%的人每天饱受着超过65分贝的交通噪音。噪音的主要来源是道路交通 (约占70%), 紧接着是空中交通 (50%) 和轨道交通 (20%)。

根据海恩斯等人1998年进行的关于人们是否习惯交通噪音的问题上的现场研究结果, 通常保持对持续噪音水平的一致看法。

当人们长期忍受噪音的污染时, 我们将这种危害归为消极的压力, 时常伴随着一些身体反应。噪音导致的压力的一种后果就是荷尔蒙反应, 包括释放肾上腺素, 去甲肾上腺素及肾上腺皮质素的释放。这些荷尔蒙对心血管系统、新陈代谢、血脂和血压起着一定作用。长期持续的肾上腺皮质素可能带来动脉硬化和高胆固醇。失眠可能是一个次要的后果。

* Proportion of persons affected by noise among all those interviewed

* 所有被采访的人中受噪音污染的人口比例



Noise prevention and noise control have the highest priority.

预防噪音和分解噪音成为重点目标

Noise barriers along heavily frequented traffic routes reduce the load on the environment without taking up too much space.

在噪音发生频繁的交通路线设置隔音板，不仅没有占用太大的空间，而且减少了道路噪音对环境的污染。



The limiting value for the risk of heart attack due to noise is a level of 65 dB(A) during the day and 55 dB(A) at night, because this level provokes the release of higher quantities of stress hormones even while people sleep, and even if they are not wakened by the noise. At this noise level, the risk of heart attack goes up by 20%.

Noise is therefore a serious health risk to which we are exposed and to which we must react.

Despite a variety of steps, such as the noise limits for motor vehicles spelled out in EU Directive 92/97/EEC the development of quieter tires and noise-reducing road surfaces, noise cannot be prevented completely.

由于噪音引起心脏病发作的极限值分别为白天65分贝和夜晚55分贝，因为这个级别的分贝值即便在人们睡觉时也能促进释放大量压力荷尔蒙，甚至在没有被噪音吵醒的情况下，压力荷尔蒙也可以被释放。在这个噪声级上，心脏病发作的风险上升20%。

因此，噪音已然对健康产生了严重的威胁。我们正饱受危害，我们必须有所行动。

尽管各种措施已经实施，例如欧盟指令92/97/EEC中阐明对机动车辆实施噪音限制，开发低噪音轮胎和降噪路面，噪音仍然不能完全被阻止。



Noise control along traffic routes is increasingly gaining in importance to control noise levels in the face of rising traffic volume.

面对交通量上升, 沿交通路线的噪音控制设施对控制噪音等级的作用日益受到重视。

Functional and aesthetic noise control with Superior™

实用美观的Superior™ 噪音控制装置

Earthberms and noise barriers of sufficient height are the number one noise control instrument. Since earthberms (usually landscaped) take up a lot of space, noise barriers are normally given preference in built-up areas. As the space between buildings and roads is becoming ever smaller, these barriers need to be attractive-looking as well as functional. Transparent sections in noise barriers help to avoid the tiring tunnel effect for drivers, and offer a better view without casting shadows on the road surface or neighbouring Properties. Noise barriers made from Superior™ S-STOP combine functionality and attractiveness with protection for residents. At the same time, they create a more interesting environment for road users, and successfully dispel the impression of driving through a tunnel.

When noise barriers are installed along bridges, the inherent weight of the structure, its resistance to bridge vibrations and lightweight architecture play an important role in addition to space saving. Here too, highly transparent Superior™ S-STOP, which is much lighter than silicate glass, and above all, much more break-resistant, has proved increasingly suitable in past years.

足够高的噪音屏障和隔音板已经成为控制噪音的最好设备。由于护墙（通常经过美化）占用不少空间，所以在建筑物林立地区通常优先考虑使用隔音板。由于道路和建筑物的空间越来越小，这些屏障就要求兼具醒目的外观和良好的实用性。屏障中透明的部分防止司机产生疲倦的隧道效应，同时在无需照射路面或周围物业的情况下提供更好的视野。华帅特® S-STOP 制造的隔音板结合实用性和欣赏性，并为居民生活提供良好的保障。与此同时，这些屏障给道路使用者创造了更有趣的环境，从而成功地消除了驾车穿过隧道的感觉。

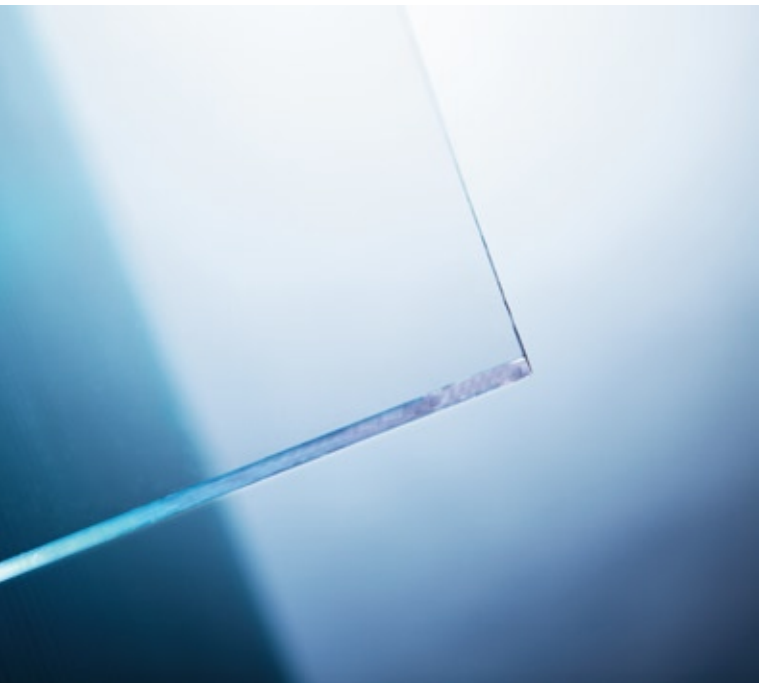
当这些隔音板沿着桥安装的时候，由于结构固有的重量，所以在对桥梁震动和轻量级建筑物的阻力方面发挥着重要作用，当然除了占用一些空间之外。同样地，华帅特® S-STOP 隔音板不但高度透明，而且重量轻于硅酸盐玻璃，最重要的是它具备了更强的抗断裂性，在过去的几年内也逐渐证明它的适用性。

Product Overview

产品简介

There is many years of worldwide experience in the use of Superior™ S-STOP. Superior™ S-STOP is available in different variants to meet a wide range of requirements.

这意味着华帅特® S-STOP在全世界拥有多年的使用经验, 并能以不同的品种来满足各种要求。



Superior™ S-STOP transparent 透明隔音板

Large-sized, highly transparent cast (GS) or extruded (XT) sheets. The clear grade offers a light transmission of over 90 percent. Superior™ S-STOP is available in Clear and in a series of transparent colors.

大尺寸, 高透明的浇铸 (GS) 或挤压板材 (XT)。透明清晰级, 透光率达90%以上。华帅特® S-STOP有一系列清晰和透明色。

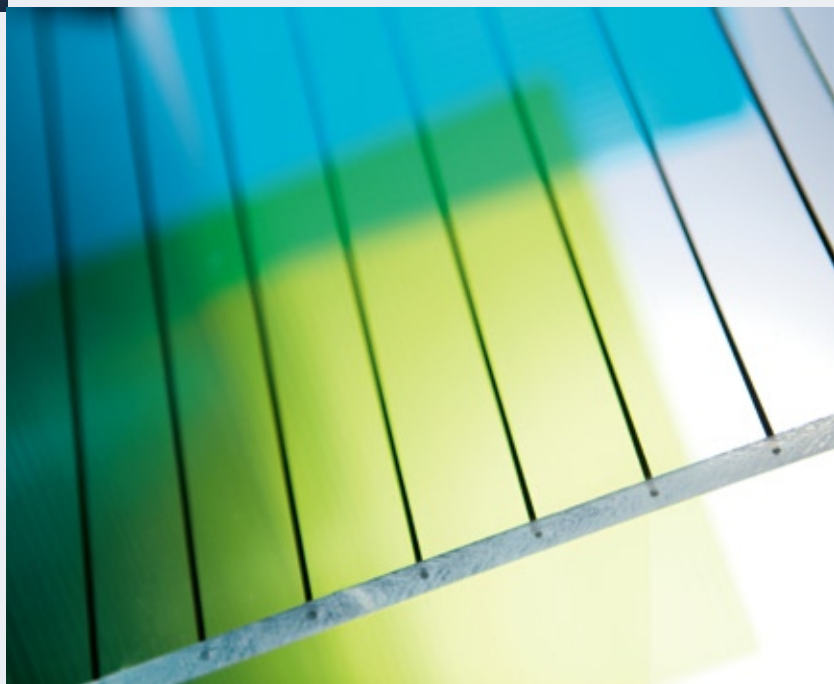
Superior™ S-STOP GS CC Transparent with integrated sliver retention 透明 带裂片保持功能

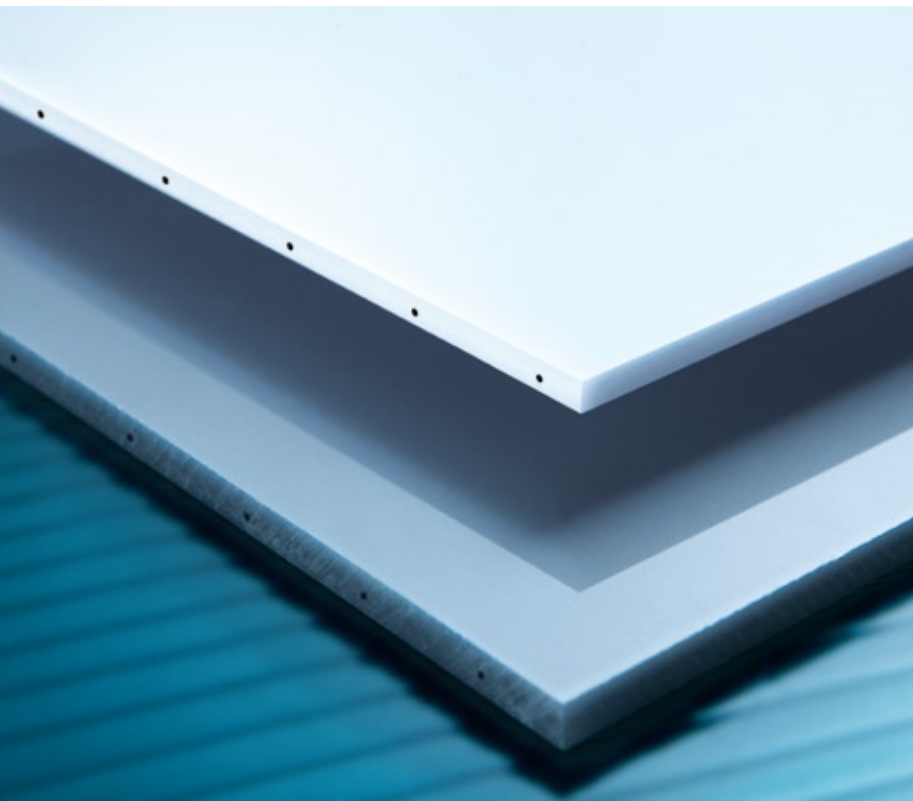
Highly transparent cast acrylic sheets with embedded reinforced threads. These threads restrain any fragments caused due to breakage during an accident, and prevent them from falling onto the road.

Superior™ S-STOP GS CC is the transparent noise barrier material approved throughout the world for use on bridges without additional restraint systems.

高透明的亚克力浇铸板材, 内含加强筋线条。这些线条可在事故发生时防止碎片散落在路面。

华帅特® S-STOP GS CC是世界上认可的透明隔音板材料, 用于沿桥梁安装而不需另外的保持系统。





Superion™ S-STOP NT CC
(non-transparent with sliver retention)
不透明 含嵌条的隔音板

Non-transparent, cast acrylic sheets with embedded reinforced threads. These restrain any fragments due to breakage during an accident, and prevent them from falling onto the road.

非透明的亚克力铸板，内含加强筋线条。这些线条可在事故发生时防止碎片散落在路面。

Superion™ S-STOP NT
(non-transparent)
不透明隔音板

Large-sized, homogenously colored cast sheets. Their large size and low weight make them ideally suited for use in conventional structures. Since the sheets are homogenously colored, the color cannot flake off.

大型，均匀着色的浇铸板。尺寸大，重量轻使该产品成为传统结构的理想选择。由于板面经过均匀着色，因此颜色不会脱落。



Functional Surfaces 板材表面功能

All Superion™ S-STOP sheets can be provided with various functional surfaces to equip them for specific applications. The following surfaces are currently available:

华帅特® S-STOP所有隔音板采用多种功能性表面, 具体应用于各种情况。目前可供板材表面工艺有以下几种:



Superion™ S-STOP with anti-soiling effect

含抗污效果的隔音板

The anti-soiling surface ensures that dew and rainwater do not remain on the sheet as droplets, but run off as a continuous film.

The sheets remain transparent even in rain and damp surroundings. Moreover, the water that runs off as a film cleans any dry soiling that does not adhere firmly to the sheet.

抗污表面保证露水和雨水不以液滴的形式留在板材上, 而以连续膜的形式冲刷下来。

即使在雨中或潮湿的环境里, 板材仍然能够保持透明度。此外, 持续不断的雨水可清洗板材上任何粘附力不强的干燥的尘埃。

The background of the entire page is a photograph of several acoustic panels. The panels are arranged in a way that shows their edges and surfaces. Some panels are white, some are green, and some are blue. The lighting is bright, creating strong highlights and shadows that emphasize the three-dimensional nature of the panels.

Superion™ S-STOP with photocatalytic coating 含光触媒涂层的隔音板

Superion™ S-STOP elements with this type of coating decompose organic soiling that adheres to the surface by means of photocatalysis. Incident light decomposes both bacteria and organic substances. The semiconductor titanium dioxide supports this process as the catalyst. This surface coating containing titanium dioxide converts dirt and bacteria into harmless substances such as carbon dioxide and water.

华帅特® S-STOP该类型的涂层成分可分解通过光触媒而紧紧粘附在表面的有机尘土。入射光可分解细菌及有机物质。半导体二氧化钛在分解过程中充当着触媒的作用。这些含有二氧化钛的表面涂层能够把污垢和细菌转换成无害物质，例如二氧化碳和水。

Superion™ S-STOP with antireflective surfaces 抗反光表面的隔音板

This product variant has a surface texture that diffuses light and reduces reflections. Distracting reflections like the lights of other vehicles are reliably prevented. Although the texture reduces the transparency of the sheets, light transmission is retained on both sides of the barrier.

该变型产品的表面纹理可扩散光线和减少反射光，并能像其他传播媒介的光线一样，能有效地阻止分散的反射光。虽然表面纹理减少了板材的透明度，但是隔音板两面仍然保持高透光率。



Superion™ S-STOP with anti-abrasive coating 含抗磨涂层的隔音板

This coating makes the already tough surface of Superion™ S-STOP even more resistant to abrasion, e.g. through gravel.

该涂层能使已经足够坚硬的华帅特® S-STOP表面具备更强的抗磨损能力, 例如抵抗砂砾的侵袭。



Superion™ S-STOP with bird-deterrent markings 含驱鸟标记的隔音板

Superion™ S-STOP GS CC sheets with integrated black threads are easily noticed by birds. Further steps can also be taken to offer even better bird protection. The types most frequently employed have brushed matte stripes, stripes applied by screen printing, dots or symbols and adhesive films, e.g. bird symbols. Brushed stripes and screen-printed markings are very durable and included in the delivery package.

由于华帅特® S-STOP GS CC板材含有黑色线条, 因此很容易被鸟类发现。为了更好地防止鸟类破坏板材, 我们必须采取进一步的措施。该类型应用最频繁的有磨砂亚光条纹, 丝网印刷涂层条纹, 圆点或符号 (例如鸟类标记) 或粘性膜。磨砂条纹、丝网印刷的标志物十分经久耐用, 并与产品一起提供。





Product Properties

产品特点

Superion™ S-STOP (in transparent grades) is highly light-transmitting and transparent.

拥有高透光率和高透明度(透明等级)

The transparent grade has light transmission of over 90 percent and is thus vastly superior to comparable sheets of glass or other transparent plastics, such as polycarbonate. The light transmission is measured according to DIN 5036, Part 3(illuminant C). The extremely good weather resistance of Superion™ also ensures that the high transmission is retained for many years. The measured value upon delivery is at least 90% and at least 88% after 10 years of outdoor exposure.

该产品的透明等级达到90%的透光率, 远胜于同类玻璃板材和其他透明塑料制品, 例如聚碳酸酯。该透光率由 DIN 5036, 第三部分(光源C)测量得出。华帅特®卓越的抗气候性保证产品的高透光率数年不变。出厂时的测量值至少为90%, 且在暴露于户外的10年后仍然保持至少88%的水平。

Superion™ S-STOP sheets offer extremely high resistance to weathering and aging.

有效抵抗风化和老化

Superion™ acrylic material is well-known for its unsurpassed resistance to weathering and aging. International vehicle manufacturers prescribe the use of this material for reverse and signal lights, because only acrylic offers the long-term brilliance and color fastness required to retain the luminous intensity and signal effect of automotive lights. In signage too, Superion™ proves its extreme longevity without its surface becoming matte, without turning yellow or brittle, and without the colors fading. Even after many years of outdoor exposure, the surfaces of Superion™ stay just as smooth as when they left the factory.

华帅特®亚克力材料以无可比拟的抗风化和抗老化性能而闻名。国际汽车制造商指定使用这种材料生产信号灯和倒车灯, 因为只有亚克力才有长久的鲜明色泽, 而它的不褪色性也保证了汽车灯的发光强度和信号效果。同样在标志牌上, 华帅特®表现出超长的使用寿命, 产品表面不易变粗糙, 黄变, 无脆性或褪色。甚至在多年暴露于户外的情况下, 华帅特®的表面仍然能像刚生产出来时一样光滑。

Superion™ S-STOP sheets are break-resistant.

抗断裂功能

Superion™ S-STOP is about 11 times more break-resistant than window glass of comparable thickness. That makes it superior even to safety glass, and meets all the safety requirements for noise control materials. The strength of the sheets plays a significant role when it comes to resisting impact as well as structural vibrations, e.g. on bridges.

华帅特® S-STOP的抗断裂性能是拥有同样厚度的窗户玻璃的11倍, 这使得它甚至比安全玻璃性能还要优越, 符合隔音材料所有安全方面的要求。在抗冲击和抗结构性震动方面(例如在桥梁上), 板材的强度也起着十分重要的作用。



Superion™ S-STOP sheets are lightweight. 轻型的板材

Superion™ S-STOP has a specific weight of 1.19g/cm^3 and weighs only half as much as silicate glass. A 20mm thick sheet therefore weighs only 24 kg per square meter. That makes it much easier to handle large sheets, in particular. The low weight of Superion™ S-STOP also enables more lightweight construction. Superion™ S-STOP sheets are very advantageous from a statical viewpoint when noise barriers are subsequently installed along bridges.

华帅特® S-STOP具有 1.19 g/cm^3 的特殊重量，比硅酸盐玻璃轻一半。因此，20毫米厚度的板材重量也只不过24千克每平方米，使得该系列大型板材尤其易于搬运。华帅特® S-STOP板材重量轻，也使其适用于更多轻型结构。当隔音板沿桥梁顺次安装时，从静力的角度看，华帅特® S-STOP板材是十分有益的。

Superion™ S-STOP sheets are easy to from in a versatile manner. 易于加工形成多种适用样式

Superion™ S-STOP sheets can be installed flat, cold-curved or thermoformed. The minimum bending radius for installing cold-curved elements is 300 times the sheet thickness. The possible radius for 20 mm thick sheets is therefore 600 mm. The structure must be sufficiently stable to maintain the cold-curved sheets in form. The sheets can be thermoformed into almost any imaginable configuration. They are heated to forming temperature and shaped as desired using suitable molds. After cooling, the sheets retain the given shape and are ready for installation. The most frequent type of forming is line bending, e.g. of the upper, free-standing edge of the noise barrier facing the road. That increases the rigidity of the sheets that are not clamped along the top edge, and improves the noise protection offered by the elements.

华帅特® S-STOP板材可通过平面，冷弯或加热成型的方式进行安装。安装冷弯构件的最小弯曲半径是板材厚度的300倍。也就是说，20毫米厚的板材的弯曲半径可以达到600毫米。板材结构必须足够稳定才能在外形上保持冷弯板材不变。这些板材通过加热几乎可以变成任何能想象得到的造型。用适当的工具，可将板材加热到成型温度，并按要求进行塑造。这些板材在冷却后保留一定的形状，并可用于安装。最常见的结构类型是弯曲线，例如面向道路的隔音板上方的独立棱线，这些棱线增加了上沿未被夹住的板材的牢度，同时也增强了板材组件的隔音效果。

Sound insulation of Superion™ S-STOP sheets 隔音性能

Superion™ S-STOP is a sound-reflecting product. The weighted sound reduction induction DLR of 15 mm thick sheets is 30 dB, which rises to 33 dB for 25 mm thick sheets.

华帅特® S-STOP是一种能反射声音的产品。15毫米厚度的板材的加权降噪感应DLR 为30分贝，这一数值对于25毫米厚度的板材则上升到33分贝。

Safety

安全

Transparent noise barriers made from Superior™ S-STOP offer drivers greater safety than non-transparent systems.

华帅特® S-STOP制成的透明隔音板，相比非透明系统为驾驶员提供更多的安全性。

Prevention of Tunnel Effect

预防隧道效应

With its high transparency, Superior™ S-STOP lets drivers look at the changing landscape. This successfully prevents the tiring and dangerous feeling of driving through a tunnel. Moreover, the high light transmission ensures that no harsh shadows are cast on the road and that the lighting conditions remain constant. The eye is not obliged to adjust to the effects of light and dark all the time.

华帅特® S-STOP的高透明度使驾驶员能够看到变化中的景观。这可以防止在隧道中行驶时产生的疲劳和不安感。此外，大透光率还保证了道路上不出现严重的影子，保证光照条件恒定。眼睛并不总是对明暗效果作出调节。

Resistance to Stone Impact according to EN

根据EN标准对石头冲击的耐受力

Superior™ S-STOP is approved as safety glass and meets all the requirements of EN 1794 for the resistance of transparent noise barrier elements to stone impact. The high break resistance of Superior™ S-STOP ensures that the sheets are not destroyed by stones or gravel projected by passing vehicles, nor by stones thrown from outside the barrier.

华帅特® S-STOP是经核准的安全玻璃，符合EN1794标准对于石头冲击透明隔音板的耐受力的一切要求。华帅特® S-STOP的高耐破损性能保证了板材不被经过的车辆所弹出的石子或石块毁坏，也不会被隔音屏障外部扔来的石头所毁坏。



Superion™ S-STOP GS CC is the material for use in noise barriers along bridges without additional restraint systems.

华帅特® S-STOP GS CC是一种可用于桥梁两侧作为隔音屏障而不需要附加约束系统的材料。

Fragment Retention

碎片保护性能

When noise barriers are installed on bridges, it must be ensured that the noise barrier presents no risk to persons or objects under the bridge. No fragments may be allowed to fall from the barrier after an accident, for example.

The German regulation ZTV-Lsw 06 and EN 1794 state that "if brittle materials or materials whose embrittlement cannot be excluded (e.g. plastics) are to be used, these elements or their fragments must be reliably secured by means of restraint structures."

The reinforced threads embedded in Superion™ S-STOP GS CC correspond to these restraint systems, because they successfully prevent sheet fragments from falling. That is why Superion™ S-STOP GS CC is the only material that may be used in noise barriers along bridges without additional restraint systems.

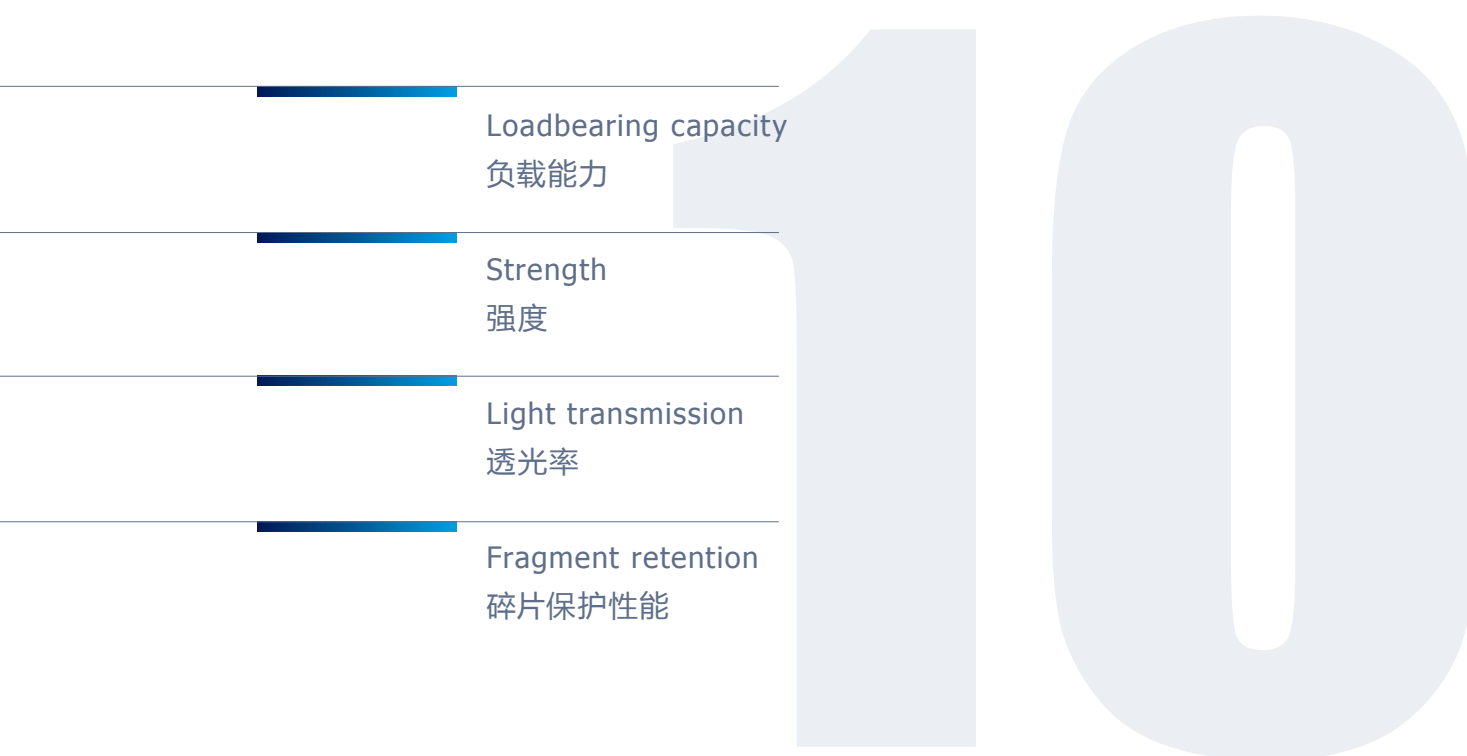
在桥梁上安装了隔音板后，必须保证隔音板不对桥下的行人和物体构成危险。比如在事故发生后，不应当有碎片从隔音板中掉落。

德国ZTV-Lsw 06规则及EN1794规则规定：“如使用脆性材料或不能排除脆裂的材料（如塑料），必须用约束结构可靠地保护好这些结构件或其碎片。

华帅特® S-STOP GS CC中所嵌入的加强筋与这些约束系统相类似，因为它们能成功地防止板材碎片掉落。这就是为什么华帅特® S-STOP GS CC是唯一被批准用于桥梁两侧作为隔音板而不需要附加约束系统的材料。

Guarantees 品质保证

Superion™ S-STOP solid sheets 10-year-guarantee on:
华帅特® S-STOP实心板材对以下性能做出10年保证:



We are convinced of the durable quality of our high-quality products that have proved their worth in practical experience. That is why we offer extensive guarantees for a number of properties.

我们的高品质产品已在实际应用中证明了它们的价值，我们相信它们的耐久性。这就是我们可以对许多性能做出广泛保证的原因。

We will be pleased to send you details of the various guarantee statements and guaranteed values on request.

我们将很乐意在您提出要求后为您发来各种保证声明及数值的详细情况。



We have been successfully implementing and constantly developing our recycling process for decades. That is how we ensure that the material stays within a closed recycling loop.

我们几十年来一直致力于成功地实施和不断地开发我们的回收工艺，以保证我们的材料处于一个循环利用的封闭环节内。

Environmental protection, ecology and recycling

环境保护、生态及回收

Environmental protection, ecology and recycling are declared aims of the HUASHUAITE Industries ESHQ strategy for the Performance Polymers Business Unit. Our active participation in the Responsible Care strategies of the chemical industry also documents how seriously we take our responsibility for the targets of environmental protection, safety, health and quality in connection with our products and production processes.

To ensure responsible handling of raw materials, we take back the products we deliver at the end of their service life and pass them on for recycling.

Extruded sheets of Superior™ S-STOP are broken up, reground, regranulated and then reintroduced into the extrusion process for new sheets. Moreover, cast and extruded Superior™ S-STOP can be reduced to the starting material by chemical means and reintroduced into the manufacturing process. Both these processes presuppose that the sheets to be recycled have been carefully separated from other materials.

环境保护、生态及回收是华帅特公司对于聚合物经营单位性能的战略目标。我们积极参与化学品工业的“负责、关爱”战略，这也表达了我们对待与我们产品及工艺相关的环保、安全、健康和质量问题的严肃、负责的态度。

为保证对原材料的尽责处理，我们在产品使用寿命结束后取回它们，并把它们传递到回收环节。

华帅特® S-STOP共挤板材被粉碎、重新研磨、重新做成颗粒并被重新送入共挤工艺流程以形成新的板材。此外，共挤和浇铸的华帅特® S-STOP板材可以通过化学方法降解为原材料并重新进入制造工序。这两种程序都是事先假定将被回收利用的板材已被仔细地与其它材料分离了。

Transparent Range

透明板材颜色范围

Colors 颜色	Product Type 产品类型	Thickness (mm) 厚度 (毫米)	Size in mm 尺寸 (毫米)	Miscellaneous 其它
Colorless/Clear 无色/透明				Various thicknesses, lengths of more than 6,000 mm, width 2,050 mm on request
Shades of blue: 蓝色系:		15.20.25	2,000 x up to 6,000 2,000x最大到6,000	根据需要提出的各种厚度、6,000mm以上长度、2,050mm以上宽度
Midnight Blue 深蓝色				
Steel Blue 钢青色				
Sky Blue 天蓝色		15.20.25	2,500 x 2000 3,500 x 2000 4,200 x 2000 5,000 x 2000	5,000 x 2,300 on request 3,300 x 2,500 on request 5,000 x 2,300mm板材 3,300 x 2,500mm板材
Shades of green: 绿色系:				
Forest Green 森林绿				With silver-retaining black reinforced threads, embedded horizontally or vertically.
Sea Green 海洋绿				Clear threads available on request 5,000 x 2,300 on request 3,300 x 2,500 on request
Spring Green 春绿色		15.20.25	2,500 x 2000 3,500 x 2000 4,200 x 2000 5,000 x 2000	带黑色的水平方向或垂直方向嵌入的加强筋线，用于碎片保护。
Shades of brown: 棕色系:				根据需要可提供无色嵌入线。
Smoky Brown 烟熏棕色				5,000 x 2,300mm板材 3,300 x 2,500mm板材

Non-Transparent (NT) Range

不透明板材颜色范围

Colors 颜色	Product Type 产品类型	Thickness (mm) 厚度（毫米）	Size in mm 尺寸（毫米）	Miscellaneous 其它
Light Grey 浅灰色		12	4,200 x 2000	Other sizes on request
Blue Grey 蓝灰色				其它尺寸根据用户需要提供
Light Blue 浅蓝色		12	4,200 x 2000	With embedded sliver-retaining reinforced threads
Mint Green 薄荷绿				Other sizes on request
Earth Brown 自然棕				带嵌入的加强筋线，用于碎片保护。 其它尺寸根据用户需要提供

On request, Superior™ S-STOP NT and NT CC are available in a flame-retardant (BF) version.

如用户需要, 可提供华帅特® S-STOP和NT CC防火 (BF) 系列。

Surface Design 表面处理

Superion™ S-STOP has perfectly smooth surfaces that are available in different versions.

华帅特® S-STOP有各种形式的完美、光滑表面。

Transparent

透明

Standard:	two high-gloss sides one matte side
标准:	两块高光侧板一块亚光侧板

Special manufacture:	two matte sides
特殊制造:	两块亚光侧板

Non-Transparent

不透明

Standard:	two matte sides
标准:	两块亚光侧板

Special manufacture:	two high-gloss sides
	one high-gloss sides
	one matte side
特殊制造:	两块高光侧板
	一块高光侧板
	一块亚光侧板

Functional Surfaces

其它表面功能扩展

Superion™ S-STOP can be provided with functional surfaces to suit specific applications.

华帅特® S-STOP 可提供功能性表面以适合特殊用途。

Protection of Birds

驱鸟保护

Brushed, bird-deterrent stripes: 20 mm stripe width, 30 mm stripe spacing
Other stripe spacings and widths on request

磨砂的、驱鸟条纹：条纹宽度 20mm，条纹间隔 30mm
根据客户需要可提供其它条纹宽度及间隔的产品

Screen-printed bird-deterrent symbols: Types of symbol on request
丝网印刷的驱鸟标志：根据客户需要可提供不同的标志类型

Coatings

涂层

Anti-soiling, photocatalytic coating, abrasion-resistant coatings: each up to 5,000 x 2,000 mm, on both sides in each case

防污、光触媒涂层、防磨损涂层：每一个案例都达到5,000 x 2,000 mm，双面

FABRICATION

加工制作

Cut-to-Size Sections

剪切截面

Rectangular sections, oblique sections, drillholes
矩形截面、斜剖面、钻孔

Thermoformed Elements

加热成型元件

Elements with entirely thermoformed surfaces or line bending: on request
完全热成型表面或弯曲线的元件：根据客户需要



亚克力声屏障
解决方案

华帅特亚克力板材的物理性能

Physical properties of Superion™ Polymethyl Methacrylate sheet

Product Properties



产品性能

Product Properties

产品物理性能

Project 测试项	8000h Artificial aging 8000小时 人工老化	Superion™ S-STOP NT	Superion™ S-STOP XT	Superion™ S-STOP GS, GS CC	Test Method 检测方法
Thickness/厚度 = 15mm	Before <input type="radio"/> 老化前 After <input checked="" type="radio"/> 老化后				
Tensile strength 抗拉强度	<input type="radio"/>	37 MPa	70 MPa	76 MPa	ISO 527-2/1B/5
	<input checked="" type="radio"/>	29 MPa	53 MPa	61 MPa	
Elongation at break 断裂伸长率	<input type="radio"/>	1.8%	4.5%	4.5%	ISO 527-2/1B/5
	<input checked="" type="radio"/>	-----	-----	-----	
Flexural strength 弯曲强度	<input type="radio"/>	62 MPa	98 MPa	76 MPa	ISO 178
	<input checked="" type="radio"/>	-----	-----	-----	
Elastic modulus 弯曲弹性模量	<input type="radio"/>	7250 MPa	3460 MPa	3624 MPa	ISO 527-2/1B/5
	<input checked="" type="radio"/>	6470 MPa	2730 MPa	2921 MPa	
Max.service temperature 最高使用温度		70 °C	70 °C	70 °C	GB/T1634.2.2004
Vicat softening temperature 维卡软化点		105 °C	102 °C	110 °C	ISO 306/B50
Light transmission of crystal-clear sheets 清晰透明的板材透光率	<input type="radio"/>	0 °C	92 °C	93 °C	GB/T2410-2008
	<input checked="" type="radio"/>	-----	89 °C	90 °C	
Weighted sound reduction index DL _R 加权降噪指数DL _R					
Thickness/厚度 = 12mm		30 dB			EN 1793-2
Thickness/厚度 = 15mm			30 dB	30 dB	EN 1793-2
Thickness/厚度 = 20mm			32 dB	32 dB	EN 1793-2
Thickness/厚度 = 25mm			33 dB	33 dB	EN 1793-2

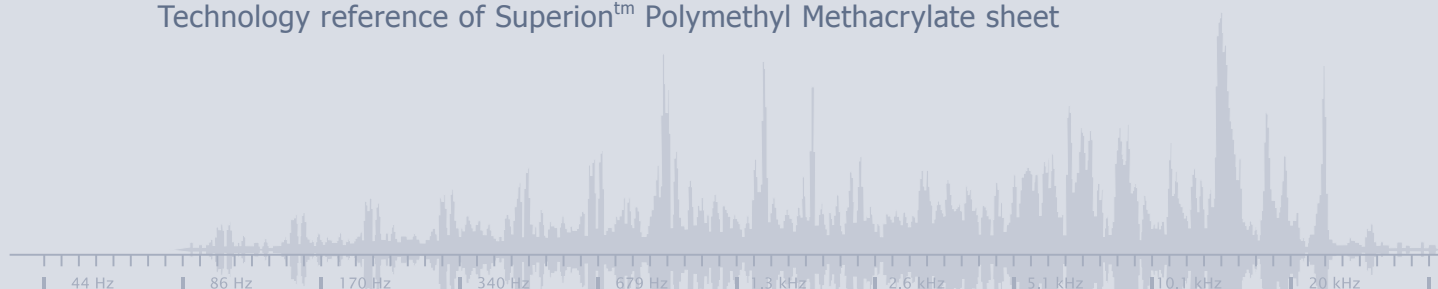
The 8000-hour artificial aging is equivalent to a 10-year exposure under moderate weather condition.
8000小时人工老化相当于暴露于中等气候条件下10年。



亚克力声屏障
解决方案

华帅特亚克力板材的技术参考

Technology reference of Superion™ Polymethyl Methacrylate sheet



技术服务

Technical Service

Bidding Texts Example

关于招标准本示例

Below you will find several examples of bidding texts for transparent noise barriers.

Please select the suitable example as a basis for your application.

以下为您提供透明隔音板的数个招标准本范例。请根据您的要求选择最适合的范例作为参考依据。

Example 1: Manufacturing Noise Control Glazing

范例1: 制造噪音控制采光体

Manufacture and install soundproof noise control glazing made of Superior™ S-STOP transparent or equivalent on bridges..... with incorporated black reinforced threads of 20mm thickness including 4 clamping structures according to ZTV ~ Lsw 06 and/or EN 1793&1794 including addendum, according to drawing and statement in the building specifications

根据建筑说明书上的图纸和详述内容, 制造并在桥梁上安装透明华帅特® S-STOP或同类材料制成的隔音玻璃……根据ZTV ~ Lsw 06 及 EN 1793&1794和附录, 以及建筑物规格图纸及说明, 须含20毫米厚的黑色加强筋线条, 包括四个夹持机构。

Example 2: Manufacturing Touch-Protection Barrier

范例2: 制造防触摸的隔音板

Manufacture touch-protection barrier according to statical, construction and safety requirements.Touch-protection barrier according to RIZ Elt 2 Sheet 1/Sheet 2.Barrier elements made of clear-transparent acrylic with embedded clear reinforced threads with test certificate according to ZTV-LSW 06 and/or EN 1793&1794. Sheet thickness:20 mm.Elements with matte stripes applied at the factory(stripe width approx. 20 mm, stripe spacing approx.60 mm) parallel to upper edge of touch-protection barrier. Secure elements with clamping structure to prevent them from falling.

防触摸隔音板是根据静力, 建筑及安全方面的要求制造防触摸隔音板。根据RIZ Elt 2板材1板材2的标准规格。板材由透明亚克力纤维及嵌入的无色加强筋线条组成, 经试验证明, 加强筋线条符合ZTV-LSW 06 及/或 EN 1793&1794的标准。板材厚度为20毫米。厂间生产的涂有磨砂条纹的板材成分(条纹宽度约为20毫米, 间距约60毫米) 与防触摸隔音板上缘的成分类似。含夹紧结构的板材成分安全可靠, 可防止碎片散落地面。

Example 3: Installing Transparent Noise Control Elements

范例3: 安装透明噪音控制装置

Manufacture, supply and install transparent noise control elements in compliance with statical and construction requirements according to drawing.Sheet thickness=20 mm, Material=transparent plastic(acrylic, min.E=3, 300 N/mm2) according to ZTV-Lsw 06 and/or EN 1793&1794, clear with black reinforced threads for sliver retention and bird protection, Superior™ S-STOP GS CC or equivalent product.

按照图纸对静力和建筑的要求, 制造, 提供并安装透明的噪音控制成分。板材厚度为20毫米, 材料为透明塑料(亚克力, 混凝土最小弹性模量为300牛每平方毫米), 根据ZTV-Lsw 06 及/或 EN 1793&1794, 华帅特® GS CC 或同类产品黑色加强筋线条可防止碎片剥落或实现驱鸟保护。

Cleaning 表面清洁

Superion™ S-STOP has a perfectly smooth surface that shows no wear even after many years owing to its excellent weather resistance.

华帅特® S-STOP有着完美的光滑表面, 因为其优良的耐候性能, 即便多年之后也不会出现磨损。

Dirt is normally removed by rainwater 通常雨水会洗去尘垢

That means rain is usually sufficient for adequate cleaning of the sheets. If more intensive cleaning is required, the sheets can be washed with low surface-tension water. The most economical way is to use high-pressure cleaning equipment.

这就意味着, 通常雨水足就以清洗板材。如需要大面积、高强度清洗, 可选用低表面张力的水清洗板材。最经济的方法是使用高压清洗设备。

Graffiti 涂鸦

Spray paints can be removed from Superion™ S-STOP We recommend the prior application of a water-soluble paint thinner, followed by washing with copious amounts of water.

可以从华帅特® S-STOP上去除喷涂的涂鸦油漆。我们建议, 预先涂一次水溶性油漆稀释剂, 然后用足量的清水进行清洗即可。



About Us

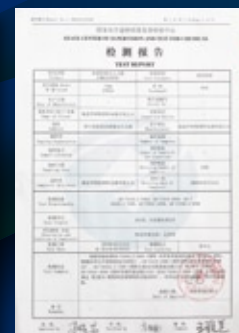
Zhejiang Huashuaite Plastics Technology Appliances Co. Ltd is a large high-tech enterprise, specialized in the development and manufacture of PMMA, PC and PVC, with fixed assets of over RMB80 million. It is located in the back yard of Shanghai---Jiaxing, north of Zhejiang Province. It has superior convenience transportation, with Huhang and Hangpu Highway crossed. It has many agents across the country, with clients in China and Europe, America and Middle East. Our company has as many as 20 production lines of PMMA, PC and PVC, winning 13 national patents. Huashuaite introduced the most advanced production equipments for casting acrylic from Britain and Taiwan in 2010, and built up and operated the best production streamline for casting acrylic in Asia, enjoying the leading position, with productivity increased. The acrylic sheets with ribs and acrylic sheets with surface treatment adopt world top-class raw materials, ensuring stabilized technology, excellent quality, environment friendliness, wide application, being the top choice for lighting and sound baffling.

The company lays stress on the science and introducing talents, developing new construction material products and technology, all reaching the international level. The company has established competitive position both in international and domestic market, promoting the advanced management style; it has passed the ISO9001 (2000) certificate in 2002, and gained the self-support right of import and export in the same year. Our products are national inspection-free products, and we have been awarded as Zhejiang High-tech Enterprise; One of Zhejiang's Most Potential Enterprises; Zhejiang Technology-based SMEs; Zhejiang AAA Creditable Enterprise; Zhejiang Famous Brand and One of Ten Best Private Owned Enterprise, China's Famous Brand, Jiaxing's Famous Brand Product, One of Haiyan's Ten Best High-tech Enterprise; One of Haiyan's Ten Most Creditable Enterprises, etc.

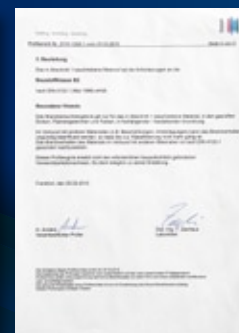
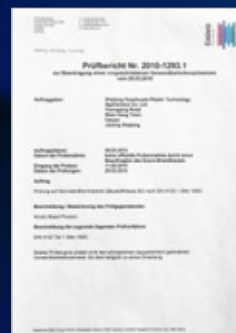
Huashuaite, depending upon the excellent geographical position, advanced technology, scientific management over talented employees and effective innovations, is facing the global construction material market. It believes that in the near future, it'll stand in the east of the world as the leader of new construction materials.



华帅特加筋强化亚克力板材物理特性检测报告
(国家化学建材质量监督检验中心)



华帅特加筋强化亚克力板材防火性能检测报告
(德国 EXOVA BRANDHAUS 威灵顿 检验中心)



华帅特加筋强化亚克力板抗冲击性能重锤实验报告
(国家建筑装饰材料质量监督检验中心)



Profession, Devotion and Concentrate!



The best production line of cast acrylic sheets in Asia

亚洲一流亚克力浇铸板材生产线

浙江华帅特塑业科技有限公司是一家专业从事研发与生产聚甲基丙烯酸甲酯（亚克力）板材、聚碳酸酯板材及PVC型材的高科技大型企业，企业固定资产达8000多万元。公司位于上海后花园 - 浙江嘉兴市境内，沪杭、杭浦高速通道穿境而过，交通十分便捷。公司在全国均有代理，客户遍及全国各地及欧美、中东等许多国家。公司拥有国际领先水平的亚克力板材、PC板材及PVC型材生产线20余条，产品获得国家专利13项。2010年华帅特引进英国和台湾最先进的亚克力浇铸生产设备，构建并运行了亚洲一流的大型亚克力浇铸板材生产线，领先业界，产能得到大幅提升。所研发的加筋亚克力板材及表面工艺处理亚克力板材，采用国际顶级璐彩特亚克力原料，技术稳定、品质卓绝、绿色环保、应用广泛，是采光、隔音工程的首选材料！

公司注重科学，注重引进科技人才，积极研发具有国际领先水准的新型建材产品及技术，确立了在国际、国内市场竞争中的地位，积极推行国际先进的管理模式，2002年通过ISO9001:2000质量体系认证，同年获得自营进出口权。产品通过国家免检产品认证，先后被评为浙江省高新技术企业；浙江省最具成长潜力的百佳企业；浙江省科技型中小企业；浙江省工商企业信用AAA级守合同、重信用单位；浙江省著名商标、嘉兴市十佳民营科技企业；中国驰名商标；嘉兴市名牌产品；海盐县十佳技术创新企业；海盐县十佳诚信示范企业等荣誉称号。

华帅特公司依托优越的地理位置、先进的科技实力、科学的人才管理、有效的技术创新，面向全球建材市场。我们坚信在不久的将来，公司将以引领新型建材潮流的身姿屹立在世界的东方。





Strong and complete R&D and manufacturing ability is the foundation of rapid development of HUASHUAITE!

强大完善的研发和制造能力是华帅特快速发展的基础!

top-grade production equipments, complete ISO9001 Quality Management System and ISO14001 Environmental management system, and professional management fleet.

在这里，有一流的生产制造设备，有完善的ISO9001质量管理体系和ISO14001环境管理体系，以及专业的管理团队。





华帅特加筋亚克力板材在声屏障中的应用

Application in Noise barriers — Superior™ PMMA sheet with integrated sliver retention





华帅特板材在声屏障中的应用

Application in Noise barriers—HUASHUAITE's sheets

- ◎ 华帅特为苏通大桥定制的风屏障板材
Huashuaite wind barriers sheets customized for Sutong Bridge



- ◎ 华帅特为杭州湾跨海大桥研发了国内首创的风屏障板材
Huashuaite develops the wind barrier sheets for Hangzhou Bay Cross-sea Bridge, which is the first sheets of this kind in China



2011.3月刊录

Mar. 2011 copy right

所有资料已经小心核对, 以求准确, 如有任何错漏, 本公司不承担因此而产生的后果。

All information has been checked carefully for accuracy. We shall not answer the consequence if clients had any mistakes and missing.

设计制作 嘉兴图语 Designed By **GraphicPower** 0573 82086393



Material Application Solution of Polymethyl Methacrylate

亚克力材料应用解决方案



浙江华帅特塑业科技有限公司

海盐华帅特塑料电器有限公司

地址: 浙江省海盐沈荡永庆东路 邮编: 314311

电话: 0573-86760307 86767688 传真: 0573-86767788

网址: www.huashuaite.com

E-mail: huashuaite@126.com

Zhejiang Huashuaite Plastics Technology Appliances Co. Ltd.

Haiyan Huashuaite Plastics Electric Appliances Co., Ltd.

Add: East Yongqing Road, Shendang Town, Jiaxing, Zhejiang, China

Tel: +86-573-86760307 Fax: +86-573-86767788

Website: <http://www.huashuaite.com>