



DSM Melamine

Growing a profitable business

Chemical Analysts Conference 2004
Vaalsbroek, 24 September 2004

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This presentation on DSM Melamine contains the following subjects:

- **Chapter 1: DSM Melamine profile**

This first part describes the position of DSM Melamine within the greater portfolio of DSM, with special attention to the economies of scale and scope of the integration of DSM Melamine's main production location within the greater framework of DSM's main site in the Netherlands.

Furthermore this chapter gives some basic information about the product melamine, and the way it is produced.

- **Chapter 2: Melamine applications & markets**

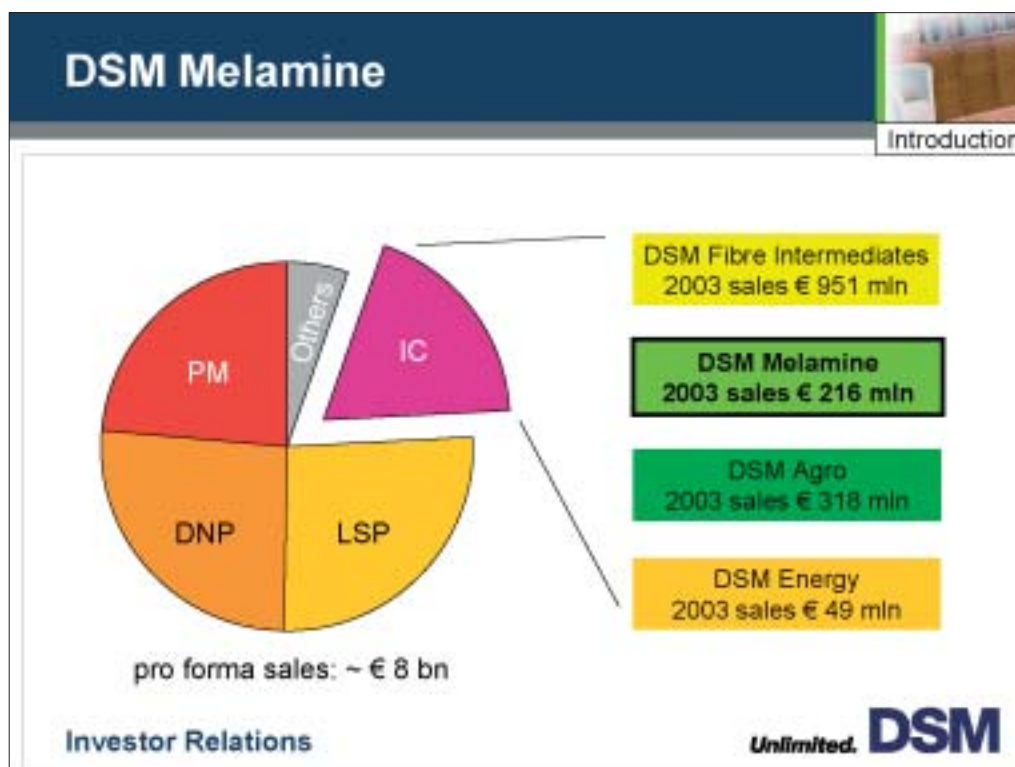
Here the main applications and market segments of melamine are discussed, including the growth drivers for melamine demand and the market structures.

- **Chapter 3: Melamine supply**

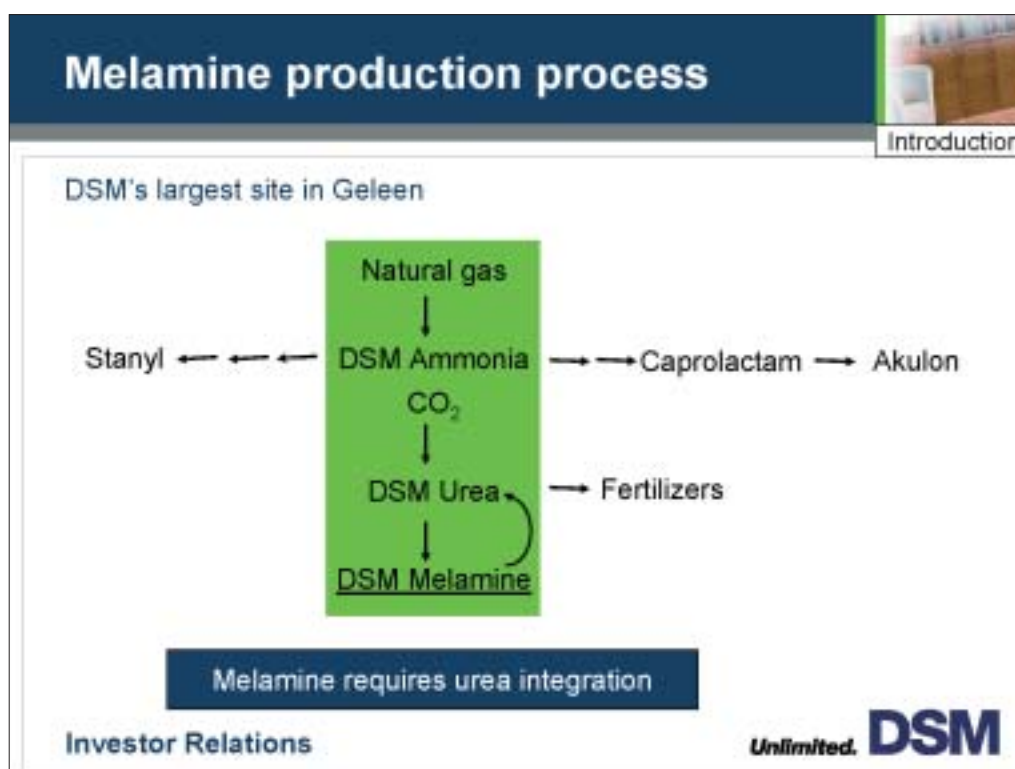
This chapter contains information about the global supply for melamine, the regional differences, the current competitive position of DSM Melamine, and its achievements in recent years to retain and strengthen its global leadership position in this market.

- **Chapter 4: The way forward**

In the final chapter the ambitions of DSM Melamine are elucidated, including the reasoning behind the recently agreed cooperation with CNOOCC (China National Offshore Oil Company Chemicals Ltd) to jointly explore the construction of a world-scale melamine plant on Hainan in China.




- At the moment DSM has an annual overall sales level of approximately € 8 billion, taking into account a full year contribution of DSM Nutritional Products. Close to 20% of these sales are realized by four Business Groups in the cluster Industrial Chemicals to which also DSM Melamine belongs. In 2003 DSM Melamine realized sales of € 216 million, which was lower than 2002 because of the three months outage of the plant in Geleen as a result of the gas-oven explosion on April 1st last year.
- The Industrial Chemicals cluster of DSM consists of the following business groups: DSM Fibre Intermediates (including DSM Acrylonitrile), DSM Melamine, DSM Agro and DSM Energy. These are capital-intensive businesses that are situated at the beginning of the value chain and require the use of large-scale production facilities in order to be competitive. DSM's industrial chemical activities have a global spread, with production sites in the Netherlands, the US and the Far East.
- DSM Melamine is the global market leader in melamine production, with a global market share of about 25%. The company is very well established, with advanced production plants on three continents and a sophisticated technical support system in place for its customers. It earns roughly 60% of its sales through long-term contracts. With the new so-called 'Melaf-4' plant in Geleen, the Netherlands, and the further debottlenecking of the plants already in operation, DSM Melamine's aggregate production capacity will rise to 240,000 tons per annum in 2004.
- DSM Melamine's objective is to strengthen its position as the world market leader, in a market that is growing at an average rate of 6-7% per annum.



- The raw material for the production of melamine is urea, which in turn is produced from ammonia and carbon dioxide. Most urea plants are connected to on-site ammonia plants. Because carbon dioxide and ammonia are also by-products in the production of melamine, backward site integration to urea production is essential for melamine production.
 - The Geleen site, the location of DSM Melamine's main production facility, is a highly integrated complex. DSM already started its melamine production on this site in 1967. In close cooperation with the other business groups of DSM's Industrial Chemicals cluster a highly integrated industrial complex has been created over time, which provides for major economies of scale and scope.
 - The site includes two world scale ammonia plants, providing the feedstock for world-scale caprolactam plants, as well as a world-scale urea plant. The urea produced is fully used captive by DSM Melamine and DSM Agro.
 - The melamine production of DSM at the Geleen site is based on highly sophisticated technologies.
- DSM Melamine has developed proprietary production technologies enabling the lowest unit costs for both large scale (120 kilotons/annum) and smaller scale (30-60 kilotons/annum) plants. The large-scale technology is based on a Gas Phase Process (GPP) which offers significant fixed costs synergies. The smaller scale technology is based on a Shortened Liquid Phase (SLP) process resulting in an overall unit price which is fully competitive with the largest scale plants, due to its low variable costs. With these outstanding production technologies DSM Melamine is the absolute global technology leader.
- The other production sites of DSM Melamine in North America and Indonesia are also integrated with urea and/or ammonia.
 - A growing part of the caprolactam output at the Geleen site is used captive by DSM Engineering Plastics, which also taps in from the ammonia production, being converted to acrylonitrile and diaminobutane respectively, as a feedstock for Stanyl® production, as will be further elucidated in the DSM Engineering Plastics presentation.

Melamine's unique qualities

Introduction



Melamine properties:

- Highly resistant to heat and physical/chemical degradation
- High gloss
- Scratch resistant
- Moisture resistant
- Flame retardant

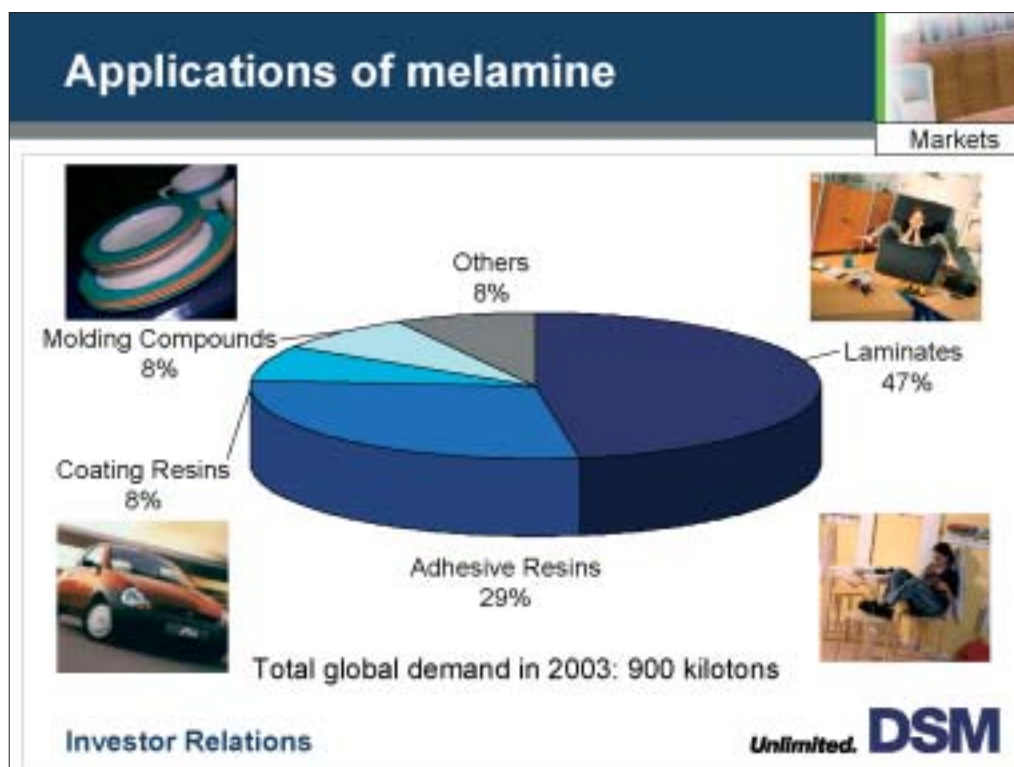
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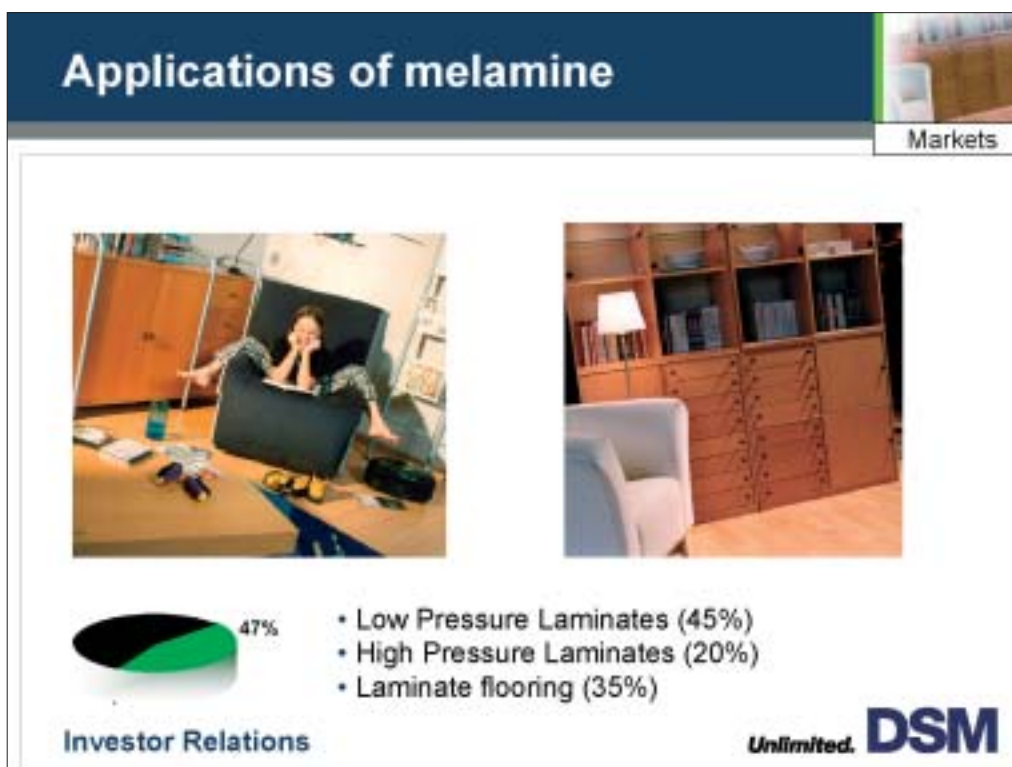
- Melamine is a chemical compound (triamino-triazine: $C_3N_6H_6$), consisting of carbon, nitrogen and hydrogen. The melamine molecule has a symmetrical structure, which to some extent accounts for its characteristics.

These are:

- a high stability, which leads to products with high resistance to heat and to physical or chemical degradation;
 - high bonding potential, which leads to products with excellent surface properties like hardness, scratch resistance and gives moisture resistant properties to wood-based panels;
 - a high nitrogen content, which makes it a good flame retardant.
- Melamine is a fine, non-hazardous white crystalline powder with a very low water solubility. In almost all applications it is combined with formaldehyde, and sometimes urea, to produce a resin. This liquid resin is subsequently used for further processing, for instance for impregnating or gluing purposes or cross linkers for coating resins.

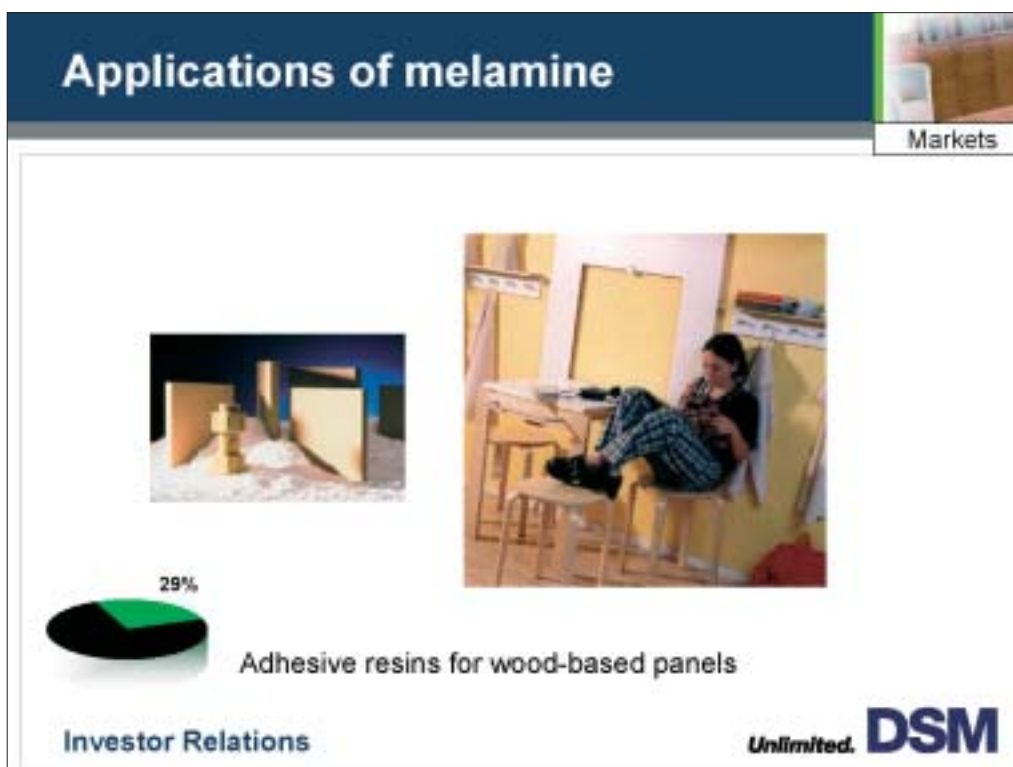


- Melamine is a very versatile material. It is found in a wide variety of applications in your kitchen, on your floor, in your cabinets, on your desk, in your walls, on your car, on your desktop, in your refrigerator, in your chair – melamine is all around you. Melamine plays a vital role in meeting the needs of the furniture, flooring and construction industries. It often improves quality, safety, durability and aesthetic appearance.
- Melamine is an important raw material for impregnating resins for laminates and adhesive resins. These waterproof melamine adhesives are either used to glue pieces of wood together to form boards and beams, or are mixed with woodchips or wood fibers and compressed to form wood-based panels. Melamine boosts the scratch-, moisture- and heat-resistance of wood products. One of the main applications in this area is the production of laminated flooring, which is a market that has been expanding rapidly for several years, particularly in Europe and China.
- Melamine-formaldehyde (MF) resins are also used in specially formulated resin systems to produce highly durable coatings. Typical applications include coatings for automotive body panels, household appliances, and beverage cans.
- Melamine-formaldehyde resins can also be blended with cellulose fillers, pigments, and other additives, to form what is called "molding compounds". Typical applications include colorful and durable dinnerware, chopsticks and electrical equipment.
- Other applications include banknotes, printed textiles, flame retardants for e.g. furniture and concrete additives.
- Total global demand amounted to approximately 900 kilotons in 2003. DSM Melamine is the global market leader, holding about a quarter of the global market.

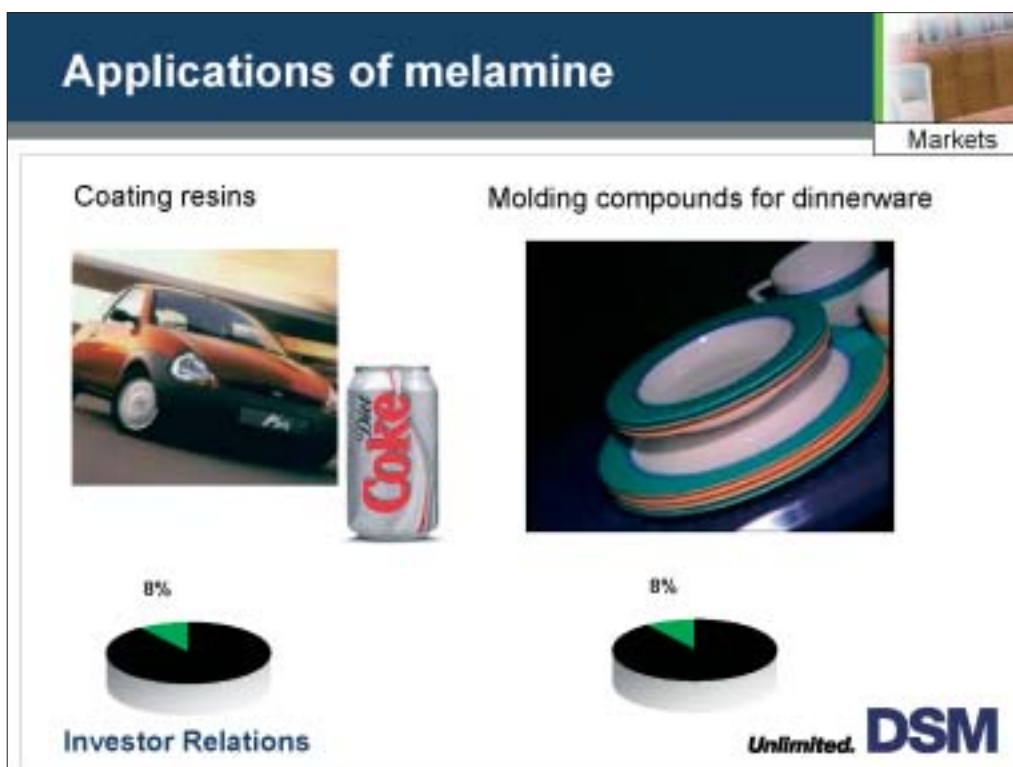


- Decorative laminates are an important application for melamine. Melamine powder reacts with other substances to form a resin or adhesive. This adhesive, which is waterproof, is added to a large quantity of wood chips and the resulting mixture is compressed to form chipboard. A sheet of paper printed with a wood (or other) design is simultaneously soaked in a similar melamine resin and then pressed onto the surface of the chipboard.
- Melamine based resins are used to produce laminates that are transparent and resistant to scratching, wear, water and chemicals. Decorative laminates are used in laminate flooring, furniture tops, kitchen and bathroom counter-tops, wall cladding, cabinets and ready-to-assemble furniture. Thanks to melamine, these products are durable, scratch resistant, heatproof, chemical resistant, moisture resistant and attractive to look at.
- Laminates are made in two types, high pressure and low pressure laminates, depending on the composition of the laminate and the methods used. High pressure laminates are preferred where durability, strength and resistance to heat and chemicals are required. Typical applications include kitchen and bathroom counter-tops, heavy-duty furniture tops and exterior wall cladding. Low pressure laminates are preferred when cost is an important factor. Typical uses include kitchen cabinets and ready-to-assemble furniture.
- Laminate flooring is the fastest growing application for melamine. A laminate floor is available in a wide variety of patterns and colors and consists of four layers:
 1. a transparent overlay sheet of melamine/aluminum oxide, providing protection and stain resistance;
 2. a wear-resistant decorative surface made of melamine based resin;
 3. a moisture-resistant wood composition based core, usually High Density Fiberboard glued with melamine urea resins;
 4. a balancing backing impregnated with mainly melamine (urea) resins.






- Besides laminates the wood-based products that contain melamine include plywood, particle board (PB), Medium Density Fiberboard (MDF), Oriented Strand Board (OSB) and beams. In these wood-based products the melamine containing resin is part of the binding system used to form the panel. For this purpose melamine is mixed with urea and formaldehyde to form a Melamine Urea Formaldehyde (MUF) resin.
The wood-based panels derive their improved durability, low formaldehyde emissions and moisture resistance from the use of melamine.
- The benefits of melamine based wood products are that they are very versatile and available in an unlimited variety of dimensions, they are cost-effective compared to competing materials like solid wood, plastics and metal, they are easy to use and can be shaped easily, and they are strong and moisture resistant.
- To produce these wood-based products fast-growing softwood, wood-waste and/or recycled wood instead of hardwood is used more efficiently. This reduces the use of hardwood and consequently helps to conserve the ancient forests.



- Melamine-formaldehyde resins are used in specially formulated (i.e. alkylated) resin systems to produce highly durable surface coatings. The coatings can be either water based or solvent based. During the coating process these resins form efficient cross-linking systems as they react with the polyester, acrylics, and epoxies. The benefits of melamine cross-linked coatings include better color retention, wear resistance and scratch resistance.
- These resins are being used in high solids and water based coatings to create lower emissions, thus contributing to a cleaner environment. Typical applications include coatings for automotive body panels, household appliances, beverage cans and coils of metal sheeting.
- Melamine-formaldehyde resins can also be blended with cellulose fillers, pigments, and other additives to form so-called "molding compounds". The molding compounds are usually supplied in powder or granules in grades formulated for a specific purpose. These compounds are used to produce colorful and durable objects, like dinnerware, chopsticks, and electrical equipment. The finished product is odorless, heatproof, tasteless, chemical resistant, and FDA approved.

Applications of melamine


Papers & Textiles

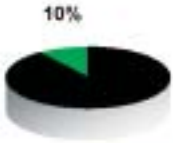


Flame retardant products



Concrete additives



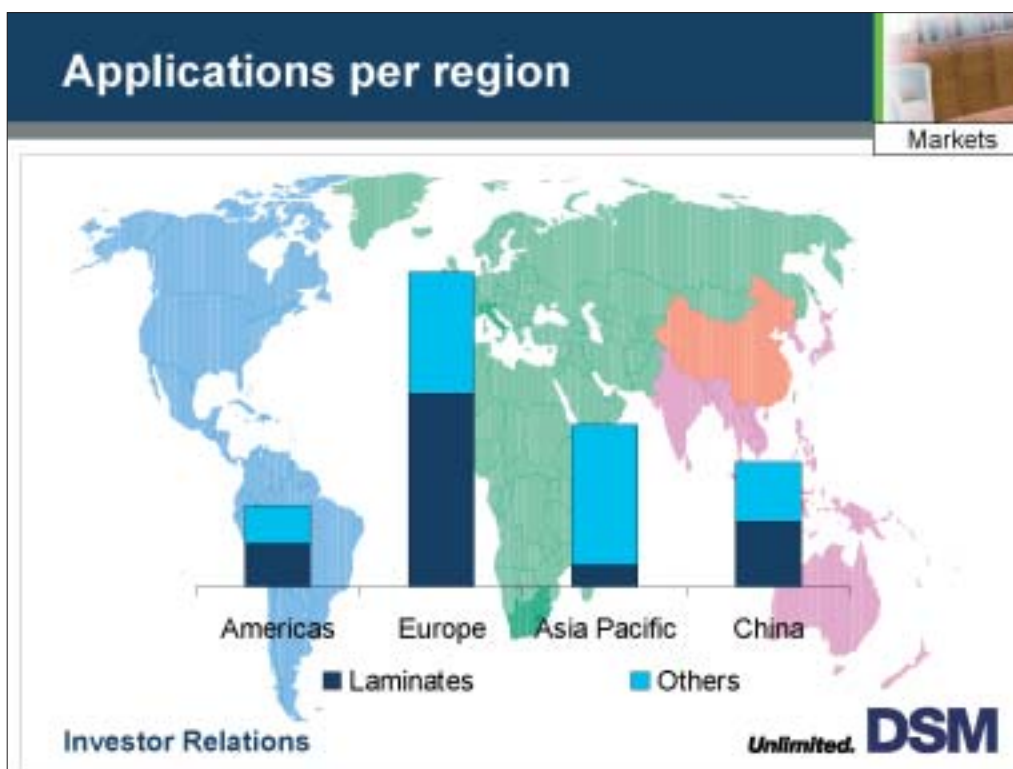


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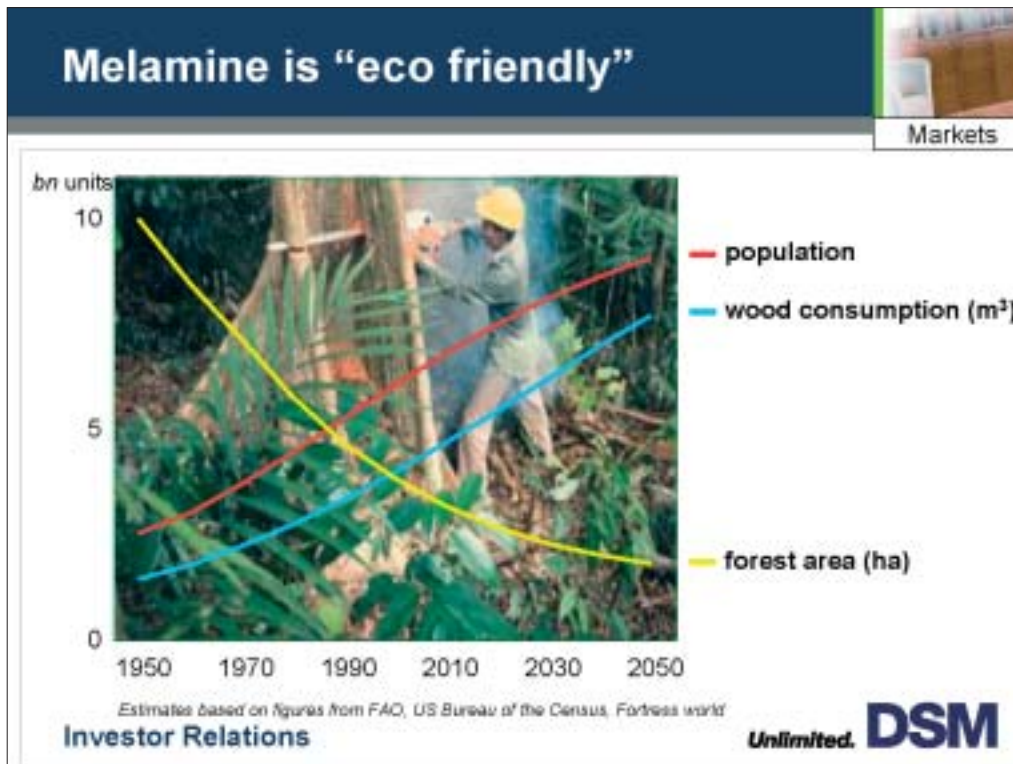
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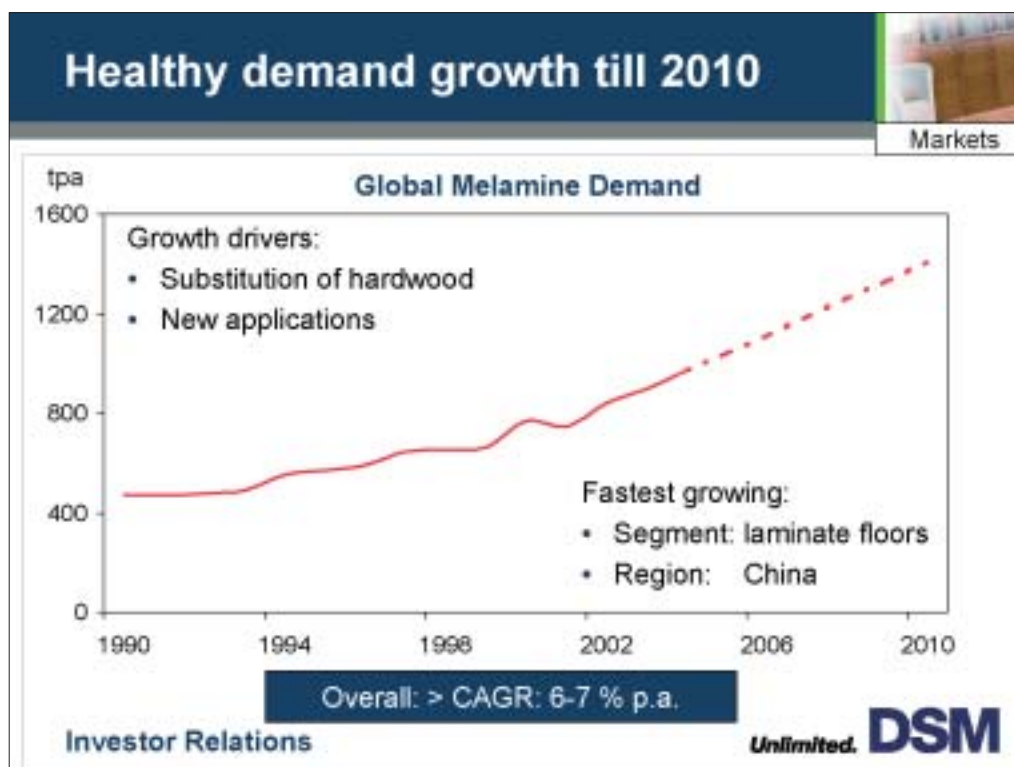
- Melamine-formaldehyde (MF) resins are used to provide wet-strength properties to specialty papers, such as banknotes, printed textiles, maps and wallpaper. Melamine based resins increase resistance to wear, thus extending the life of paper and textile. That is why melamine based banknotes, like the euro, can be wrinkled and folded endlessly and still look good. Melamine enhances color performance and color retention, and provides a glossy surface.
- Special sulfonated melamine-formaldehyde resins are used as plasticizers in concrete. They improve the flow characteristics of concrete with reduced water content. The result is a faster setting and stronger end product. The use of melamine makes concrete better workable, reduces drying time and improves the quality.
- Melamine, in its powder form, can be used to enhance the flame-retardant properties of polyurethane foam products and coatings. When exposed to heat and flames, melamine decomposes, absorbing heat and causing a cooling effect. Melamine based flame retardants are more environmentally friendly than conventional halogen based flame retardants. The foam products are used in soft furnishings, hospital and hotel bed mattresses, seats in public places (e.g. theaters and subway trains) and furniture.



- The amount of melamine consumption and its applications differ quite strongly per region.
- The consumption of melamine in the Americas is relatively low compared to the consumption in Europe. This is mainly due to a high use of alternative building & construction panels that are non-decorative and therefore contain less melamine. The laminate segment in the US is also smaller compared to Europe because of historical preference for solid wood furniture and imports of ready-to-assemble furniture.
- Europe is a typical decorative panel market with high melamine consumption. Melamine in Europe is mainly used in laminates, for example in ready-to-assemble furniture and flooring. The second largest application in Europe is in adhesive resins, mainly in the form of Melamine Urea Formaldehyde (MUF) resins, used in moisture-resistant panels and boards.
- In Asia the main melamine consumption is in adhesive resins which are predominantly used in the production of plywood and Medium Density Fiberboard (MDF) for wood-based panels. A second large application in this region is the use of melamine in molding compounds. Since the production of molding compounds has largely shifted from the Western hemisphere to the Far East, the use of melamine in Melamine-formaldehyde molding powders is also of importance in this region.
- In China, the youngest and fastest growing market, melamine like in Europe, is mainly used in laminates (flooring, furniture) wood-based panels (adhesives) and in molding compounds (dinnerware, chopsticks).



- Environmental considerations are of increasing importance as a driver for growth of melamine consumption. The growing use of melamine to produce products with a quality comparable or even better than when made of natural wood contributes significantly to reduce demand for natural hardwood. In this respect the use of melamine helps to improve the global climate. Furthermore use of melamine in adhesives strongly reduces the emissions of formaldehyde, thus improving the in-house micro climate.
- According to the FAO Global Forest Resources, the global deforestation results in an estimated net reduction of nearly 100,000 square kilometers of global forest on an annual basis. This is more than two times the size of The Netherlands, and equals several tens of soccer fields per minute. The growing population and the corresponding growing wood consumption can lead to an even further reduction of the global forests. This is a major concern since forests are extremely important for the global environment and climate. Deforestation therefore has many social, economic and ecological effects. Melamine enables the effective use of wood waste, recycled wood and fast growing softwood as a good alternative to hardwood furniture and floors. Melamine enables the optimum use of the wood via processed waste and recycled wood. It therefore helps to conserve hardwood and ancient forests.
- The use of melamine also strongly supports the environment via a reduction of emission of formaldehyde, which is recently being classified as carcinogenic to humans (IARC, June 2004). In adhesive resins, melamine catches formaldehyde. By increasing the amounts of melamine in the adhesives, formaldehyde emissions can even be reduced to below natural wood emission levels. Equal effects can also be reached by using a surface covering for wood-based panels, such as a melamine sheet.



- After a number of decades when melamine consumption grew at or around GDP levels, demand growth clearly accelerated as of 2000. In recent years demand has been growing at 6-7% per annum on a global scale.
- Environmental concerns, as discussed on the previous page, are a major driver for this accelerated use of melamine. Particularly in Europe the use of natural hardwood is losing popularity, as melamine reinforced substitutes offer nowadays the same, or even better qualities with regard to durability, processability and aesthetics.
- Strongest growth in this respect is seen in the use of melamine to produce laminate floors. This particularly is the case in Europe and in the Far East, including China. According to industry consultants the share of laminates in total flooring is to double in the coming years.
- As the qualities melamine can add to various other end products are being recognized more and more, and the applications of melamine are getting more refined, we witness a continuous innovation leading to new applications of melamine in a fast growing range of products.
- Geographically the strongest increase in melamine consumption is seen in China, with an annual growth of 25-30% over the past years. Drivers are the large housing projects in conjunction with the booming developments of the Chinese economy. This leads to high growth figures for both furniture and floors. Furthermore China is developing fast growing exports of products containing melamine (e.g. ready-to-assemble furniture, laminate flooring). Consequently half of the global increase in the consumption of melamine in the coming years will be realized in China.
- As a world leader DSM Melamine is excellently placed to capture a large part of this growth. The general market conditions look favorable with an annual growth rate above GDP. On the following pages DSM Melamine's ambitions in this context will be further elucidated.

Customer base

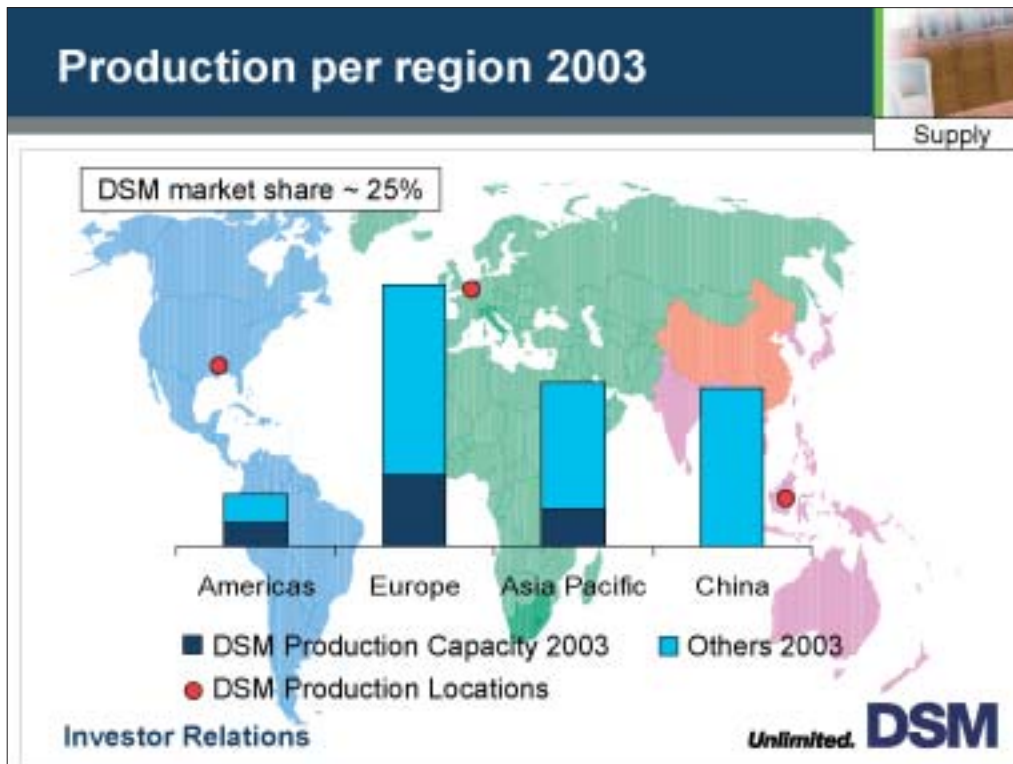
Markets

- Various types
 - Global versus regional
 - Dedicated versus integrated
- Trend: consolidation of customers
- Larger customers require
 - Security of supply
 - Consistent product quality
 - Global approach
 - Support in R&D for new products

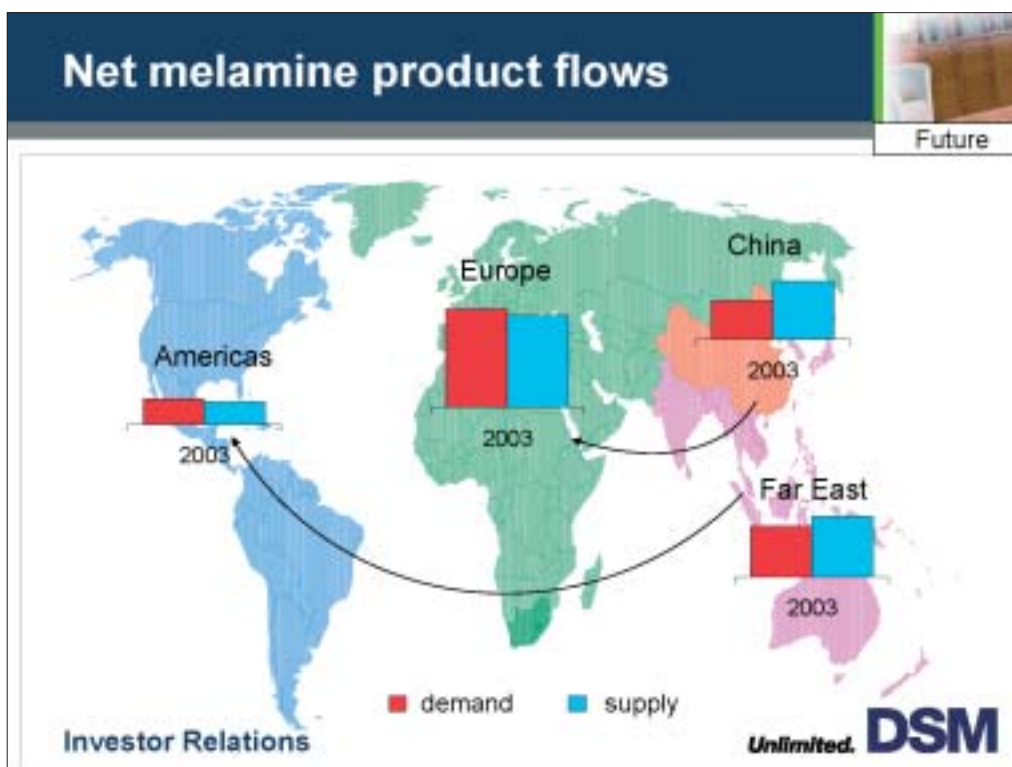
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- The customers of melamine can be segmented along various lines, the most meaningful two being:
 - a segmentation according to their regional presence and
 - a segmentation according to the degree of forward integration.
 - A growing portion of the melamine sales goes to integrated panel producers, who cover the whole value chain from resin production, via production of wood panels to the end products: furniture and laminate flooring elements. While initially most of these integrated panel producers had a fairly restricted regional presence – often concentrating their production in mega sites to capture economies of scale – we now see some of these larger integrated panel producers setting up production facilities in different regions, e.g. in China.
 - Among the dedicated resin producers both global players and regional players are represented, the latter often with relatively small production units, catering for the local market only.
 - Overall there is a clear trend towards consolidation among the customers of melamine.
- This consolidation has progressed already in the Western markets. It is expected that also the markets in the Far East, including China, which still show a high degree of fragmentation with a large number of relatively small customers, will show significant consolidation into the mega-site model that we see in Europe: possibly with foreign partners. Larger scale integrated panel producers will need larger scale local melamine supply.
- Generally speaking, large customers show a preference for large globally operating suppliers. Since DSM is the market leader, it is best capable to provide the product and services required by these customers. DSM has a very good track record on meeting demands for quality, reliability of supply, logistical flexibility, global supply contracts and technical service, as is a.o. shown by the amount of long-term contracts.
 - DSM Melamine is strongly represented at the large customers in every region on the globe. About 60% of DSM Melamine's sales are realized via longstanding relationships, which are formalized in long-term contracts. About 25% of DSM's total melamine production is sold via eBusiness channels.



- The global demand of melamine totals approximately 900 kilotons in 2003. DSM Melamine is the global leader, holding about a quarter of the global market.
- DSM's production capacity in the US stems from the 80 kilotons/annum plant in Addis, Louisiana, which is a 50/50 production joint venture with Cytec. Each partner is responsible for marketing and sales of its share in the melamine produced. Currently, there are no other melamine producers in North and South America.
- In Europe DSM's production is concentrated on the Geleen site in the Netherlands divided over two plants. The current capacity amounts to 150 kilotons/annum, the largest portion stemming from the so-called 'Melaf-2' plant, which with a capacity of 120 kilotons/annum is the largest single-line melamine plant in the world. Recently the new 'Melaf 4' plant was commissioned with an annual capacity of 30 kilotons. As 'Melaf-4' is based on a new proprietary technology, unit costs are in line with the unit costs of the large-scale plant which is based on a different technology. These capacities represent 30% of total melamine production capacity in Europe.
- In the Asia Pacific region DSM holds a 60% share in a business joint venture with local partners in Indonesia. The production capacity totals 55 kilotons/annum, representing 21% of the total melamine production capacity in this region. DSM Melamine is responsible for marketing and sales of the total output of this venture.
- Currently DSM has no production base for melamine in China. As will be elucidated later in this presentation, this will change with the expected establishment of a world-scale melamine plant on Hainan Island in the coming years. DSM Melamine is already present in the Chinese market with material imported from its other production sites.



- Basically regional markets for melamine are well balanced. Just about 10% of total production is exported to a different region. In 2003 the net trade flows were from Asia (both in and outside China) to western markets in Europe and the Americas.
- Imports into Europe late 2003, early 2004, were partially triggered by the exchange rate developments favouring producers outside the Euro zone. This year some extra melamine capacity came on stream in Europe through additions of the two largest producers, DSM Melamine and AMI. This will turn Europe from a net-import area into a net-export area.
- Exports to the Americas recently increased, and will probably have a more permanent character, due to the closure of an American melamine producer early 2004. Furthermore, the structural high cost of natural gas in North America results in low ammonia production and subsequently has its effect on the competitive position of domestic melamine producers.
- Fast growing demand in China will automatically lead to a more balanced supply/demand ratio in China in the coming years.

Market trends 2004-2005

Future

- New melamine production capacity
 - Europe +80 kt, China +30 kt
- High cost producers under continued pressure
- Urea prices expected to remain high
- Increased foreign investments in China and Americas
- Classification of formaldehyde

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- If the planned capacity expansion will be realized next year, it will change Europe from a net-import to a net-export area. Furthermore, from global perspective, this will most likely result in a relatively small oversupply of approximately 10%. This will increase the pressure on the melamine market price.
- However, it is expected that urea prices will remain high, preventing substantial price decreases of melamine, especially in China/Far East. As already seen this year, the non-integrated melamine producers that need to buy urea from the merchant market are under severe financial pressure.
- Producers of downstream products (panels, flooring), i.e. DSM's customers, will increase their investments in both North America and China, for local supply and/or export.
- The new classification of formaldehyde will result in the production of low-formaldehyde emitting products. It is expected that this will increase the amount of melamine in resin formulations, since melamine helps to reduce formaldehyde emissions.

Competitive environment

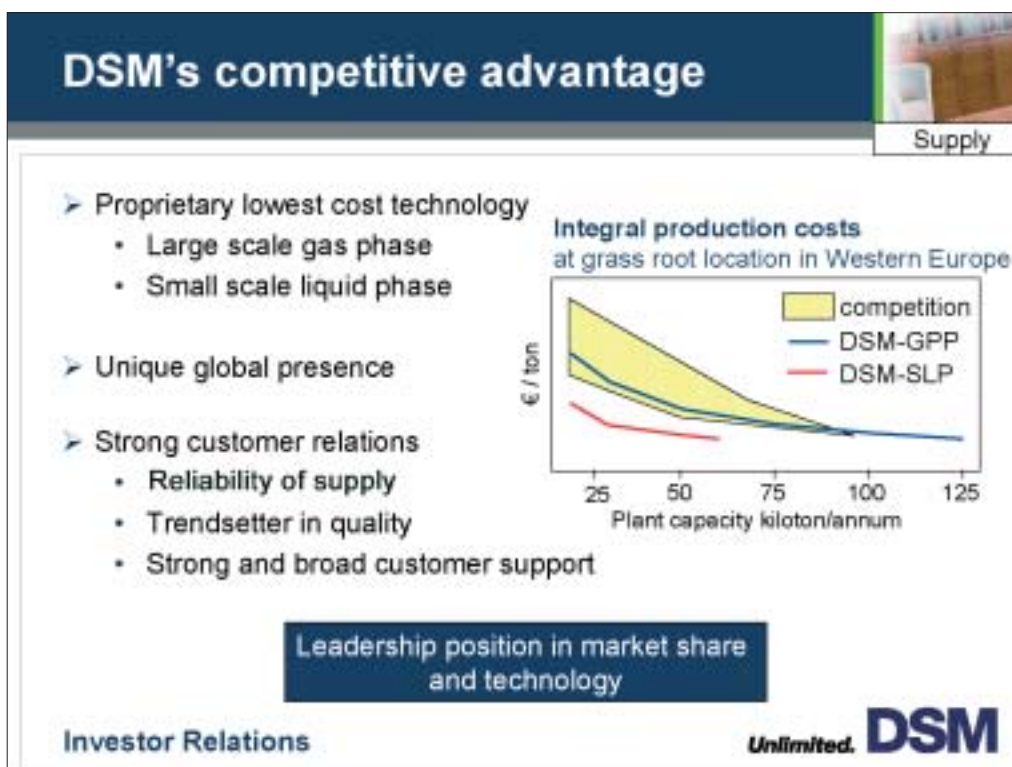
Supply

Europe	Americas	Asia Pacific	China
DSM	DSM / Cytec*	DSM	SCW
AMI		Nissan	Shangdong Haihua
BASF*		Mitsui*	Zhongyuan Fertilizers
Pulawy		Mitsubishi	Small others
Small others		Small others	

* largely captive

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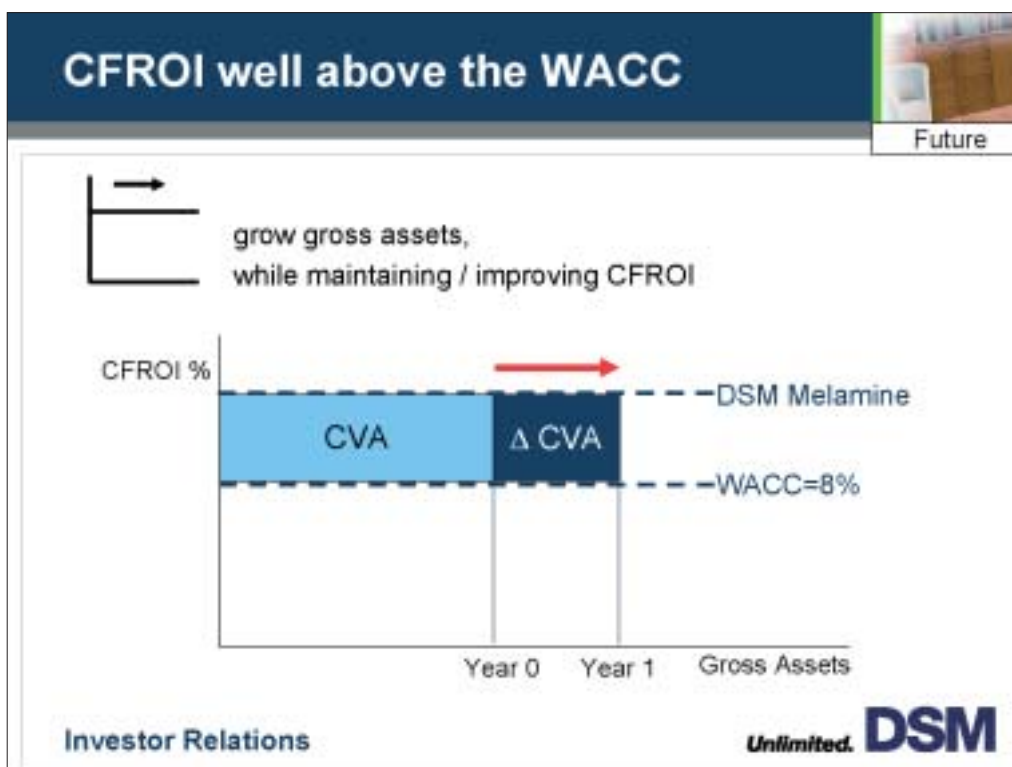

- The competitive field for melamine strongly differs per region. In Europe and the Americas concentration among melamine producers is high. In the Asian/Pacific countries outside China industry restructuring has started, while in the relatively young market of China consolidation still has to begin.
 - In the relatively small American melamine markets two players, DSM and Cytec, are the single large-scale producers currently, after closures of competitors. DSM Melamine, with a 50% share in the 80 kilotons/annum plant in Louisiana, is the leading merchant producer on this continent.
 - The European production of melamine is fairly consolidated with a small number of producers accounting for close to 90% of the total capacity on this continent.
 - In the Far East outside China production stems from a more fragmented production base, including still a fairly large number of smaller, less efficient older plants with sometimes non-integrated feedstock supply. Gradually these plants are forced out of the market by the construction of newer large-scale plants.
- Also in this region DSM Melamine is the largest producer with its DSM Kaltim Melamine JV in Indonesia.
- In China the melamine market is clearly still in its early phases. There are currently about 50 melamine producers active, however, only 7 producers operate plants with a capacity of over 10 kilotons/annum. It is to be expected that overtime the smaller units of 500 – 2000 tons/annum, will be phased out. Many of them having less favorable economics and their out-dated technologies pose a non sustainable burden for the environment.
 - Most important cost drivers for melamine production are scale and technology of the plant, raw material position and proximity to the market. As a world market leader DSM is excellently placed in this respect a.o. due to its proprietary production processes that are the most cost efficient. In areas where natural gas is expensive, like the US, Japan, Taiwan and Korea producers will come under increasing cost-price pressure. The same goes for producers on mainland China with plants based on coal or naphtha as primary feedstock.



- DSM's global leadership in melamine is built on its outstanding technology position, having developed proprietary production processes that are the most cost efficient in the world for either large scale or smaller scale plants. Gas Phase Process (GPP) technology has a proven capacity of up to 120 kilotons/annum and offers significant fixed costs synergies. The Shortened Liquid Phase (SLP) process used for the new Melaf-4 plant in Geleen results in an overall unit price which is fully competitive with the largest scale plants, due to its low variable costs. This unique toolbox offers DSM the opportunity to tailor capacity additions to the growth in the market that should be supplied.
- DSM is the only melamine producer active in all major markets around the globe and present on the main continents. This makes DSM the supplier of choice for large global customers, that are increasing their market share in the consolidating markets for melamine.
- To further strengthen its customer relations DSM Melamine successfully puts great emphasis on security of supply, delivery reliability, quality and customer support. These efforts are translated into security of sales; about 60% of sales are realized under long-term contracts.
- Next to investing continuously in process-related R&D DSM Melamine has also an established technical support center, manned with a staff of about 15 specialists, to assist its customers in the development of their applications for melamine. The staff of this technical support center can draw on the vast knowledge base within DSM regarding material science and chemical technology.
- DSM Melamine offers its customers a range of ways of doing business via a fully operational eBusiness platform. At the end of this year approx. 25% of the total melamine volume will be sold by eBusiness to more than 70 relations. The options available vary from spot sales via the DSM Webshop to Vendor-managed-Inventory relationships.



- Melamine consumption is expected to show a healthy demand growth for the years to come, especially in China the growth is expected to be high. This relatively high growth in China is driven by both the above average GDP growth and the above average growth in the construction of new housing.
- Prosperity amongst China's growing population increasingly affects middle classes which means that millions of Chinese, following decades of collective housing allocated by the state, are now determined to own and consequently decorate and furnish their own homes. The 10th 5-yrs plan of the government aims to raise standards of living by increasing the housing surface per capita to 30 m² by 2010 (in the early 80's this was 4 m²).
- This house-construction 'machine' has just started. Over the period 1998-2003 1.3 billion m² housing was completed; at the end of 2003 almost 1 billion m² housing was under construction. The current 5-yrs plan targets realization of another 6.7 billion m² between 2003 – 2010. This will accelerate demand for products like Medium Density Fiberboard (MDF), particle board and melamine laminate surfaces. Anticipating this upswing in consumer demand, the big name furniture retailers are already moving in.
- Currently, the laminate market is very fragmented with many relatively small manufacturers of wood-based panels and furniture mostly spread along the coastal area. There are also still many state owned companies that are subjects for privatization. Large integrated mega-sites (production sites with a panel capacity of more than 700,000 m³ per annum, according to the European model) are not yet seen, although Chinese business culture shows a tendency to integrate wherever possible.
- Furniture production for both domestic markets and exports remains the single most important driver for wood-based panel demand. This will result in increasing melamine based laminate consumption. A lot of growth is also focused on laminate flooring. Local production of laminate flooring is already increasing in China through domestic suppliers and joint ventures with European manufacturers.



- DSM has adopted the Value Based Business Steering (VBBS) model for internally assessing and steering its financial performance. VBBS measures and steers financial performance in terms of value creation, based on a cash flow return on (historical) investment minus the weighted average cost of capital (WACC).
- Cash Value Added (CVA) is DSM's internal measure to determine the value realized by a business, that is, its cash earnings over the WACC. In order to create value a business has to improve its CVA over time.
- DSM Melamine's CFROI has been well above the WACC during the last five years; its returns on its invested capital exceeded the WACC. The way to create additional value is therefore to grow this business while improving or maintaining CFROI.
- Generally, businesses in this kind of situation will rank among the top group in their industry segment. This is also clearly the case for DSM Melamine. DSM Melamine outperforms its competitors in terms of return by virtue of proprietary technology, better economies of scale, better distribution channels, better customer support, etc.
- The future challenge is to capitalize on this excellent business position, to further grow this profitable business and maintain the global leadership position.



DSM Melamine's ambitions

Future

Ambitions:

- Maintain global leadership position
- Growing a profitable business
- Increase market share in China
 - Create production base in China

Success factors:

- Excellent feedstock position through cooperation with CNOOCC
- Combined with DSM's superior technology for a world-scale plant
- Proximity to exciting markets with double digit growth

Investor Relations

Unlimited. **DSM**

- DSM Melamine has the ambition to maintain its global leadership position in this attractive market. As DSM Melamine consistently outperforms the WACC, it is eminently placed to invest in expanding its business. This will further reinforce its position as the world's # 1 melamine producer.
- DSM Melamine is excellently placed to capture a large share of the fast growing Chinese market. DSM Melamine is the market leader that sets the quality standards in the industry, and is best capable of meeting demands for reliability of supply, logistical flexibility, global supply contracts and technical service. To further build on this excellent position DSM initiated together with its partner CNOOCC (China National Offshore Oil Company Chemicals Ltd) a feasibility study to erect a world-scale melamine plant in Hainan China. DSM Melamine will hold a 70% share and CNOOCC 30%. Assuming a positive investment decision in Q1 2005, the plant is expected to be mechanically complete by the end of 2007.
- This project logically follows from the considerations as presented on the previous pages. Key success factors for this project are:
 - an excellent feedstock position through the cooperation with CNOOCC, which operates a state-of-the-art urea plant based on DSM's proprietary technology on Hainan, sourced by its vast natural gas reserves in the area;
 - a leading Gas Phase Process which enables a world-scale plant of 120 kilotons/annum, securing a very competitive unit price;
 - proximity to a market where demand growth will be largest; from Hainan all coastal regions of South-East China can be reached directly.

China project

Future

- 120 kta Melamine plant in Hainan, China
 - proximity to a fast growing market
 - excellent raw material position
 - economies of scale
 - superior technology



Investor Relations


- In July of this year DSM Melamine and China National Offshore Oil Corp. Chemical Ltd. (CNOOCC) signed a letter of intent to jointly study the feasibility of building a new 120 kilotons/annum melamine plant on Hainan Island, China. The project combines an excellent raw material position, economies of scale and a superior technology with proximity to an exciting regional market that is expected to grow double digit.
- CNOOCC is a fully-owned subsidiary of CNOOC, China's 3rd largest oil and gas company. CNOOC, which realized a total production of 33 million tons of oil equivalent in 2003, operates a number of natural gas fields in the South China Seas area. On Hainan Island CNOOCC operates state-of-the-art ammonia and urea plants sourced by this natural gas. The melamine plant will be integrated with CNOOCC's modern large-scale urea plant – based on technology licensed by DSM – on Hainan.
- The melamine plant under study will be based on DSM's proven Gas Phase Process (GPP) technology. With a name plate capacity of 120 kilotons/annum it will be the largest melamine plant in the world, similar in output to the current Gas Phase plant of DSM Melamine in Geleen. The combination of the favorable feedstock position with the superior production technology and the economies of scale to be derived, secure a very competitive position for this project.
- Hainan Island is perfectly placed to supply melamine customers located in various places along the coastal region of South-East China. As elucidated on the previous pages melamine demand is anticipated to grow double digit in this region. Hainan offers also ample opportunities to export melamine to neighboring countries in the region. In addition, the government of Hainan province is willing to actively support the project.
- The envisaged co-operation between DSM and CNOOCC is a foreign investment company Ltd, in which DSM's share is 70%. The total investment amount is expected to be approximately USD 100 million. The final investment decision is foreseen for Q1, 2005.

The way forward

Future

Growing a profitable business

- China project
- Ongoing cost reduction
 - Geleen Copernicus project
- Asset utilization
 - DSM Kaltim improvement potential
- Maintaining & strengthening customer relations

Investor Relations

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- The growth in melamine demand is healthy and robust. DSM is very well placed to maintain its leadership position in a continued profitable way. Further value creation requires expanding of the asset base. Building a world-scale plant in China is therefore a logical next step.
- Management attention will continue to be focused on the value drivers in this business. These are the fixed out of pocket costs per ton, asset utilization and customer relations.
- Further fixed out of pocket cost reductions will a.o. be addressed in the Copernicus project for the Geleen site.
- Increasing DSM Melamine’s asset utilization will a.o. be addressed at DSM’s site in Indonesia. Currently DSM Kaltim Melamine – the lowest cost plant – already has a production capacity of 55 kilotons/annum as a result of successful creep projects. It is expected that this capacity can be boosted up to over 60 kilotons/annum at minor capital expenditure.
- By realizing the above DSM Melamine will achieve the ambitions mentioned in the title:

“ Growing a profitable business ”