



**Impacts of raw material
shortages and rising material
costs in the Road Marking and
High Friction Surfacing sector
- May 2010**



**ISSUES SURROUNDING RAW MATERIAL SHORTAGES, POTENTIAL FINISHED MATERIAL
SHORTAGES AND RISING MATERIAL COSTS IN THE ROAD MARKING
AND HIGH FRICTION SECTOR
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This report has been produced by the Road Safety Markings Association in order to provide all stakeholders within the road marking sector with a summary of the problems being faced by the sector as a result shortages of raw materials vital to the manufacture of road marking product, as at 6th May 2010.

These raw material shortages have a potentially massive impact upon all stakeholders whether they are Material Manufacturers, Road Marking Contractors, Central Government Agencies, Term Maintenance Agents & Contractors, Local Authority Clients or actual road users. The implications of material shortages range from financial to critical road safety solutions and there is a need for all stakeholders to respond to the issues that are raised in the report.

The report provides an impartial outline of the problems being faced along, with an analysis of what this could mean for clients and contractors over the Summer of 2010, in terms of availability of road marking materials and the upward price pressures that these raw materials shortages are generating. Particular attention is drawn to the section on the estimated impact on UK supply of Road Marking materials and Costs in the UK road marking sector on Page 4.

Report Contents

Introduction	Page 1
Resin/Rosin Shortages	Page 1
Impact of Resin/Rosin Shortages	Page 2
- Direct Impact	
- Short Term Implications	
- Longer term Implications	
Shortages of Titanium Dioxide	Page 4
Estimated Impact on UK Supply of Road Marking materials and Costs in the UK road marking sector	Page 4 - 6
- Resin Supplies: Impact upon supply and factory gate prices	
- Titanium Dioxide Supplies: Impact upon supply and factory gate prices	
- Conclusions	
o Supply of Road Marking Materials	
o Cost of Road Marking Materials	
Action that could be taken	Page 6
Source Information Extract Issues surrounding hot melt availability, taken from www.specialchem4adhesives.com	Page 7 - 8

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INTRODUCTION

The road marking sector is facing an imminent crisis resulting from a shortage of base raw materials used in road marking product; this shortage jeopardises both the production of materials and the economics of the sector and significantly could have major implications for road safety in the United Kingdom.

These raw material shortages are based around the restricted supply/availability of both resin used as binder in thermoplastic and cold plastic road marking materials and the production of high friction surfacing, combined with a similar scarcity of titanium dioxide used to whiten road marking materials in order that they meet their performance criteria.

RESIN/ROSIN SHORTAGES

At the time of writing there is grave concern within the road marking sector over restricted availability of both rosin esters, gum resin and hydrocarbon resin materials that are used as binders in the manufacture of both thermoplastic and cold plastic road marking materials and high friction surfacing.

This raw material shortage is not just limited to the road marking sector and is impacting upon all polymer manufacturing processes. The major difference in respect to the road marking sector is that these shortages have the potential to have a major impact on the safety of roads in the UK.

The restricted availability of these raw materials, whereby all UK manufacturers (and it would appear Continental and worldwide manufacturers) of these materials are receiving rationed supplies, is leading to interrupted manufacture of finished materials and therefore a potential restriction in the capacity of the road marking manufacturing sector to meet the demand for finished materials from contractors and their clients within national and local highway authority clients.

This shortage of essential raw materials is to be based on the coalescence of a range of factors that individually may not have led to a critical situation but collectively risk interruption of supply of road marking materials in the UK and beyond.

The factors involved appear to be the following:

- A lower than average harvest of gum resin in China in 2009; as a result of low commodity value the volumes harvested was historically low. Unfortunately it would appear that at this time of low harvest, demand for such raw materials increased leading to a combination of low supply and rapidly escalating prices. It would appear that only one Chinese province out of three provinces historically linked with gum resin production has actually harvested the material. It is anticipated that the next harvesting season which will commence in June 2010 will see larger volumes harvested, although it is uncertain whether this will be at a level to satisfy demand or the impact this will have on raw material prices, now that they have accelerated to the current level.
- Production of Hydrocarbon based (C5) resins, which is historically predominately dependent on one manufacturer has apparently suffered production difficulties over the winter months leading to a significant reduction in output and a subsequent rise in prices, further compounded by increasing oil prices internationally.

- These production difficulties have also combined with a move to a different type of oil processing (light cracking feeds), which has resulted in reduced volumes and content of useful chemicals resulting from the process. It is believed that the production difficulties outlined are expected to ease and that production should increase in the coming few months, however, it is unlikely that there will be any alteration in the move to low cracking feeds; consequently we believe that overall production may remain lower than historic levels, providing no guarantees in respect to manufacturing levels or realistically the price of materials.

IMPACT OF RESIN/ROSIN SHORTAGES

Direct Impact

The direct impact of these shortages has been two fold:

i. **Rationing of supply**

The rationing of supply of raw materials to material manufacturers (in the UK this is predominately thermoplastic manufacturers), leading to interrupted production and reduced volume output.

The specific impact is that stocks of thermoplastic materials in the UK which would normally be increasing at this time, to supply the busiest road marking period of May to October, are currently declining.

As a result of the interrupted nature of supply of raw materials many manufacturers are having difficulty in both meeting current demand and in predicting how long they can sustain continuity of supply. Some manufacturers estimate that supply may be down to as little as two weeks to satisfy contractual commitments.

There are a number of critical situations already starting to develop; for example, a major road in the Republic of Ireland is scheduled to open in three weeks, however, the contractor concerned has no guarantee of supply of materials with which to undertake the work. There is evidence from manufacturers in the UK that this is a situation that is likely to develop here within the next two to three weeks (mid to late May 2010).

ii. **Increased factory gate prices**

With increasing raw material costs related to resin/rosin shortages currently estimated to be running in excess of 60% over 9 months, there is unavoidable pressure on manufacturers to increase their factory gate prices or face financial ruin.

Short term implications

The indirect impact of these shortages, will be many and varied, however, of specific short term concerns are the following:

i. **Inadequate material availability to mark UK roads**

The potential for interruptions of supply of materials to lead to a shortage that will restrict the industry's capacity to deliver current and future contractual commitments to clients at a national and local level is currently rated as very high. This is a situation likely to sustain until the end of July at the earliest.

In reality the shortage of raw materials is not a phenomenon restricted to the UK and therefore the capacity to import our way out of finished material shortages is virtually non-existent.

At current levels of raw material supply manufacturers indicate that, without intervention at a higher (governmental) level, interruptions to the installation of road markings could start by the middle of May 2010. Should supply fail then it is possible that other essential road maintenance activities such as surface dressing and resurfacing, particularly vital following our harsh winter may have to be suspended until supply difficulties ease.

ii. Price Inflation pressures

As indicated above the level of increases in raw material prices has led to significant upward pressures on factory gate prices and whilst actual increases will be a matter for individual manufacturers this will inevitably lead to some level of increased cost in road markings as installed.

Initial research by the RSMA puts this increased cost in road markings, as installed by contractors, in the range of an estimated 6.2% to 9.5%, which, if not passed onto clients will lead to a substantial level of business failure amongst contractors.

Clearly there is pressure in this area as many contractors are working on contracts with restricted capacity (and in some case willingness from clients) to raise output costs.

The combination of rapidly escalating fuel prices in part exacerbated by Government's decision to remove the sector's red diesel exemptions in 2008 and material cost pressures will have a significant impact on the sector for the foreseeable future leading potentially to significant business failures across the sector.

iii. Constraint in supply

It is hard to provide a specific answer to the question of how long the constraint on supply may last. Increased prices should (in a non-distorted market) encourage a large harvest of Gum Resin in China during the 2010 season.

In a perfect environment this would suggest that increased supply should start to reach the UK market place by August 2010 (allowing time for harvest, processing and shipping), notwithstanding the potential of interference in (supply to) the market in order to sustain higher prices this timescale is likely to be insufficient to guarantee uninterrupted supply of road marking materials in the UK for the foreseeable future.

In respect to C5 production, as indicated above, the change in processing practice means that the levels of production of this resin are unlikely to reach levels common under heavy oil processing, although production levels should rise significantly now that Exxon have resolved their production problems.

It is clear from even a rudimentary analysis of the available information that presuming supply was to return to normal the issues of cost inflation is likely to sustain and that prices are unlikely to return to the position prior to shortage.

Longer term implications

Sectors similar to the road marking sector have, in recent years, faced similar circumstances not least the high friction surfacing industry where shortages in bauxite supply around the period of the 2008 Olympics have led to discontinuity of supply ever since and a long term significant rise in raw material prices. Such increases in costs have arguably jeopardised the viability of the high friction sector.

It is expected that the longer term implications for the road marking sector are likely to include on going inconsistency in supply and the potential for significant long term price instability. Should supply return to anything approaching what is deemed to be 'normal' levels within the next 6 months then there is an expectation that the price inflation that has seen resin prices double between 2008 and April 2010 will lead to a longer term price far in excess of historic values.

This type of phenomena is not unique to the road marking sector in that the drive by some nations to corner or control the sourcing and supply of essential commodity resources is likely to become a longer term issue for both industry and public procurers.

SHORTAGES OF TITANIUM DIOXIDE

The shortage of the resin/rosin raw materials is being exacerbated by a similar constraint in the supply of titanium dioxide to the sector.

Initial research indicates that this shortage may also be in small part be due to the control of commodity supply by some nations and corporations however the principal cause is as a result of a fatal explosion at a production facility in Grimsby which resulted in a six week closure of the plant (which only came back on stream in early April). The Grimsby plant's capacity is 150'000MT per annum across a number of grades - multipurpose, plastics, paper/laminates etc. UK demand for TiO₂ is estimated at approx 110'000 MT.

The impact of these factors has been to see a rise in the cost of this essential raw material of circa 100% since April 2009, whilst supply has been constrained with manufacturers unable to secure adequate supplies at reasonable cost.

ESTIMATED IMPACT ON UK SUPPLY AND COSTS IN THE UK ROAD MARKING SECTOR

In response to these issues the RSMA have undertaken urgent research into the supply and cost implications for the UK road marking sector by investigating the supply constraints and raw material cost increases being experienced by road marking material manufacturers and the subsequent trend in price increases for finished materials at the 'factory gate'.

The RSMA issued research questionnaires to UK thermoplastic manufacturers and received responses from manufacturers responsible for the production of circa 90% of road marking materials installed on UK highways every year.

The questionnaires sought to identify:

- Whether manufacturers were experiencing difficulties in obtaining raw material supplies of resin and titanium dioxide used in the production of road marking materials
- If they were experiencing difficulties whether this would be likely to lead to a restriction in the availability of finished product over the next 8 weeks
- Whether as a result of supply difficulties there would be an escalation in factory gate prices for finished materials supplied to road marking contractors and whether this could be quantified.

Note: The results of the survey are based on basic calculations and do not use weightings for the size of manufacturers and the proportion of the market they supply. There appears to be no consistency regarding the size of companies that are facing the biggest level of supply difficulties

The results were as follows:

Section A: Resin Supplies - Impact on supply and factory gate prices

- All responding manufacturers indicated that they are facing difficulties sourcing the required levels of resin/rosin required to produce road marking material and that supplies were currently running at an average of only 75% of that required to meet production requirements.
- Nearly 90% of manufacturers believe that the shortage of resin/rosin will lead to an interruption in the supply of finished materials to their normal contracting customers

The timescale of when such interruptions to supply would impact was less clear, since some suppliers were having difficulty in confirming what level of demand could be met after mid May as a result of uncertainty over raw material supply.

The results were as follows with supply shown as a percentage of demand, where a manufacturer could reasonably predict what level of demand they could meet:

- **80%** of demand could be met up until mid May
- **66%** of demand could be met up until the end of May
- **45%** of demand could be met up until mid June
- **43%** of demand could be met up until the end of June

Based on accessibility of resin/rosin materials 50% of responding manufacturers expected to be unable to manufacture and/or supply contractors on a timescale between late May and early July. Some others would only be able to maintain supply through placing customers on allocation. Only two respondents (25%) believed that they would be able to continue supply (based on normal demand by regular customers) without any interruption.

Respondents were asked whether the scarcity of resin/rosin materials and the consequent price rises they have faced would lead to a rise in factory gate prices.

- **87.5% (7 out of 8)** of manufacturers would need to increase their factory gate prices as a result of rising resin/rosin material price rise

Such price rises would range from **12% to 25%**, with an average **13.7% rise in factory gate prices** resulting from resin/rosin price increases

Section B: Titanium Dioxide Supplies - Impact on supply and factory gate prices

- **75%** of responding manufacturers (6 out of 8) indicated that they are facing difficulties sourcing the required levels of Titanium Dioxide required to produce road marking material and that supplies were currently running at an average of only **77%** of that required to meet production requirements.
- Some 5 from 8 (**62.5%**) of manufacturers believe that the shortage of Titanium Dioxide will lead to an interruption in the supply of finished materials to their normal contracting customers

The estimated timescale of when such interruptions to supply (and incidence of non supply) would impact ranged from late May to mid July

Respondents were asked whether the scarcity of Titanium Dioxide and the consequent price rises they have faced would lead to a rise in factory gate prices.

- 87.5% (7 out of 8) of manufacturers would need to increase their factory gate prices as a result of rising resin/rosin material price rise

Such price rises would range from 3% to 10%, with an average 6% rise in factory gate prices resulting from Titanium Dioxide price increases

Section C. Conclusions

Supply of Road Marking Materials

Based on the results of the rudimentary survey undertaken by RSMA of manufacturers producing 90% of the road marking materials installed on UK roads shortages of supplied materials will start to impact from late May; with less than 45% of road marking material demand being met by the end of June 2010. This is based on manufacturers still being able to source the resin/rosin raw materials they have been promised by suppliers. The shortage in availability of Titanium Dioxide merely compounds this shortage, although it would appear to have no additional supply impact in its own right on finished product.

Cost of road marking materials

The escalation in cost of both raw materials, will, according to manufacturers, have an impact on factory gate prices for thermoplastic materials, with an average rise in costs of 20% being a reasonable estimate. This would translate into an estimated rise in application costs of between 6.5% and 9.5% depending on the type of marking being installed.

ACTION THAT COULD BE TAKEN

The introduction to this paper indicated that one of the main issues that impact upon this situation is the risk to road safety in the UK resulting from an inability to install markings (and undertake safety and maintenance critical surfacing activities) on UK roads in the short term and the escalation in costs in the short and medium term.

It is the opinion of the road marking industry in the UK that there is an urgent need for Government intervention to address these issues and that such intervention should take the following approach:

- Enter into urgent discussion with representatives of the road marking sector to discuss the viability of, at least, the following actions
 - i. Intervention to divert essential raw material supplies towards the UK road marking manufacturing sector from other less safety critical areas of manufacture.
 - ii. Release additional financial resource to allow both the Highways Agency and Local Authorities meet the rising costs of road marking installation
 - iii. Support initiatives to suspend penalty clauses penalizing contractors for late and/or non delivery of service under term contracts

Hot Melt Raw Material Availability

Andrew Extance - Mar 10, 2010



Some of the major raw materials used in hot melt adhesives have more in common than just their end application. They are also less plentiful, and more expensive, than most manufacturers would wish.

In late January Platt's Global Petrochemical Index reached an 18-month high¹, up nearly 150 percent since the recession bottomed at the end of 2008. While lower prices through 2009 indicated eased supply constraints, they also made producers reduce outputs. Some of these changes are long-term, creating new challenges as demand for hot melts returns.

A key driver behind the Platt's Index rise is the price of naphtha, which rose to \$775/tonne, up from \$245 in late 2008. Naphtha is cracked to produce ethylene and benzene, the two primary feedstocks for styrene, and generates butadiene as a by-product. The market for naphtha is currently tight, largely driven by downstream demand for ethylene from Royal Dutch Shell's new 750,000 tonne per annum monoethylene glycol plant in Singapore.²

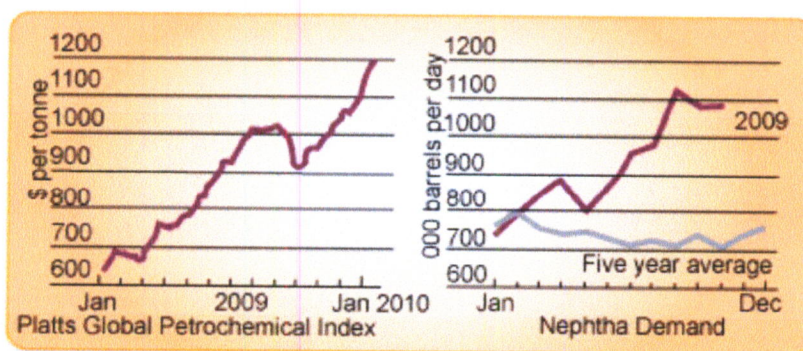


Figure 1 : Petrochemical demand recovers Source: Platts, IEA

This has varying consequences for the supply of backbone polymers providing the spacial framework for hot melt adhesives. For one, increased competition for ethylene supplies has raised ethyl vinyl acetate copolymer prices in recent months. Ethylene prices are more likely to be bad news for styrene producers than users, as overcapacity keeps prices of the monomer low. This is still the case, even after Dow ceased output from its Freeport, Texas, facility as it exited the US styrene monomer production at the end of 2009. However the increased ethylene production could have driven the reduced butadiene prices seen in Europe and the US at the beginning of 2010.³ Some expectations will have been confounded by this decrease, as shifts to lighter feeds for cracking have been expected to reduce the output of C4 (butadiene) and C5 (isoprene) feedstocks. This led to increasing isoprene prices through 2009, but as the C5 by-product fraction from steam cracking naphtha to make ethylene is 10-15% isoprene, output should increase in 2010. Overall, styrene-butadiene rubber, styrene-isoprene-styrene and styrene-butadiene-styrene copolymer prices had been expected to stabilise in Q1 2010⁴, but recent acceleration of demand from Asia seen by Platts and others now makes that seem optimistic.

Tackifying resins play a crucial role in providing initial adhesion for hot melts. Supply of C5-C9 hydrocarbon based varieties is also being restricted due to the move to light cracking feeds. Not only is less volume of these fractions being produced, but the content of useful chemicals in them has fallen. Tackifier manufacturers must therefore raise input volumes to maintain output. Consequently, one producer has imposed sales controls on C5 tackifiers, and more price increases are expected.

Tight supplies of these products have driven a shift to using rosin tackifiers instead. Rosins come in two main varieties: tall oil rosin, which is dominant in North America, and gum rosin, which is dominant in Asia. With the supply of gum rosin seemingly unable to meet demand at the end of 2009, prices rose by around 50%.



Figure 2: Gum rosin, the price of which jumped 50% in 2009

Adhesive manufacturers have, in turn, switched to tall oil rosin. Tall oil is a by-product of the pulp and paper industry, made at the same time as more profitable fatty acid chemicals. The paper industry lowered its output in 2009 in response to weak demand, while fatty acid demand also fell, both of which impacted the supply of tall oil. All of these factors have combined to raise the prices of tall oil rosin also.

Among the performance enhancing and modifying waxes, the perennial pressure on Fischer-Tropsch wax supply eased somewhat due to lower demand in 2009. However Sasol in South Africa, shut its Fischer-Tropsch production site - one of only two in the world - down for six weeks' maintenance at the end of the year. This will be followed by another three week statutory shutdown in March 2010, setting back inventory levels and keeping prices high well into 2010. Meanwhile, exports of paraffin wax from China have slowed due to intentional and unintentional shutdowns at oil refineries. This has restricted supply, and prices have increased in line with crude oil.

How do you see the current supply situation for hot melt raw materials? Please share your insights using the tools below.

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2. Peng, S. L. Reuters, "Shell ethylene demand for new plant bolsters naphtha". <http://uk.reuters.com/article/idUKSGE5BM06620100106?pageNumber=1&virtualBrandChannel=0&sp=true> (accessed February 2010)
3. ICIS News, "February ICIS IPEX petrochemical price index up 7.8%", <http://www.icis.com/Articles/2010/02/02/9331167/february-icis-ipex-petrochemical-price-index-up-7.8.html> (accessed February 2010)
4. Henkel, Adhesives Raw Materials Facts, "Hot melts on the rise", http://www.henkelna.com/us/content_data/RMF_NA_AI_Dec09Final.pdf (accessed February 2010)

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