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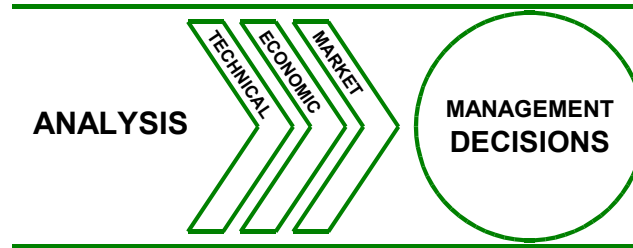
CONSULTANTS TO THE PLASTICS AND RUBBER INDUSTRIES

# **DEVELOPMENTS FOR SPECIALTY TPEs IN CHINA**

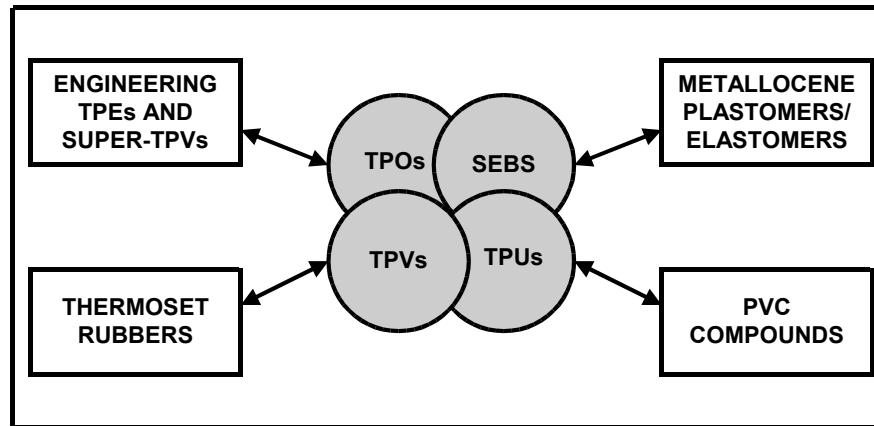
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**3<sup>RD</sup> ASIA/CHINA SPECIALTY  
ELASTOMERS MARKETS  
CONFERENCE  
SHANGHAI, CHINA  
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Rea/papers & presentations/ShanghaiCMT100306.ppt



**Specialty Thermoplastic Elastomers . . . Markets, Economics, Intermaterials Competition, and Industry Structure in China**



*A Multiclient Industry Analysis*

2006

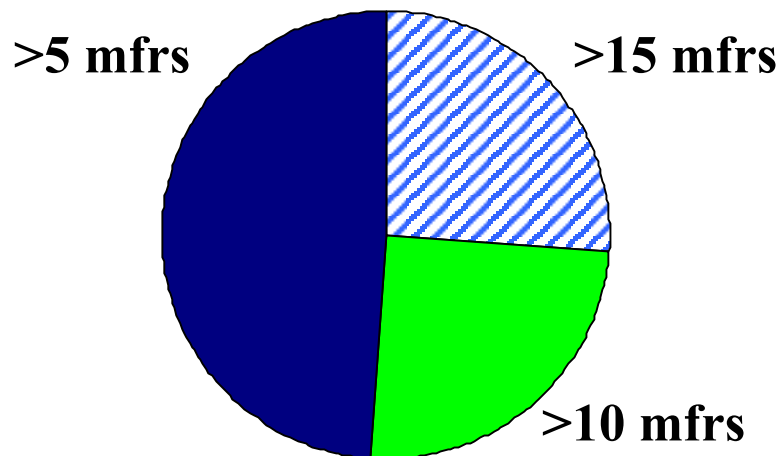
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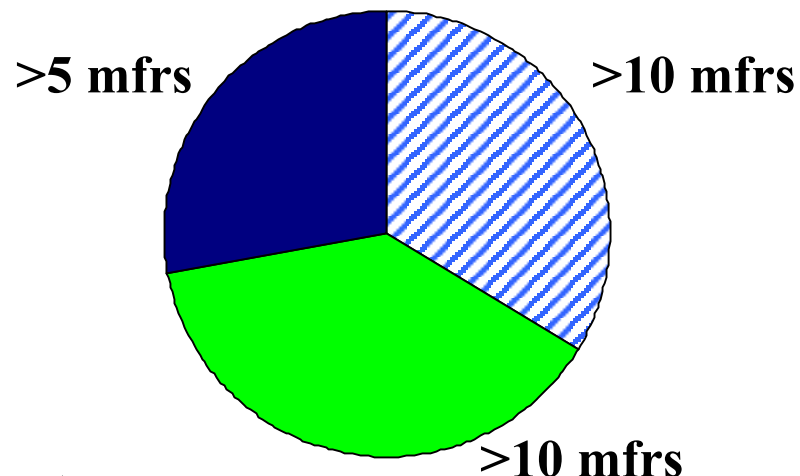
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# COMPARATIVE INDUSTRY STRUCTURE

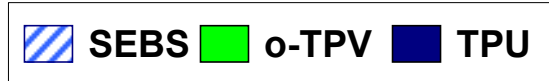
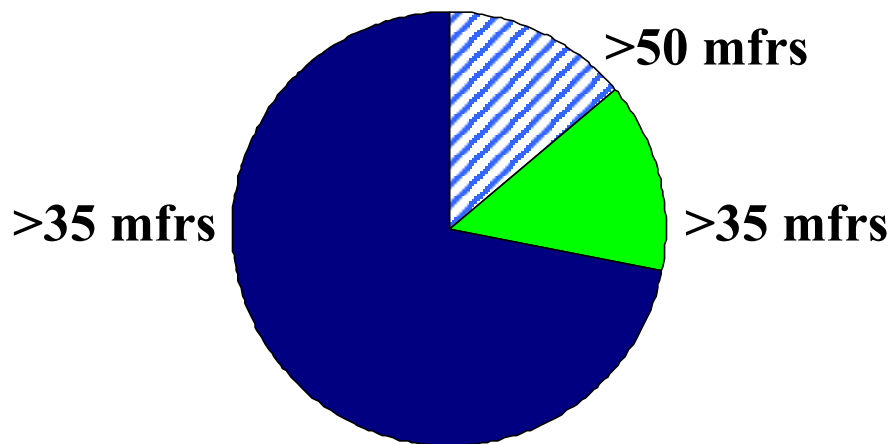
## EUROPE



## N. AMERICA



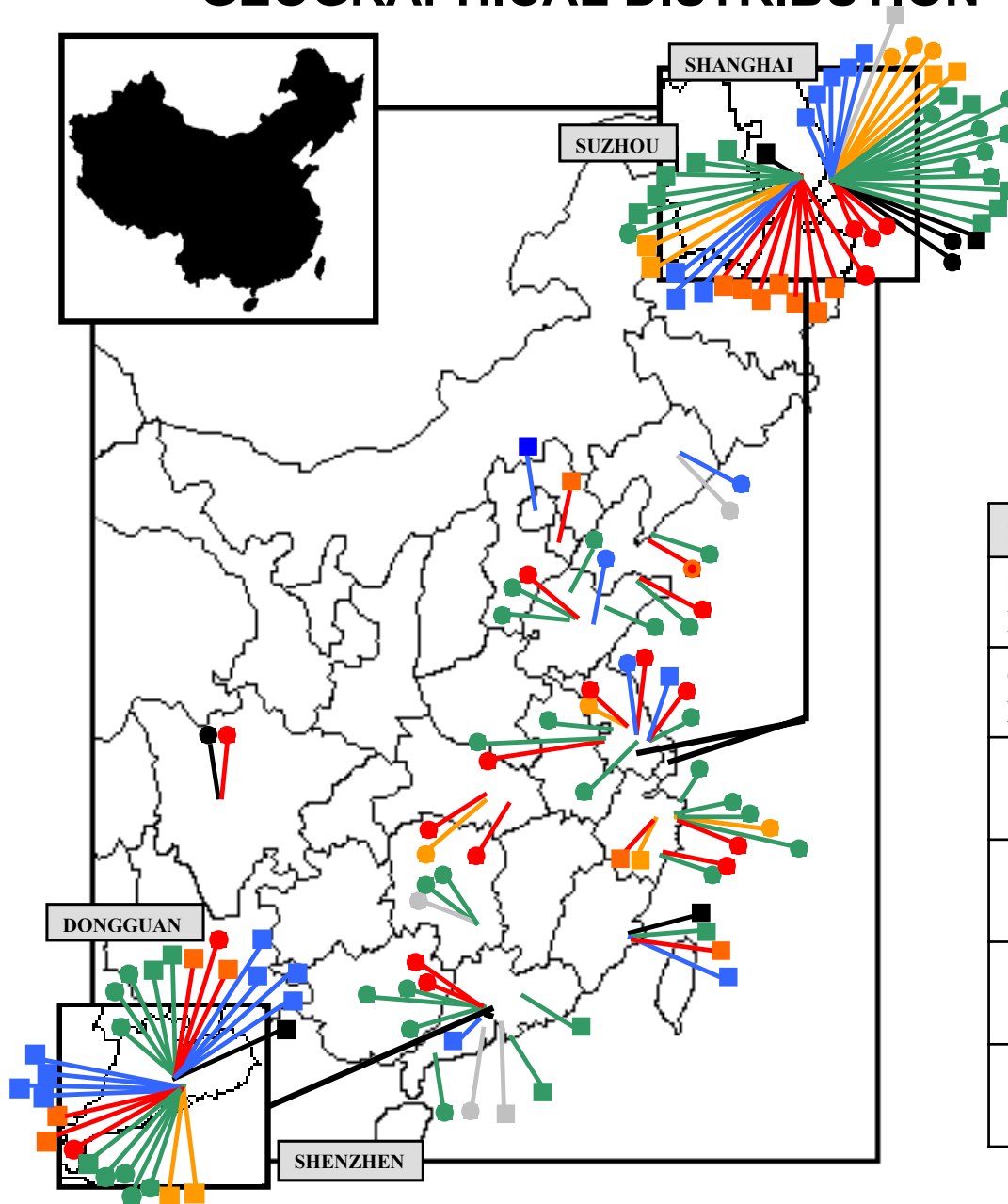
## CHINA



# China Market Characteristics

- Smaller, more regionalized domestic compounders
- Strong influence of the footwear industry
- Many more compounders than in Europe/U.S.
- Typically operate at lower capacity utilization than is typical in Europe/U.S.
- Sales organizations are very relationship oriented using *guanxi*
- Are typically leveraged vs. MNC companies by an approximate 30% cost advantage
- A parallel supply chain based on nationality has been the model to date, but is changing
- Exports are yet to play a significant role, but some compounders are beginning to attempt to sell product overseas (e.g., Shangdong Dawn and Wenzhou Juner)

# GEOGRAPHICAL DISTRIBUTION



SHAPES	COLORS
SQUARE = MNC	RED = TPV
CIRCLE = DOMESTIC	ORANGE = TPO
	BLUE = TPU
	GREEN = SBCs
	BLACK = COPE (TPEE)
	GREY = OTHER

# China Market Growth

- China market will grow at an average rate of 14%, well above GDP forecasts of 9%.
- Growth will be driven by increased penetration of the domestic Chinese markets, but TPE export applications will continue to shift from North America/Europe.
- Growth demand will be driven by the automotive market sector which will grow at over 20%, followed by Consumer Products/Housewares, Fluid Handling, and Industrial market segments.
- o-TPVs will lead materials growth at over 20% due to increased penetration into the automotive market sector, particularly in seals (auto, construction, and other seal applications)

# New Market Entries

- Over the past 5 years, 8-10 new compounders have entered the domestic Chinese market.
- Primary target has been soft touch applications.
- SEBS compounders have been the largest group, many of them with Western technology, often from Chinese expats.
- Many of these entries lack the local Chinese relationship connections that are key to doing business.
- These entries are using a more typical Western model to doing business and will not be as localized; will attempt to sell compounds on a more national basis.

# Technology Sources

- JOINT VENTURES
- WESTERN CHINESE EX-PATS
- WESTERN CONSULTANTS
- RESEARCH INSTITUTES (OFTEN STATE FUNDED)
- UNIVERSITIES
- MNC WOFEs
- LICENSING (VERY LIMITED)
- MATERIAL SUPPLIERS

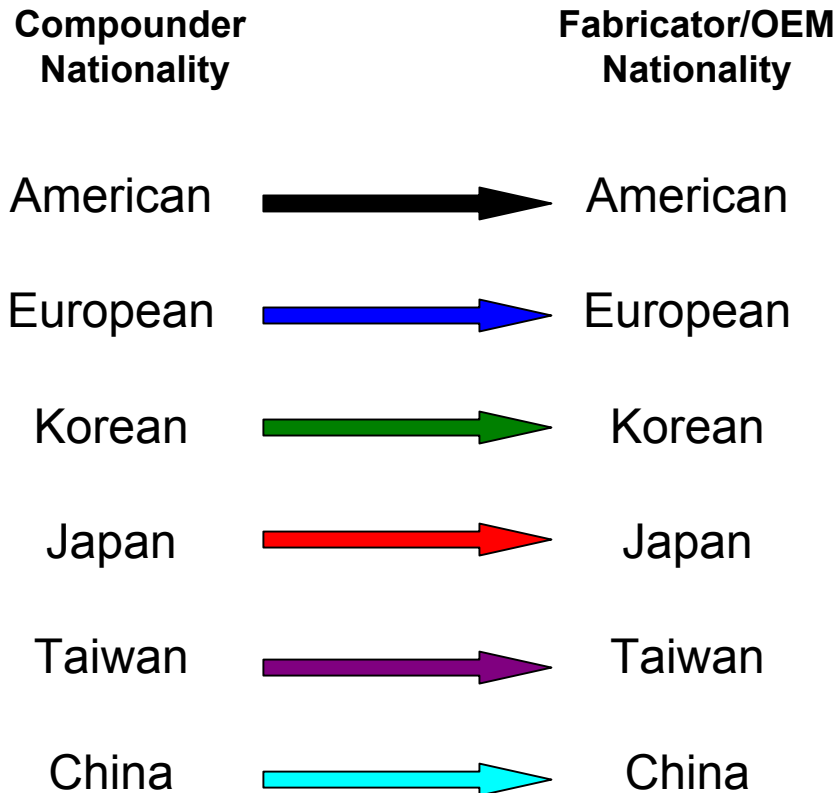


# PARALLEL SUPPLY CHAIN RESTRUCTURE

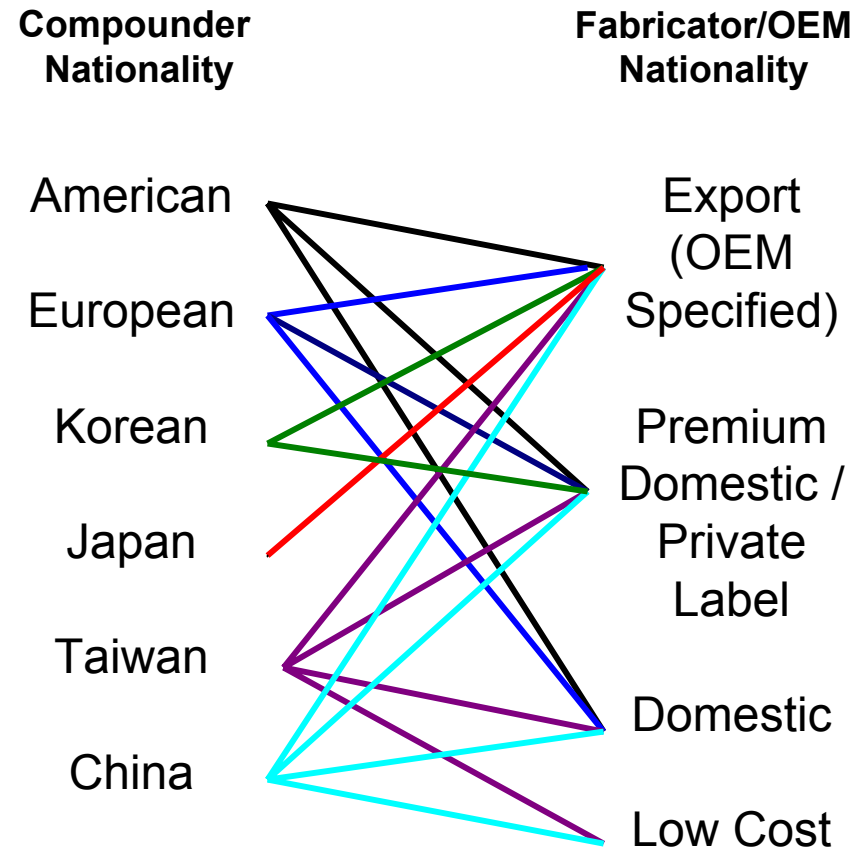
- **TYPICALLY NATIONALITY BASED (WESTERN COMPANIES SUPPLYING WESTERN TRANSPLANTS, KOREAN SUPPLIERS SUPPLYING KOREAN TRANSPLANTS, JAPANESE SUPPLIERS SUPPLYING JAPANESE COMPANIES, ETC.)**
- **WILL SHIFT TO PERFORMANCE/QUALITY BASED SUPPLY STRUCTURE WITH LOCAL SUPPLIERS WORKING UP AND TRANSPLANT SUPPLIERS MOVING DOWN THE SUPPLY CHAIN INTO THE DOMESTIC CAR PRODUCERS**
- **“TOOTHBRUSH SYNDROME”**

# Parallel Supply Chain

## Nationality Based



## Quality/Performance Based



# The Chinese Advantage

- Domestic Chinese compounders have typically a 30% or greater cost advantage than MNCs
  - 4-10 times less capital depreciation (depending on source of compounding equipment)
  - Lower cost raw materials (domestic sources)
  - Creative use of alternative material sources
  - Lower packaging costs
  - Lower labor costs
  - State supported research efforts
  - Lower shipping costs

# How Will MNCs Compete?

- Chasing the supply chain supplying the premium end of the market
  - OEM-specified markets, particularly where Western companies control the specifications
- Will be forced to adapt to Chinese market and will have to find ways to cut costs to meet local pricing
- Pursue domestic business
  - Rebranding products
  - Alter the quality requirements of existing products
  - A more national sales approach

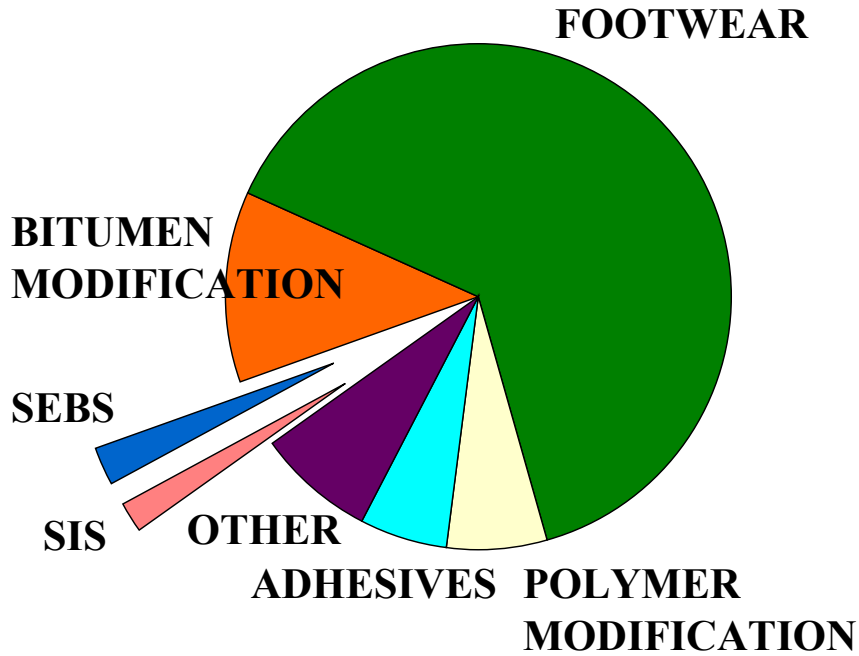
# THE RISING COST OF LABOR

- Loss of low labor costs
  - Labor increasing in Eastern China at a 25%/year rate
  - Shift of labor sensitive business to lower cost labor locations: Western China, Vietnam, India
  - Skilled labor becoming more difficult to find
  - Competition from MNC entry
    - **Suzhou example: MNCs hiring from domestic Chinese compounders and new MNC entries hiring from early MNC entries, driving up labor costs**

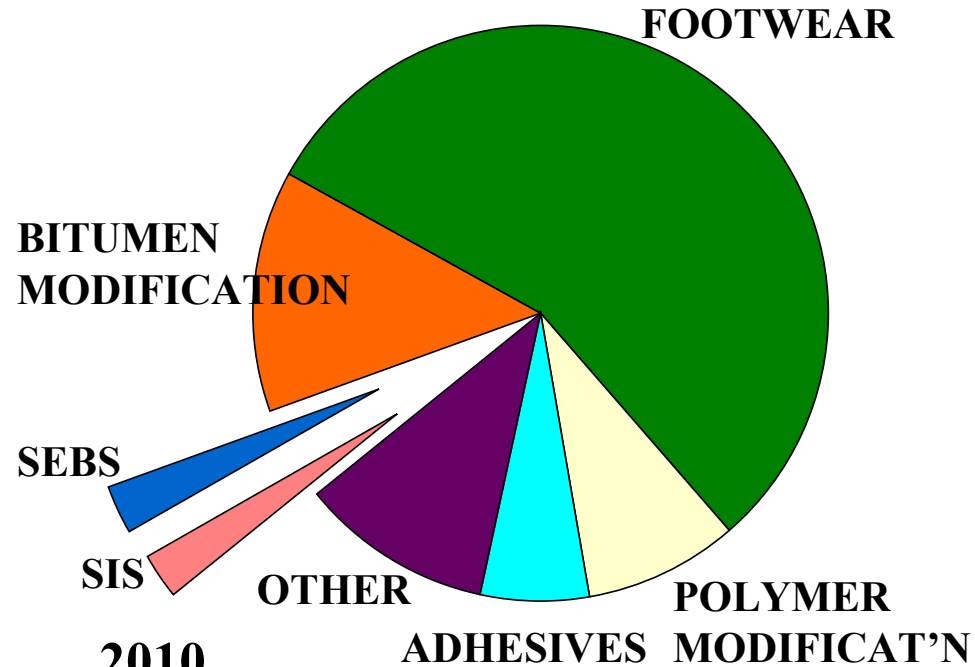
# SBCs IN CHINA

## (2005-2010)

**2005**



**2010**



**2005**

**2010**

GREATER CHINA CAPACITY	610 kT	1000 kT
GREATER CHINA SUPPLY	430 kT	710 kT
IMPORTS	40 kT	50 kT
EXPORTS	5 kT	60 kT
<b>DEMAND (TOTAL)</b>	<b>465 kT</b>	<b>700 kT</b>

# SBC RESIN SUPPLY

- Greater China will become the largest global producer of SBCs
  - Driven by footwear, bitumen modification (large infrastructure projects), toys, and adhesives markets growing at 9%/yr.
- New Capacity being constructed
  - LCY (+100 kT Huizhou)
  - Petrochina (+180 kT Dushanzi)
  - SEBS suppliers
    - Kraton (+20 kT “Asia”)
    - TSRC (+20 kT Nantong??)
  - Speculation: potential entry of Dynasol in Asia?
- China SEBS capacity increasing from no domestic source to 60 kT from 2005 to 2010
  - Net SEBS exporter?
- Impact of Sinopec Baling
  - +20 kT SEBS plant started 2006
  - Lower cost domestic material?
  - Increased availability of wide spec grades?
- Wide-spec SEBS resin grades commonly used in the market

# SEBS

- Soft touch applications dominate (approx. 60% of the demand)
- Entrance of North American leader (GLS) and European leader Kraiburg will alter the competitive mix
  - GLS with very strong position in personal care soft touch products
  - Kraiburg bringing automotive product mix
- Intermaterial competition with SBS
- Growth in E/E & Personal Communication markets and Wire/Cable
- TSRC is market leader (supplies both raw material and compound)



# o-TPV

- Dominated by ExxonMobil (50% market share)
  - Price leader usually getting a premium price
  - Lack of confidence in domestic produced o-TPVs by Western OEMs
- Will grow in excess of 20%/year until 2010
- No MNC with domestic manufacturing capabilities
- Partially crosslinked products are active in the market
- Domestic compounders often produce a wide range of TPEs or ETPs to utilize capacity
- Significant installed domestic capacity being under utilized to produce o-TPVs
- Automotive growth will be major driver for o-TPV growth
- Seals (automotive, construction and other applications) will be the major growth application
- Downward substitution pressure to lower cost materials

# WHERE ARE THE JAPANESE TPE COMPOUNDERS?

- **JAPANESE COMPOUNDERS HAVE STRONG TECHNOLOGY, PARTICULARLY IN THE o-TPV SEGMENT**
- **COMPARED TO THEIR GLOBAL POSITIONS, JAPANESE TPE COMPOUNDERS ARE PLAYING A MUCH SMALLER ROLE**
  - **IP CONCERNS**
  - **FOCUSED ELSEWHERE (MIDDLE EAST, INDIA)**
  - **CULTURAL ANIMOSITY**
  - **RAW MATERIAL SHORTAGES INTERNALLY**
  - **CONCERNS OVER INCREASING LABOR COSTS**
  - **CONCERNS OVER POWER**
  - **CONCERNS OVER STAFF RETENTION**
  - **CONCERNS OVER NON-UNIFORM TAX STRUCTURE**
  - **CONCERNS OVER QUALITY**
  - **LATE ENTRY?**

**EXCUSES OR REALITY?**

**WILL JAPANESE AUTO COMPANIES PRESSURE JAPANESE SUPPLY CHAIN TO LOCATE IN CHINA TO SUPPLY?**

# TPU

- Capacity under utilized, new companies still entering the market (Shanghai LeJoin in 2005)
- Wanhua largest domestic supplier
- Taiwanese manufacturers strong (Ure-tech/X-ude Rubber, Headway, Emore, Coating Fine Chemical, Dongguan Hontex, and Sunko)
- MDI raw material position improving
  - Yantai Wanhua had been sole domestic supplier
  - BASF, Huntsman, Bayer all have capacity just coming on line producing high quality MDI
- MNCs arriving in force:
  - Noveon expanding
  - Bayer plant 2008
  - BASF plant 2007
  - COIM opened a representative office
- Footwear is driving market/competition with COPA
  - 4 times the size of the next largest market
- Film/Sheet/Fiber markets and Industrial/Fluid Handling are also larger than 10 kT in size, growing at 10%/year

# Automotive

- The driver for TPE growth.
- Europe/U.S. auto market is 50% of the TPE market, China has only a 30% share.
- Car growth from 2005-2010 will grow from 4.6MM to nearly 10MM cars (and if growth experienced this year continues, it may possibly be sooner).
- Automotive is the decelerator for Chinese GDP growth.
- Growth will come from not only growth in the Chinese auto production, but also from increased penetration as Western technology flows into domestic Chinese car production.

# **DOMESTIC COMPOUNDERS vs. MNCs**

- **TYPICAL 30% LOWER COSTS/PRICES**
- **LOWER CAPITAL (6-10 TIMES LESS DEPRECIATION THAN MNCs)**
- **USE OF LOWER COST LABOR**
- **USE OF LOWER COST RAW MATERIALS (WIDER SPEC GRADES)**
- **USE OF RECYCLATES**
- **R&D INSTITUTES FUNDED BY STATE ORGANIZATIONS**
- **LOWER COST PACKAGING**
- **LOWER BREAK-EVEN POINT: LESS PRESSURE ON CAPITAL UTILIZATION**
- **LOWER UTILIZATION RATES ARE FORCING DOMESTIC COMPOUNDING COMPANIES THAT WERE PREVIOUSLY SOLELY FOCUSED ON TPEs TO DIVERSIFY PRODUCT LINES TO ETP/PP COMPOUNDS**
- **PRICING FOCUSED ON COST OF MANUFACTURE RATHER THAN ON VALUE**

# **NEW DEVELOPMENTS THAT WILL IMPACT CHINA TPE MARKET**

- **MATERIALS**

- **OBCs FROM DOW: WILL THEY COMPETE WITH SBCs??**
- **PARADIGM SHIFTS DRIVEN BY RECYCLE USE/REDEFINING QUALITY RESULTING IN DOWNWARD SUBSTITUTION: A RETHINKING OF THE WESTERN SOLUTIONS IN BOTH MATERIALS AND FABRICATION**

- **FABRICATION**

- **LARGE-PART SOFT TOUCH RECENTLY BECOMING COMMERCIAL**
- **FOAMS STILL A TARGET, PARTICULARLY FOR SEALS: STILL NOT THERE BROADLY ACROSS THE MARKET**

# Large-Part Soft Touch Parts From 2-Shot Molding

## Lear/Husky/DCM/Kraiburg

- Dodge Caliber Medallion
- SEBS compound/PP on one machine (horizontal rotating core)

## “Dolphin” Project

- Engel/BASF/PGroup/Georg Kaufmann
- TPEE/COPE (Pibiflex) over PBT/ASA blend for instrument panel upper
- Foam via MuCell (but not necessarily limited to MuCell)
- Double Daylight Mold using injection compression technology (vertical rotating core)

# 2-SHOT MOLDED DOOR MEDALLION



**VEHICLE:** DODGE CALIBER ('07)

**MOLDER:** LEAR

**MATERIAL:** THERMOPLASTIC ELASTOMER ON PP



# INTERIOR SKIN DEVELOPMENT (2006 HONDA CIVIC)



- **PART: PASSENGER AIRBAG DOOR**
- **KEY FEATURES:**
  - SEAMLESS
  - NO PAINT
  - LOW GLOSS
- **MOLDER: VISTEON**
- **TPO SKIN SUPPLIER: OKAMOTO/O'SULLIVAN**
- **TPO SUPPLIER: MITSUBISHI CHEMICAL**
- **MOLDING PROCESS: VISTEON VLIM**

**SOURCE: VISTEON, 2005**

# CHINA vs. INDIA

	<u>CHINA</u>	<u>INDIA</u>
<b>POT'L DOMESTIC MARKETS</b>	<ul style="list-style-type: none"><li>• 1.3 BILLION PEOPLE</li></ul>	<ul style="list-style-type: none"><li>• 1.0 BILLION PEOPLE</li></ul>
<b>INFRASTRUCTURE</b>	<ul style="list-style-type: none"><li>• AGGRESSIVELY BUILDING INFRASTRUCTURE AROUND ECONOMIC DEV. ZONES, FACILITIES OFTEN IN PLACE WAITING FOR NEW PLANTS</li></ul>	<ul style="list-style-type: none"><li>• ROADS/PORTS/LOGISTICS POOR</li><li>• GOLDEN QUADRANGLE A HELP, BUT ONLY A START</li></ul>
<b>GOVERNMENT</b>	<ul style="list-style-type: none"><li>• CONTINUITY TO A PLAN, A SENSE OF CONSTANCY</li><li>• EXCELLENT CENTRAL PLANNING = STRENGTH</li><li>• BECOMING VERY BUSINESS FRIENDLY<ul style="list-style-type: none"><li>– CONTINUALLY OPENING UP FOR MORE FOREIGN INVESTMENT</li><li>– FLOATING OF THE YUAN</li><li>– BONDED WAREHOUSING</li></ul></li><li>• CORRUPTION EXISTS, BUT FOCUSED ON A FEW PEOPLE</li></ul>	<ul style="list-style-type: none"><li>• DEMOCRATIC GOV'T. CHANGED FREQ. (ELECTIONS EVERY 4 YEARS)</li><li>• NEW GOV'TS. MEAN A STOP-START</li><li>• BUREAUCRACY THAT IS NOT HIGHLY BUSINESS FRIENDLY</li><li>• CORRUPTION EXISTS BROADLY</li></ul>
<b>BUSINESS</b>	<ul style="list-style-type: none"><li>• WILL DOMINATE GLOBAL MFG., PARTICULARLY MFG. FOR EXPORT FOR THE NEXT 10 YRS.</li></ul>	<ul style="list-style-type: none"><li>• WILL DOMINATE SERVICE CENTER AND SOFTWARE COMPANIES THAT CAN TAKE ADVANTAGE OF QUICKLY BUILT ELECTRONIC HWYS.</li></ul>

# SUMMARY

This is one exciting market:

- High growth
- New applications
- New competitors
- New looks at old ways



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