Inorganic Pigments – Color for life

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Agenda

- **IPG – Business overview**
- Growth drivers
- Investments
- Outlook

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IPG – Benchmark for inorganic pigments

Performance Chemicals

- Material Protection Products
- **Inorganic Pigments**
- Functional Chemicals
- Leather
- Rhein Chemie
- Rubber Chemicals
- Ion Exchange Resins

Applications Inorganic Pigments

Construction	Paint & coatings	Specialties
		
		
		

Inorganic pigments: non hydrocarbon based colorants (e.g. iron oxide, chrome oxide, titanium dioxide, carbon black, etc.)
Organic pigments: hydrocarbon based colorants (e.g. azopigments, polycyclic pigments)

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IPG – Business overview

Facts	▪ Production capacity	~350,000 t/a (80% in Germany)
	▪ Sales:	€200-500 m
	▪ Employees:	~1,500
	▪ Customers:	~4,500
	▪ Customer structure:	market leaders in all target industries
Products & brands	▪ Products:	~1,100
	▪ Product groups:	Iron oxide (red, yellow, black, brown); Chromium oxide (green)
	▪ Main brands:	Bayferrox®, Colortherm®, Bayoxide®
Markets & competition	▪ Market share:	Globally leading position in inorganic pigments
	▪ Growth markets:	BRIC, North America
	▪ Competitors:	Rockwood; Chinese iron oxide producers/ traders (e.g. Cathay Pigments, Yipin Pigments)

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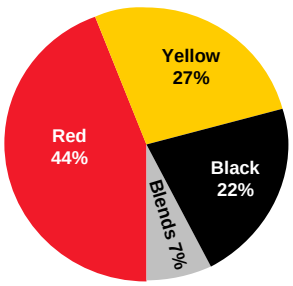
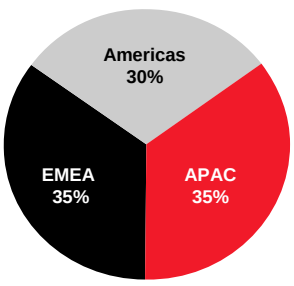
Iron oxide pigments market equally split across major regions with important foothold in construction applications

Global market for synthetic iron oxide pigments [~920kt]*

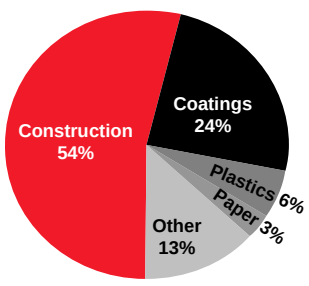
By color [kt, 2009]



By region [kt in %, 2009]



By application [kt, 2009]



IPG share of capacities: EMEA: >60%, globally ~40%

* Sources: IPG GPM market analysis; LXS estimates based on Cologne strategy group

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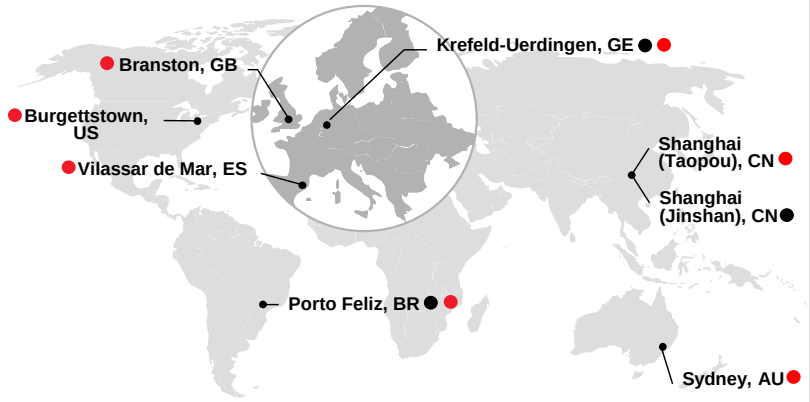
IPG – Strong global production network, headquartered in Germany



- Synthesis site: production of raw pigments
- Blending site: further value adding by mixing and/or milling to obtain better dispersibility and more homogeneous quality or special color shades

- Only true global player with global asset network (production sites in five continents)
- Expansion of production network in 2008 (acquisition of Jinzhou Chemicals in Jinshan, CN)
- Globally environmental standards as competitive edge

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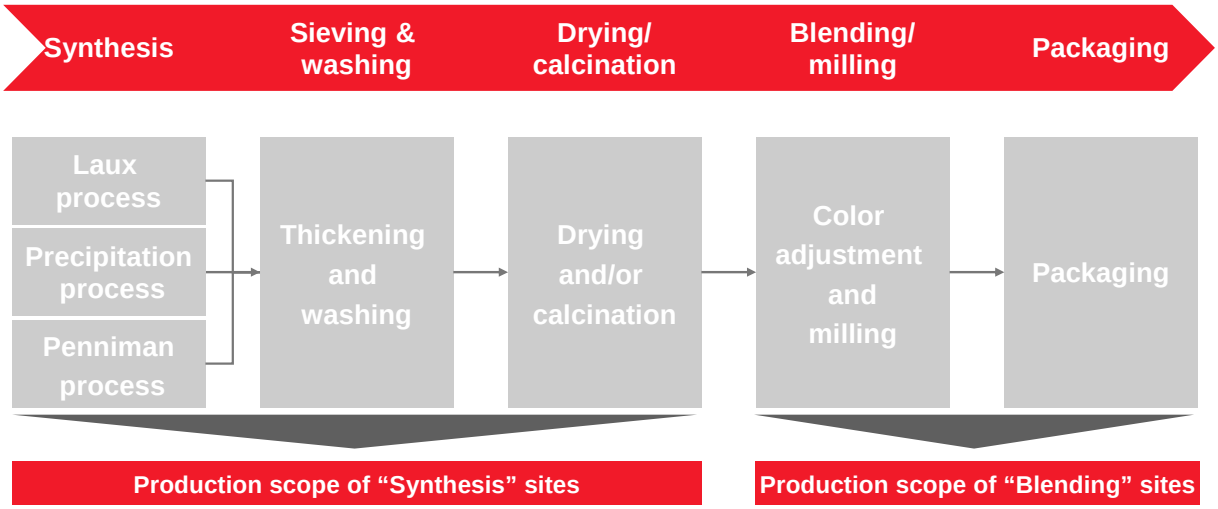
IPG provides full value chain of inorganic pigments production



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Inorganic pigments are used in coloring and various technical applications

Iron and chrome oxides for color

- **Construction material** (e.g. paving stones, roof tiles, ready mix concrete, mortar)
- **Paints & coatings** (e.g. corrosion paints, industrial paints, architectural paints)
- **Plastics** (e.g. plastic materials, artificial turf, artificial lumber)
- **Other colorings** (e.g. laminate flooring, cigarette paper, cosmetics)






Iron and chrome oxides for technical applications

- **Toners** (FEO)
- **As adsorber** (FEO)
- **Styrene catalysts** (FEO)
- **Brake linings** (FEO & CRO)
- **Airbags** (FEO)
- **Polishing / abrasives** (FEO & CRO)
- **Refractories** (CRO)
- **Ceramics** (CRO)





FEO: Ferrous Oxide; CRO: Chromium Oxide

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IPG – Three main growth drivers

Urbanization

- Growing world population
- New fields of application and ways of using colorings

Regional market changes

- China
  - Increasing demand for higher quality products in middle class
- North America
  - Changed competitive environment

Sustainability

- Higher environmental awareness
- Increased level of guidelines, public control by the government, HSEQ standards, etc., esp. in emerging countries (lead to market consolidation in China)

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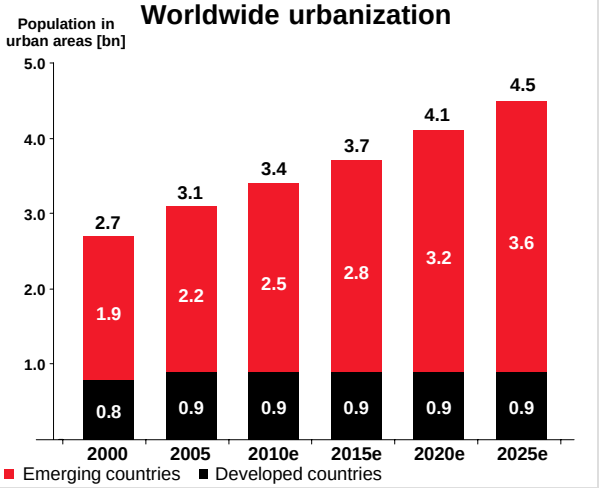
Urbanization will continue, strongly driven by emerging countries

Urbanization | Regional market changes | Sustainability



- Urbanization in emerging countries driven mainly by China, India and Brazil
- ~100,000 people in China and India are moving into cities every day
- By 2020, 11 new megacities are expected to rise in China and India
- 80% of global urban population will be found in emerging countries by 2020
- Rise of urbanization drives need for new construction and infrastructure development
- Emerging societies tend to build in more sophisticated, more beautiful way; increasing need for color in construction applications

Source: McKinsey&Company, Global Forces, 2010

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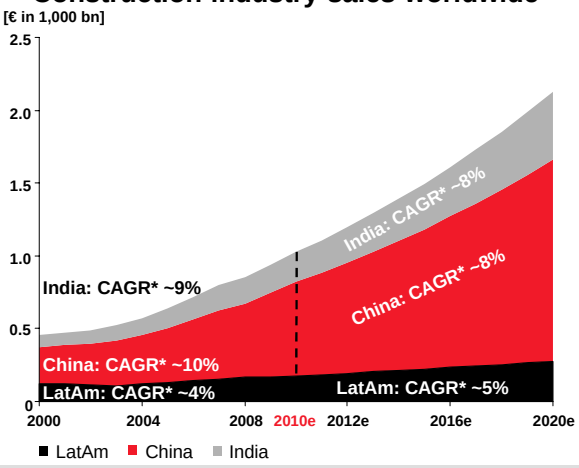
Construction activities with expected substantial growth rates in BRIC countries

Urbanization | Regional market changes | Sustainability

Construction industry sales worldwide*



- Rapid urbanization leads to increasing construction activities, with strongest growth in Asia and Latin America
- Growth rates clearly above developed countries (e.g. Western Europe with CAGR* of 1.7%)
- Construction activities include
  - increasing number of buildings, triggering demand for IPG products in: paving stones, mortar, roof tiles, wall paint, laminate flooring, etc.
  - infrastructural upgrades triggering demand for IPG products for: streets, foot or bike paths, bus lanes, isolating walls, sport stadiums, etc.

Source: Global Insight, 2010; * CAGR: 2010-2020

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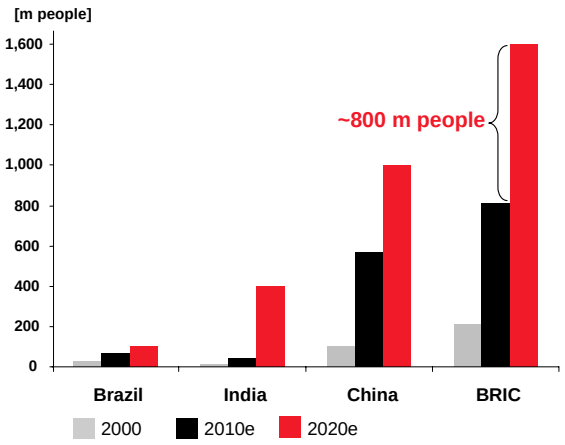
Strong growth of middle class in emerging countries will bring up more quality oriented consumers

Urbanization | **Regional market changes** | Sustainability

Growing middle class*



- Growing middle class with increasing standard of living requires higher quality of living space design, resulting in increasing use of color
- Increasing customer requirements for
  - product quality and quality consistency
  - environmental and health standards in production and application of goods
- IPG's core competencies in quality, service and sustainability perfectly serve new customer standards

Sources: Goldman Sachs Global Economics Group, "Is this the BRICs decade?", 2010; Michelin estimates

*Population with income >6,000 USD and <30,000 USD/capita in BRIC countries

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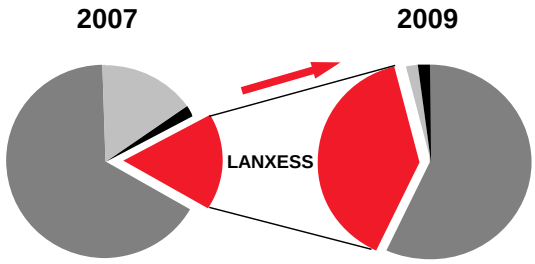
IPG gained market share in North America

Urbanization | **Regional market changes** | Sustainability

North American iron oxide granules market for construction



- North American (NA) market for granules for construction used to be blocked for IPG due to patent protection reasons
- Patent expiration in 2007 lead to changed competitive environment
- NA market with new attractive growth potential for IPG in high-quality construction applications
- IPG is gaining market share due to focus on core competencies in terms of
  - product quality, customer relations, technical service, etc.
  - improved supply-chain concept

Source: IPG market analysis by competitor

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IPG – Setting up new sustainability standards in iron oxide and chrome oxides business

Urbanization | Regional market changes | **Sustainability**

IPG focus sustainability

- IPG is driver for continuous HSEQ improvements within the iron oxide industry globally (especially in emerging countries)
- All production sites comply with global LANXESS standards (partly even above local regulations)
- IPG's focus on HSEQ has proven successful during ongoing consolidation of competitive environment
- Focus on sustainability further increases competitiveness

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Growing awareness for sustainability worldwide will trigger implementation of environmental standards

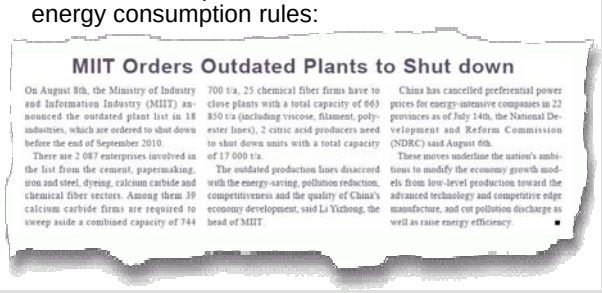
Urbanization | Regional market changes | **Sustainability**

Sustainable production in emerging countries

- Increased level of HSEQ guidelines and governmental enforcement:
  - New wave of regulations in China (e.g. for cleaner production of iron oxide pigments)
  - Increased consolidation of chemical production in chemical parks in China (esp. in developed areas such as Shanghai and Jiangsu province)
- Global sustainability approach leads to more environmentally friendly processes and products

Several plants in China ordered to shut-down due to non-compliance with pollution standards

- Chinese Ministry of Environmental Protection approved a mandatory National Standard for iron oxide pigment pollution emissions to be completed in 2012
- Chinese Ministry of Industry and IT ordered 2,087 plants to be shut down by end-September 2010 due to non-compliance of environmental and energy consumption rules:



MIIT Orders Outdated Plants to Shut down

On August 8th, the Ministry of Industry and Information Industry (MIIT) announced the outdated plant list in 18 industries, which are ordered to shut down before the end of September 2010.

There are 2 087 enterprises involved in the list from the cement, papermaking, iron and steel, dyeing, calcium carbide and chemical fiber sectors. Among them 39 calcium carbide firms are required to sweep aside a combined capacity of 744 700 t/a, 25 chemical fiber firms have to close plants with a total capacity of 663 850 t/a (including viscose, filament, polyester lines); 2 citric acid producers need to shut down units with a total capacity of 17 000 t/a.

The outdated production lines disaccord with the energy-saving, pollution reduction, competitiveness and the quality of China's economy development, said Li Yizhong, the head of MIIT.

China has cancelled preferential power prices for energy-intensive companies in 22 provinces as of July 14th, the National Development and Reform Commission (NDRC) said August 6th.

These moves underline the nation's ambitions to modify the economy growth models from low-level production toward the advanced technology and competitive edge manufacture, and cut pollution discharge as well as raise energy efficiency.

Sources: China Chemical Industry News (August 31, 2009); China Chemical Reporter (August 21, 2010)

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Asia is increasingly demanding eco-friendly and sustainable urbanization

Urbanization | Regional market changes | **Sustainability**

Sustainable investments and consumption

- Increased environmental awareness by consumers
- Pilot projects for **sustainable urbanization** such as the Sino-Singapore Tianjin Eco-City initiated to promote environmentally friendly, resource-efficient and economically sustainable living condition
- A “Green Building Evaluation Standard” has been established to make this kind of approach scalable and replicable

IPG with clear competitive advantage due to its consequent sustainable approach in all production steps

New Eco-Cities in Asia

Source: Keppel Corp. Website (Sino-Singapore Tianjin Eco-City Project)

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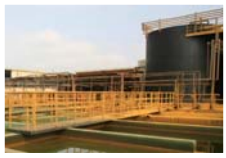
IPG initiatives in manufacturing to increase sustainability and production efficiency

Urbanization	Regional market changes	Sustainability	
Jinshan, China	▪ State-of-the-art wastewater treatment plant ▪ 15% reduced emissions in 2009 by improved energy utilization and water management ▪ New black plant recycling by-product from yellow production lines		
Porto Feliz, Brazil	▪ CO_2 neutral production of energy by using bagasse, a residual of the sugar industry (Co-Generation plant) ▪ Reduction of CO_2 emissions by 44kt annually		
Krefeld-Uerdingen, Germany	▪ Innovative process enables complete waste water recycling to produce iron oxide pigments ▪ Processed water of recovery unit needs no further cleaning and is directly piped into the river Rhine		

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IPG investments in Krefeld-Uerdingen support further market growth globally

Investments on main IPG site

- Krefeld-Uerdingen is the world's largest production site for inorganic pigments with a capacity of 280,000 t/a
- Over 50% of total BU investments of ~€20 m in 2010 in Krefeld-Uerdingen
- Continuous further measurements to increase energy efficiency, debottlenecking processes and thereby extend capacity for pigment production
- May 2010: production record with around 25,000 metric tons of pigments – largest volume ever
- Ongoing high utilization based on continuous market success worldwide

Strong set-up and strategic position drives continuous organic growth

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IPG – Targeted investments in BRIC countries serve increasing global demand and sustainability claim

Investments in China

- Iron oxide yellow:
  Technical improvements and expansion to 28,000 tons in 2010
- Iron oxide black:
  New production plant, production start Q4/2010, capacity 10,000 tons

Investments in Brazil

- Iron oxide yellow:
  Ongoing capacity expansion for production of yellow iron oxide pigments
- Continuous investments in sustainable production, e.g. Co-Generation plant for CO_2-neutral production of energy (started 2010)

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IPG – Market leader with sustainable global growth

- **Excellent cost structure based on economies of scale**
- **Megatrend urbanization drives future growth**
- **Sustainable production as unique selling proposition**
- **Continuous successful investments in organic and external growth**

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Energizing Chemistry

IPG products contribute to improve HSE in our daily life

Urbanization		Regional market changes	Sustainability	
Arsenic adsorber	Bayoxide® E33 removes arsenic contaminations out of drinking-water (special project was set up in Bangladesh)		**Desulfuri-zation of biogas**	Iron oxides to remove hydrogensulfide from methane during the fermentation process of biological waste
Free flowing granules	Free flowing, low-dusting Bayferrox® granules/compacts for a dust free working environment		**Safety use of airbags**	Specially developed iron oxide used as catalyst for airbag production to ensure controlled unfolding of the airbag	
Soluble sacks	Special sacks dissolve in water or melt into the polymer needed for process and improve occupational hygiene and technical handling		**Precursor for catalysts**	Iron oxides as precursors for catalysts in large scale industrial processes (e.g. Styrene synthesis, Fischer-Tropsch-Synthesis)	

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