PPG's Aerospace Business – Information Session

Montreal, Canada

June 4, 2019



























Forward-looking statements

The Private Securities Litigation Reform Act of 1995 provides a safe harbor for forward-looking statements made by or on behalf of the Company. This presentation contains forward-looking statements that reflect the Company's current views with respect to future events and financial performance. You can identify forward-looking statements by the fact that they do not relate strictly to current or historic facts. Forward-looking statements are identified by the use of the words "aim," "believe," "expect," "anticipate," "intend," "estimate," "project," "outlook," "forecast" and other expressions that indicate future events and trends. Any forward-looking statement speaks only as of the date on which such statement is made, and the Company undertakes no obligation to update any forward looking statement, whether as a result of new information, future events or otherwise. You are advised, however, to consult any further disclosures we make on related subjects in our reports to the Securities and Exchange Commission. Also, note the following cautionary statements:

Many factors could cause actual results to differ materially from the Company's forward-looking statements. Such factors include global economic conditions, increasing price and product competition by foreign and domestic competitors, fluctuations in cost and availability of raw materials, the ability to achieve selling price increases, the ability to recover margins, the ability to maintain favorable supplier relationships and arrangements, the timing of and the realization of anticipated cost savings from restructuring initiatives, difficulties in integrating acquired businesses and achieving expected synergies therefrom, economic and political conditions in international markets, the ability to penetrate existing, developing and emerging foreign and domestic markets, foreign exchange rates and fluctuations in such rates, fluctuations in tax rates, the impact of future legislation, the impact of environmental regulations, unexpected business disruptions, the effectiveness of our internal control over financial reporting, the unpredictability of existing and possible future litigation, including asbestos litigation, and governmental investigations. However, it is not possible to predict or identify all such factors. Consequently, while the list of factors presented here and under Item 1A of PPG's 2018 Form 10-K is considered representative, no such list should be considered to be a complete statement of all potential risks and uncertainties. Unlisted factors may present significant additional obstacles to the realization of forward-looking statements. Consequences of material differences in the results compared with those anticipated in the forward-looking statements could include, among other things, lower sales or earnings, business disruption, operational problems, financial loss, legal liability to third parties, other factors set forth in Item 1A of PPG's 2018 Form 10-K and similar risks, any of which could have a material adverse effect on the Company's consolidated financial condition, results of operations or liquidity.

All of this information speaks only as of June 4, 2019, and any distribution of this presentation after that date is not intended and will not be construed as updating or confirming such information. PPG undertakes no obligation to update any forward-looking statement, except as otherwise required by applicable law.

PPG Investor Relations “Deep Dive” Program

Year	Topic(s)	Location
2007	PPG Aerospace	PPG aerospace facility Huntsville, AL
2008	SigmaKalon Acquisition Overview	Offsite
2010	PPG Asia and PPG Auto OEM Coatings	BMW facility Greenville, SC
2011	PPG Automotive Refinish	Penske Racing facility Charlotte, NC
2012	PPG Industrial Coatings	Harley-Davidson facility York, PA
2013	PPG Packaging Coatings	Ball Container facility Williamsburg, VA
2014	PPG Architectural Coatings	PPG company-owned stores, Lowes & The Home Depot locations Dallas, Texas
2015	PPG Comex	Cabo San Lucas, Mexico
2016	PPG Research and Development	Allison Park, PA
2018	PPG Industrial Coatings	PPG/John Deere facilities, East Moline, IL
2019	PPG Aerospace	Bombardier facility Montreal, Canada

No financial updates will be provided during today's presentation.

Today’s presentation agenda

8:30 AM **PPG’s Aerospace Business Information Session**

- Corporate and Business Overview
- Technology and Capabilities
- Aerospace Industry Dynamics
- Growth Opportunities
- Conclusion
- Additional Q&A / Wrap Up

11:30 AM **Plant Tour**



PPG speakers and attendees



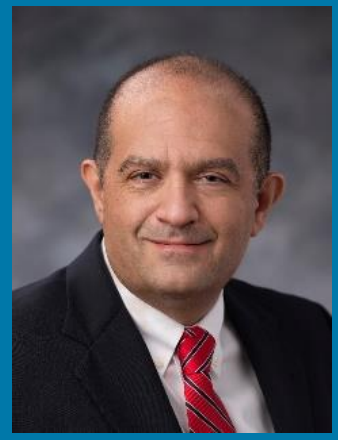
Daniel G. Korte

Global Vice President, Aerospace



Vincent J. Morales

Senior Vice President & CFO



John Bruno

Director Investor Relations

PPG executive profiles



Dan Korte
Global Vice President, Aerospace

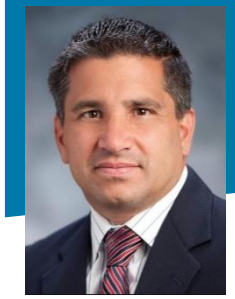
Dan Korte is global vice president, aerospace, PPG.

He joined PPG in May 2018 with more than 30 years of aerospace and defense industry leadership experience in design and systems engineering, integrated product team leadership, supplier management and program management. In his most recent role at LMI Aerospace, Inc., Korte served as the chief executive officer and a member of the company's board of directors. Prior to LMI, he progressed through various roles at Boeing, including program manager, F/A-18E/F; vice president, supplier management and procurement; and vice president and general manager, global strike systems. He also served as president of the defense business at Rolls-Royce in London.

Korte currently serves as director and member of the audit committee of Woodward Inc., an aerospace and industrial company. He also serves as a member of the board of trustees of the St. Louis Science Center; board member of the St. Louis University Master of International Business program; member of the executive committee and head of the development committee of Southern Illinois University (SIU); and member of SIU's Industrial Advisory Board, where he advises the College of Engineering on technology and curriculum. In addition, Korte serves as a board member and member of the nominating and technology committees of the United Way of Greater St. Louis.

Korte earned a bachelor's of science degree in electrical engineering and an associate of applied science in computer engineering from Southern Illinois University. He holds a master of business administration from Lindenwood University in Missouri. He is also a graduate of the Strategic Thinking and Management for Competitive Advantage Program at the University of Pennsylvania's Wharton School of Business.

PPG executive profiles



Vincent J. Morales

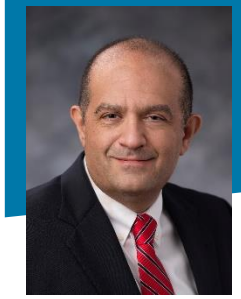
Senior Vice President and Chief Financial Officer

Vince Morales is senior vice president and chief financial officer of PPG. He serves on the company's executive and operating committees.

Morales joined PPG in the corporate controller's office, Pittsburgh headquarters, in 1985. He then advanced through finance and accounting assignments at PPG facilities such as supervisor, shared accounting services, at the Chillicothe, Ohio, shared services center and director, information and financial services, at the former PPG glass plant in Mount Zion, Illinois.

Morales returned to Pittsburgh in 2000 as manager, chemical revenue recognition, and then became director, internal financial reporting, in 2001. He was named director, investor relations, in 2004 and then promoted to vice president in 2007. Morales added responsibility as corporate treasurer in 2015. He was appointed vice president, finance, in June 2016, and he assumed his current role in March 2017.

A native of Pittsburgh, Morales earned a bachelor's degree in accounting from Robert Morris University and a Master of Business Administration from the Ohio State University.



John Bruno

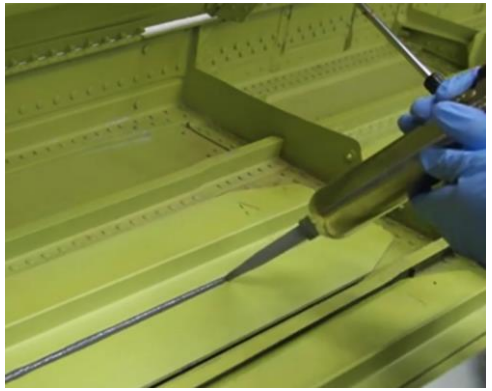
Director, Investor Relations

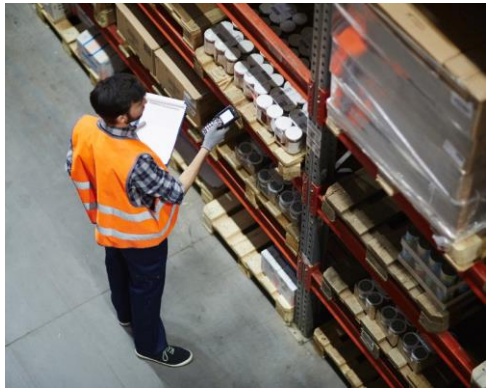
Since July 1, 2017, John Bruno has served as director, investor relations at PPG, a leading coatings and specialty products and services company based in Pittsburgh, Pennsylvania. He oversees all of PPG's interactions with the investment community.

Bruno has broad financial and leadership experience in his over 20 years with PPG since 1995. Before his current role, he was located in Hong Kong as chief financial officer, Asia Pacific, from November 2013 to June 2017, responsible for all finance matters in the region and overseeing approximately 300 employees. Prior to that, Bruno was located in Pittsburgh as director, corporate audit services, including an appointment as the Secretary of the Audit Committee of the PPG Board of Directors from December 1, 2009 to November 1, 2013, and an additional interim chief compliance officer role from April to November 2013. From 2007 to 2009, he was located in Rolle, Switzerland to support the integration of PPG's SigmaKalon acquisition and then serving as corporate controller, Europe, Middle East and Africa. His previous roles included senior finance positions in the automotive replacement glass, insurance and services businesses and in corporate development. Prior to joining PPG, Bruno spent six years in financial positions at United States Steel Corporation from 1989 to 1995 and was an adjunct accounting professor at Duquesne University, Pittsburgh, Pennsylvania, from 2000 to 2007.

Bruno holds bachelor of science in finance and master of business administration degrees from Duquesne University and is an active certified public accountant.







Corporate and Business Overview

47,000 employees protecting and beautifying our world

A global maker of paints, coatings, and specialty materials.

A leader in all our businesses: construction, consumer products, industrial and transportation, and aftermarkets.



$15.4B

In net sales from global operations in 2018

PPG

Founded in 1883 and headquarters in Pittsburgh, Pennsylvania

Operations

47,000 employees operating in more than 70 countries worldwide

R&D

6 core Research & Development Centers with more than 70 global Technical Centers

#205

Fortune 500
Ranked 205

NYSE

Ticker symbol “PPG”

PPG's Aerospace Business

Aerospace supplier since 1927

- **1927** — Glass Transparencies
- **1999** — Coatings, Sealants, & Packaging
- **2006** — Advanced Plastic Transparencies

The Segments We Serve



Commercial Aviation



General Aviation



Military

An Industry Driven By Innovation

- Lightweight
- Reliability
- Efficiency
- Sustainability
- Performance

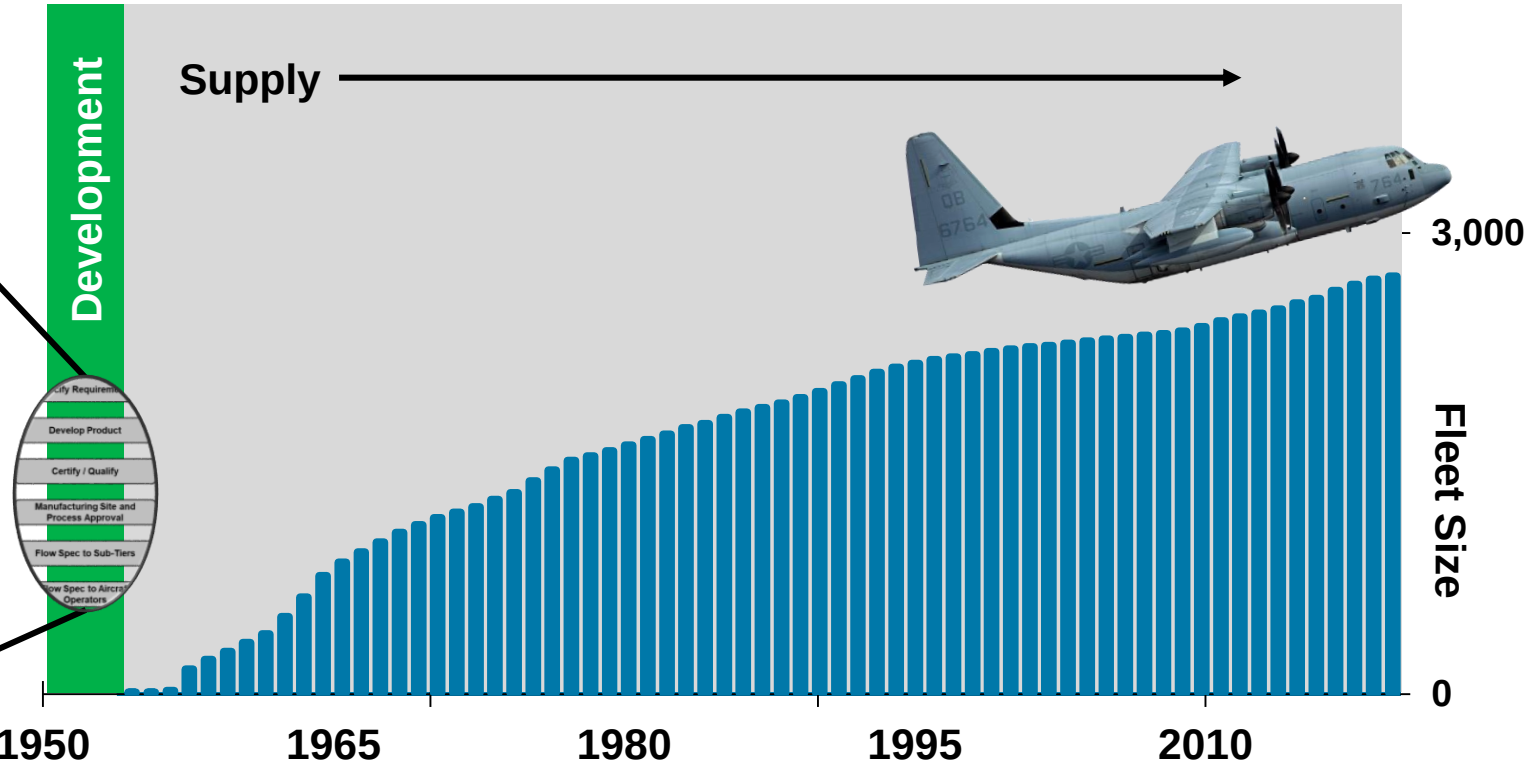
Bringing Innovation to Aerospace Since 1927

An industry that's driven by the ability to meet specifications

Lockheed C-130: Flying with PPG specified products since 1954

OEM & PPG Collaborative Development Steps

- Specify Requirements
- Develop Product
- Certify / Qualify
- Manufacturing Site and Process Approval
- Flow Spec to Sub-Tiers
- Flow Spec to Aircraft Operators

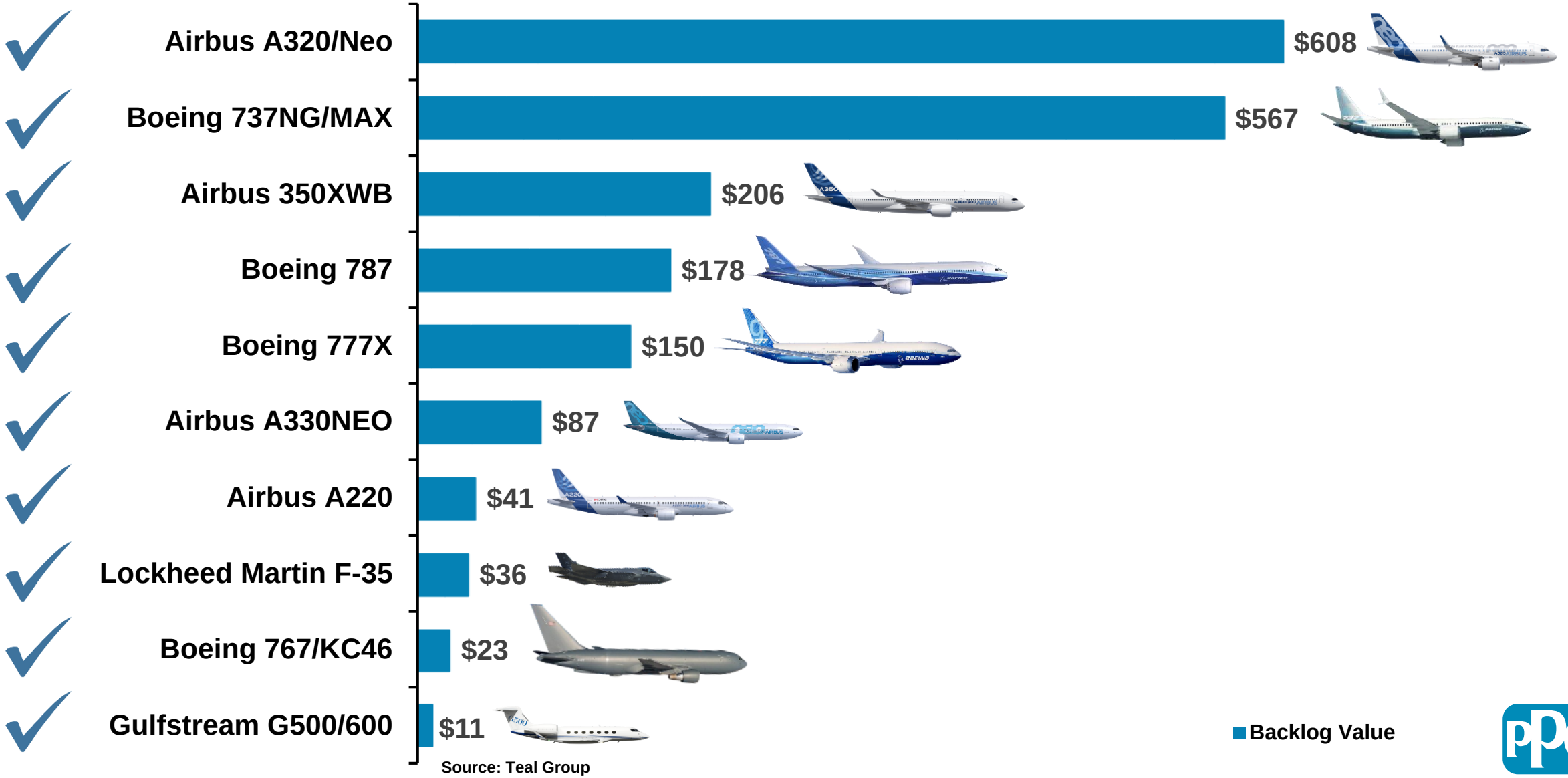


Collaborative efforts to develop products and specifications for new aircraft ensure long-term partnership

PPG is trusted by the world's largest aviation programs

PPG Content

Industry Backlog Value 2019 $US-B



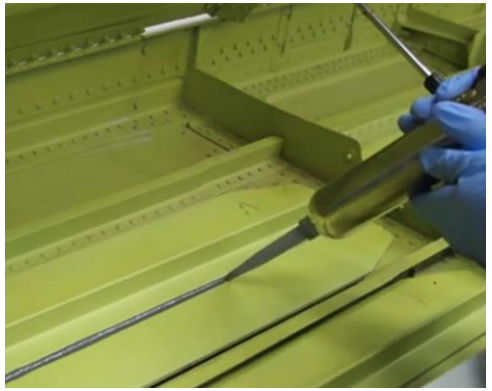
Source: Teal Group

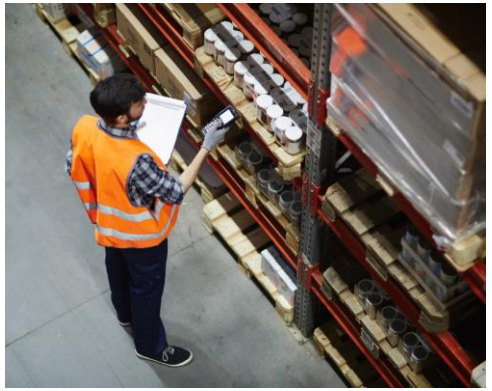
A broad range of products & services

	Coatings	Adhesives & Sealants	Transparencies	Packaging	CMS
PPG	●	●	●	●	●
3M		●			
Akzo Nobel	●				
BASF		●			
GKN			●		
H.B. Fuller		●		●	
Henkel		●			●
Mankiewicz	●				
Nordson EFD				●	
Saint Gobain Sully			●		
Sherwin Williams	●				
Wesco					●

Note: Selected competitors - not representative of entire industry

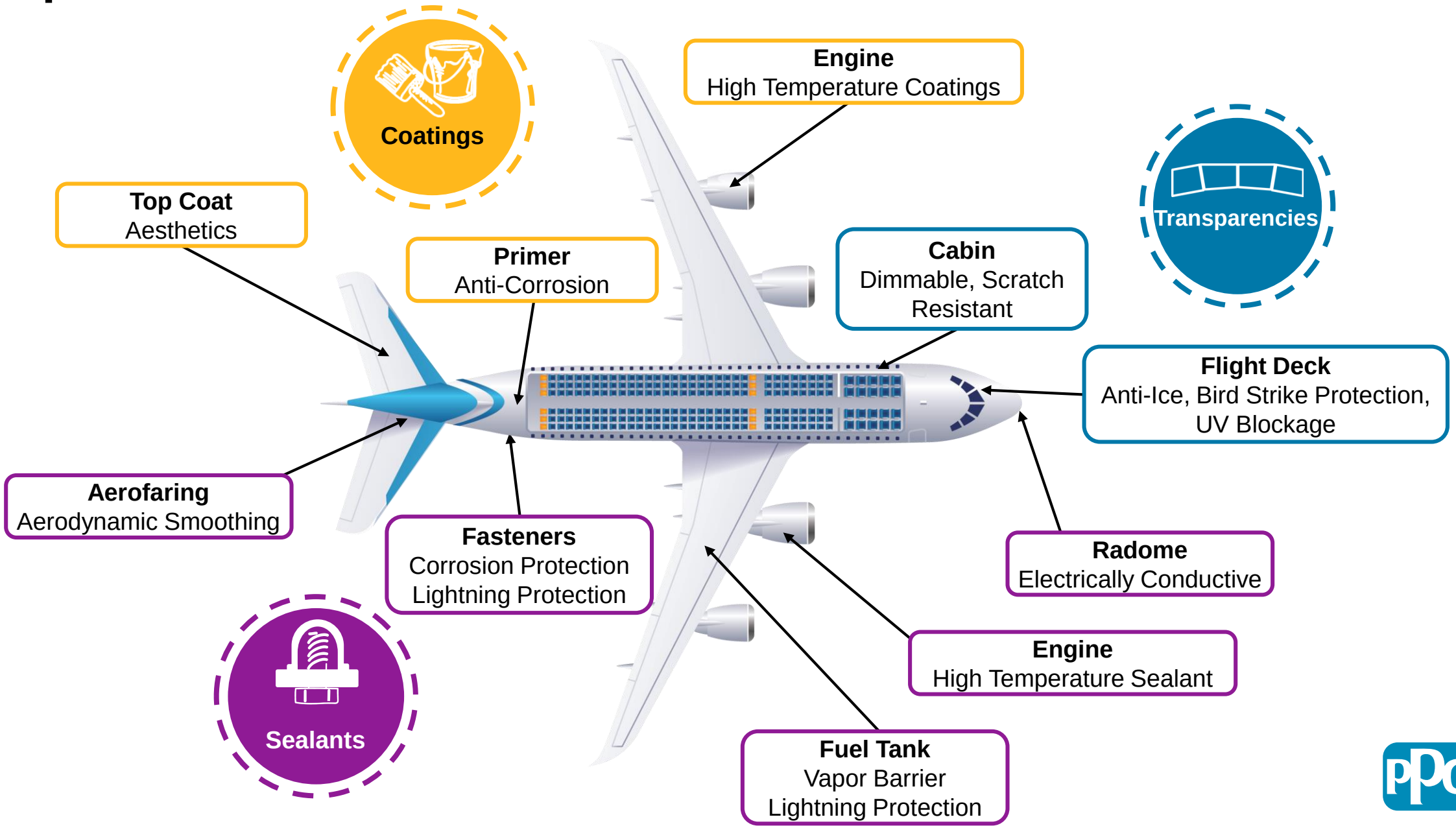






Technology and Capabilities

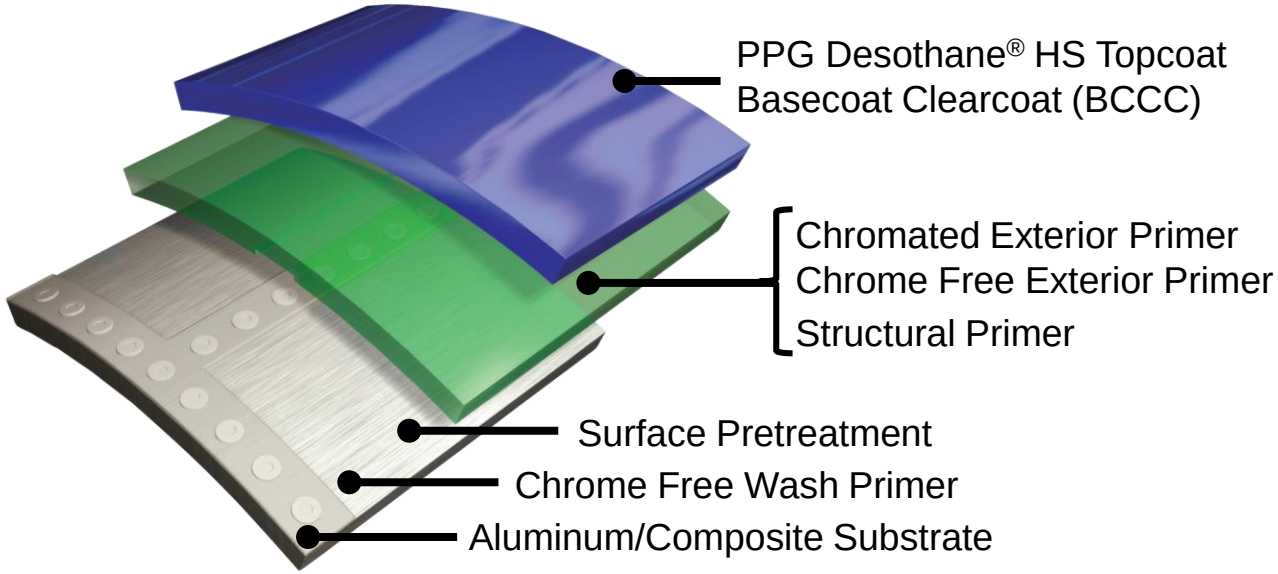
PPG's products cover the entire airframe



Our coatings provide color…

- Corrosion Protection
- Aesthetics
- Solar Heat Management
- Thermal Barrier
- Aerodynamics
- Military Requirements

Standard High Solid Exterior Commercial Topcoat System







…and help fight corrosion on aircraft structure

Our technology improves product performance

Brand Differentiation

PPG Andaro® coatings add vibrancy



Traditional coating system

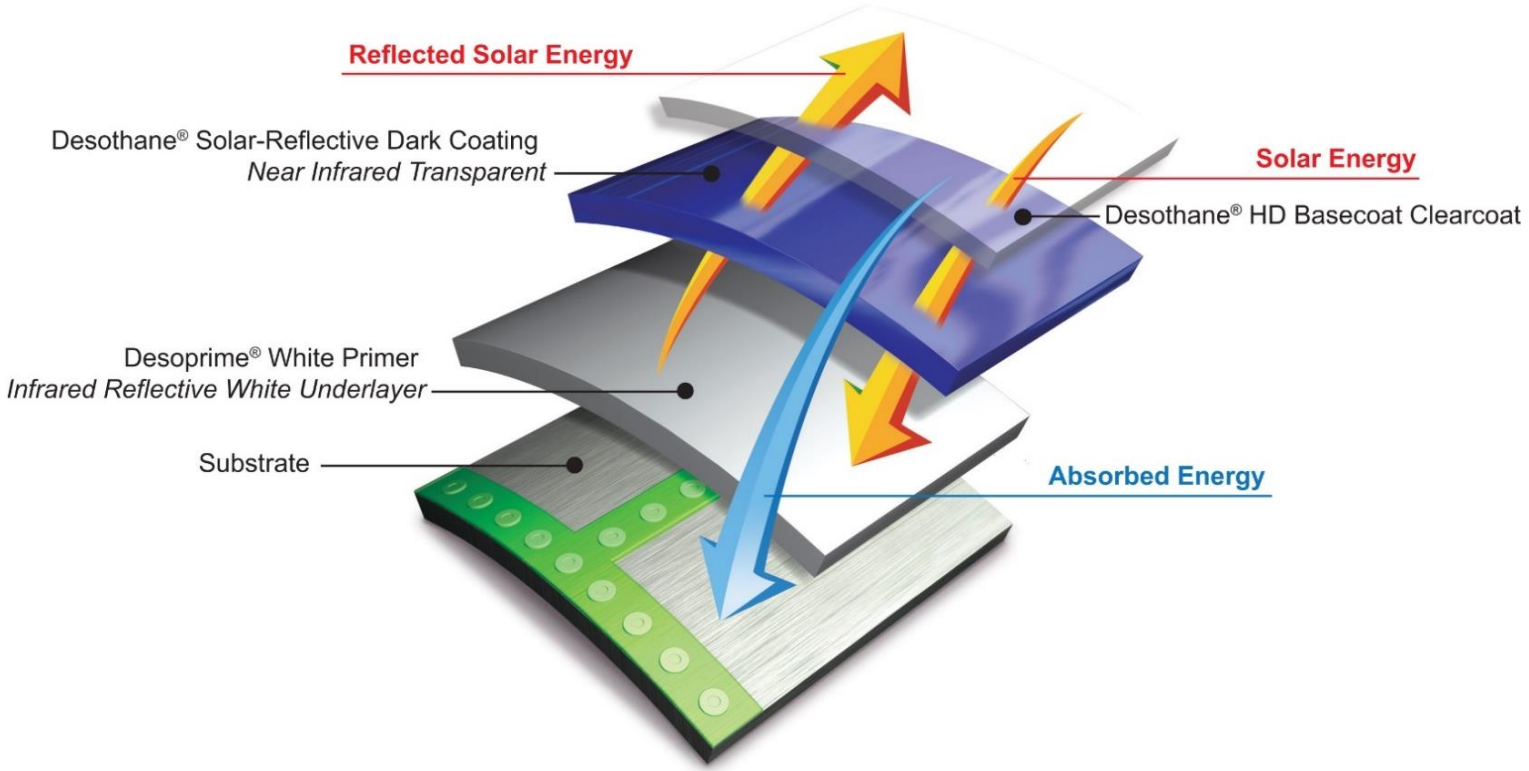


Photo by Mikhail Okrochkov

Coated with PPG Andaro® special-effect pigments

Heat Reflective

Solar heat management coatings allow darker colors



Our coating innovations enhance color intensity and help reflect heat away from the aircraft

Creating / capturing value – levering PPG capability

PPG Aerocron™ Electrocoat primer and coating system

Automotive

PPG Pioneer (Steel)



Aerospace

PPG Pioneer 2010's



- Chrome & metal free
- 90-95% material usage – no overspray
- Uniformly coats complex parts (weight control)
- Eliminates process steps

PPG promotes sustainability with products that eliminate chrome and reduce waste

Our sealants provide a critical barrier…



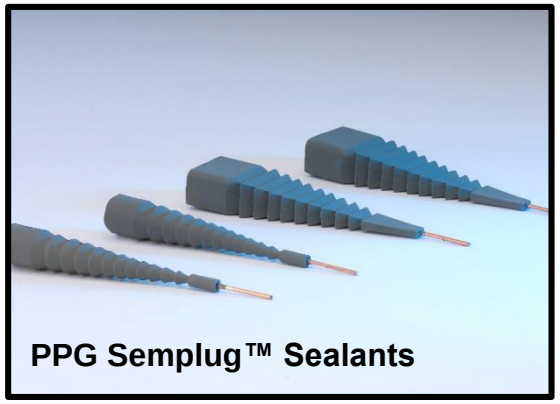
- Vapor Barrier
- Pressure Barrier
- Lightning Protection
- Aerodynamic Smoothing
- Corrosion Protection
- Electrical Conduction

Products Designed To Save Time, Reduce Rework, and Improve Quality













…that protects the aircraft from the harsh flight environment

Creating / capturing value – improving aircraft performance

Lightweight sealant technology (PR-2870)

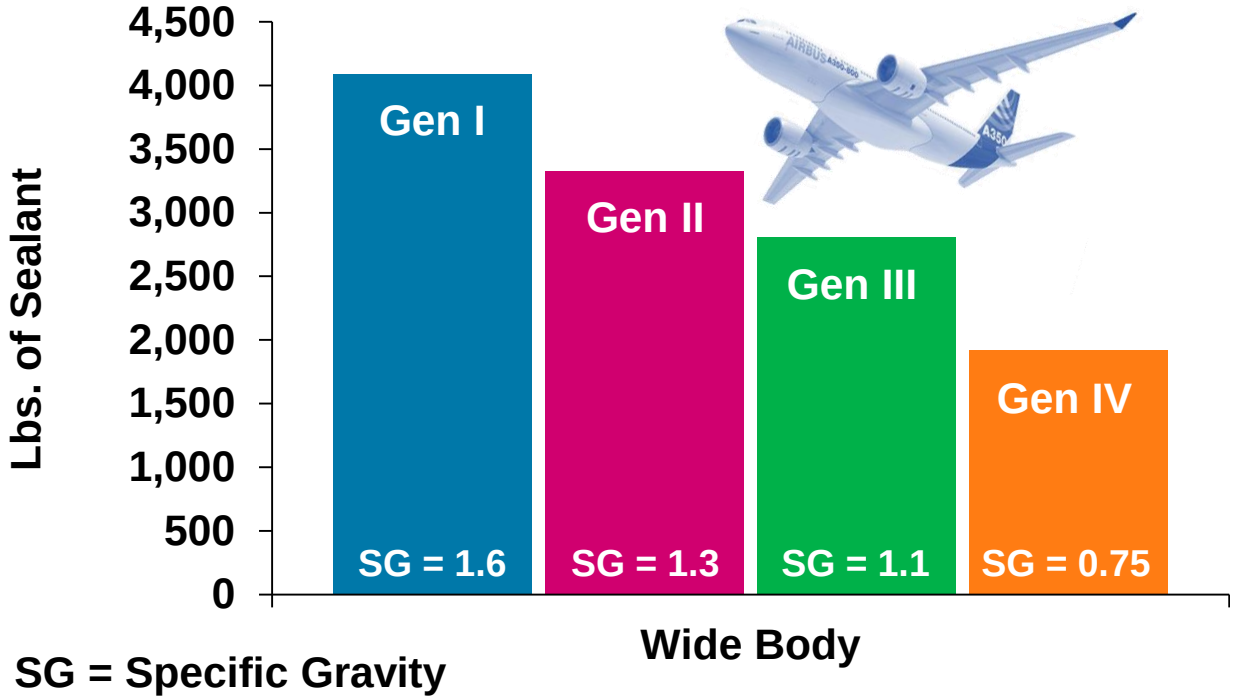
- Extends range and improve operating efficiency
- The Next Gen Corrosive Inhibitive Sealant
- REACh Compliant & Chrome-Free
  - Environmentally Friendly
  - Cures Faster
  - Lighter Weight

PR-2870 Sealant

Packaged in PPG Semkit®



Weight Savings on Wide Body Aircraft



SG = Specific Gravity

Gen IV Sealants reduce weight by thousands of pounds

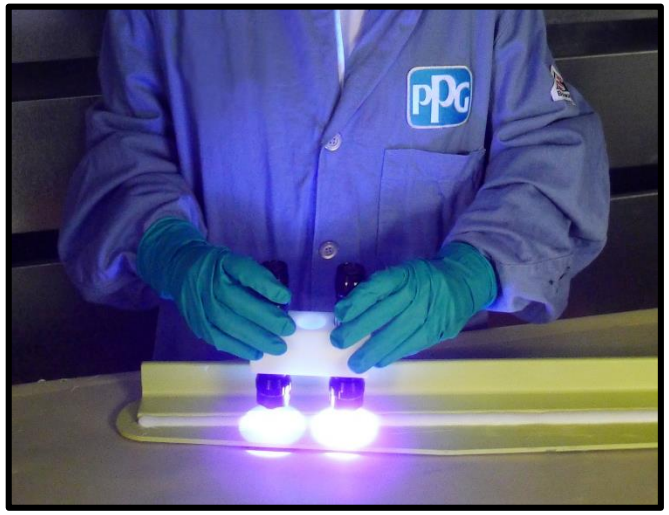
PPG continually innovates products to reduce airframe weight and improve aircraft operating efficiency

Creating / capturing value – customer manufacturing performance

Airframe Assembly Speed

PPG products decrease customer cycle time to support increasing build rates

UV cure sealants reduce assembly line cure time



- “Infinite” application time
- Cures in seconds
- Excellent depth of cure: ~ 15mm
- Low density: 1.15 specific gravity
- Solvent-free and low shrinkage

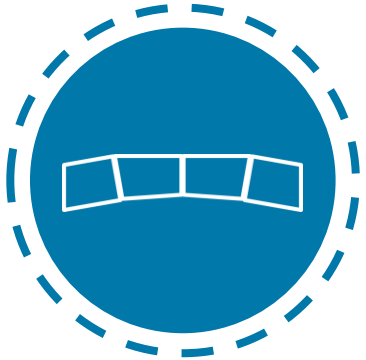
Pre-molded **seal caps** speed the assembly process



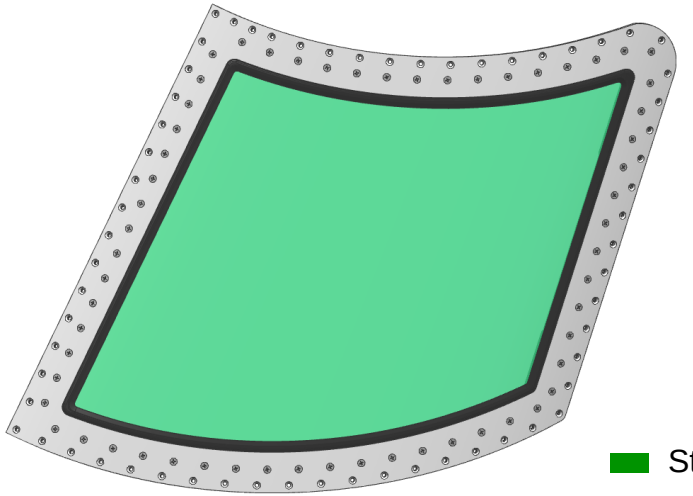
- Fast installation
- Reduces waste
- Eliminates “artisan skill”
- Lightning strike protection

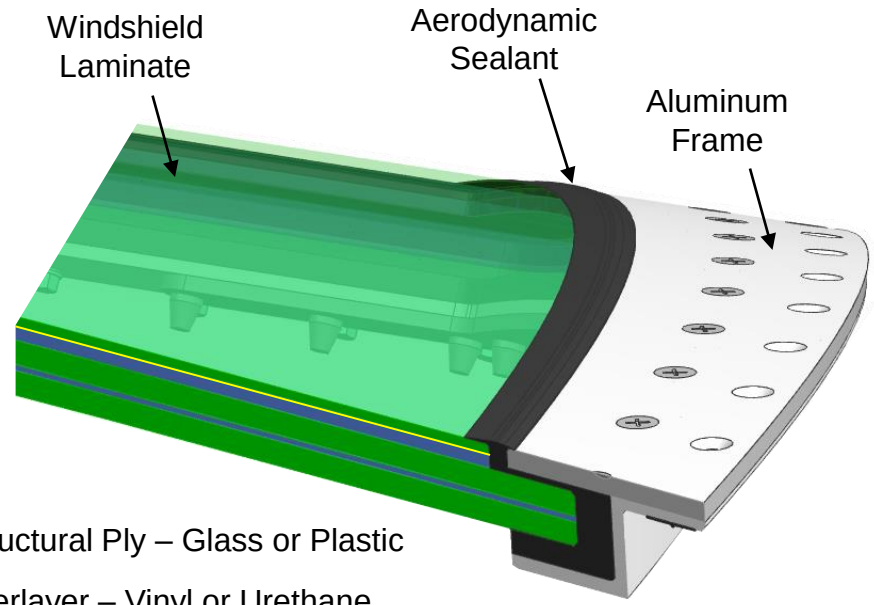
PPG innovations in UV cure materials and pre-molded seal components increase aircraft assembly speed

Our transparencies provide a clear view…



- Critical Aerostructure
- Crew & Passenger Protection
- Anti-Ice
- Optics & Visibility
- Solar Protection & Control
- Dimmable
- Ballistic Protection
- Lightning Strike Protection
- Special Mission





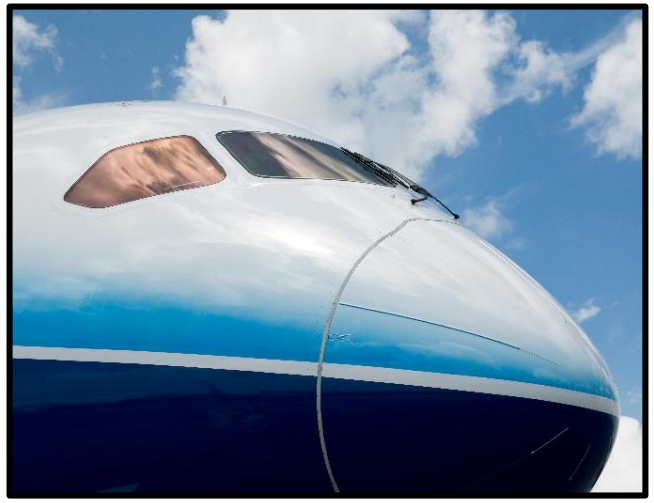


…and act as critical aerostructure to help keep passengers and crew safe

Creating / capturing value – improving aircraft performance

Lightweight

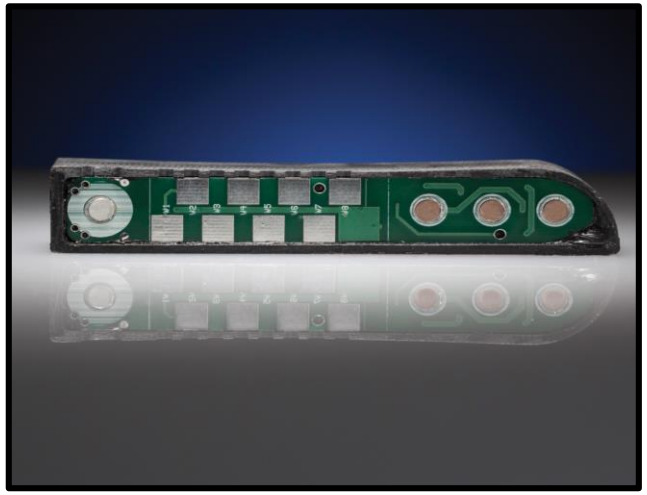
Extend range and improve operating efficiency



Composite windshields reduce aircraft weight by more than 100 lbs

Predictable

Reduce aircraft maintenance costs



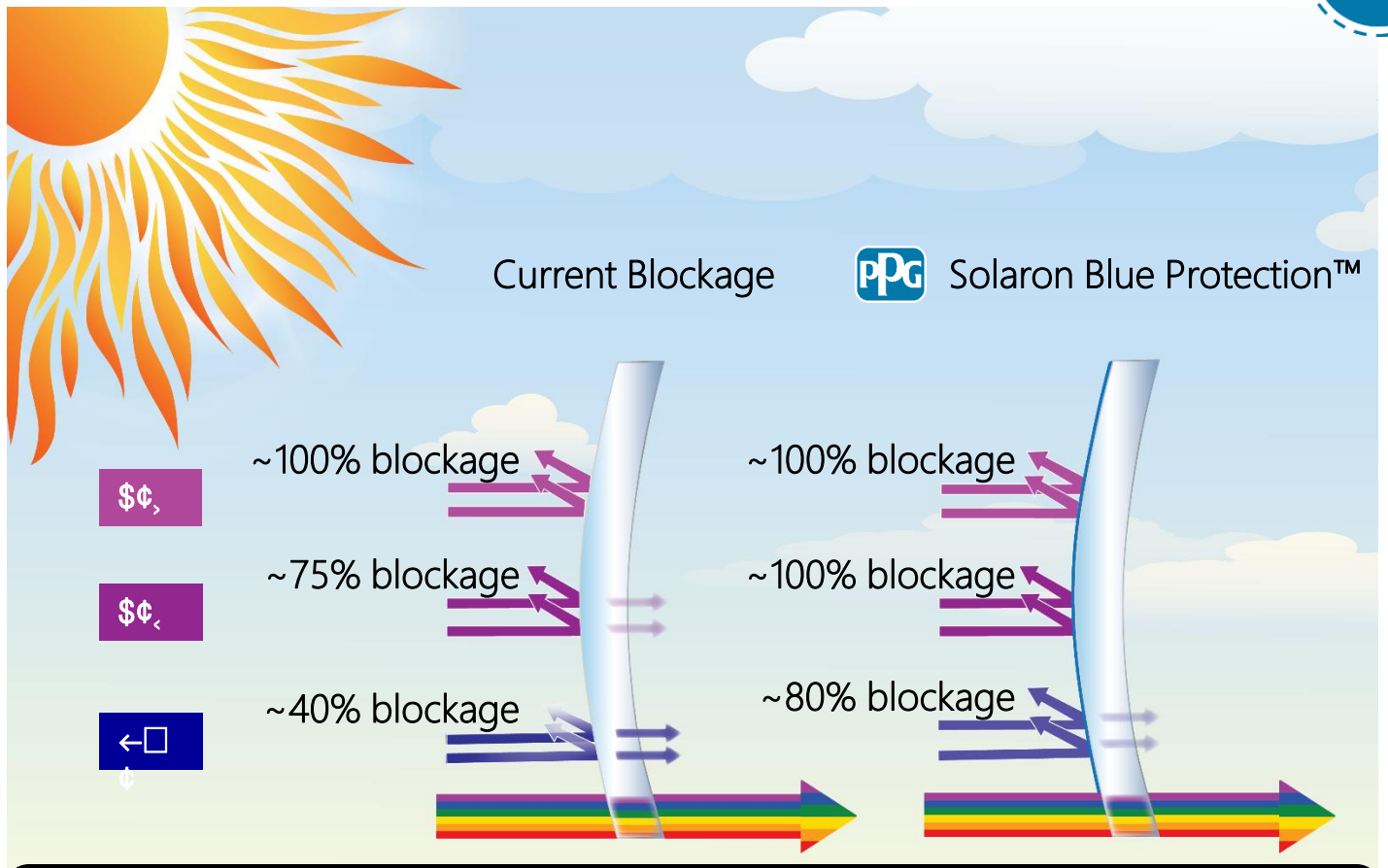
PPG WinLogic™ sensors minimize unscheduled windshield removals

Our transparency innovations improve airline operating costs by saving fuel and reducing unscheduled maintenance

Creating / capturing value – improving product performance

Solaron Blue Protection™
UV+ blocking technology

Increased blockage over a greater range



PPG's Solaron Blue Protection™ outperforms current technology by shielding ~100% UV and most HEV light

PPG window technology enhances crew / passenger safety by reducing exposure to ultraviolet and high energy visible (HEV) light

Creating / capturing value – levering PPG capability

PPG Opticor™ advanced transparency material

PPG's Specialty Coatings & Materials

Optical Products



PPG's Aerospace

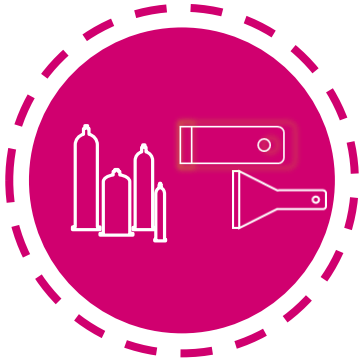
Flight Deck and Passenger Windows



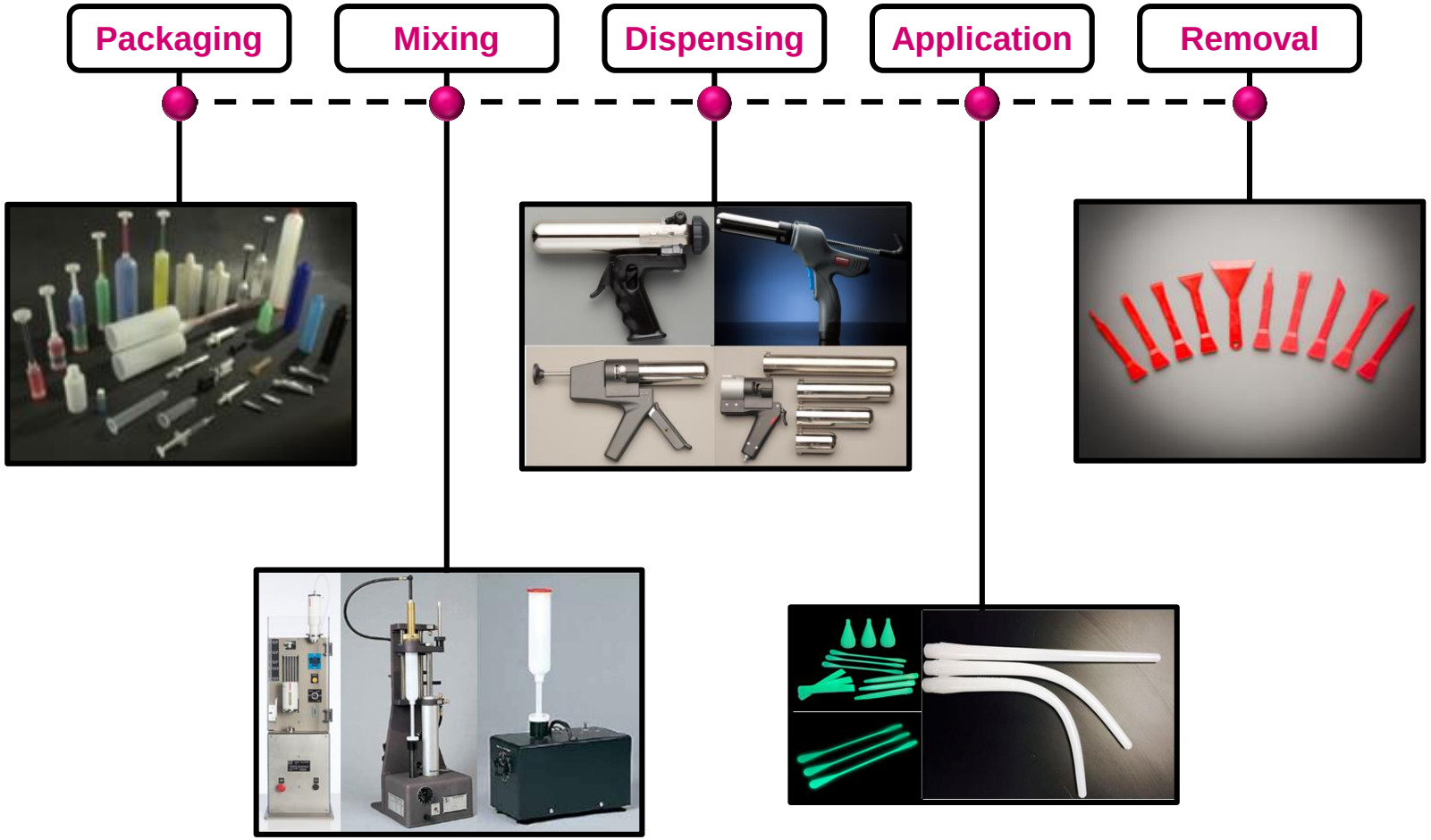
- Reduced weight versus acrylic
- Improved scratch resistance
- Improved chemical resistance
- Improved impact resistance

Revolutionary PPG Opticor™ is first FAA-qualified transparent material for aerospace since polycarbonate in 1960's

Our packaging systems simplify manufacturing…



- Process Efficiency
- Right Sizing
- Foreign Object Debris Reduction
- Contaminant Containment

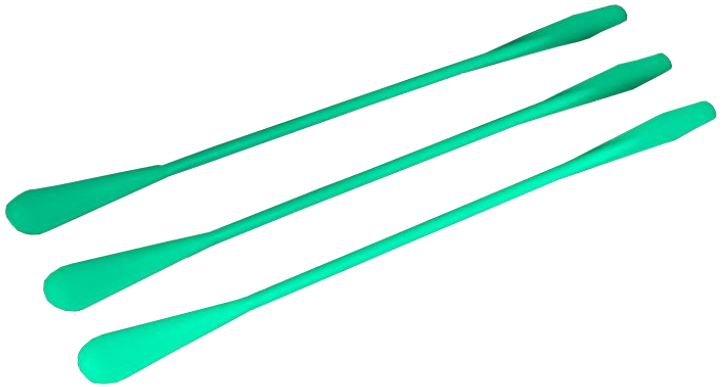


…and provide customized solutions that ‘right-size’ product delivery to reduce waste

Creating / capturing value – application packaging

Semco® Glow-in-the-Dark Applicators

- Reduces orphaned debris during final assembly
- Made from proprietary GID formula
- Excellent for use in any area where limited light is available



UV Blocking Packaging

- Blocks UV light, preventing UV-activated materials from reacting
- Non-leaching material reduces likelihood of contamination





PPG innovations for product application streamline customers' production environments

Our chemical management services help customers optimize supply chain…

- Just-In-Time
- Waste Elimination
- Shop Floor Control
- Critical Documentation Management
- Hazardous Material Management







Customer site shop floor control using RFID and PPG smartphone app to manage inventory movements



…and manage environmental and compliance requirements

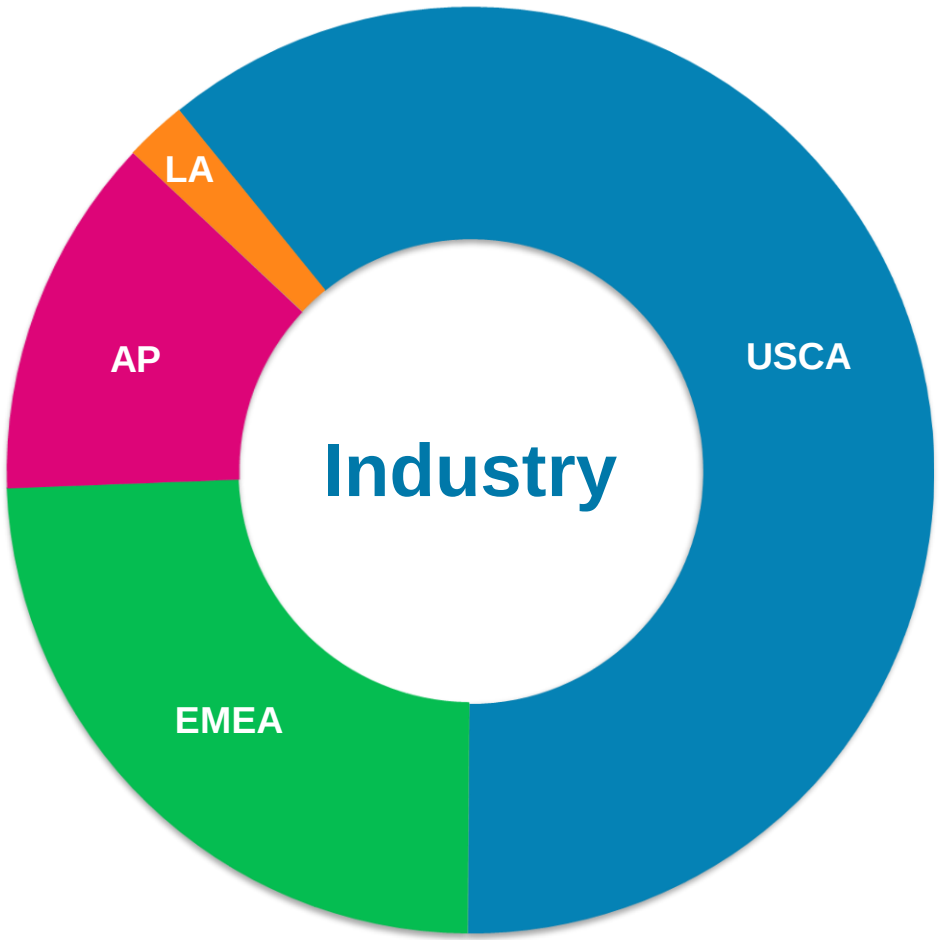
PPG technology: adding value to the aerospace industry for nearly 100 years

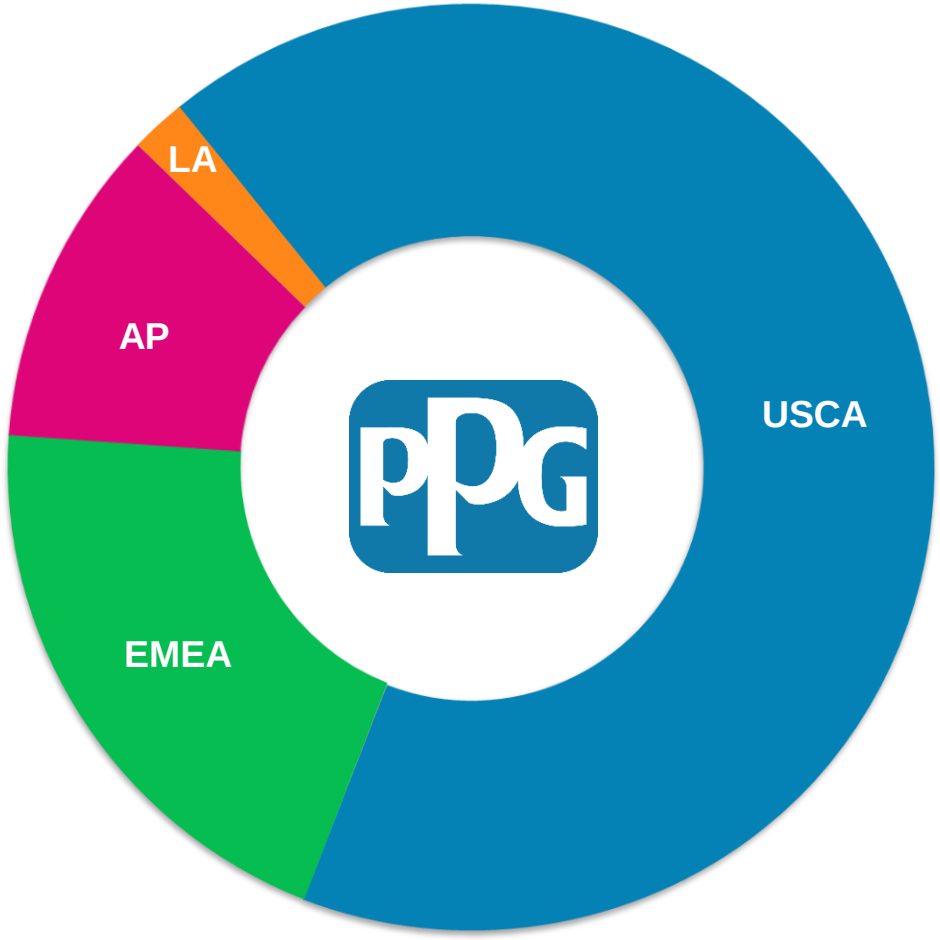
- ✓ Investment in technology to create mutual value with customers
- ✓ Improving aircraft performance and operations
  - Lightweight and aerodynamic products
  - Continuous reliability improvement
- ✓ Enhancing product performance
  - Additional functionality
  - Simplified product use and application
- ✓ Improving customer manufacturing performance
  - Products that improve throughput
  - Products that reduce waste and costs
- ✓ Safety and Sustainability
  - Products that enhance safety for passengers and crew
  - Environmentally friendly products
  - Carbon footprint reduction
- ✓ Protect and beautify
  - Anti-corrosion & degradation
  - Color technology leader



PPG well positioned for continued growth in the future

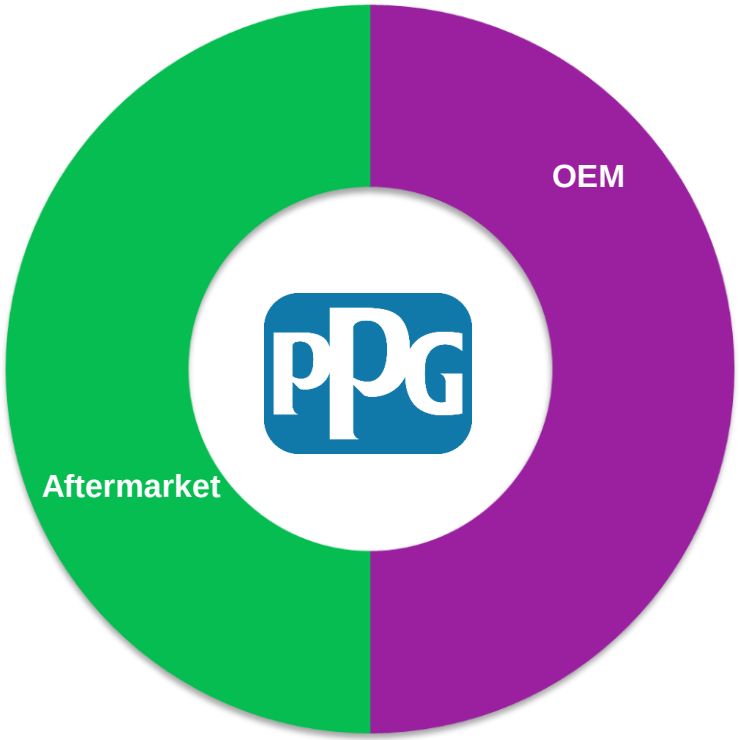
It’s a global industry

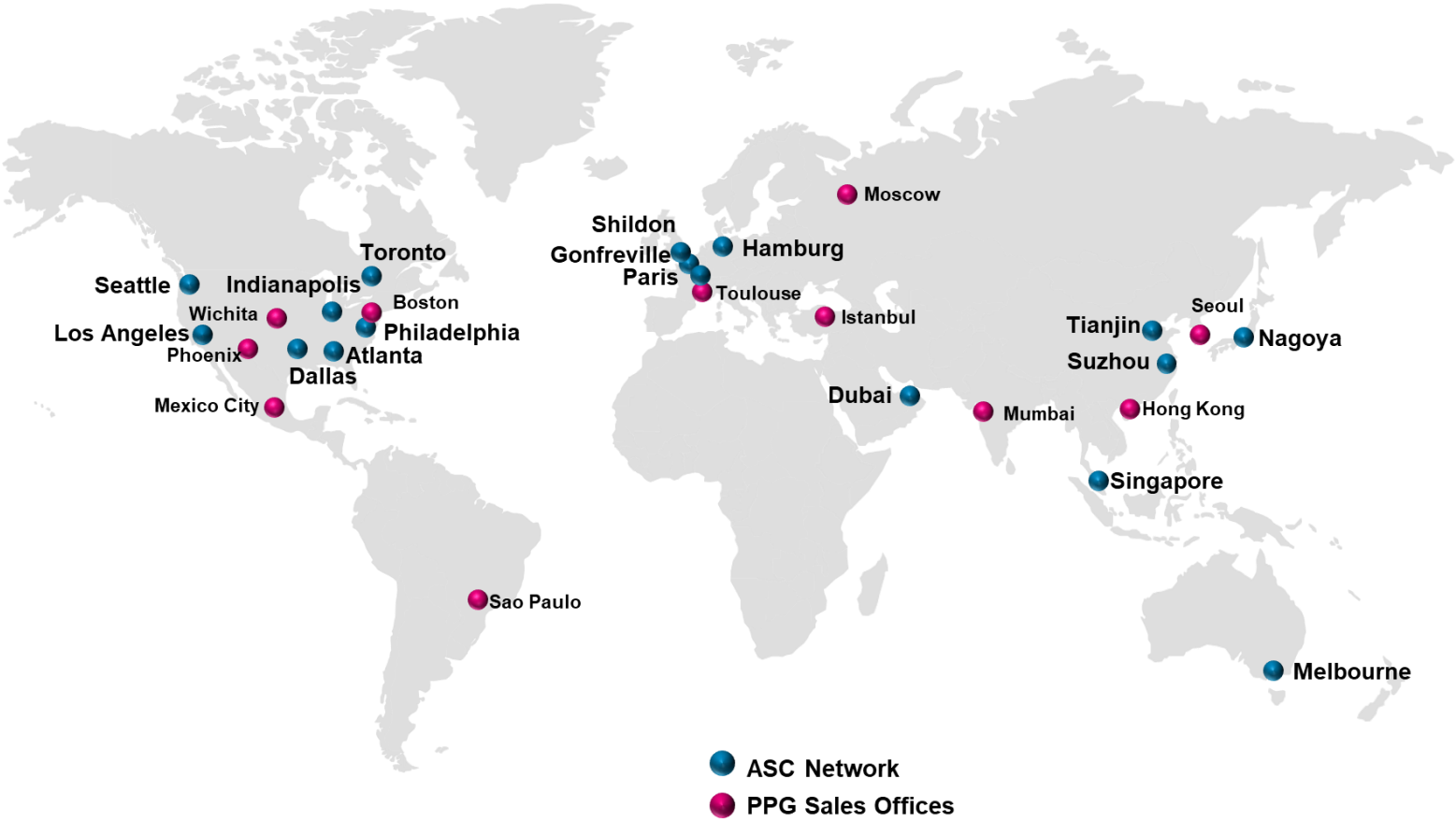




PPG supports the aerospace industry around the entire globe

It’s a diversified industry…

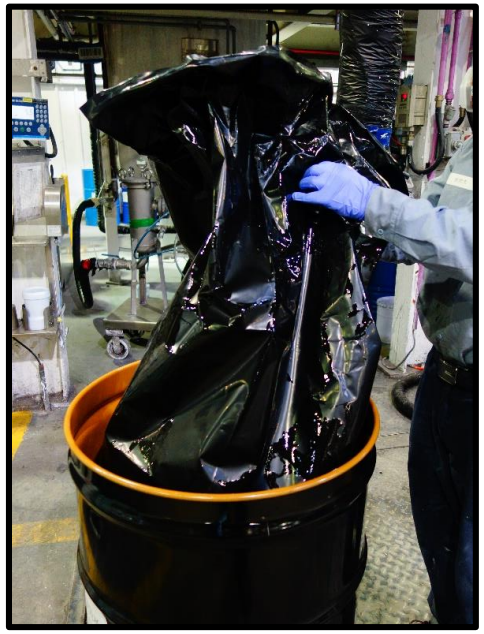




…supported by a global PPG network

That values sustainability

Dedicated to protecting the environment



5.6% decline in total waste in 2018

We value our employees



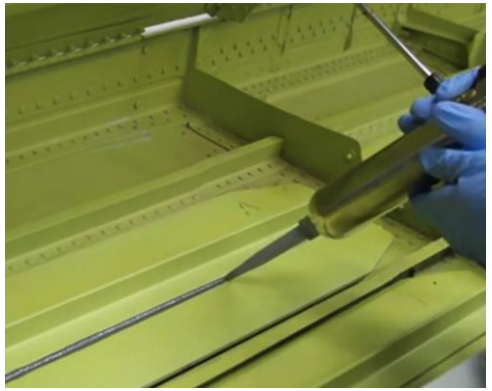
Record low number of injury cases in 2018

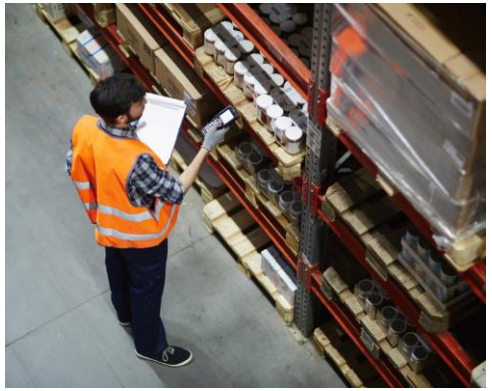
We value our communities



$3.7 million committed to the *COLORFUL COMMUNITITES®* program through 2018







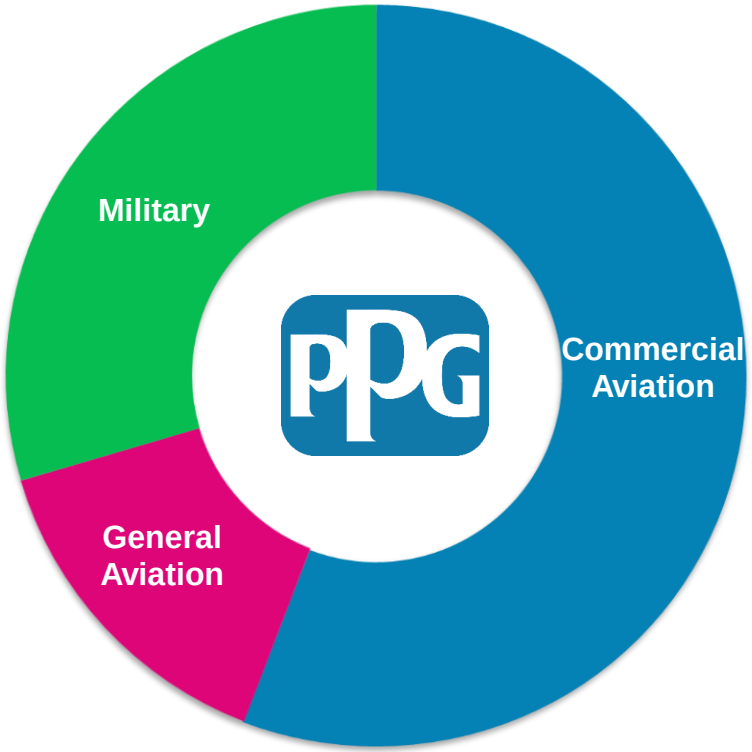
Aerospace Industry Dynamics

The industry is defined by three principle types of customers

Commercial Aviation

General Aviation & Business Jets

Military Fighters & Transports



- Aircraft build rate dependent
- Aftermarket / maintenance activity

Aircraft build rates and fleet maintenance are measures of industry size

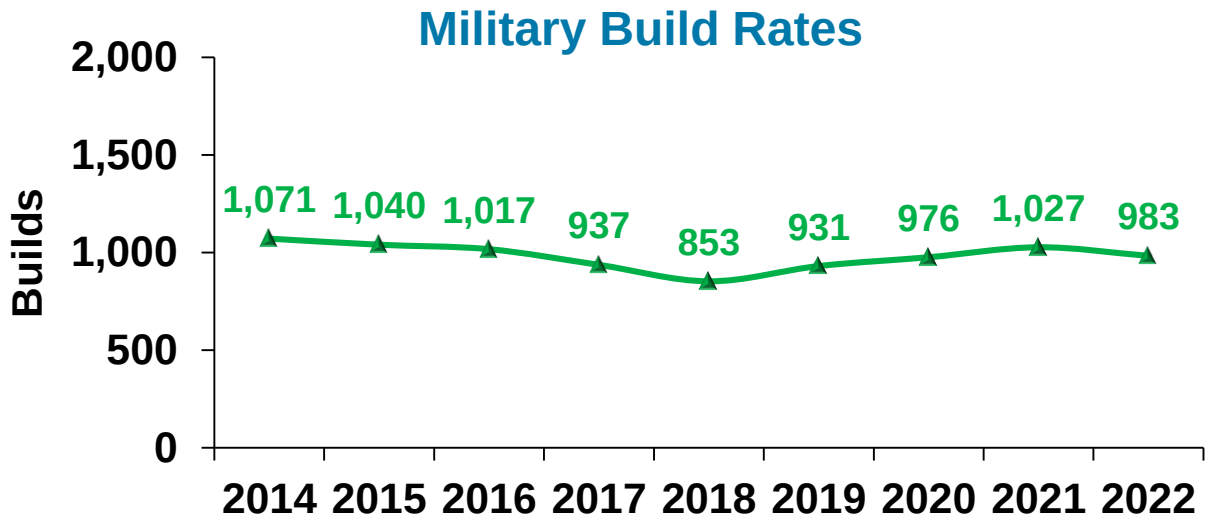
What's driving military growth?

- Heightened geopolitical tension
- Military spending increasing
- Replacing aging fleets
- Advanced aircraft
- Maintenance intensity





Fighters & Transports



Source: Forecast International

Maintenance intensity of latest generation replacements creating greater aftermarket opportunity

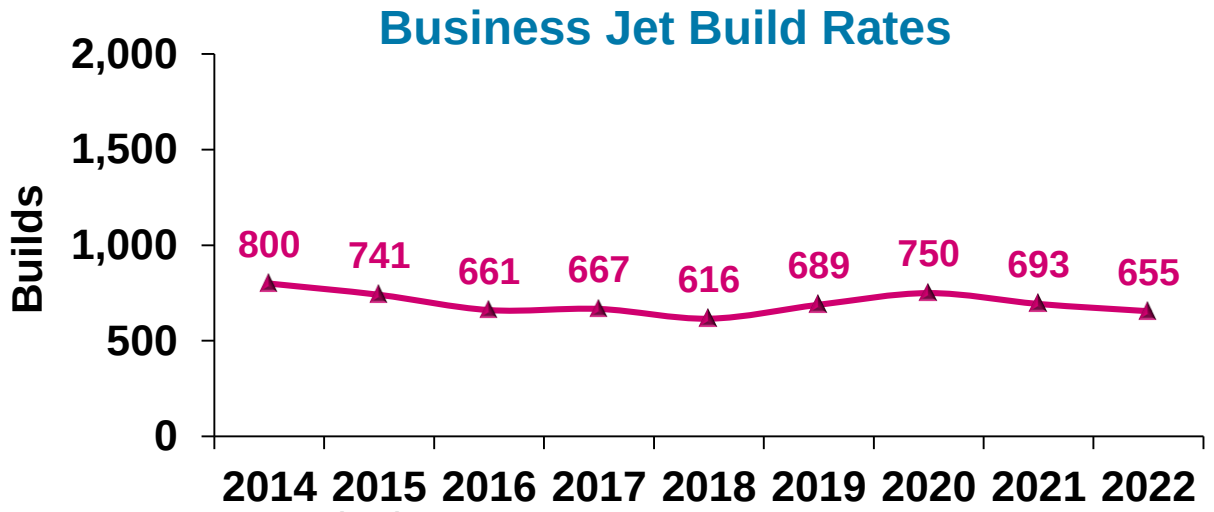
What's driving business aviation growth?

- Growing / aging fleet
- High utilization
- Low used inventory
- Higher maintenance spending





Private & Business Aircraft



Source: Forecast International

Stable fleet growth with increasing aftermarket opportunity

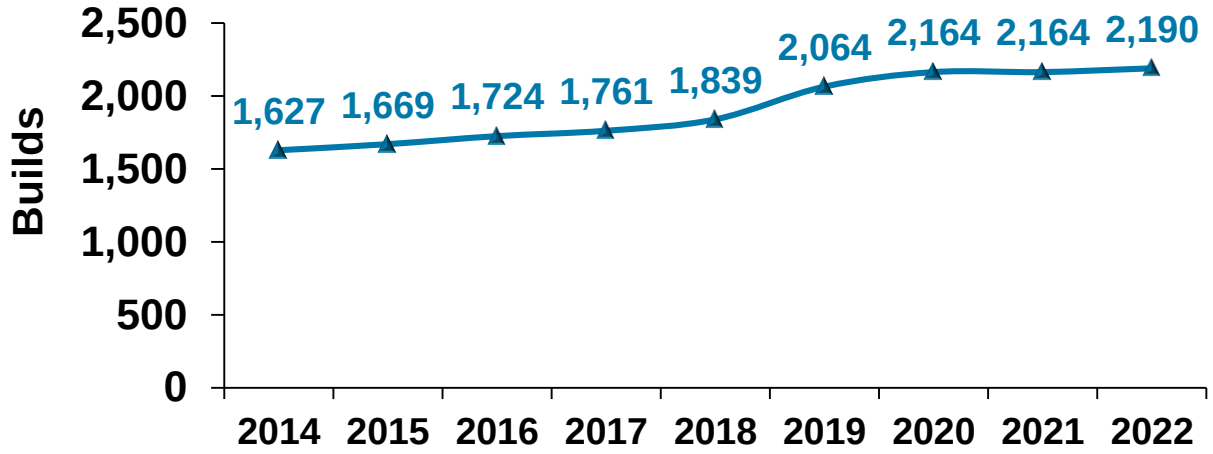
Commercial aviation is the biggest growth driver

- High backlog for new aircraft
- Demand for new, more efficient aircraft
- Demand for greater passenger capacity
- Traffic drives higher maintenance spend



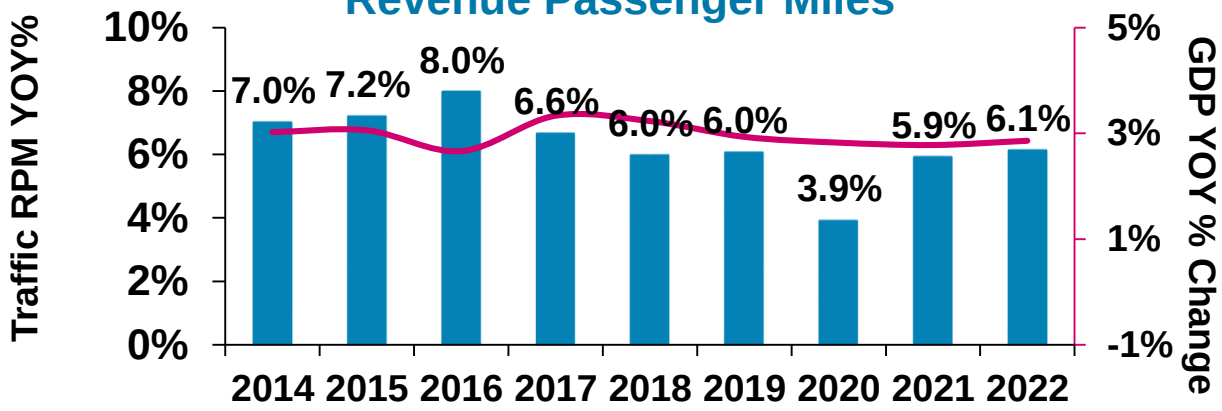
Commercial Aviation
Airlines and Freighters

Commercial Build Rates



Source: Forecast International

Worldwide Traffic and GDP
Revenue Passenger Miles

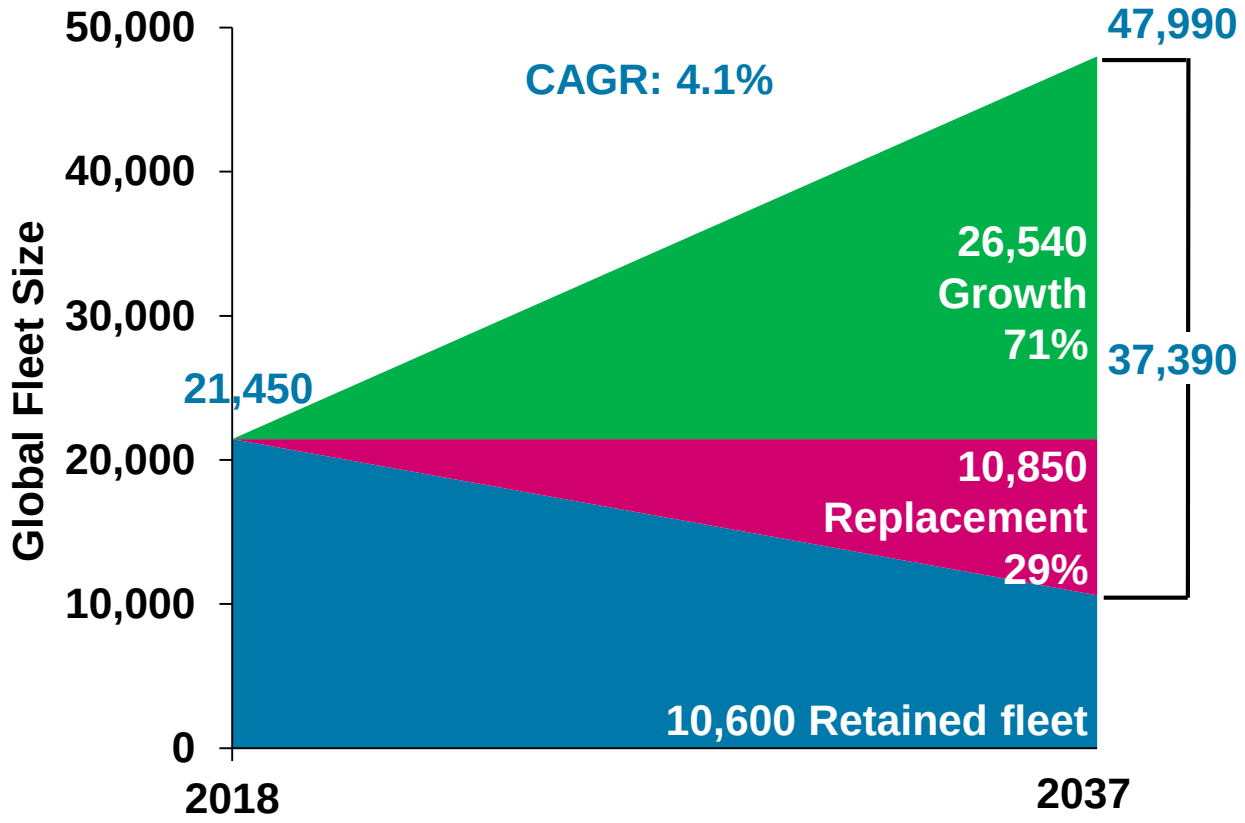


Source: Economic Indicators and Airline Monitor

Industry fundamentals remain strong

What's driving commercial growth?

….doubling the global commercial fleet by 2037



Source: SpeedNews

It's less expensive than ever to fly…..

- More efficient aircraft
- Favorable interest rates
- Stable fuel prices
- Airline route and operation optimization
- Aircraft utilization at all-time high 81.9%

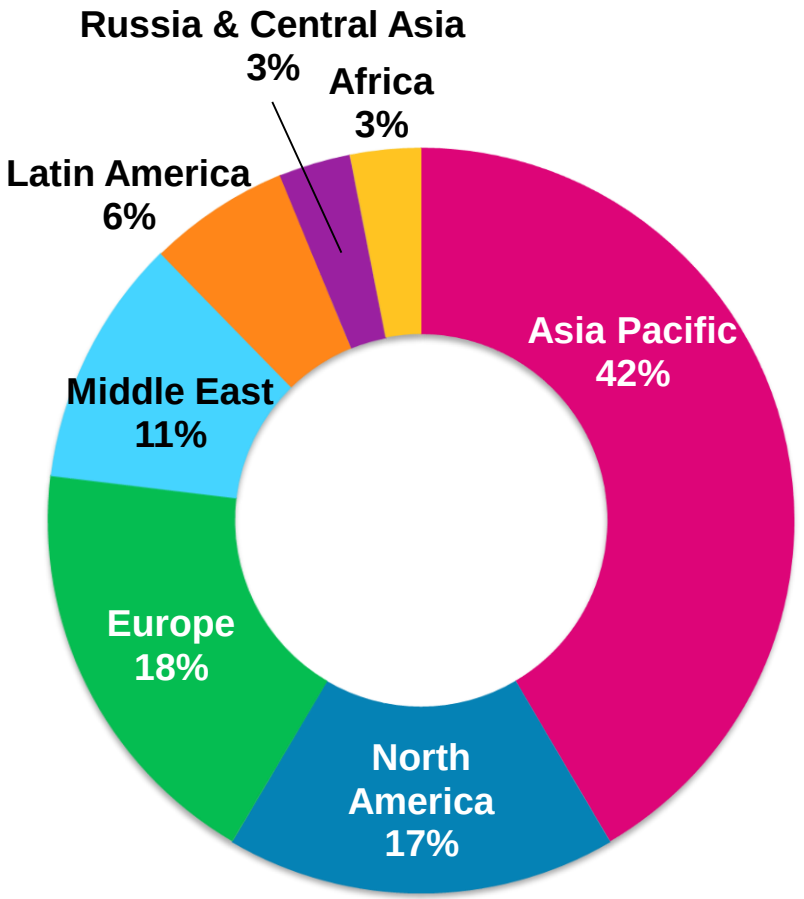
Demand for commercial air travel will double the global fleet in 20 years

More of the world can afford to fly



- Global GDP ↑
- Emerging region traffic ↑
- More cities connected together than ever before

Airplane Deliveries By Region Next 20 Years

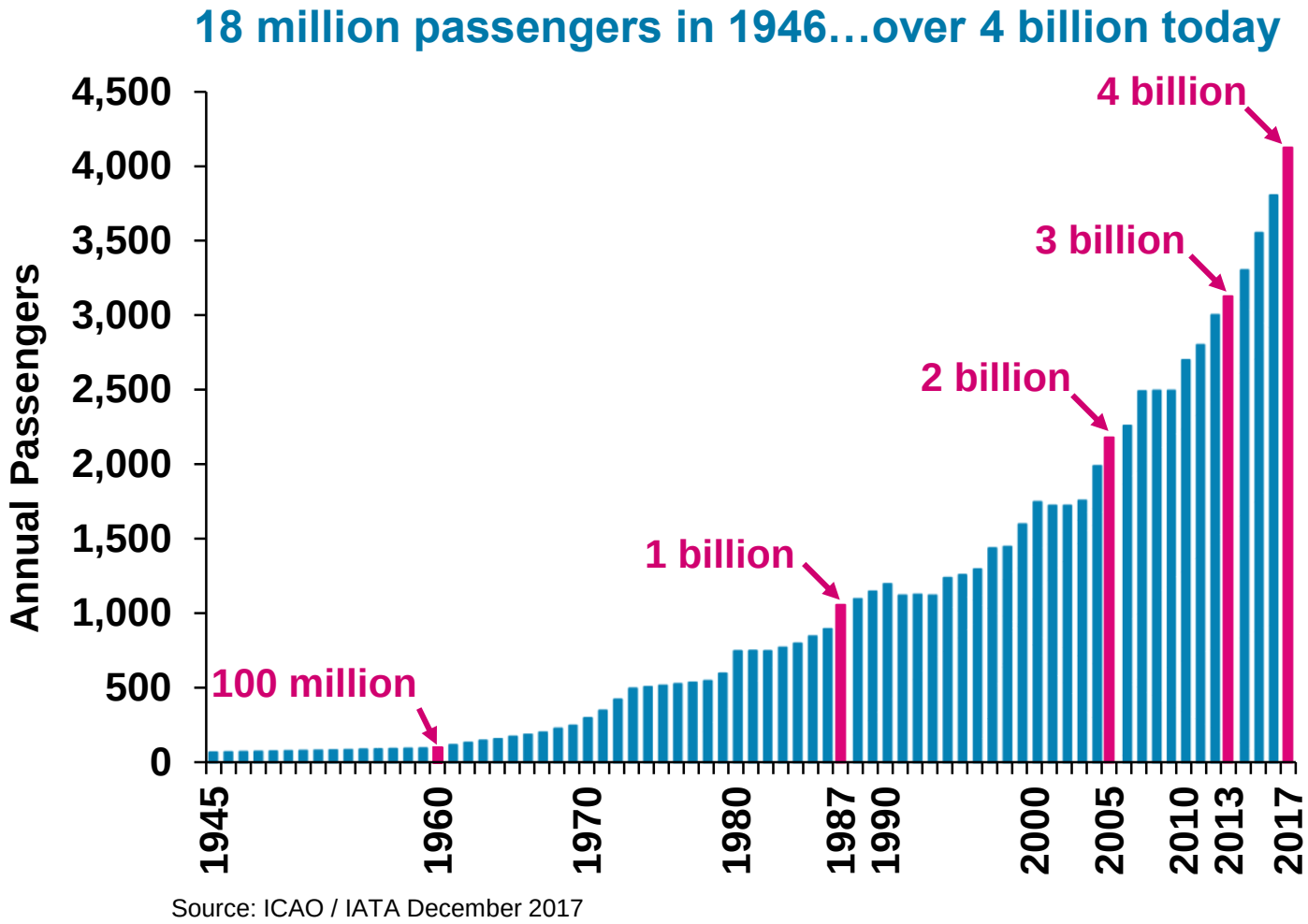


Source: SpeedNews

A greater middle class in emerging regions

And more of the world is flying

- Growth in air travel continues in all regions
- Emerging regions sustaining higher growth with population of new flyers



Source: ICAO / IATA December 2017

More of the world now travels by air – 100 million people flew for the first time in 2017

Giving the industry a global reach

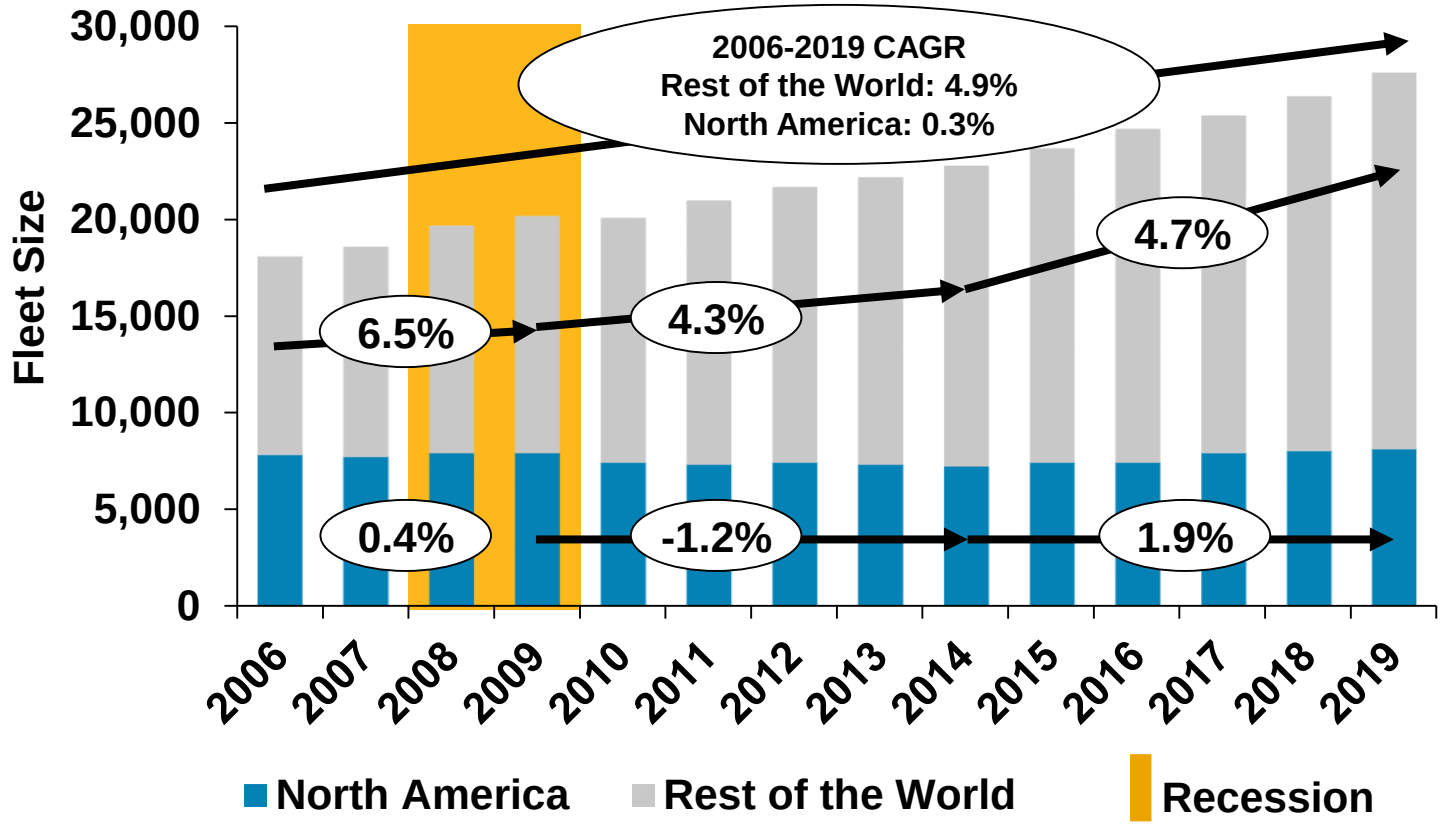
North America Fleet Growth

- Mature flying population
- Low growth in fleet size

‘Rest of World’ Fleet Growth

- Impact of 2008 recession minimal
- Driving global fleet dynamics
- Exceeds global GDP growth

Annual Fleet Size North America vs Rest of the World

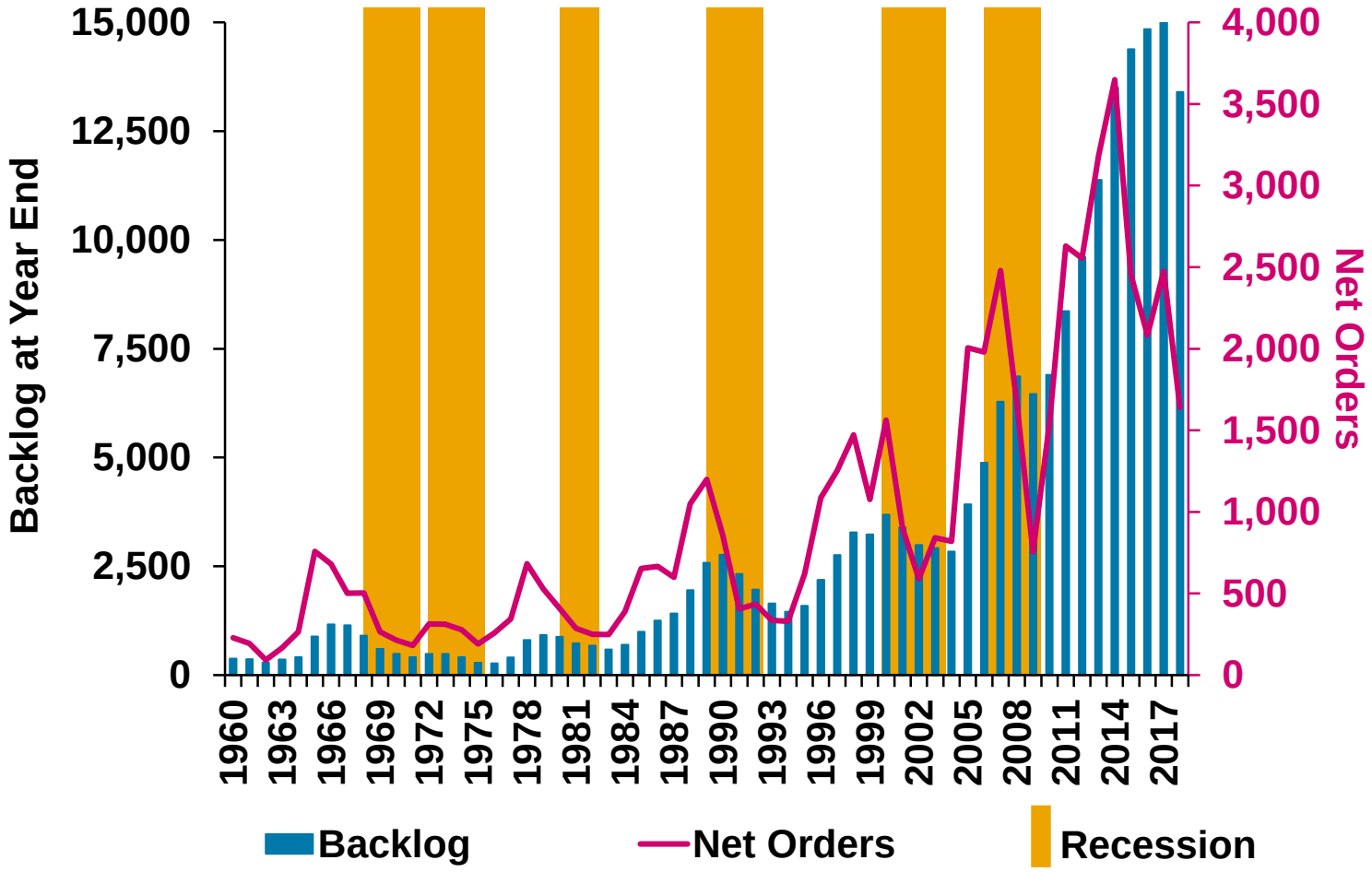


Source: Oliver Wyman at MRO Americas

The industry has become more global as emerging regions increase demand for air travel

The industry is more geographically diversified

Commercial Aircraft Backlog



Source: Airbus and Boeing annual reports

Recessions before 2008

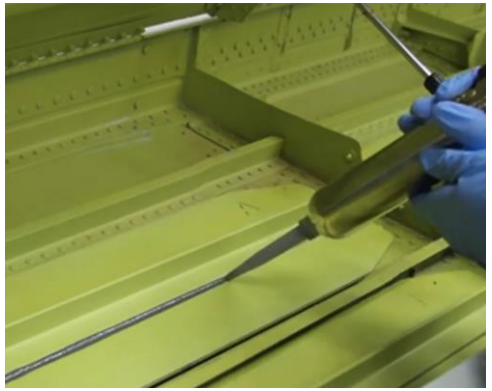
- Aircraft backlog reduced
- Aircraft deliveries reduced

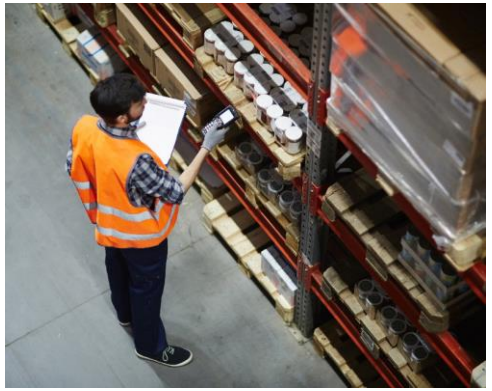
2008 Recession

- Global backlog supported build rate stability

Globalization is making the industry less sensitive to recession than in the past





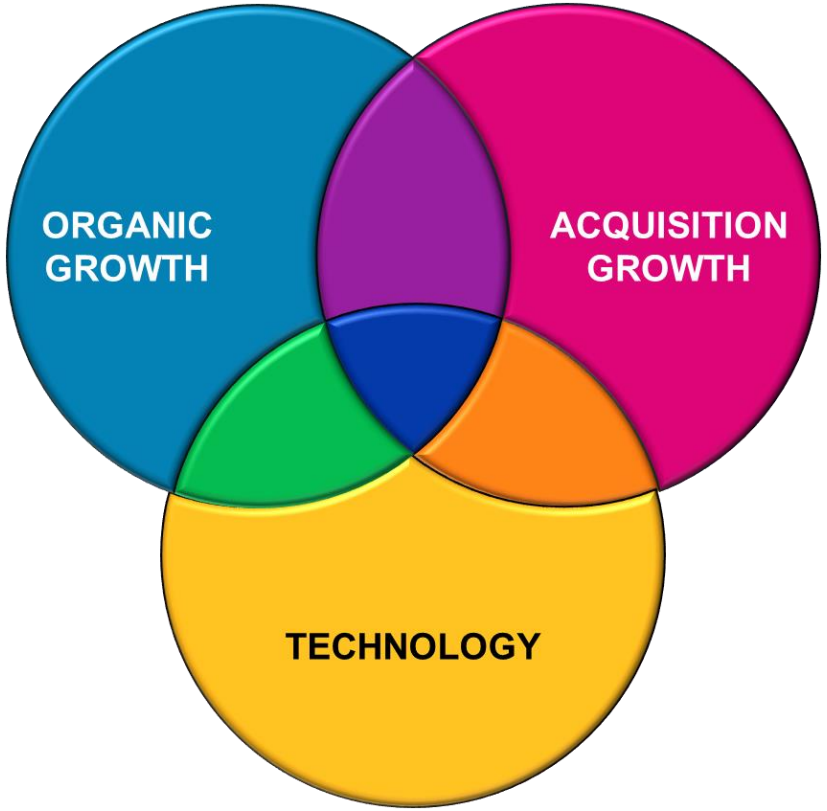


Growth Opportunities

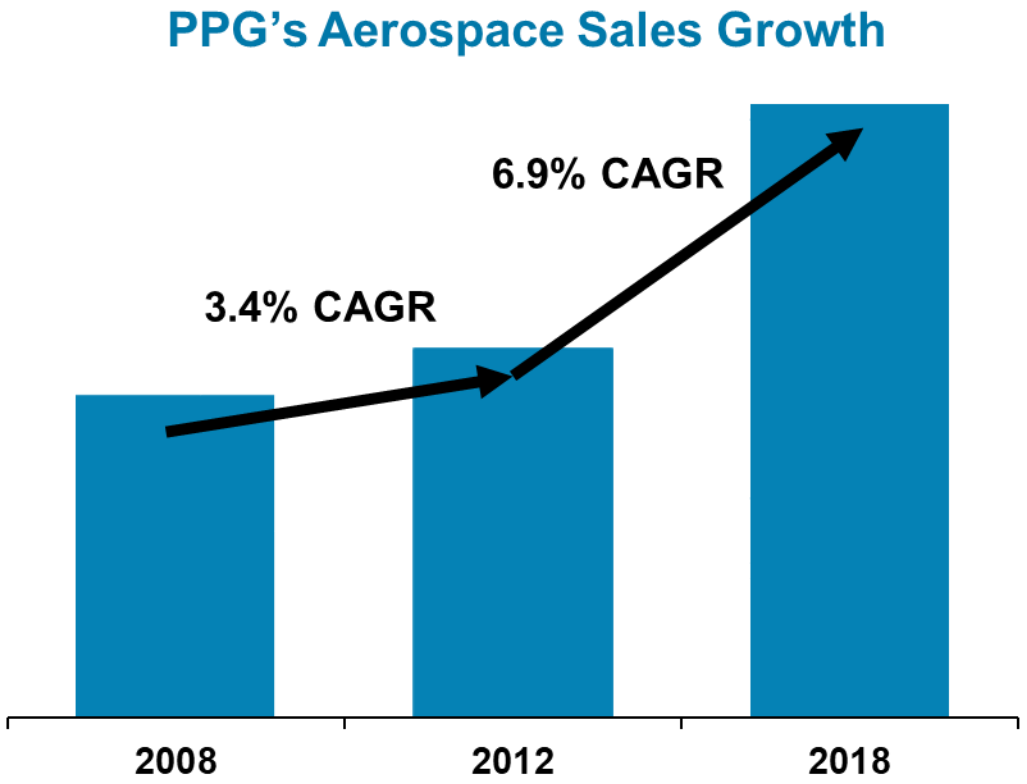
An integrated vision to growth

Best-in-class service

Focused Acquisition Process



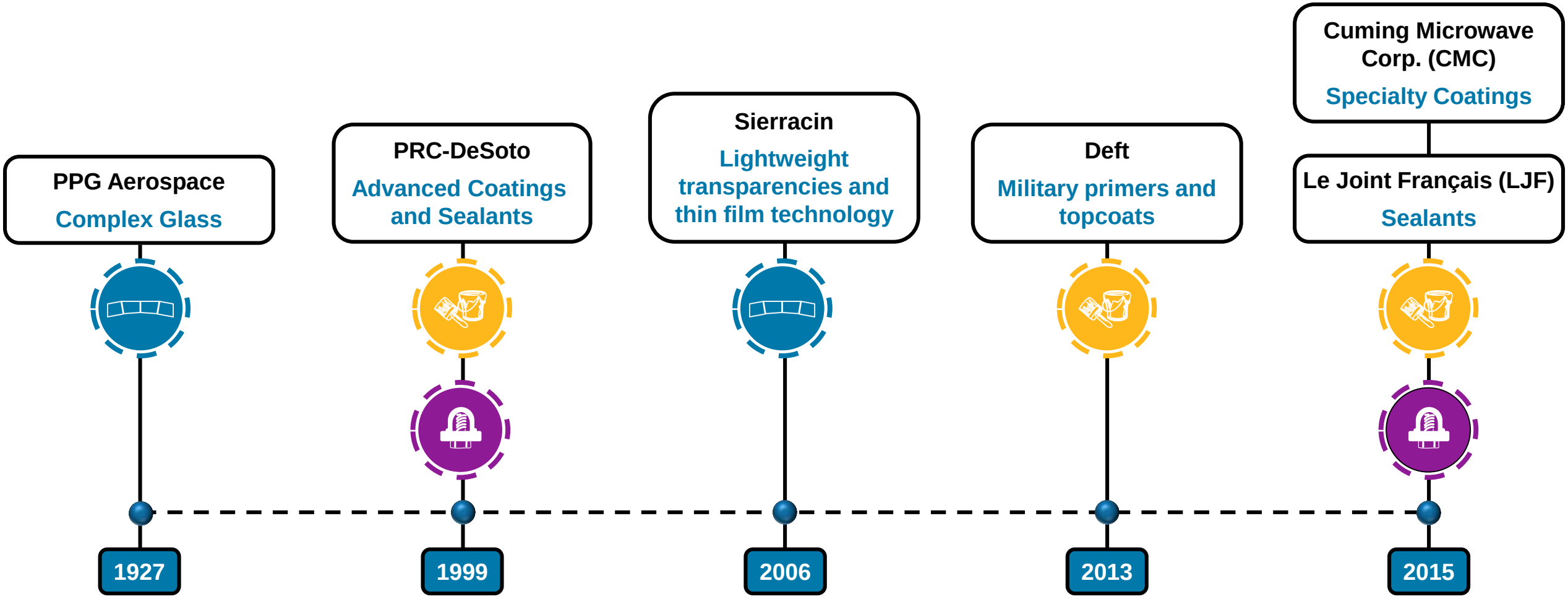
Voice of customer innovation



2012-2018 growth driven by broader customer reach and increased adoption of new technologies

Aerospace delivers consistent growth

PPG acquisition history



Our aerospace research centers

Harmarville, PA



Allison Park, PA



Shildon, UK



Bezons, France



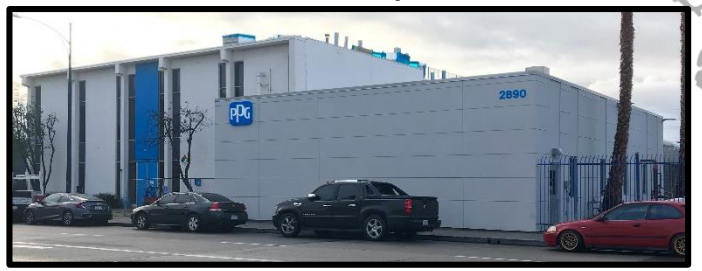
Gonfreville, France



Sylmar, CA



Burbank, CA



Our aerospace manufacturing locations

Boston, MA



Shildon, UK



Bezons, France



Gonfreville, France



Sylmar, CA



Mojave, CA



Huntsville, AL



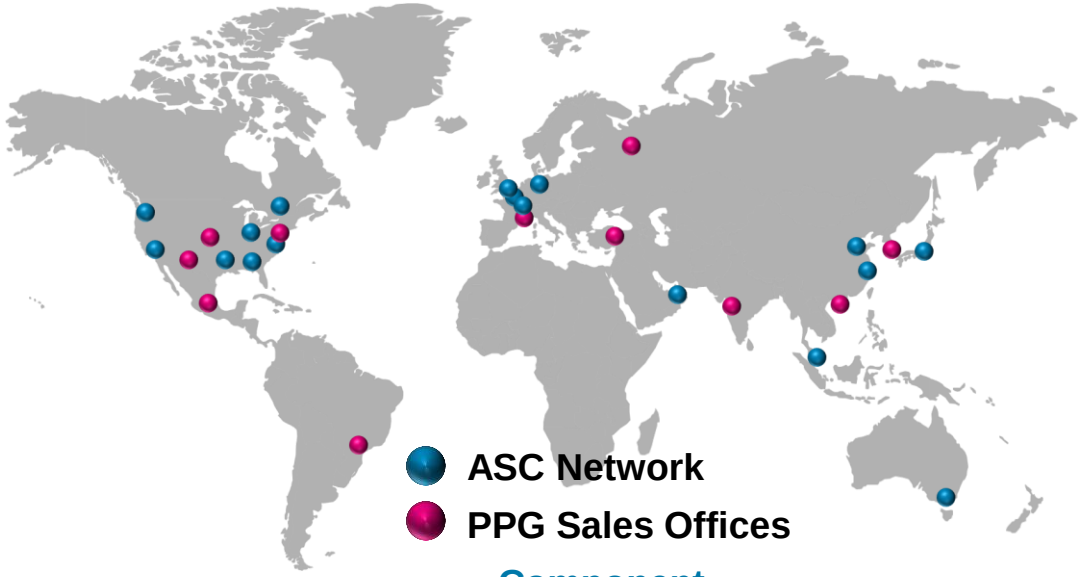
Milan, Italy



Strong Operational Excellence and Customer Qualification, AS9000 and NADCAP certified

Adding value with integrated solutions and service

Application Support Center (ASC)



- Fast response time
- Local support staff
  - Sales and customer support
  - Technical specialists
- Regional inventory management
- Same day delivery when required
- Supply chain management
- Hazardous material reporting
- Customer inventory optimization
- Designated source delegation

Filling



Component Manufacturing



Color Blending



Third Party Packaging



Conformance Testing



Regulatory Compliance & Reporting Management



Providing services that add value close to the customer

Supporting Future Growth in Asia

Application Support Center (ASC)



Suzhou, China



Tianjin, China

- Supports COMAC ARJ & C919 builds
- Supports Boeing 737 & Airbus 320 final assembly
- Support region airlines

New Singapore ASC

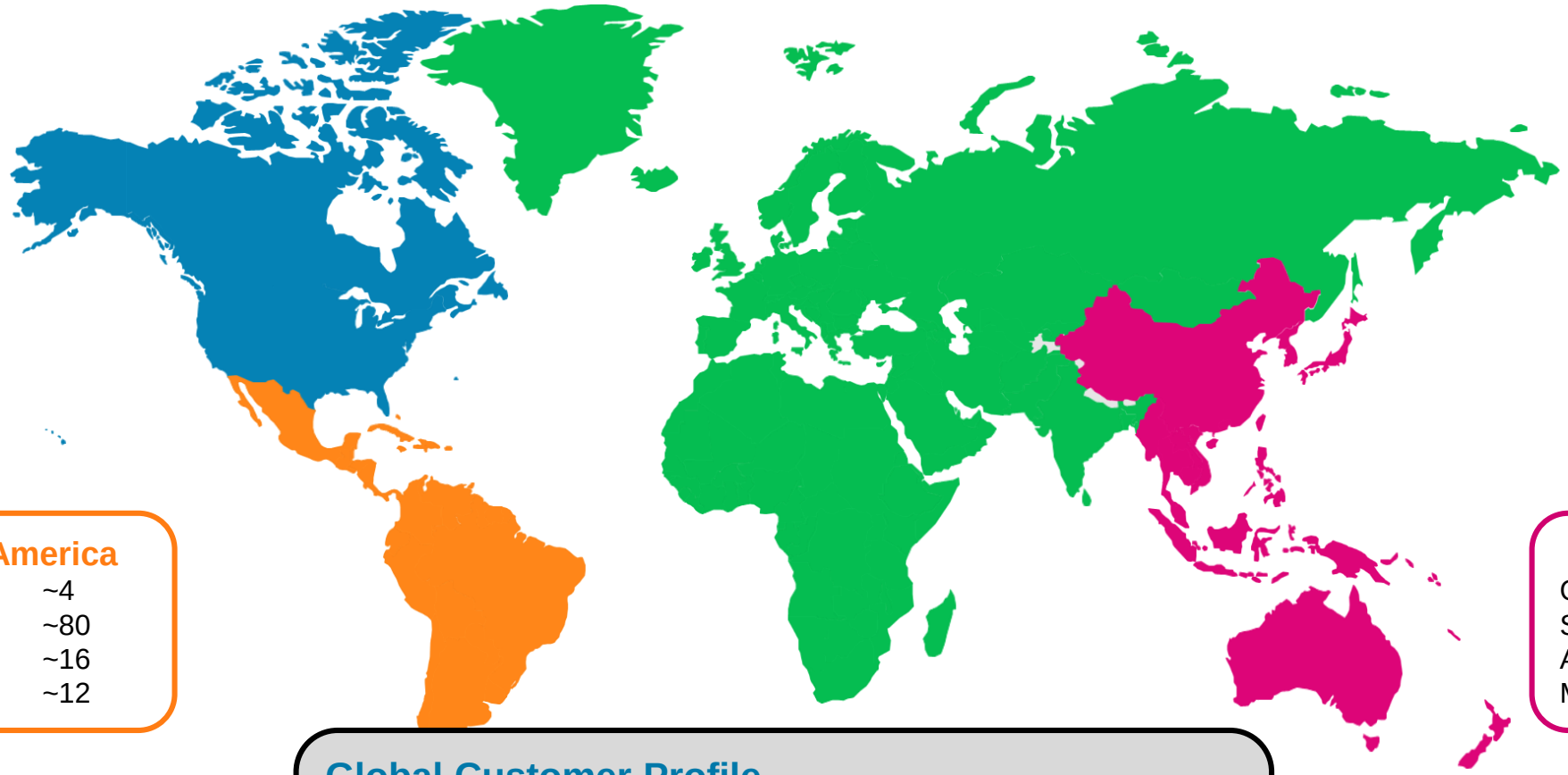
- Support SEA region growth
- Coatings and Sealants Packaging Center
- Chemical Management Services



Singapore

Providing services that add value close to the customer

Our aerospace customers



USCA

OEM	~28
Sub-Tiers	~360
Airlines	~52
MRO	~40

EMEA

OEM	~22
Sub-Tiers	~150
Airlines	~69
MRO	~50

Latin America

OEM	~4
Sub-Tiers	~80
Airlines	~16
MRO	~12

Asia Pacific

OEM	~10
Sub-Tiers	~70
Airlines	~71
MRO	~45

Global Customer Profile

OEM:	Airplane Manufacturers
Sub-Tiers:	Critical Structure, Systems, Subsystems, Materials
Airlines:	Passenger and Freight
MRO:	Maintenance, Repair, Overhaul

PPG's breadth of reach supports the entire global industry

Summary



- Nearly 100 years in aerospace
- Close alignment and long history with OEMs
- Technology leader with broad range of materials/products/qualifications
- Continuous investment in technology, innovation, and operations
- Technology incubated by cross pollination with other PPG businesses
- Global footprint to support growth in all regions
- High growth industry driven by continuous innovation and global demand for air travel

PPG well positioned for continued growth

2019 Investor Deep Dive

We protect and beautify the world™

BOMBARDIER



Image Courtesy of Bombardier

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