



Apex Tool Group - Aerospace

- Apex Tool Group Overview
- Why ATG?
- ATG Complete Solution Portfolio
- Appendices

A leading global manufacturer of professional hand and power tools, industrial assembly solutions and services

- Revenues of \$1.5 billion in 2012 with over 8,500 associates
- Manufacturing in 27 locations in the Americas, Europe, Asia, Australia

Diversified sales profile and strong relationships with global OEM's, industrial distributors, and retail customers

- Commercial operations in over 120 countries

Strong end-user focused product development culture delivering relevant innovation

- Over 200 engineering and R&D associates globally
- Design centers in Germany, France, US, and China

Globally managed with the Apex Business System (ABS)

- Enables us to provide innovative solutions with outstanding operational excellence and consistent earnings growth

Owned by Bain Capital since February 2013

Our Vision

The focused leader in Assembly and Repair Tools delivering smart productivity and smarter results.

Our Mission

To be the first choice for industrial and professional customers by delivering outstanding innovation, productivity solutions and exceptional service around the globe

Our Values





Industry Focused Solutions

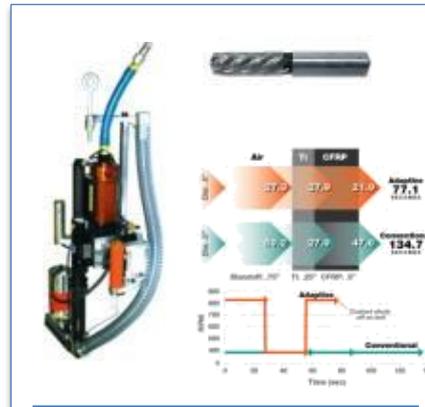
Motor Vehicle

Aerospace

General Industry

Electronics

Products



Customers



Power Tools
(~\$325 Million)

Electronic Tools
(~\$125 Million)



60+ Years in Aerospace

For decades, Aerospace production facilities all over the world have depended on Recoules, Quackenbush, Cleco, Dotco, and Apex products to deliver powerful, reliable, safe, efficient, and user-friendly performance. These products have been designed to bring exceptional value with durability, ergonomics, ease of integration and increased aero build rates in mind.



Advanced drilling equipment, Cutters, and Microstop cages



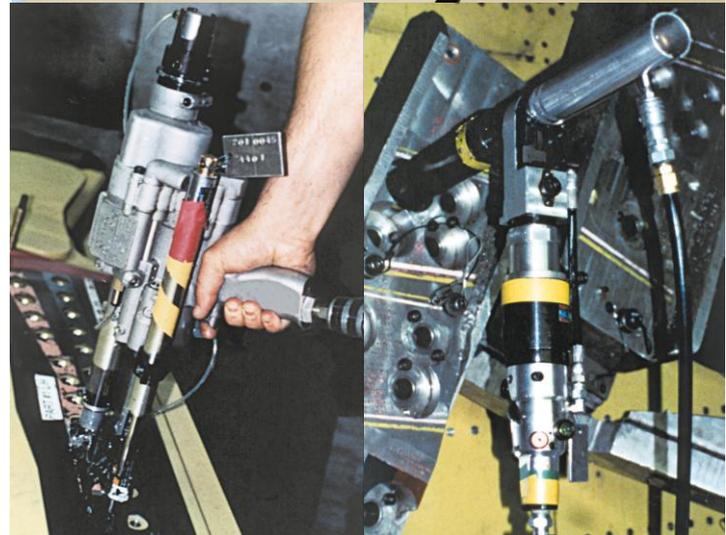
Pneumatic and Electric Fastening Tools and Systems



Tough, long lasting bits and sockets



Precision Material Removal air tools



Creating Durable Products For Years That Last For Years.



60+ Years of Aerospace

1947 Quackenbush Established

Quackenbush

1949 The first flight of the prototype DeHavilland Comet, the first commercial jet aircraft.



1950 Dotco Established

DOTCO

1957 Boeing 707-120



1963 Boeing 727-100

1967 Boeing 737-100



First human lunar landing. "one small step for man - one giant leap for mankind."

1969 Embraer Empresa Brasileira de Aeronautica SA, Embraer Formed



1969 Boeing 747-100



1970 Airbus Industrie GIE formed



1970 Recoules Established

AIRBUS
Recoules

1972 Airbus A330 First Flight
STS-6, the first flight of the Space Shuttle Challenger.



1987 Airbus A320 First Flight



1989 The first flight of the B-2 "Spirit" bomber,

1989

Embraer Began developing the EMB 145 (currently named ERJ 145), 50-passenger aircraft



1989

Short Brothers is acquired by Bombardier
Bombardier First flight of CRJ, a stretch of its Challenger executive jet.

BOMBARDIER
the evolution of mobility

1991

Airbus A330/340 LR First Flight



1992

Bombardier CRJ200 enters service



1994

Boeing 777-200



1994

Airbus A300-600 Super Transporter First Flight

1997

Airbus A330-200 makes its first flight.

2003

Bombardier Maiden flight of Global 5000



2005

Airbus A380 First Flight

2006

Lockheed Maiden flight of the F-35 Joint Strike Fighter



2009

Boeing The Boeing 787 Dreamliner makes its first flight.



2010

Apex Tool Group Established



2013

Airbus A350 Completes Maiden Flight.

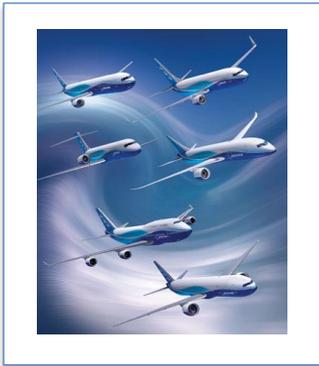


2013

Bombardier Maiden flight of CSeries commercial aircraft



Aircraft



Commercial



Regional



Business



Military



Rotocraft

Space



Defense





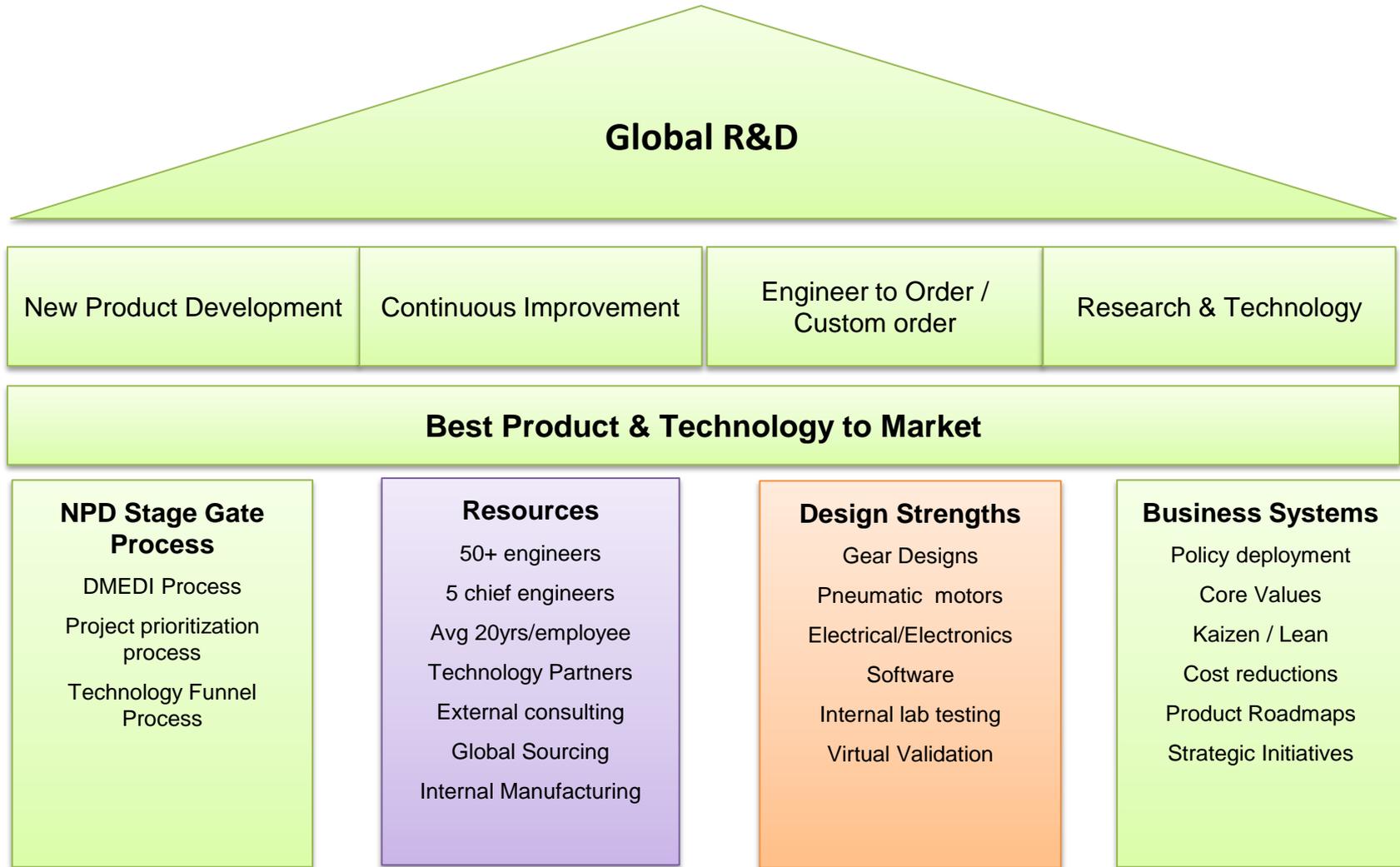
Aerospace Customers



Global Provider For Global Customers



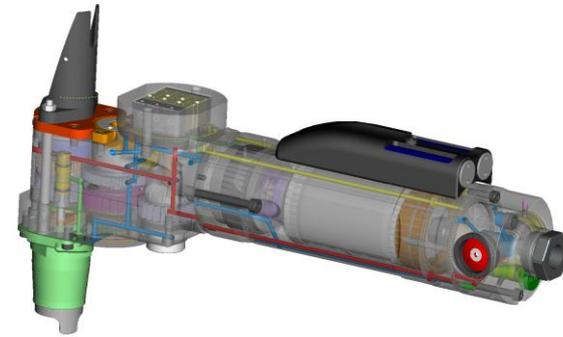
Global R&D Foundation





Product Differentiation

- Technology
 - Create / Embed latest technology
- Performance & Capability
 - Optimized designs
 - Breadth of product offerings
- Ergonomics
 - Best power density
 - Operator comfort
- Quality & Serviceability
 - Modularity
 - High durability
- Total Customer Value
 - Total cost of ownership





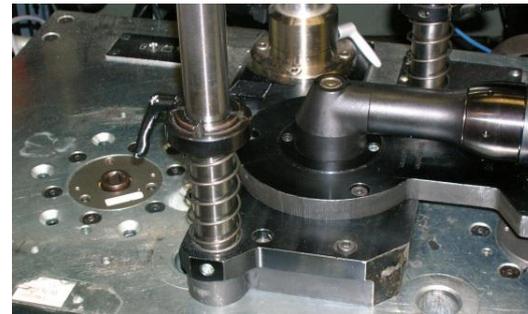
Testing & Validation

- Accelerated testing (HALT/HASS)
 - Faster response to quality issues
 - Reduced time in development
 - Competitor Testing

- Full Tool Testing
 - Run to failure

- Field Testing
 - Pilot testing

- Certifications
 - Customer / CE etc.





Broad Operations Footprint



Global Design And Operating Locations Able To Serve Customers Regionally



Why ATG?



ATG Aerospace Solutions

■ Complete Solution Portfolio

- ADE and Cutters with Tightening and Material Removal solution portfolio
- Turn Key Solutions provider, application expertise, solution development, project management
- Global service network, after-sales service, maintenance and reconditioning capabilities

■ Solutions that reduce Total Cost of Ownership

- **Productivity** e.g. Cycle time, process time, repair time, set up time, calibration time,
- **Durability** e.g. Saving on repair parts (less parts, less costly parts), more years of use
- **Ergonomics** e.g. More up time, less worker fatigue
- **Quality** e.g. Less defects
- **Acquisition Cost** e.g. Livewire system architecture of multiple tools per controller

■ History and Experience

- ADE proven and qualified on multiple major programs
- Enables implementation of known solutions in less time
- Technical experts with industry process knowledge to get “right first time” solution
- Tightening Solutions proven in MVI can be applied to Aerospace





Aerospace Complete Solution Portfolio



Aerospace Solution Portfolio

Products

Brands

Advanced Drilling

- Positive Feed



- Self Colleting



- Specialty



Specialty Cutters

- Drilling
- Countersinking (Manual)
- Drill and Countersink
- Reamers
- Back Spot Face



Tightening

- DC Electric Fastening
- Pneumatic Fastening
- Riveting
- Bits & Sockets



Material Removal

- Hand Drills & Microstop Cages
- Rivet Shavers
- Grinders
- Sanders



Universal Joints

- Universal Joints



Custom Solution/Service



Largest Portfolio In The Industry



Advanced Drilling and Cutter Solutions

Products

Specialty



CD Drill



Nut Plate Drill



Back Spotfacer



Compact Power Feed

Self Collecting



Template Foot



Concentric Collet



Twist Lock



C Foot

Cutters



Positive Feed

Right Angle



Inline



New Technology



A1



Fragmented Chips

Chip Fragmentation – Mitis™



Adaptive 2 Speed

Complete Solutions For Hole Production

Tightening Solutions

Pneumatic

Corded Electric

Wireless

Automation

Specialty Heads

Stall and shut Off

Current control

Torque control

Livewire

I Wrench

Tool presence

Fixtured multiple

Automated systems

Pulse tools



Frangible Fasteners/Eddie Bolts

Non Frangible Fasteners





Material Removal Solutions

Drilling and Countersinking



Deburring/Grinding



Sanding/Surface Preparation



Products

Applications



Durable Proven Products



Turn Key Solutions Provider

Equipment



Custom Drill and Countersink solution that took a 3 step process down to one step with vacuum, error proofing and enhanced ergonomics



Custom 10 Spindle wheel multiple solution with advanced tightening strategies, error proofing and data collection for optimum quality



Multi Spindle Robot end effector solution with advanced tightening strategies, error proofing and data collection, reconfigurable for optimum productivity

Support

- Application and proposal support
- Project management and process



- Mechanical & controls engineering
- Installation support
- Field service support
- Training

Solutions

- Lower Cost of Ownership
 - Productivity
 - Durability
 - Ergonomics
 - Quality
- Process Improvements
- Error Proofing
- Data Management
- Advanced Tightening Strategies



Global Service Network



IN-HOUSE REPAIR NETWORK



USA:

Norwalk, California
 Redmond, Washington
 Houston, Texas
 Auburn Hills, Michigan
 York, Pennsylvania
 Lexington, South Carolina

CANADA:

Mississauga, Ontario

MEXICO:

Queretaro, Mexico

BRAZIL:

Sorocaba, Brazil

CHINA:

Shanghai, China

INDIA:

Pune, India

ENGLAND:

Staffordshire, UK

FRANCE:

Ozoir, France

GERMANY:

Westhausen, Germany

HUNGARY:

Győr, Hungary



With a full range of tools for every production and maintenance operation, we are your ultimate productivity solutions partner. Our global service network can provide the level of professional repair and maintenance required to keep you up and running. No matter what your current tool repair capabilities are, we can maintain and manage your entire fleet of tools, even those built by other brands. You can rely on our in-house service centers and global distributor-based service network to deliver world-class support.



Appendix 1

- ADE and Cutters Product



ADE Positive Feed – Portfolio

Positive Feed Portfolio

Base Tools



Attachments



Accessories



Features/Benefits

- Full range of positive feed up to 1” in Ti 1 3/8” in Al
- Inline and right angle to suit application
- Wide range of speeds and feeds
- Variable speed options on some models
- Up to 2.3hp/1600lbs of thrust
- Extensive range of attachments
- Accessories to suit your needs
 - MQL lubricators
 - Counter for cutter and service life
 - External Mitis™ compatible
- Adaptive option
- Custom design engineering to specific needs



ADE Positive Feed – 15QRHD

Head Duty 15QRHD Gear Head

Base Tools



Attachments



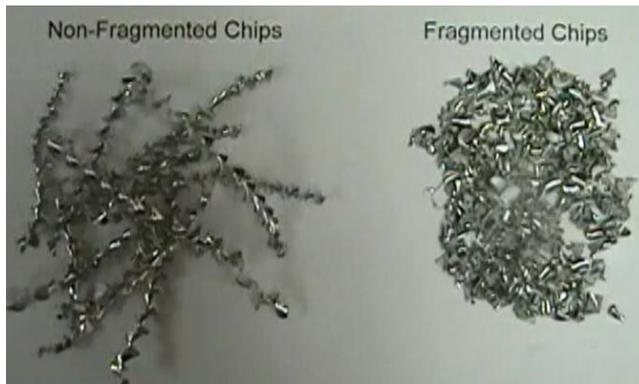
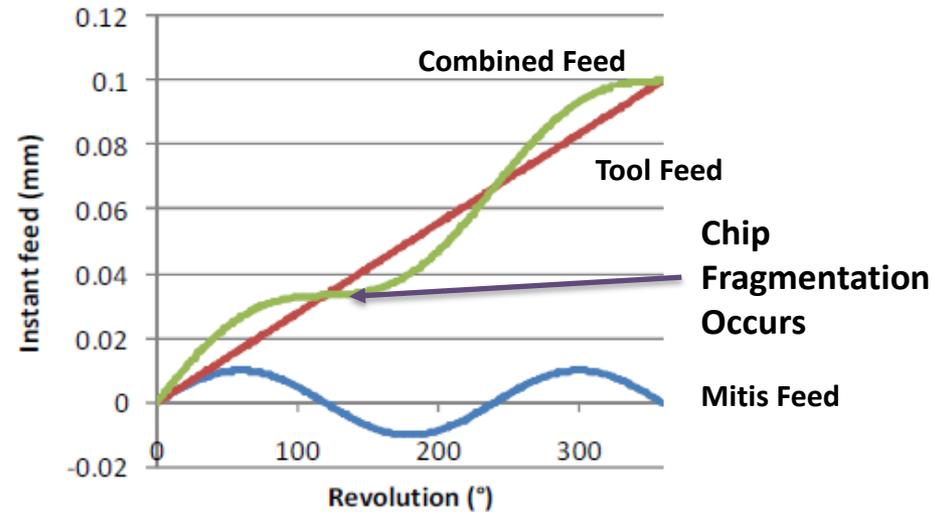
Accessories



Features/Benefits

- New design heavy duty gear head
 - Increased torque capability x 2
 - Improved durability
 - Greater hole capacity
- Interchangeable with existing 15 head
 - Less investment to upgrade existing tools
- 1.6hp with extended speed range
 - Greater range of applications possible
- Extensive range of attachments and accessories
- External Mitis™ compatible
- Adaptive Option

Mitis – External or Internal Feed Oscillation



Features/Benefits

- Greatly improves vacuuming of chips
 - Less FOD
 - Less clean up time
 - More efficient cutting
- Reduces risk of marking surfaces due to long chips
- Less torque spikes due to chip packing
- Predictable cutter life from consistent process
- Potential to extend cutter life
- Reduces heat build up in the cutter
- Minimizes need for lubrication
- External can be added to any positive feed
- Internal available on 9X2



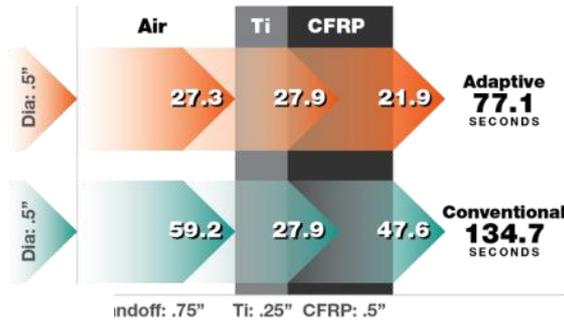
ADE Positive Feed – Pneumatic Adaptive

Positive Feed Adaptive

Programmable 2 Speed Drilling System

Ideal for

- CFRP/Ti
- Ti/CFRP
- Ti/CFRP/Ti
- Al/CFRP/Ti
- Ti/Al



DMP
(Drill Manager Pneumatic)



Adaptive
Drill

Increased Productivity and more...

Features/Benefits

- Automatic high speed/low speed in material
- Reduced cycle time
- More holes per cutter
- Stops system after preset cutter count
 - Virtually eliminates use of a worn cutter
- Check tool performance on start up
 - Reduces chance of using a worn tool
- Optimizes Coolant Usage
 - Programmable for material
 - Shut of on exit
- Stores cycle and maintenance life on the tool
- On board air tool lubrication
 - Optimal tool performance
- Can be retrofitted to existing tools



ADE Specialty – 10QNPD

10QNPD Nut Plate Drill



- Capacity .1285" Drill/ .250" Countersink*
- .6"/15mm Feed Stroke, 7/16"/11mm Clamp Stroke
- Power 0.7hp/0.5kW
- Weight 5lbs/2.3Kg*
- RPM 600/6000
- Minimum Countersink Depth Accuracy of +/- .001"
- Countersink Depth adjustable in .001" increments
- Variable spacing available from .3"/7.6mm to 1.0"/25.4mm
- M Mini Spindle Option for closer centers (0.219/5.6mm)" min)
- Pressure foot options to suit Nut plate Centers

Features/Benefits

- Higher power - drill/countersink Faster
- More durable - less maintenance
- Flexible (re)configurations – Multiple applications possible with single base tool
- Electronic counter
 - For cutter life – reduces chance of using worn cutter/bad hole
 - Allows implementation of preventive maintenance – reduces chance of tool failure, less down time, less overall repair costs



Appendix 2

- Tightening Product Presentations



Tightening - 19 Series

19 Series Screwdrivers and Nutrunners



Features/Benefits

- World-class ergonomics and comfort
- Industry-leading accuracy and precision
- 5-year clutch warranty
- Designed and tested to over 1 million cycles
- Available in over 100 variations, including custom-built configurations
- Perfect for all fastening applications, from mass production to quality-critical assembly



Tightening - Global Controller

mPRO400 Global Controller

Livewire™



Corded 18/48/67



I Wrench



Multiples



Intelligent Spindle



Features/Benefits

- Common to all ATG electric tools
- Flexible product configurations
 - Corded and cordless
 - Fixtured and hand held
- Modular system builds
 - Up to 32 tools
- Key communication protocols
- Data management options
- Full serviceability
- Global product support
- Universal connectivity for ultimate flexibility
- Auto sensing voltage

A Global Solution



Tightening - Livewire™

Livewire™

mPRO400
Global Controller



Livewire™



Features/Benefits

- Leader in wireless
- Serviceable angle heads
- Engineered solutions
- Proven equipment
- Lower cost of ownership
- Multiple wireless options
- 16 Tools, 1 Controller – servo & controller on-board Tool
- Eliminate cables and cable management
- Increase operator efficiency and productivity
- Reduce in-system damage costs
- Multiple power supply options
 - Lithium-ion battery packs (26v or 44v)
 - Tethered Power Module (48v)
 - Auto Sensing

Manage Up to 16 Cordless Tools with 1 Controller

Electric Corded 18/48

mPRO400
Global Controller



Features/Benefits

- Over 50 years of experience
- One controller for all tools
- Serviceable angle heads
- Serviceable motors
- Proven equipment
- Lower cost of ownership
- Inline, pistol, and angle offering
- 2 – 230 Nm torque range
- Brushless motor technology
- Resolver speed / angle control
- Reaction transducer
- Ergonomic comfort handles
- High visibility status LED's



Tightening - I Wrench





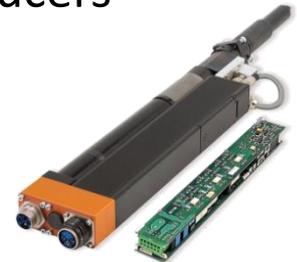
Tightening - Intelligent Spindle

- Torque Range : 2 – 2800 NM
 - Compact on-board intelligence
 - Modular Construction – Ultimate Versatility



- High Productivity
 - World class durability (MTBF 3 Mil cycles @80%)
 - World class accuracy (Cmk >1.67 @ +/- 5%)
 - Dual torque transducers
 - Angle Encoder
 - Resolver

- Over 25,000 nutrunners installed
- European Homologation Compliance
- Complete product portfolio
- Proven lower cost of ownership





Appendix 3

- Material Removal Product



Material Removal - Hand Drills

Pistol Grip



- Most common style of air drill
- Use when drilling axis is horizontal or the work piece is below the operator
- Chuck sizes usually vary between 1/4" to 1/2" (6.4 to 12mm)
- Options include governor, reverse switch, auxiliary handle, etc.

Angle



- Uses short drill bits to access tight or cramped spaces
- Popular in aerospace and confined area drilling
- Comes in a variety of configurations to optimize accessibility



Inline



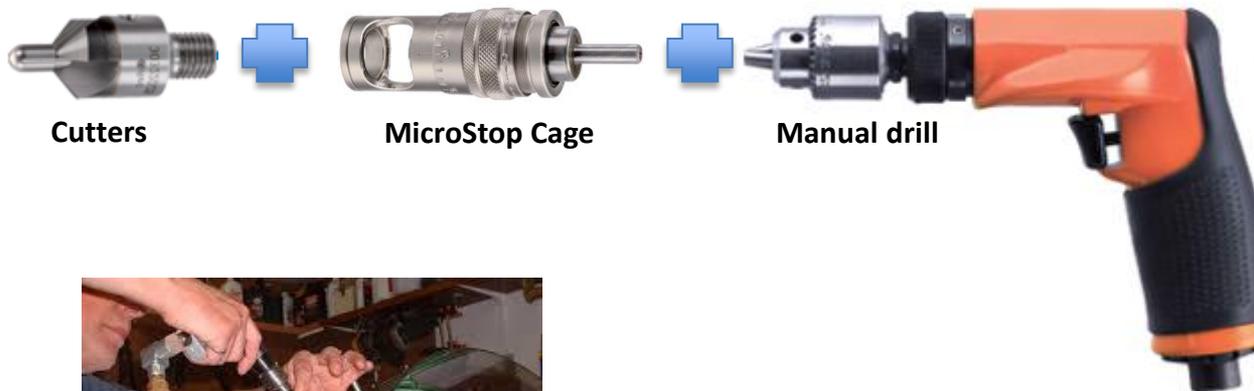
- Drilling vertical holes along the sight line of the operator
- Can be great for drilling in cramped and awkward spaces where the inline configuration is required
- Least popular version of handheld drills



Material Removal - Microstop Cages & Cutters

Manual Drill and Countersinking

Features/Benefits



- **Quality**
 - Centering cone of the cutter for perfect concentricity
 - Ball pivoting spindle to ensure alignment
- **Durability**
 - Microstop depth secured by steel locknut
 - Hardened and ground chrome-nickel steel spindle
- **Accuracy**
 - Micro depth adjustment
 - Multiple base options to ensure maximum stability when drilling/countersinking
- **Productivity**
 - Optional integral vacuum for chip extraction reducing clean up



Material Removal - Die Grinders

High Speed Turbine



- Characterized by high-speed turbine motor
- Typically 0.04-0.08 Kw
- Some are governed
- Mostly front exhaust
- Do not lubricate!
- 1/8" Collet or 3mm Collet

Pencil



- Rotary vane motor
- Mostly non-governed
- Front and rear exhaust
- 1/8" collet

Angle



- Rotary vane motor
- 0.15-0.75 Kw
- 1/4" collet
- Geared angle head and non-geared available
- Many combinations of speeds, governing options, speed regulation, and housing material

Inline



- All rotary vane motor driven
- Typically range from 0.15 – 0.75 Kw
- 1/4" Collet
- Numerous variations and combinations of lengths, speeds, governing options, speed regulation, and housing material





Material Removal - Sanders, Buffers, Polishers

Angle/Vertical Sanders



- Uses sanding discs (PSA, Hook and Loop, etc.), flap wheels, polishing pad or bonnet
- Used with backing pad and/or intermediate soft/medium pad
- Can be angle, handle, or pistol grip

Inline / Straight Sander



- Uses the edge rather than the face of the flap or bristle wheel
- Consumables are abrasives on an attachment shank

Belt Sanders



- Uses belt-shaped abrasives which comes in a variety of lengths and widths to suit the application
- Ideal for deburring and finishing in tight areas or where sanding has to conform to a contour

Orbital & Random Orbital Sanders



- Typically use sanding discs or sand paper (PSA or Hook and Loop),
- Popular orbit patterns are 3/16" or 3/32" (2 or 4 mm)
- May feature central vacuum
- One or two-handed grip



Proven Durable Tools