

CYCLONE MANUFACTURING INC.

Growth, Our Endless Goal.

MACHINING - 3,4,5 AXIS

HEAT TREATMENT

SHOT PEENING

CMM INSPECTION

SURFACE TREATMENT TECHNOLOGY

ASSEMBLY

TUBE BENDING

SHEET METAL FABRICATION



CONNECTING THE WORLD
VERTICALLY INTEGRATED
FULL SERVICE PROVIDER

Cyclone Manufacturing Inc. began in 1964 as a company to fill a void in cylindrical grinding for larger machine shops in the Toronto area. With expansion of operations to become one of Canada's first to manufacture and grind a new technology of indexable cutters. Continuing expansions during the 1970's, Cyclone diversified into providing manufacturing support for various aerospace companies. Purchasing its first CNC in the early 1980's to support its aerospace business Cyclone began shifting

treatment and surface treatment, Cyclone purchased two additional facilities, sized at 44,000 and 90,000 sq feet.

During the past five years Cyclone invested into new state of the art surface treatment facility coupled with the addition of a new sheet metal facility. In total Cyclone facilities combine for a total of 220,000 sq. ft.



Main Door Fitting
3.5" x 6.25" x 30"

CYCLONE HISTORY

its focus to the aerospace industry. Expansion continued with a larger facility, going from 24,000 sq feet to 80,000 sq feet for additional 4 and 5-axis capability.

With assembly capabilities Cyclone Manufacturing had continual growth in the aerospace industry. Continuing to grow both in its core manufacturing capabilities and into new areas of sheet metal fabrication, tube bending, heat



Rib
3.75" x 26.1" x 44.5"



PLANT ONE CAPABILITIES

HEADQUARTERS & MAIN MANUFACTURING FACILITY

Cyclone Manufacturing Inc. is a vertically integrated full service provider working in the commercial aerospace, military and nuclear industries. Cyclone produces small, medium and large machined structural components, sheet metal fabrication, tube bending, advance surface treatment and assembly.



WATER-JET TECHNOLOGY

REDUCING COST THROUGH MATERIAL CONTROL

Water-jet cutting used effectively will reduce material waste while reducing machining times, saving cost and expenses while expanding flexibility for machining and first stage of production.



Water-jet – two techjets

- Working surface
 - 120" x 192"
 - 84" x 156"
- 7" Cutting capability
- Improved material yield

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MACHINING CAPABILITIES

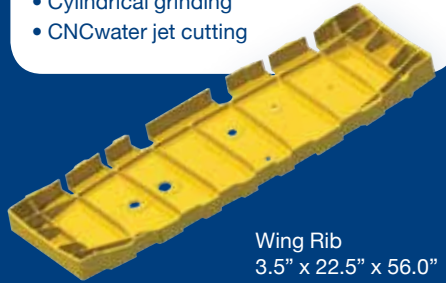
MULTI-AXIS CAPABILITIES, RANGE OF SIZE CAPABILITIES

Wide range of 3, 4 and 5 axis machining gives redundancy of capability and tailoring of machining ability to part complexity. Reducing number of operations through multi-axis machining reduces time and cost of manufacturing. Shorter set-up times keeps machining centers productive and cost effective.

Range of size for machining centers increases capability through management of part workload. Machining centers are utilized by having correctly sized machinery working on proper range of parts.

MACHINING CAPABILITIES:

- Three-axis CNC, up to 122" x 46" x 30"
- Four-axis CNC, up to 120" x 25" x 25"
- Five-axis CNC up to 480" x 84" x 24"
- CNC lathe
- Conventional milling
- Conventional lathe
- Cylindrical grinding
- CNC water jet cutting



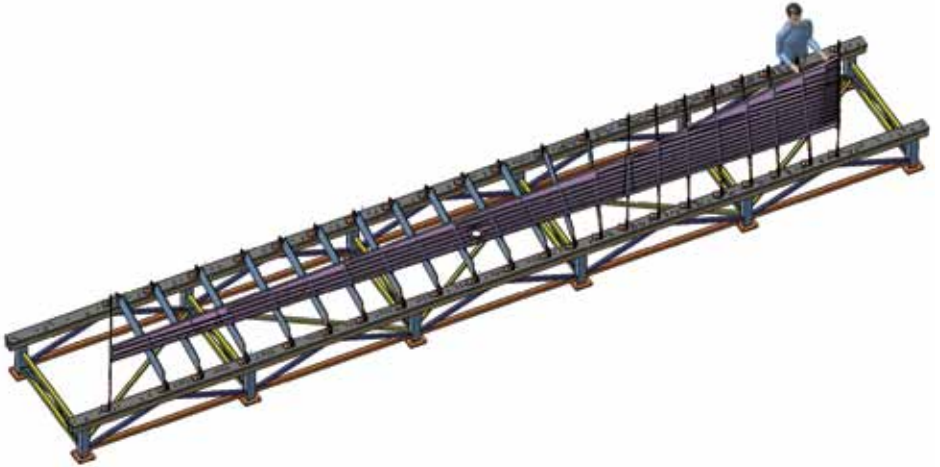
Wing Rib
3.5" x 22.5" x 56.0"



ENGINEERING

EXPERIENCED ENGINEERING PLANNERS, PROGRAMMERS AND TOOL DESIGNERS DRIVE THE COMPANY FORWARD

Based on the client supplied specifications and engineering drawings, Cyclone Manufacturing prepares manufacturing process plans, tooling designs and creates complex CNC programs all in-house. Cyclone currently has over 35 engineers on staff supporting all requirements of the engineering department.”



CMM INSPECTION

INSPECTION DRIVES QUALITY AND PERFORMANCE

Cyclone’s internal quality department insures that manufactured components meet customer specifications. CMM reports confirm precision and quality of components that customers have come to expect from Cyclone Manufacturing.



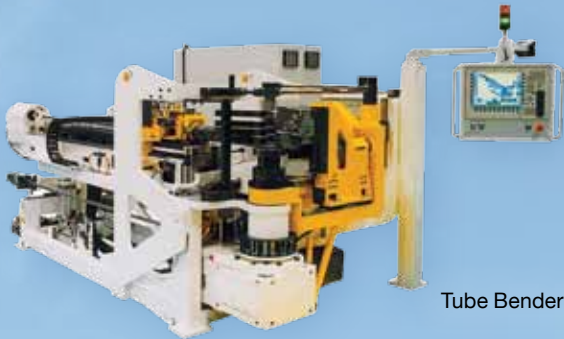
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PLANT TWO CAPABILITIES

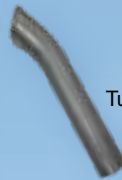
EXPANDING CAPABILITIES TO SHRINK COSTS

Cyclone has expanded to accommodate increasing processes done internally while still maintaining the level of machining and traditional capabilities needed by our customers.

With the addition of Cyclone's second facility, Cyclone has expanded its capabilities for sheet metal fabrication, tube bending and heat treatment.



Tube Bender



Tube Bending

TUBE BENDING CAPABILITY

Cyclone's tube bending capability provides our customer greater flexibility in outsourcing work package kits to one supplier that require machined components.

- 2.75" diameter capability
- Multi-axis
- End Former
- Edge Finisher



Inlet Fuel Filter



SHEET METAL FABRICATION

FORMING COMPLETES THE ASSEMBLY

Cyclone's sheet metal fabrication facilities give access to cutting, deburring, and forming of sheet metal components needed for further Cyclone assemblies or to be delivered separately.



C.N.C ROUTER

- 144" x 48"
- VACUUM BED
- CUTS UP TO 1" THICK MATERIAL



C.N.C BREAK PRESS

- 130" MAX LENGTH
- AXIS DEPTH 20"
- 125 TON
- 4 AXIS



RUBBER PRESS OPERATION

- WORKING ZONE 24" x 48"
- TOOL HEIGHT 3.5"
- 2000 TON



AUTOMATED DEBURRING

- 48" x INFINITE
- ALUMINUM OXIDE BRUSHES
- VACUUM BELT

HEAT TREATMENT

IMPROVEMENT THROUGH HEAT

Cyclone heat treatment facilities are designed nadcap specification, allows Cyclone to heat treat and age aluminium components both rough and finished machined. Automated for increased efficiency and quality control Cyclone's heat treatment gives process improvement without unnecessary long lead times.



PYRADIA DROP BOTTOM FURNACE

- Designed and Built NADCAP Specification
- 6 Seconds Quench Time
- 4ft x 4 ft x 6ft Capacity
- Maximum Temperature 1200 Degrees F
- Temperature Uniformity +/- 5 Degrees F

ARTIFICIAL AGING HEAT TREATMENT

- Working zone: 64"x40"x64"
- Temperature range room – 500°f
- Type j thermocouples
- Electronic data logger
- Networked
- Nadcap approved
- Lockheed Martin approved
- I.A.I. Approved
- Bombardier approved



PLANT THREE CAPABILITIES

GROWING CAPABILITIES FOR GROWING DEMAND

Cyclone's third facility was acquired to meet customer demand for machined components. Increasing machining capability and adding surface treatment technology to give customers a complete manufacturing package.



SHOT PEEN FACILITY

STRENGTH THROUGH STRESS

Cyclone performs saturation shot peening, shot peen straightening and shot peen forming. Cyclone's shot peening facility holds NADCAP and OEM customer approvals.



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SURFACE TREATMENT FACILITY

PROCESS STEPS WITHOUT THE TRAVEL

Automated and state of the art facilities for multiple surface treatment processes reduce cost and lead times while maintaining quality. Cyclone's processing facility is able to perform Boric Acid Anodizing (BCA), Chromic Acid Anodizing (CAA) and Tartaric-Sulphuric Acid Anodizing (TSA) with NADCAP and OEM processing approvals.



OEM APPROVALS

LOCKHEED MARTIN 

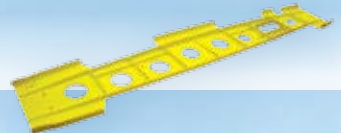
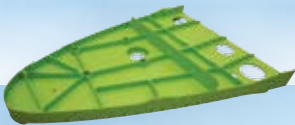
 **BOEING**[®]

BOMBARDIER

 **IAI**

 **AIRBUS**

 **EMBRAER**



ASSEMBLY CAPABILITY

SIMPLE PARTS TURN INTO COMPLEX ASSEMBLIES

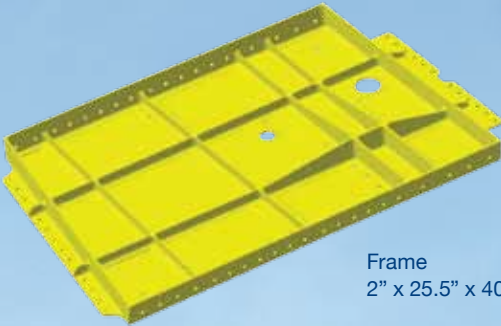
Cyclones capabilities for assemblies range from bushing installation to riveting of components with the associated alodine and paint touch-up facilities available for small rework areas caused by the assembly process.



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Rib Hinge
3.4" x 27.5" x 41"

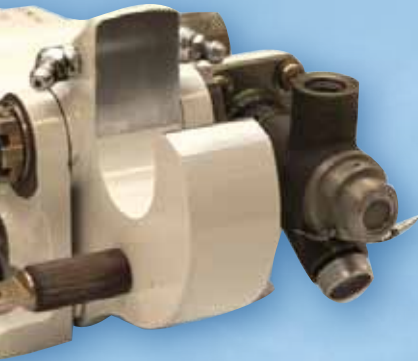


Frame
2" x 25.5" x 40.0"





Wing Skin
2.5" x 47" x 334"



Main Landing Gear
Up Lock Assembly



Small Wing Skin
2.0" x 33" x 119"



Wing Spar
2.3" x 20" x 367"

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QUALITY MANAGEMENT SYSTEM



ISO 9001:2000 & AS9100-B
Certification



Side Support Fitting
6.86" x 16.34" x 28.93"





NADCAP Approvals



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CONTROLLED PROCESS & SURFACE TREATMENT APPROVALS

		Bombardier	Bombardier - De Havilland	Bombardier - Short Brothers
Heat Treatment	Heat Treatment / Aging / Stress Relief	BAPS 168-007 BAPS 168-015 BAPS 168-030	PPS 30.04 PPS 30.06	P.SPEC. 401 P.SPEC. 434 P.SPEC. 440
Non-Destructive Testing	Penetrant Inspection	BAPS 176-002	PPS 20.03	P.SPEC. 300
Shot Peen	Shot Peen / Shot Peen Forming	BAPS 185-002 BAPS 185-003	PPS 17.03 PPS 17.04	P.SPEC. 703 P.SPEC. 708
Chemical Processing	Boric Sulphuric Acid Anodizing			
	Chromic Acid Anodizing	BAPS 160-010	PPS 32.03	P.SPEC. 410
	Tartaric Sulphuric Acid Anodizing			
	Chem Film / Conversion Coating	BAPS 160-020 BAPS 160-040	PPS 32.01 PPS 32.02 PPS 32.35	P.SPEC. 419
Paint	Primer / Fuel Tank Coating / Topcoat	BAPS 138-043 BAPS 138-044 BAPS 138-046 BAPS 138-055 BAPS 157-026	PPS 21.03 PPS 32.09 PPS 34.03 PPS 34.08 PPS 34.16	P.SPEC. 910
Miscellaneous	Machining/ Fabrication	BAPS 188-002 MPS 250-051 MPS 250-072	PPS 01.02	
	Inspection	BAPS 168-013 MPS 250-303	PPS 20.07 PPS 20.08	
	Assembly	BAPS 151-001 BAPS 157-028 BAPS 157-030 BAPS 175-004 BAPS 175-005	PPS 12.04 PPS 21.20 PPS 21.21	
	Chemical Cleaning	BAPS 180-001 BAPS 180-029 BAPS 180-030 BAPS 180-032	PPS 31.02	
	Laboratory	BAERD-GEN-018		

Airbus	Boeing	Embraer	Israel Aerospace Industries (IAI)	Lockheed Martin	Messier-Dowty
	BAC 5602			STP 54-101 C-0521 AMS-2770	
AITM6-100 1	BAC 5423 BSS 7039	NE 07-001	PS 810100	MIL-STD-6866 ASTM-E-1417 STP 53-201 C-0567	
AIPI 03-10-001	BAC 5730	NE 03-076 NE 40-072 NE 40-100	PS 220100	AMS 2430 MIL-S-13165 STP51-501 C-1476	PCS-2300
	BAC 5632				
ABP 1-1023	BAC 5019	NE 40-030	PS 231120	MIL-A-8625 Ty 1,1B STP 58-209	
AIPI 02-01-003					
AIPI 02-05-001	BAC 5719	NE 40-006	PS 233200	AMS-C-5541 Ty 1,3 MIL-DTL-5541 STP 58-405 CI 1 Ty 1,2 STP 58-405 CI 1 C-0498	
AIPI 05-02-009	BAC 5710 BAC 5736 BAC 5845 BAC 5882	NE 40-135 NE 40-143 NE 40-159 NE 40-160	PS 243500 PS 243701 PS 243900 PS 243520 PS 249150	MIL-F-18264 MIL-C-27725 AMS-C-27725 STP 59-505 G639	
AIPI 01-02-003 AIPI 03-11-001 AIPI 03-11-003					
	BAC 5946			LMA-PC009 C-0566	
AIPI 09-01-002 AIPI 09-01-003		NE 40-012	PS 211600	STP57-301 C-0170	
	ASTM-B-117			ASTM-B-117	



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CYCLONE'S MANUFACTURING CAPABILITIES

COMPLEX MACHINING

- CNC 3 AXIS – 11 MACHINES
 - 5 – 040", 1 – 080", 5 – 120"
 - 4 – OKK, 3 – MAZAK, 2 – TAKUMI, 1 – MATSUURA, 1 – AWEA
- CNC 4 AXIS – 21 MACHINES
 - 8 – 040", 10 – 060", 3 – 120"
 - 13 – OKK, 4 – MAZAK, 3 – MORI-SEIKI, 1 – MAKINO
- CNC 5 AXIS - 24 MACHINES
 - 11 – 040", 3 – 080", 5 – 120", 1 – 160", 1 – 400", 1 – 480"
 - 17 – MAZAK/Variaxis, 5 – SNK, 1 – CINCINNATI, 1 – MAKINO"

TURNING – HORIZONTAL & VERTICAL

- CNC 2 axis
- CNC 3 axis (live tooling)
- CNC multi-axis (mill turn live tooling)
- CNC multi-spindle
- Screw machining
- Thread rolling
- Thread cutting
- Diamond turning
- Dynamic balancing

GRINDING

- Blanchard
- Centreless
- Cylindrical
- Internal
- Flat face
- Jig
- Honing
- Disc

DRILLING/TAPPING

- Gun drilling
- Jig boring
- Tapping

PART MARKING

- Engraving
- Etching
- Ink
- Barcode
- 3D marking

ASSEMBLY

- Sheet metal
- Aircraft structures

INSPECTION

- Visual inspection
- Electrical & hardness testing
- CMM inspection

TOOL MAKING

- Blanking tools
- Dies
- Jigs & fixtures
- Pattern & model making

FINISHING

- Deburring
- Degreasing & cleaning
- Peening, glass bead
- Peening, shot

SHEET METAL

- Blanking
- Cutting water
- Forming & shearing
- General sheet metal
- Hydroforming
- Jogging
- Presswork
- Tube Bending
- Tube End Forming & Finishing



Spar
2.5" x 21" x 388"



CYCLONE SENIOR MANAGEMENT TEAM

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