



## 2023 PRODUCTION PROCESSES

BLUE ENGINEERING	SRS	SPI	MASSUCCO INDUSTRIE	COMUTENSILI	LMB	MEPIT	SMF	TTN	LICAT	ROSFER	AERONDI	FLEXIDER	LABORMET DUE	TEMI	OUTSOURCING
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MACHINING	ROUGH MACHINING				A	A	A	A							
	FINISH MACHINING				A	A	A	A							
	MILLING				A	A	A	A		A					A
	4-AXIS BORING				A	A	A	A							
	5-AXIS BORING						A								
	BROACHES PRODUCTION AND PERIODIC CONTROL				A										
	BROACHES DESIGN				A										
	DRILLING						A			A					
	DEEP DRILLING						A			A					
	STATOR-ROTOR BLADES DRILLING				A		A								
	STRAIGHT-TOOTH CUTTING									A					
	CUTTING TOOTH AFTER COPPER PLATING									A					
	VERTICAL MILLING					A	A								
	AUTOMATIC DEBURRING									A					
	MANUAL DEBURRING						A			A					
	TUMBLING DEBURRING									A					
	AUTOMATIC CHAMFERING						A			A					
	4-AXIS WORKING CENTER OPERATIONS				A	A	A	A							
	5-AXIS WORKING CENTER OPERATIONS						A	A							
	MACHINE AIRFOIL				A										
	TOOLING DESIGN	A		A			A	A		A					A
	SMALL ROTORS BALANCING							A							
	TOOLING MANUFACTURING (HWD)						A	A	A	A					A
	MARKING						A			A					
GRINDING	JIG GRINDING									A					
	HIGH-SPEED GRINDING				A	A									
	OUTER SPUR GEARS									A					
	INNER SPUR GEARS/SPLINES									A					
	INNER/OUTER DIAMETER GRINDING				A					A					
	FLAT GRINDING				A	A				A					
	HONING				A			A							
	PLANETARY GRINDING							A		A					
	TOOLING DESIGN				A			A		A					A
	STOCK REMOVAL						A								
SPECIAL PROCESSES	NITAL				A					A					
	SANDBLASTING				A			A	A						A
	WETBLASTING								A						
	GAS NITRIDING								A						
	ION NITRIDING								A						
	PHOSPHATING				A										
	SPOT WELDING							A							A
	OVEN BRAZING							A							
	TOOLING DESIGN				A			A							A
	TOOLING MANUFACTURING (HWD)							A		A					A

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<b>WELDING</b>	TOOLING DESIGN		A				A	A							A
	TIG							A							
	MIG							A							
	MICRO SPOT WELDING							A							
	INERTIA WELDING														A
	TOOLING MANUFACTURING (HWD)					A	A			A					
<b>LASER</b>	BLADE AND VANE ECM				A										
	TOOLING DESIGN				A					A					
	TOOLING MANUFACTURING (HWD)									A					
<b>HEAT TREATMENTS</b>	CARBURIZING			A					A						
	LOW-PRESSURE CARBURIZING								A						
	SOLUBILIZATION							A	A						
	AGEING/PRECIPIATION HARDENING							A	A						
	NORMALIZING			A				A	A						
	QUENCHING AND TEMPERING							A	A						
	ANNEALING			A				A	A						
	STRESS RELIEVING							A	A						
	CRYOGENIC TREATMENT			A					A						
	VACUUM BRAZING							A							
	BRAZING TOOLING DESIGN						A	A							
	BRAZING TOOLING MANUFACTURING (HWD)						A	A							
	QUENCHING AND STRESS RELIEVE			A				A	A						
	INDUCTION HARDENING								A						
	PRESS QUENCHING TOOLING DESIGN			A				A			A				
	PRESS QUENCHING MANUFACTURING FIXTURE (HWD)							A			A				
<b>EDM</b>	DIE-SINK				A	A		A							
	WIRE				A			A	A						
	TOOLING DESIGN			A				A	A		A				
	TOOLING MANUFACTURING (HWD)							A	A						
<b>MANUFACTURING ENGINEERING</b>	MANUFACTURING PROCESS SHEET			A				A							
	INSPECTION PROCESS SHEET			A				A							
	CNC PROGRAMMING			A				A							
	CMM PROGRAMMING			A				A							
	ASSEMBLY PROCESS SHEET			A				A							
	TOOL PATH SIMULATION			A				A							
	PART PROGRAM PRODUCTION VALIDATION			A				A							
	PART PROGRAM CMM VALIDATION			A				A							
	CAE SIMULATION		A					A							
<b>PAINTING</b>	SPRAY PAINT - ELECTROSTATIC PAINT														A
	TOOLING DESIGN	A		A				A							
	TOOLING MANUFACTURING (HWD)							A							
<b>INSPECTIONS</b>	AUTOMATIC CLEANING														A
	NITAL ETCHING				A					A					
	DIMENSIONAL /GEOMETRY CMM						A	A		A	A		A		
	DIMENSIONAL /GEOMETRY CHECKS									A			A		
	TOOLING AND SPECIAL GAUGES DESIGN			A				A	A		A			A	
	TOOLING AND SPECIAL GAUGES PRODUCTION							A	A		A			A	
	SURFACE ROUGHNESS							A	A		A			A	
	TECHNICAL VALIDATION AND Cp/Cpk INDICATORS							A	A						
	FIRST ARTICLE INSPECTION (AS 9102 FORM)							A	A		A				

FPI: FLUORESCENT PENETRANT INSPECTION

A

A

A

A

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<b>INSPECTIONS</b>	EDDY CURRENT										A				A	
	CT SCAN INSPECTION												A			
	ULTRASONIC CONTROL								A		A				A	
	RADIOGRAPHIC										A				A	
	TAPPING TEST										A				A	
	VISUAL INSPECTION					A	A				A				A	
	RESIDUAL MAGNETISM										A				A	
	DIMENSIONAL BENCH INSPECTION					A	A		A							
<b>FUNCTIONAL TESTS</b>	CONTACT PATTERN INSPECTION								A							
	AIR FLOW				A		A									
	PRESSURE/LEAKS					A	A									
	OIL PRESSURE					A										
	WASH AND FLOW CORE PASSAGES + LIGHT BOROSCOPE														A	
	MILLIPORE														A	
	FLOW RATE				A											
	HRC HARDNESS						A	A			A		A		A	
	HV HARDNESS								A		A		A		A	
	HB HARDNESS								A		A		A		A	
	TEST BENCH DESIGN	A		A			A			A						
	TEST BENCH MANUFACTURING (HWD)						A									
	TEST EQUIPMENT DESIGN	A		A			A			A						
	TEST EQUIPMENT MANUFACTURING (HWD)						A									
	<b>QUALITY SYSTEM</b>	NADCAP			A			A	A			A				A
AS/EN 9100				A	A		A	A	A		A		A		A	
AGUSTA WESTLAND								A		A					A	
AVIO AERO		A			A		A	A			A		A		A	
GE AVIATION		A			A		A	A								
LEONARDO		A					A		A		A		A		A	
PRATT & WHITNEY					A		A									
ROLLS-ROYCE plc					A											
GE ALSTOM						A										
HITACHI RAIL					A											
UTAS ITALY							A	A								
ANSALDO ENERGIA						A	A			A			A			
IATF 16949:2016															A	
ISO 14001:2015															A	
<b>COMPOSITES</b>		ISO 9001	A	A		A	A	A	A	A		A		A	A	A
		AUTOMATIC SURFACES CUT														A
	CARBON FIBRE LAMINATION IN CLEAN ROOM														A	
	AUTOCLAVE POLYMERIZATION														A	
	THERMOPOLYMERIZATION														A	
<b>HOT FORGING</b>	BONDING														A	
	HOT FORGING				A											
<b>COLD FORMING</b>	HOT ROLLING				A											
	SHEARING							A								
	MANUFACTURING FIXTURE TOOLS AND DEVICE							A								
	BENDING							A								
	DIE DESING							A						A		
	DIE MANUFACTURING (HWD)							A								

KEY	
Third-party Approval Bodies	A
Customer Approvals	A
Active Processes	A
Outsourcing Processes	A