FluxGen Industries Ltd.
Forging Tomorrow's Welds
Airdrie, Alberta, Canada
http://www.fluxgenindustries.ca

Facility Site Requirements & Specifications

Site Requirements Executive Summary

FluxGen Industries requires a strategic industrial location in the Airdrie region to establish its SAW flux manufacturing facility. The site must accommodate current production requirements while providing expansion capability for future growth.

Key Site Requirements:

• Land Area: 10-15 acres with expansion potential
• Zoning: Heavy industrial with chemical processing permits
• Utilities: High-capacity electrical, natural gas, water, and wastewater
• Transportation: Highway access with rail connectivity preferred
• Environmental: Compliance with air quality and waste management regulations

Strategic Location Factors:

• Proximity to major transportation corridors (Highway 2, Calgary ring road)
• Access to skilled workforce in Calgary-Airdrie industrial corridor
• Reasonable distance from suppliers and customers
• Municipal support for industrial development and job creation
• Competitive land and utility costs

Investment Considerations: The facility site selection will significantly impact FluxGen's operational efficiency, transportation costs, and expansion flexibility. The chosen location must support both immediate production needs and long-term strategic growth objectives.

Land Area & Physical Requirements

Facility Land Use Planning

Facility Area	Initial Size	Expansion Size	Total Requirement	Key Features

Manufacturing Building	10,000 sq ft	15,000 sq ft	25,000 sq ft	High bay, crane service, utilities
Raw Material Storage	3,000 sq ft	5,000 sq ft	8,000 sq ft	Covered silos, segregated bays
Finished Goods Warehouse	4,000 sq ft	6,000 sq ft	10,000 sq ft	Climate controlled, loading docks
Office & Laboratory	2,000 sq ft	1,000 sq ft	3,000 sq ft	HVAC, fume hoods, meeting rooms
Maintenance Shop	1,000 sq ft	500 sq ft	1,500 sq ft	Equipment access, parts storage
Parking & Landscaping	5,000 sq ft	2,000 sq ft	7,000 sq ft	Employee & visitor parking
Outdoor Storage/Expansion	10,000 sq ft	20,000 sq ft	30,000 sq ft	Future expansion, equipment storage
Total Building Area	25,000 sq ft	29,500 sq ft	54,500 sq ft	
Total Land Requirement	10 acres	5 acres	15 acres	Including setbacks & reserves

Site Characteristics & Requirements

Topography & Soil Conditions:
• Relatively level terrain to minimize grading and foundation costs
• Well-draining soils suitable for heavy industrial construction
• Stable soil conditions for equipment foundations and building loads
• Minimal environmental contamination or geotechnical challenges
• Flood zone considerations and drainage planning
Site Configuration:
• Rectangular or square configuration for efficient layout
• Multiple access points for truck and employee traffic
• Adequate setbacks from property lines and neighboring uses
• Orientation allowing for future expansion without disruption
• Buffer areas for environmental compliance and aesthetics
Accessibility Requirements:
• Direct access to major arterial roads (Highway 2 corridor preferred)
• Truck access routes avoiding residential areas
• Employee access with public transit connectivity
• Emergency vehicle access for fire and ambulance services
• Clear sight lines and safe ingress/egress for all vehicle types
Future Expansion Considerations:
• Additional 5-10 acres available for purchase or lease
• Expansion areas not constrained by utilities or environmental issues
• Ability to add production capacity without disrupting existing operations

• Flexibility for different product lines or manufacturing processes
• Option for additional buildings or outdoor storage areas

Utilities & Infrastructure Requirements

Utility Requirements & Specifications

Utility	Initial Requirement	Future Requirement	Specifications	Backup/Redundancy
Electrical Power	300 kW demand	500 kW demand	480V, 3-phase service	Emergency generator 150 kW
Natural Gas	1.5 MMBtu/hr	3.0 MMBtu/hr	Medium pressure service	Propane backup for critical equipment
Water Supply	200 gal/day	500 gal/day	Potable water, 60+ PSI	Storage tank for process water
Wastewater	150 gal/day	400 gal/day	Industrial discharge permit	On-site treatment if required
Compressed Air	50 SCFM	100 SCFM	100 PSI, clean & dry	Dual compressors for reliability
Communications	High-speed internet	Fiber connectivity	100+ Mbps bandwidth	Redundant providers
Waste Management	2 dumpsters/week	4 dumpsters/week	Industrial waste collection	Recycling programs

Electrical Infrastructure

Primary Electrical Service:
• 480V, 3-phase service with 300 kW initial capacity
• Expansion capability to 500+ kW for future growth
• High-voltage switch gear and distribution panels
• Power factor correction to maintain efficiency
• Lightning protection system for equipment safety
Equipment Power Requirements:
• Batch Mixer: 75 kW variable frequency drive

• Pelletizing Equipment: 15 kW with speed control
• Rotary Dryer: 120 kW including fans and heating
• Material Handling: 30 kW for conveyors and elevators
• Dust Collection: 25 kW for baghouse and fans
• Building Systems: 35 kW for lighting, HVAC, compressed air

Emergency Power:

• 150 kW diesel generator for critical systems
• Automatic transfer switch with 10-second response
• Fuel tank capacity for 48-hour operation
• Emergency lighting and life safety systems
• UPS systems for process control and communications

Energy Efficiency Measures:

• LED lighting throughout facility with occupancy sensors
• High-efficiency motors with variable frequency drives
• Power monitoring and energy management systems
• Heat recovery from dryer exhaust for building heating
• Solar panel installation consideration for future sustainability

Gas & Water Systems

Natural Gas Requirements:

• Medium pressure service (2+ PSI) for dryer operations
• 1.5 MMBtu/hr initial capacity, expandable to 3.0 MMBtu/hr
• Pressure regulation and safety shut-off systems
• Gas detection and alarm systems for safety
• Backup propane system for critical equipment

Water Systems:

• Potable water for employee facilities and emergency systems
• Process water for equipment cooling and cleaning
• Fire protection water with adequate pressure and flow
• Wastewater collection and treatment as required
• Stormwater management and runoff control

Compressed Air System:

• 50 SCFM initial capacity, 100+ PSI delivery pressure
• Dual compressors for redundancy and maintenance
• Air dryer and filtration for clean, dry air
• Distribution piping to all equipment locations
• Monitoring and leak detection systems

Transportation & Logistics Infrastructure

Transportation Infrastructure Requirements

Transportation Mode	Requirement	Specifications	Usage Pattern	Infrastructure Needs
Truck Access	Primary shipping mode	53-foot trailers, 80,000 lb GVW	Daily inbound/outbound	Wide turning radii, loading docks
Rail Access	Bulk materials (preferred)	Rail spur, covered hoppers	Weekly/bi-weekly	Rail siding, unloading equipment
Employee Vehicles	Daily workforce	25-30 parking spaces	Shift changes	Paved parking, lighting, security
Emergency Vehicles	Safety compliance	Fire trucks, ambulances	As needed	Clear access routes, hydrants
Maintenance Vehicles	Equipment service	Service trucks, cranes	Weekly service calls	Equipment access doors
Visitor Parking	Customers, vendors	10-15 spaces	Business hours	Separate from employee parking

Road Access & Traffic Considerations

Primary Access Requirements:
• Direct connection to Highway 2 corridor or major arterial road
• Minimum 24-foot wide access road with concrete or heavy-duty asphalt
• Traffic signal or controlled intersection for safe truck access
• Adequate sight distances for safe vehicle movement
• Separation of truck and employee traffic where possible
Traffic Generation:
• Truck Traffic: 8-12 trucks per day (inbound materials, outbound products)
• Employee Traffic: 25-30 vehicles per day during shift changes
• Visitor Traffic: 5-10 vehicles per day (customers, vendors, services)
• Peak Traffic: Morning and evening shift changes, delivery periods
Internal Circulation:
• One-way circulation pattern to minimize conflicts
• Loading dock areas separated from parking
• Fire lane access maintained around all buildings
• Pedestrian walkways separated from vehicle areas
• Clear signage and traffic control devices
Rail Infrastructure (Preferred):
• Direct rail spur connection to CN or CP main lines
• Covered unloading facility for bulk materials

• Rail car storage capacity for 2-3 cars
• Material handling equipment for efficient unloading
• Switch equipment and signaling as required by railway

Zoning & Regulatory Requirements

Regulatory Approval Requirements

Regulatory Category	Requirement	Jurisdiction	Timeline	Key Considerations
Zoning Designation	Heavy Industrial (M-2 or equiv)	Municipal	2-4 months	Chemical processing permitted
Development Permit	Site plan approval	Municipal	3-6 months	Building placement, landscaping
Building Permit	Construction authorization	Municipal	2-3 months	Code compliance, inspections
Environmental Permit	Air emissions, waste discharge	Provincial	6-12 months	Environmental impact assessment
Fire Safety Approval	Fire prevention/suppression	Municipal/Provincial	1-2 months	Access, water supply, systems
Occupancy Permit	Final approval to operate	Municipal	1 month	All systems operational, inspected

Municipal Requirements

City of Airdrie Requirements:
• Land Use Bylaw compliance for industrial development
• Development permit application with detailed site plans
• Building permit applications for all structures
• Municipal utility connections and capacity allocations
• Business license and operational permits
Setback & Buffer Requirements:
• Minimum 30-foot setbacks from all property lines
• 50-foot buffer from residential or commercial zones
• Landscape screening along public road frontages
• Fence and gate requirements for security and safety
• Signage regulations and architectural standards
Municipal Services:

• Fire protection services and emergency response
• Municipal water and wastewater connections
• Storm drainage and stormwater management
• Solid waste collection and recycling services
• Snow removal and road maintenance for access roads

Environmental Compliance

Alberta Environment Requirements:
• Environmental Protection and Enhancement Act compliance
• Air emissions permit for dust and combustion sources
• Waste management permit for industrial waste streams
• Groundwater protection and monitoring requirements
• Spill prevention and emergency response planning
Air Quality Management:
• Dust collection system with 99.5%+ efficiency
• Stack height calculations and dispersion modeling
• Ambient air quality monitoring if required
• Fugitive emissions control measures
• Regular emissions testing and reporting
Waste & Water Management:
• Industrial waste characterization and disposal
• Wastewater discharge permit if connecting to municipal system
• Stormwater management plan with retention/detention
• Spill containment and cleanup procedures
• Recycling programs for packaging and materials
Noise & Vibration Control:
• Noise impact assessment and mitigation measures
• Equipment enclosures and sound barriers
• Operating hour restrictions if required
• Vibration control for sensitive equipment
• Community relations and complaint resolution procedures

Facility Layout & Design Considerations

Facility Zone Layout & Requirements

Facility Zone	Size (sq ft)	Key Features	Adjacent Zones	Special Requirements
Raw Material Receiving	1,500	Truck dock, scales, silos	Storage, Production	Dust control, material flow
Raw Material Storage	3,000	Segregated bays, silos	Receiving, Production	Climate control, inventory mgmt

Production Area	6,000	Processing equipment	Storage, QC Lab	Overhead crane, utilities
Quality Control Lab	400	Testing equipment, fume hoods	Production, Offices	Vibration isolation, HVAC
Finished Goods Warehouse	4,000	Racking, shipping dock	Production, Shipping	Climate control, security
Maintenance Shop	600	Equipment repair, parts	Production Area	Tool storage, welding area
Office & Admin	800	Offices, conference, reception	Main entrance	HVAC, IT infrastructure
Employee Facilities	300	Locker rooms, break room	Office Area	Ventilation, plumbing
Utility Room	400	Electrical, compressed air	Production Area	Ventilation, equipment access

Material Flow & Process Layout

Material Flow Design Principles:
• Linear flow from raw material receiving to finished goods shipping
• Minimal material handling and transportation distances
• Segregation of raw materials to prevent cross-contamination
• Efficient workflow with minimal operator travel
• Clear pathways for maintenance and emergency access
Production Area Layout:
• Sequential arrangement of process equipment
• Overhead crane coverage for equipment maintenance
• Adequate space for equipment access and maintenance
• Dust collection ductwork and utility distribution
• Emergency exits and safety shower/eyewash stations
Storage Area Design:
• Raw material silos with individual discharge gates
• Segregated storage bays for different materials
• FIFO (first-in, first-out) inventory rotation
• Climate-controlled finished goods storage
• Secure storage for valuable alloy materials
Traffic Flow & Circulation:
• Separate truck and employee entrances
• One-way circulation to minimize vehicle conflicts
• Loading docks positioned for efficient material flow
• Emergency vehicle access to all areas
• Visitor parking separated from operational areas

Building Design Specifications

Building Component	Specification	Requirement	Design Standard
Foundation	Reinforced concrete slab	6-inch thickness, vapor barrier	Heavy equipment loads
Structure	Pre-engineered steel building	26-foot clear height	Crane loads, wind/snow
Roof	Standing seam metal	Insulated, R-30 minimum	Weather-tight, low maintenance
Walls	Insulated metal panels	R-19 insulation, vapor barrier	Energy efficient, durable
Doors	Overhead doors (truck height)	12x14 foot truck doors	Insulated, high-cycle
Windows	Insulated glazing	Office areas, natural light	Energy efficient, security
HVAC	Gas-fired unit heaters	Production area heating	Zoned control, energy efficient
Lighting	LED high bay fixtures	50+ foot-candle levels	Energy efficient, long life

Environmental Impact & Mitigation

Environmental Impact Assessment

Environmental Aspect	Potential Impact	Mitigation Measures	Monitoring Requirements
Air Emissions	Dust from material handling	Baghouse filtration, enclosures	Stack testing, opacity monitoring
Noise	Equipment operation	Sound barriers, enclosures	Periodic noise measurements
Water Usage	Process and cooling water	Recycling, efficient usage	Flow monitoring, usage tracking
Wastewater	Process water discharge	Treatment, municipal connection	Discharge monitoring, pH control
Stormwater	Site runoff	Retention pond, oil separation	Water quality monitoring
Waste Generation	Packaging, maintenance waste	Recycling, proper disposal	Waste tracking, manifests
Soil Protection	Spill prevention	Containment, cleanup procedures	Spill reporting, soil testing
Visual Impact	Industrial appearance	Landscaping, screening	Maintenance of landscaping

Sustainability Measures

Energy Efficiency:
• High-efficiency equipment and motors with variable frequency drives
• LED lighting throughout facility with occupancy and daylight sensors
• Building insulation exceeding minimum code requirements
• Heat recovery from dryer exhaust for space heating
• Energy monitoring and management systems
Water Conservation:
• Closed-loop cooling water systems with minimal makeup
• Rainwater collection for non-potable uses
• Low-flow fixtures and water-efficient equipment
• Process water recycling and reuse
• Native landscaping requiring minimal irrigation
Waste Minimization:
• Material recycling programs for packaging and scrap
• Bulk material handling to reduce packaging waste
• Reusable packaging systems with customers
• Equipment maintenance to maximize useful life

• Employee training on waste reduction practices

Environmental Management:

• Environmental management system implementation
• Regular environmental audits and performance monitoring
• Continuous improvement in environmental performance
• Community engagement and transparency
• Compliance with or exceeding regulatory requirements

Future Sustainability Initiatives:

• Solar panel installation for renewable energy
• Electric vehicle charging stations for employees
• Carbon footprint assessment and reduction programs
• Green building certification consideration (LEED)
• Partnership with local environmental organizations

Site Selection Criteria & Evaluation

Site Selection Evaluation Criteria

Evaluation Criteria	Weight (%)	Scoring Method	Key Factors	Decision Impact
Location & Access	25%	1-10 scale	Highway access, customer proximity	Transportation costs, delivery times
Land Cost & Availability	20%	Cost per acre	Purchase/lease cost, expansion land	Capital investment, future flexibility
Utilities Availability	20%	Capacity vs. need	Electrical, gas, water capacity	Infrastructure investment, reliability
Regulatory Environment	15%	Permit complexity	Zoning approval, permit timeline	Project schedule, compliance cost
Workforce Access	10%	Labor availability	Skilled workforce, unemployment rate	Recruitment cost, training needs
Community Support	5%	Municipal cooperation	Economic development support	Permit efficiency, tax incentives
Environmental Factors	5%	Impact complexity	Environmental constraints	Permit cost, mitigation requirements

Preferred Site Characteristics

Ideal Site Profile:

Location:

• Within 15 minutes of Highway 2 corridor
• Airdrie or Calgary industrial area
• Proximity to skilled workforce and suppliers
• Access to CN or CP rail lines (preferred)
• Municipal support for industrial development

Physical Characteristics:

• 10-15 acres with expansion potential
• Level terrain requiring minimal site preparation
• Good soil conditions for heavy construction
• No environmental contamination or restrictions
• Attractive industrial setting with landscaping potential

Infrastructure Readiness:

• Utilities available at property boundary
• Road access adequate for truck traffic
• Municipal services (fire, police, utilities) available
• Telecommunications infrastructure in place
• Waste management and recycling services

Economic Factors:

• Competitive land cost (purchase or lease)
• Municipal tax rates and incentive programs
• Utility rates competitive with regional standards
• Minimal infrastructure investment required
• Property appreciation potential

Regulatory Advantages:

• Appropriate industrial zoning in place
• Streamlined permit processes
• Municipal support for job creation
• No significant environmental constraints
• Established industrial area with precedent uses

Strategic Considerations: FluxGen's site selection will balance immediate operational needs with long-term strategic objectives. The chosen location must support efficient operations, provide growth flexibility, and position the company competitively in the Western Canadian market.

Key success factors include minimizing transportation costs, ensuring reliable utility supply, maintaining regulatory compliance, and building strong community relationships.