

AgriDock Safety & Compliance

Essential Safety Guidelines for Operations

Version 2.0

Complete safety procedures, regulatory compliance, and emergency protocols

1. Critical Safety Warnings

DANGER - READ CAREFULLY BEFORE OPERATION


AgriDock systems are professional-grade equipment that can cause serious injury or death if misused. Failure to follow all safety procedures may result in:

- Severe lacerations from rotating propellers
- Eye and respiratory injuries from chemical spray
- Burns from lithium polymer battery fires
- Head trauma or fractures from falling aircraft
- Electrocution from high-voltage systems

YOU ARE RESPONSIBLE FOR ENSURING SAFE OPERATION. THIS MANUAL CONTAINS CRITICAL INFORMATION FOR YOUR SAFETY.

Operator Requirements

- **Minimum Age:** 18 years old
- **Certification:** Commercial UAV pilot license (FAA Part 107, CAA PfCO, or equivalent)
- **Medical:** Ability to respond quickly in emergencies (good vision, hearing, mobility)
- **Training:** Manufacturer-provided safety training completed
- **Insurance:** Commercial UAV liability insurance (minimum \$1,000,000 coverage)

 **Liability Notice:** Operators and owners are fully liable for all damage, injuries, or violations resulting from this equipment's use. AgriDock Inc. is not responsible for operator errors or negligence.

2. Regulatory Compliance

United States (FAA Part 107)

All operations in US airspace require FAA Part 107 certification:

- Aircraft must be registered with FAA
- Pilot must hold Remote Pilot Certificate with Small UAS rating
- Operations limited to daylight, within visual line of sight
- Maximum altitude: 400 feet AGL (above ground level)
- Minimum distance from people: 25 feet (except immediate area)
- Operation prohibited over people, moving vehicles, buildings in congested areas
- Speed limit: 100 mph ground speed
- Airspace authorization required (via LAANC) for Class B, C, D, E airspace

Note: Agricultural operations may have different rules. Check with your local FAA FSDO (Flight Standards District Office) before operations.

European Union (EASA)

- EASA Open Category: <2kg UAS can be flown without certification
- EASA Specific Category: Licensed pilot (PfCO) required
- EASA Certified Category: Aircraft & pilot certification required
- Agricultural operations typically require Specific Category certification
- Insurance minimum: €1,000,000 liability coverage

Other Regions

Requirements vary by country. Research and comply with local aviation authority regulations before operating in:

- Canada (Transport Canada - Advanced Operations Certificate)
- Australia (CASA - Remote Operator's Certificate)
- Japan, South Korea, India (country-specific licensing)

3. Pre-Operation Safety Checklist

Complete this checklist **BEFORE** every flight. Do not fly if any item fails.

Weather Assessment

- Wind speed below 12 m/s (check anemometer if available)
- No rain, fog, or low-visibility conditions
- No electrical storms within 50 km radius
- Temperature within operating range (-10°C to +45°C)
- No snow or ice on aircraft or propellers

Location & Airspace

- Flight area is clear of obstacles (buildings, trees, power lines)
- No people or animals within 100m radius of aircraft
- LAANC approval obtained (USA) or equivalent authorization
- Landing zone is flat, minimum 10m × 10m clear area
- No restricted airspace (military, national parks, airports)
- Property owner permission obtained for private land

Aircraft Condition

- Visual inspection: no cracks, damage, or loose components
- Propellers: balanced, no chips or cracks
- Motors: spin freely, no grinding sounds
- Battery: fully charged, no swelling, voltage >22V (6S)
- Connectors: all secure, no loose wires
- Landing gear: no damage, properly attached

- Sensors (GPS, compass, camera): functioning

Equipment & Documentation

- Remote controller: fully charged, all functions tested
- Mobile device/tablet: charged, app updated
- Emergency contact numbers saved and accessible
- Pilot certificate and airspace authorization available
- Insurance proof available if requested
- First aid kit on-site and accessible

Safety Equipment

- Fire extinguisher (Class D, minimum 5 lbs) available
- First aid kit including eye wash and burn treatment
- Ground crew briefed on emergency procedures
- Communication system (radio or phone) between pilot and observers

4. Safe Operating Procedures

Ground Operations Safety

Propeller Safety

EXTREME HAZARD: Spinning propellers can cause severe lacerations. Never approach aircraft with running motors. Keep all people, animals, and objects away from propeller disk.

- Always remove propellers when transporting or storing aircraft
- Keep hands, hair, and loose clothing clear of propellers
- Never touch propellers until motors have completely stopped (30+ seconds)
- Use guards or barriers to keep unauthorized people away during operations

Battery Safety

⚠ FIRE HAZARD: Lithium polymer batteries can catch fire if damaged, overcharged, or short-circuited.

- Store batteries in fireproof container when not in use
- Never store charged batteries in closed spaces (cabin, car trunk)
- Do not charge unattended. Monitor charging process continuously
- If battery becomes hot ($>60^{\circ}\text{C}$) during charging, disconnect immediately
- If battery shows any swelling, stop use immediately and recycle properly
- Never allow wet batteries to dry near heat source

Chemical Spray Safety

- Wear appropriate PPE: gloves, safety glasses, long sleeves, pants
- Use only approved agricultural chemicals in correct dilution ratio
- Never spray toward people, animals, or buildings
- Observe wind direction and downwind safety perimeter (minimum 50m)
- Avoid spraying near water sources used for drinking or irrigation
- Keep tank drain, disposal system, and empty containers away from waterways
- Follow chemical manufacturer's safety data sheet (SDS) requirements
- Document all chemical applications for regulatory compliance

Ground Crew Safety

- Brief all observers on emergency procedures before operations begin
- Designate safe zones where people must stand during flight (outside 100m exclusion)
- Use visual spotters to warn of approaching obstacles or airspace violations
- Keep radio communication open between pilot and ground crew
- Have at least one additional trained operator present during flights

5. In-Flight Safety Procedures

Take-Off Precautions

- Clear landing zone of all people, animals, and obstacles
- Position aircraft on level ground, facing takeoff direction
- Arm motors only when ready to launch (keep fingers away from propellers)
- Gradually increase throttle to avoid sudden jumps
- Monitor aircraft behavior: should ascend smoothly without drifting
- If abnormal behavior observed, land immediately and investigate

Flight Safety

- **Maintain Visual Line of Sight (VLOS):** Keep aircraft visible at all times without binoculars
- **Monitor GPS/RTK status:** Do not fly if GPS fix is weak or RTK corrections lost
- **Altitude awareness:** Stay below 400 feet AGL (check local regulations)
- **Battery management:** Return to dock when battery shows 20% remaining (do not fly to 0%)
- **Speed control:** Maintain moderate speed (avoid high-speed turns or maneuvers)
- **Obstacle avoidance:** Use forward and downward sensors. Do not disable safety features
- **Weather monitoring:** Land if wind increases or weather deteriorates

Emergency Procedures

GPS Loss During Flight

- Switch to manual control mode immediately
- Descend to safe altitude (50-100m) to regain GPS lock
- Use manual controls to navigate back to known location
- If GPS remains unavailable, land immediately in safe area

Motor or Propeller Failure

- Aircraft may lose altitude rapidly—land immediately in nearest safe area
- Do not attempt to continue flying—aircraft is unstable
- After landing, do not restart motors. Investigate failure before next flight.

Loss of Control

- Press "Emergency Stop" button on controller (if available)
- Aircraft will disarm motors and fall (may cause damage but safer than uncontrolled flight)
- Ensure landing area is clear of people before pressing Emergency Stop

Battery Failure During Flight

- Aircraft will immediately descend as motors shut down
- Identify nearest safe landing area before battery depletes completely
- Return to dock immediately when battery reaches 25%

6. Landing & Post-Flight Safety

Landing Procedure

- Clear landing zone of all people and obstacles
- Approach landing zone at reduced speed and altitude
- For auto-landing: engage "Return to Dock" mode and let system land automatically
- For manual landing: reduce throttle smoothly and descend at controlled rate
- Touch down gently. Do not land hard (can damage components)
- Immediately disarm motors after touchdown

Post-Flight Procedures

Safety Note: Aircraft may still be dangerous after landing. Propellers may still spin briefly due to momentum. Keep clear until motors have stopped completely.

- Allow motors to spin down fully (30+ seconds after disarming)
- Keep hands and objects clear of propeller area
- Remove propellers if aircraft will be on ground for >1 hour
- Allow battery to cool to room temperature before storing
- Check for damage and document any issues
- Review flight log and footage for analysis
- Clear landing zone of all equipment and debris

Emergency Landing Safely

If emergency landing required in non-ideal location:

- Identify best available area (avoid people, buildings, water)

- Reduce altitude and approach at reduced speed
- Land on soft ground if possible (grass, dirt) to minimize damage
- Disarm immediately after touchdown
- Keep people away and secure aircraft in place
- Document damage and retrieve aircraft safely after area secured

7. Safety Decision Matrix

Condition	Assessment	Action
Wind 8-12 m/s	Marginal	Fly cautiously with experienced pilot
Wind >12 m/s	Unsafe	DO NOT FLY - cancel operations
Rain/Drizzle	Risky	DO NOT FLY - water damage risk
Fog (visibility <500m)	Unsafe	DO NOT FLY - visual line of sight impossible
Temperature <-10°C or >45°C	Risky	Do not fly - battery/motor damage risk
GPS weak (<8 satellites)	Marginal	Fly manual mode only; do not use Auto-Dock
Battery <20%	Critical	Return to dock immediately
People within 100m	Unsafe	DO NOT FLY - exclusion zone violated
Unknown airspace	Unsafe	Do not fly until airspace authorization confirmed
Aircraft abnormality observed	Unsafe	Land immediately and inspect before next flight

