Aeromedical Support to Multi-Record Winning Wingsuit Attempt

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What is a Wingsuit?

• Fabric between Arms & Legs
• Creates a Surface Area & Acts Like Aerofoil
• Shallow Glide Angle & High Speed
• Parachute For Landing
• Fraser’s ‘State of the Art’
• Advanced Composite Components
Fraser’s Record Breaking Wingsuit

**Carbon Fibre Wingtip gripper** – Allowing increased wing size whilst enabling tension to be maintained across wing in flight.

**Ultra-light coated rip stop Nylon Fabric** throughout the wingsuit enabling reduced parasitic drag, tear resistance and reduced weight.

**Semi Rigid Intakes** – Enabling high pressurisation of wings increasing rigidity and flight performance.

**Rigid 3D shaped leading edge** optimised for performance, generating high lift and reduced drag with its thin profile.

**The Arm wing and tapered sleeve** allows for easy access for safe deployment of main parachute.

**Central inlet hole** – Creates lateral stability as it enables clean airflow over the top surface of the tail wing.

**Carbon Fibre Blades** – Ensuring even at high speeds; control is not compromised whilst the leg wing remains optimised for performance.
What’s Wingsuit Flying Like?

Iron Man? Superman?

No, ........ Fraser!

You will believe a man can fly!
The Record Attempts

Highest Altitude Jumped

Highest Speed Achieved

Longest Time Flown

Furthest Distance Flown
Aircraft, Balloon & Altitudes

Aircraft 38,000 Feet
Balloon 42,000 Feet
Hypoxia

At 42,000 ft lack of Oxygen
= Loss of Consciousness in 12s

Even 100% Oxygen Inadequate to Support Exercise
Pressure Breathing System Required

<table>
<thead>
<tr>
<th>Altitude</th>
<th>Time of Useful Consciousness</th>
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<tbody>
<tr>
<td>45,000 feet MSL</td>
<td>9 to 15 seconds</td>
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<tr>
<td>40,000 feet MSL</td>
<td>15 to 20 seconds</td>
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<tr>
<td>35,000 feet MSL</td>
<td>30 to 60 seconds</td>
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<tr>
<td>30,000 feet MSL</td>
<td>1 to 2 minutes</td>
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<tr>
<td>28,000 feet MSL</td>
<td>2½ to 3 minutes</td>
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<tr>
<td>25,000 feet MSL</td>
<td>3 to 5 minutes</td>
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<tr>
<td>22,000 feet MSL</td>
<td>5 to 10 minutes</td>
</tr>
<tr>
<td>20,000 feet MSL</td>
<td>30 minutes or more</td>
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Decompression Sickness

Very High Risk of DCS at 42,000 feet

Especially Musculoskeletal, but also Respiratory, Cutaneous or Neurological Bends

Use of a 100% Oxygen System with Long Pre-Breathe Mandated
Cold Effects on Man & Equipment

42,000 feet is in the Tropopause
Average temperature is -56C (-69F)
With Windchill at 200mph+
Equivalent to ~-95C (-139F)
Extreme Cold Protection Required
Equipment: Oxygen Regulator

Cobham CRU 103 Regulator
100% Oxygen Only: (Hypoxia & DCS)
Pressure Breathing Enabled (40kft+)
Dynamic Testing showed
Excellent Breathing Performance
Man Mounted, heated & insulated
Head Equipment Assembly

Modified Phantom Oxygen Mask
(Gentex MBU Derivative)
Integrated within Helmet Visor Assembly
(Impact & Cold Protection)
Expiratory Gases Ported Out
(Reduce Icing of Expirate)
Oxygen Cylinder and Console

Oxygen Cylinder (Cobham)
Carbon Fibre Full Composite (CFFC)
3000psig, 410 litres O2 (NTP)

Oxygen Console (Cobham Phantom)
3000psig, 3,600 litres O2 (NTP)
STANAG 7056 Certified for Prebreathing
Cold Protection for Man & Equipment

Insulated Wingsuit & Thermal Skinsuit

Electric hand warmers (Li ion)

Chemical Heating Pads
(for hands & regulator)
Teaching, Hypoxia & Pressure Breathing Training

Teaching: Altitude, Hypoxia, DCS
Cold Implications, Prevention & Management

Personal experience of Hypoxia

Pressure Breathing Training
A Competitive Edge? Altitude Acclimatization

Live at Altitude for Several Days

Reduced Oxygen Breathing Device
The Jump & Record Attempt

Can we fly faster than 234mph?

Aircraft Altitude Restricted by Heat

Attempt Cancelled due to Wind & Rain

Jump 1 From Aircraft

Jump 2 from Balloon

Bad Weather!
The Jump & Record Attempt

Can we fly faster than 234mph?

However, this is how it went
shaping tomorrow with you
The Jump & Record Attempt: Result

Despite Only having One Attempt Fraser Broke the Following 4 Records:

1. World Record for Fastest Peak Speed (246.6mph, 396.88kph)
2. FAI Continental Altitude Record (10,824m, 35,509ft)
3. FAI British Altitude Record (10,824m, 35,509ft)
4. FAI European Record Furthest Distance of Fall (9,741m, 31,959ft)
The Jump & Record Attempt: Conclusions

All of the following worked very well:

Wingsuit

Oxygen System

Thermal Protective Systems

Pre Attempt Preparation & Training

Had Weather been better More

Records would have Probably Fallen
Questions?