

## Profile MediGuardian roll over side airbag system

According to the studies<sup>1</sup>, 69% of crashes comes from side of an ambulance, I.E side collision, roll over, grossing accident etc.

MediGuardian roll over airbag system protects medics at roll over crashes.

Installation position on right wall at medic seat and on left wall at ventilation medic seat



Head injury criterion (HIC) is a measure of the likelihood of head injury arising from an impact. HIC is derived from the measurement of head deceleration over a period of time.

- At a HIC of 1000, there is a 90% probability of a moderate head injury to the average adult
- At a HIC of 150, the probability of moderate head injury drops to 5%

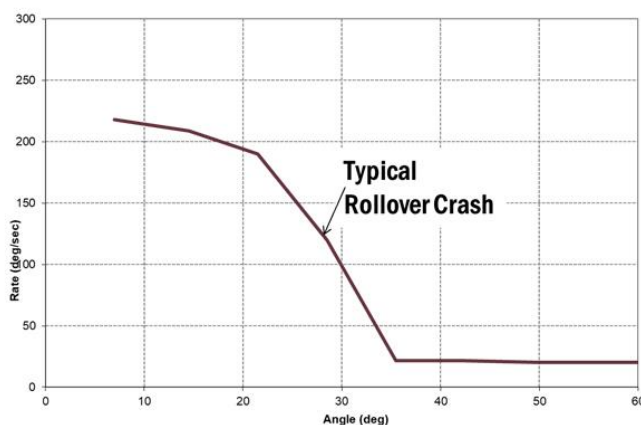


Without MediGuardian airbag: 1100 – 1300 HIC "common rate at accidents for head hit"

With MediGuardian airbag: 125 – 140 HIC

**Airbag operation:**

- Roll Sensor uses a combination of angular rate and position to determine a roll is eminent
- Send a signal to airbag module to deploy side airbag(s)
- Sensor makes decision in <0.25 seconds



**Testing:**

Ambulance is equipped with rollover protection system. The system is tested using Hybrid III 5<sup>th</sup> female (49kg, 653mm height), 50<sup>th</sup> Male (78 kg and 782mm height) and 95<sup>th</sup> Male (101 kg and 782mm height) test dummies. All of the Hybrid III test dummies used have standard instrumentation (head, chest and pelvis accelerometers, femur load cells, and load cells in the neck). All injury numbers are recorded by test and compared to the maximum allowable HIC values in IARV (For instance, a HIC (Head Injury Criteria number) of 1000 equals a 12% probability that a healthy 30-year-old will sustain a skull fracture).

Dynamic rollover testing was done using the Profile test cabin and rolling approximately 120 degrees per second. Live airbags were used and fired at 60 degrees. High speed video capture to ensure that the airbag capably interposes between the side wall of the cabin and the test dummy's head. A certificate from the test house doing testing and the airbags have the appropriate CE mark included on them. The test lab must be able to produce all calibration records for all equipment and test dummies used during testing. (Certified to IATF 16949).

Test video:

<https://www.youtube.com/watch?v=tS6RMMezQFo>

**Trained personnel:**

An airbag is a precisely calibrated safety device and the ambulance manufacturer must have trained personnel for the safe handling, installation and troubleshooting of airbag system.

<sup>1</sup> Ongevallenstatistiek voorrangsvoertuigen 2018-2019, Instituut Fysieke Veiligheid

