

## **SANTA FACTS.....**

What happens when engineers think to much about Christmas....

1. No known species of reindeer can fly. But there are 300.000 species of flying organisms yet to be classified and while most of these are insects and germs, this does not completely rule out flying reindeer, which only Santa has seen.
2. There are 2 billion children (under 18) in the world. But since Santa doesn't appear to handle Muslim, Hindu, Buddhist and Jewish children, that reduces the work load to 15% of the total -378 million or so. At an average rate of 3,5 children per household, that's 91,8 million homes. One presumes there's at least one good child in each.
3. Santa has 31 hours of Christmas to work thanks to time zones and the rotation of the earth, assuming he travels east to west. This works out to 822,6 visits per second. This is to say that for each household with good children, Santa has 1/1000<sup>th</sup> of a second to park, hop out of the sleigh, jump down the chimney, fill the stockings, distribute the remaining gifts under the tree, eat the snacks, get back up the chimney, get back in the sleigh and move on to the next house. Assuming that each of these 91,8 million homes are distributed evenly (which we know to be false but for the sake of these calculations we will accept) we are now talking about 0,78 miles per household, a total trip of 75,5 million miles, not counting bathroom stops. This means that Santa's sleigh is traveling at 650 miles per second, 3000 times the speed of sound. For comparison, the fastest man made vehicle, the Ulysis space probe moves at a pokey 27,4 miles per second; the average reindeer runs at 15 miles per hour.
4. The sleighs payload adds another interesting element. Assuming that each child gets nothing more than a medium sized LEGO-set (2 pounds), the sleigh is carrying 321.300 tons, not counting Santa, who is inexorably described as overweight. On land, conventional reindeer can pull no more than a 300 pounds. Even granting that 'flying reindeer' (see point 1) could pull ten times the usual amount, we can not do the job with 8 or 9, we need 214.000 reindeer. This increases the weight, not even counting the sleigh, to 353.000 tons. Again for comparison this is 4 times the weight of the Queen Elizabeth 2.
5. 353.000 tons traveling at 650 miles per second creates enormous air resistance. This will heat the reindeer in the same manner as a spacecraft re-entering the earth's atmosphere. The lead pair of reindeer will absorb 14,2 quintillion joules of energy per second. Each. In short, they will burst into flame almost instantaneously, exposing the next pair of reindeer and creating deafening sonic booms in their wake. The entire team will be vaporized within 4,26 thousands of a second. Santa meanwhile, will be subjected to centrifugal forces 17.500,06 times the force of gravity. A 300 pounds Santa would be pinned to the back of the sleigh by 4.315.015 pound of force.
6. Conclusion: There was a Santa, but he is dead now.