Scuba Tank Explodes!

From an article in the Norwegian magazine "Diving" written by Kai Garseg [4/97]

Do you believe the scuba tank manufacturers when they say that tanks only explode when they are overfilled or otherwise abused? After reading this article, you may have a surprise coming. On May 30, 1997, Dag Deberitz, from Tjoeme in Vestfold County, Norway, got a "surprise" that he could have done without.

A scuba tank made from aluminum alloy 5283 exploded while sitting inside his garage. The explosion nearly flattened out the garage and everything in it! His 16" winter tires and other things were blown through the walls leaving large holes behind. Fortunately nobody was present.

The back wall of the garage was almost completely gone. Other diving equipment stored along with this bottle was transformed into small bits and pieces. Today, Mr. Deberitz is thankful that nobody was nearby to get injured in the blast.

Mr. Deberitz is, among other things, a scuba instructor. The week before, the tank had been in the luggage compartment of his 16 seat van alongside 12 other scuba tanks that he was using in a diving course he instructs. He hardly dares to think about what could have happened if the tank had exploded in the van with himself, the other instructors, and all the student divers inside. "We would not have survived," Mr. Deberitz says.

Before the tank was placed in the van, it was being stored in the basement of his parent's summer home nearby. If it had exploded there, it would have blown the wooden building off its foundation.

The scuba tank was a 10.3 liter tank which holds about 72 cubic feet of air. It was manufactured by Gerzat (A French Company) in 1973 out of the 5283 aluminum alloy. The 5283 aluminum alloy is just as bad as the 6351 aluminum alloy. The scuba tank itself had been successfully hydrotested in December 1993. The tank had not been used since then and was holding a steady 2800 psi (180 BAR).

Mr. Deberitz has now completely lost his confidence in aluminium scuba tanks, at least those over 10 years old, and wishes to warn other divers and dive center personnel to be cautious of these tanks.

The molecular structure of this aluminium alloy seems to change if the tank ever gets overheated, overfilled or over ten years old. If metal valves (other than aluminium) are installed without some kind of plumber's tape, galvanic corrosion will destroy the threads. This phenomenon is hastened whenever the tanks are exposed to water - especially salt water.

Of course some of these things may also occur to steel bottles, but Mr. Deberitz now feels a lot more comfortable dealing with steel cylinders in his diving center/diving school. Dag says, "I will never fill an aluminium scuba tank that is over 10 years old again!"

He now has proof from the French manufacturer that the explosion was caused by the defective 5283 alloy, and that this scuba tank was a bomb waiting to explode. The local fire department said that the temperature in the garage could not have exceeded 100 F (40 C) on the actual day of explosion.

Although there have been very few scuba tanks that have exploded, there have been similar cases in Sweden, the USA and in some dive shops in the West Indies and other tropical places. While this may be the first such case in Norway, the general opinion in the Norwegian diving industry is to scrap aluminium alloy cylinders of all kinds when they reach 10 years of age.

The following photograph was taken on Saturday, 9/9/2001 at "Tjömetreffen2001", a dive camp held by Dag's diving club. Arild Vangen from Poseidon Service in Oslo held an information meeting and showed equipment telling about proper handling, storage, maintainance and use of diving equipment and high pressure compressors. There were 39 divers who attended from Germany, Holland, Norway and Scandinavia. Of these 39 divers, 8 had scuba tanks made from 6351, Gerzat 5283 or similar alloys!

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