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## Investigation of some vapours and dust explosions

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Industrial accidents often entail a domino effect which enlarge the scenario magnitude and increase the challenges in the evidence collection process. The highest the level of damage the more difficult is the investigation since more variables such as the fire brigade intervention modality and strategy have to be taken into account. Large magnitude accidents are mostly the consequence of a chain of events which can be very articulated with several root causes connected each other in a complex network which forms a chain of events. More than ever such investigations can be successful only in case beside the evidence collection process a proper process of evidence analysis is developed. This phase should allow the investigation team to analyze all the possible chains of events so that the actual sequence is defined. This process leads to define also the root causes of the accident and, last but not least, to define the lessons learned. This paper describes the investigation of several vapours and dust explosions occurred in industrial plants. One occurred in the reservoir park of a plant that processed pomace oil to get edible olive oil, was followed by a huge fire and caused 4 fatalities. The second was a small explosion that occurred in a tank park where no flammable paraffin should have been stored. Fortunately this accident caused only minor injuries and few damages. Then three different aluminum dust explosions investigations are presented, all of those occurred in suction plants and caused one fatality and severe damages.

### Biography

Luca Marmo is Professor of "Safety of industrial processes" at Politecnico di Torino. He is a Chemical Engineer and PhD in Chemical Engineering. Since 20 years he has worked as technical expert in Court. He investigated more than 100 fire and explosions that occurred in civil buildings and industrial plants. He has research experience in the field of chemical reactors, loss prevention and dust explosion. He is the Director of the Center for safety of flammable atmosphere of the Politecnico di Torino.

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