

# Jet Fire Testing

Applus+ has specialist open-field facilities to conduct real-scale simulations of open fires and gas explosions. We conduct, amongst others, jet fire tests according to ISO 22899-1.



The storage and transport of hydrocarbons and other chemical products in plants, tanks, pipes and vessels call for extremely strict fire-protection measures. As these inflammable products are stored under pressure, any leak could result in a virulent fire with a high rate of flame spread. For this reason, **passive fire-protection products aimed at the oil and gas or marine industry** must pass specific tests that simulate the extreme conditions they would face in the event of a fire.

Applus+ has specialist open-field facilities in which real-scale simulations of open fires, gas explosions or spillages of inflammable liquids (chemical risks) can be carried out. This testing ground, located just a few kilometres from the [Applus+ fire laboratories in Barcelona](#) (Spain). Our fire laboratories (LGAI Technological Center S.A.) are ISO/IEC 17025 accredited by ENAC/ILAC (nº 9/LE895).

We are currently completing the Lloyds Register (LR) accreditation for our Jet Fire testing laboratory. Lloyds Register certification is a benchmark in fire-safety standards for the oil, gas and marine industries. With this accreditation, jet-fire tests performed at our facilities verify products meet LR certification requirements.

Our training ground is prepared to conduct highly specialised fire tests:

## Jet Fire Tests (ISO 22899-1) for Passive Fire Protection Materials

One of the principal open-field tests that Applus+ conducts is the Jet Fire Test (ISO 22899-1). This test involves **assessing the flame resistance of passive fire-protection**

**products to be used on structural elements, tanks, pipes, valves, etc.** During this test, the sample is submitted to a continuous jet fire.

The Jet Fire Test simulates the type of fire caused by a leak in a tank, pipe or other equipment in which flammable fuel is being stored or transported under pressure. During the course of the test, temperatures can exceed 1200°C and radiation can reach levels of 250Kw/m<sup>2</sup>.

At the moment, very few laboratories in the world are capable of performing the Jet Fire Test. This test has been specifically designed for a highly specialist sector and is intended for use on partitions and elements installed in vessels, chemical plants, fuel tanks and oil or gas platforms.

## **Jet Fire and Hydrocarbon Curve Tests (EN 13381-4 and EN 13381-8)**

The Jet Fire Standard was developed to be combined with [in-furnace hydrocarbon curve tests](#) (EN 13381-4 and 8) in order to assess passive fire-protection systems to be applied on structural elements.

Such a combined assessment is required for these materials since tests performed in furnaces do not accurately represent the realities of a fire caused by hydrocarbon-based liquids or gases. This is because the effects of thermal radiation, turbulence and the forces of erosion, among other things, cannot be reproduced realistically in a furnace. Applus+ has the capacity required to undertake the analytical methodology set out in ISO 22899-2 to achieve both results. In this way, we can successfully determine the thickness of protective material required for the Jet Fire testing of profiles of differing masses and sizes.

## **Jet Fire Tests for Other Elements**

ISO 22899 also outlines the types of tests required on products and systems that are aimed at protecting a variety of a facility's constituent parts. As well as describing the assessment of structural elements, the standard outlines **the testing methodology to be used on panels and their respective protective materials, pipes and penetration seals**. This enables the methodology to be adapted to the specific requirements of particular products.