Many types of material are exothermic without exposure to an external stimulus. The internal temperature of the material can increase to the point where it begins to burn spontaneously. The resulting fire and intense heat can ignite nearby material. If not caught in time, an entire warehouse or storage area and the product contained in it can be destroyed.

Although warehouses and storage areas are equipped with fire alarms and fire-fighting systems, these systems only initiate when a fire already exists. **Thermal imaging helps to detect hot spots before a fire occurs** so that the necessary measures can be taken.

**System Solution**

Viper’s system includes FLIR thermal imaging cameras, placed in robust housings, installed in fixed positions where they have a clear field of view (FOV) of the storage area or product. These cameras capture video images in real time while constantly calculating temperature. FLIR thermal imaging cameras clearly reveal hot spots and provide precise temperature and locations of these spots. FLIR cameras are integrated with the ViperVision software to directly communicate with most industrial platform controllers. The software will analyze and compare the data against the predefined parameters, and will trigger an alarm if warranted. When an alarm occurs, personnel can verify the problem and see its exact location using the visual display. These parameters can be adjusted based on specific application needs. Defining these alarm parameters also allows ViperVision software to ignore high temperatures from objects around the region of interest that are still within the camera’s field of view (FOV). This increases the system’s dependability by reducing the number of false alarms.

Depending on the predefined temperature parameters, a thermal imaging camera will detect fire in either the incipient or smoldering stage. A smoke detector relies on smoke production to detect the developing fire, so it can only detect fire at the end of the smoldering stage or the beginning of the flame stage.
Typical Installation
The illustration is an example of Viper’s Hot Spot Detection System for Fire Prevention using FLIR A310 cameras (or any other A-series camera from FLIR). In this example, Viper’s design places cameras around the coal storage area to ensure the most complete thermal map possible. The camera’s digital data stream is connected via Ethernet, Fiber Optic cable or wirelessly to the ViperVision control system. The ViperVision software controls all camera functions, collects temperature data, displays thermal images and analyzes data.

Viper’s Hot Spot Detection Systems are designed for hazardous environments. Our thermal imaging camera enclosures are application-specific and include the appropriate purge and pressurization to protect the camera equipment. Viper Imaging provides solutions for Class I, Division I and Division II environments - as well as a variety of other industrial settings.

Key Benefits
• Improved safety for plant personnel
• Detect fires at a very early stage
• Reduced risk of product loss and damage to plant equipment
• Reliable and rugged system designed for harsh environments
• Easy integration into existing plant control system