
TUFF SS
Hot·Work Made Safe™

"TUFF as a Diamond" ™

TUFFss Negative Pressure Habitat Solution -For LNG and Refinery Maintenance

The TUFFss Negative Pressure Habitat Solution is a specialized system that provides solutions for refineries and petrochemical plants that need to perform blasting and/or coating maintenance work. Our proprietary system incorporates five different elements, which ensure productivity and protection of your assets in the safest environment possible.

The Benefits:

- Containment:
  - Site containment
  - Protect against rain/snow/wind
- Increased Productivity:
  - Longer working hours
  - Comfortable working zone
- Safer Working Environment:
  - Gas Detection
  - Automatic Safety Shutdown
  - Emergency Gas Jet Extraction

TUFF Shrink Wrap Habitat

The core element of the TUFFss Negative Pressure Habitat Solution is the *TUFF Shrink Wrap Habitat*. The main function of the Habitat is to contain grit blasting, TSA and potential gas leaks inside the work zone.

The secondary purpose is to provide protection and containment from adverse weather conditions such as sun, rain, wind and snow. This makes it possible for your crew to work in virtually any kind of weather situation.

The Habitats are erected utilizing TUFF Shrink Wrap, which provides a durable, drum tight professional solution that can withstand high winds, adverse weather conditions and chemical exposure. It is cost effective and provides UV protection for long-term usage (12 months +).

When installed by our professional installation team, the TUFF Shrink Wrap provides a drum TIGHT fit around the work zone, making sure to contain everything, including gasses. The TUFF Shrink Wrap is flame retardant up to 150 degrees Celsius/300 degrees Fahrenheit. The shrink wrap contains special additives that will self-extinguish within seconds in case it ignites.

Each Habitat will have at least two access and egress points. Therefore, we deploy the necessary number of custom made self-closing doors that allow for easy access and exits.

By utilizing our *TUFF Shrink Wrap Habitat* as a full and complete enclosure, along with our Industrial Heating and Cooling (HVAC) systems, we can ensure that the temperature and humidity are maintained so that your coating is applied per specifications as well as a comfortable working environment.

In combination with our custom built Dust Collection system, we also make sure the air has high visibility – even when doing grit blasting.

At the same time, we remove the dust/grit to a central location where it can be recycled or disposed, resulting in minimal cleanup within the Habitat.

The best advantage?

Your assets are protected. There is no work downtime due to adverse weather conditions so your project is completed on time and within budget. As an additional benefit, your workers are more comfortable, thus more productive.

TUFF Automatic Safety Shutdown

The second element is the proprietary *TUFF Automatic Safety Shutdown*. The system is designed as an emergency shutdown system that is capable of giving audio and visual warnings based on the gas sensor readings. This enables either manual shutdown or automatic termination of any work inside or outside the Habitat.

Gas sensors are placed outside the Habitat at the air intake and designated points to detect any dangerous gasses before the gasses reach the inside.

Additionally, we place the necessary number of gas sensors inside the Habitat to detect any possible gas leaks within the enclosure.

The *TUFF Automatic Safety Shutdown* is controlled by a programmable logic controller (PLC) unit, which can be placed inside or outside of the Habitat.

The TUFF Automatic Safety Shutdown monitors gasses as well as pressure. In the event there is a loss of negative pressure within the Habitat, all work is automatically shut down.

Additionally, we can also control welding, grinding, power, blasting, painting, HVAC, Dust Collection, etc. which is in use whether inside or outside the Habitat. In the event there is a detection of gasses or loss of negative pressure within the Habitat, all electrical and pneumatic equipment will be shutdown automatically.

It is also possible for our *TUFF Certified Safety Technicians* to perform a manual shutdown if deemed necessary. The *TUFF Automatic Safety Shutdown* will shut down all connected equipment. In which case, a shutdown activates the *TUFF Emergency Gas Jet Extraction*.

The TUFF Automatic Safety Shutdown controls all equipment through the use of both electrical connections and solenoid valves outside the classified exclusion zones, or pneumatic controls within the classified areas.

TUFF Emergency Gas Jet Extraction

The third element is our proprietary *TUFF Emergency Gas Jet Extraction system*. This system is based on the venturi theory, working like a jet engine. It is able to remove large amounts of air and gas in a relatively short period of time.

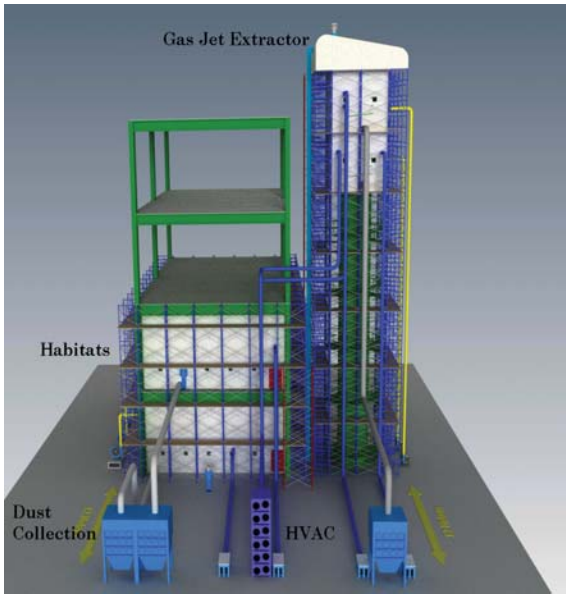
The *TUFF Emergency Gas Jet Extraction system* consists of hard ducts running from each Habitat in use to a flame arrestor mounted on a high point where it will be safe to release gasses such as hydrocarbon into the atmospheric air.

The TUFF Emergency Gas Jet Extraction system is controlled through the *TUFF Automatic Safety Shutdown* and is automatically activated in the event of gas detection inside or around the Habitat, or loss of negative pressure within.

TUFF Certified Safety Technicians

The fourth element is the *TUFF Certified Safety Technicians*. TUFF places all of their technicians through an intensive and thorough training programme to become certified Habitat & Safety Technicians.

The training teaches our technicians to understand what Hot-Work is and be professionals in all safety procedures to prevent incidents.

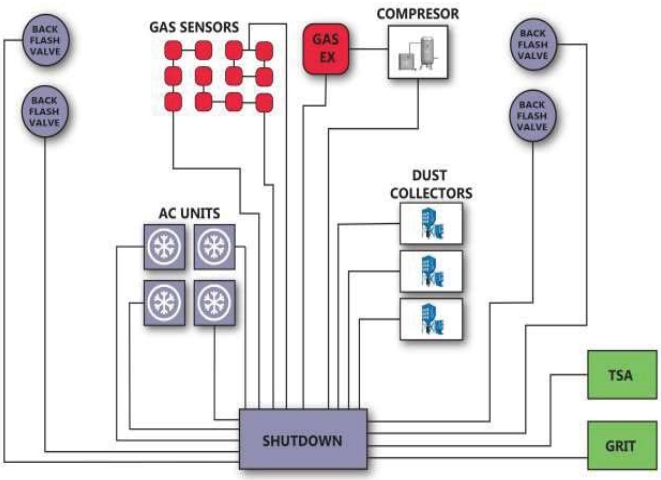


This rigorous training ensures that all of our technicians have the knowledge and experience to provide our clients with the safest optimal solutions in any situation.

Our technicians are experts in how to assemble the Habitat in the SAFEST manner, under any circumstances and in an efficient time frame.

TUFF Negative Pressure Solution

The fifth element is the *TUFF Negative Pressure Solution*. We have designed a solution that ensures continual negative pressure within the Habitat in order to contain any possible hydrocarbon leak that might happen when performing blasting of the pipes and/or vessels.



In order to provide a negative pressure atmosphere within the Habitat, we utilize a number of HVAC Units, which also provides dehumidification in tandem with our Dust Collection System.

The Dust Collection system removes air at a higher rate than is introduced by the HVAC. The pressure is constantly monitored by utilizing pressure gauges that are mounted inside the Habitat. The pressure gauges are connected to the *TUFF Automatic Safety Shutdown*.

This combined setup provides the necessary negative pressure to contain any potential leak, maintaining humidity at or below 75% at all times and a comfortable working environment.

TUFFss Nigeria Limited
Port Harcourt, Nigeria
Phone: +234-809-853-6868
E-mail: info@tuffss-nigeria.com
web: www.tuffss-nigeria.com

TUFF Safety Solutions UK Ltd. Aberdeen, UK
Phone: +44-1224-980178
E-mail: info@tuffss.co.uk
web: www.tuffss.co.uk

Roboka
The Woodlands, Texas
Phone: +1-281-724-7777
E-mail: info@roboka-services.com
web: www.roboka-services.com