VALENT APPLICATIONS

VIPER

ULTRA- PORTABLE
REMOTE CASE ENTRY SYSTEM

Sealed access, physical sampling, emptying
& backflushing in a single compact system

- Entire system weighs less than 15kg & fits in a standard rucksack.
- Sealed access, sample drain and backflush through one penetration.
- Modular configuration allows operators to optimise the equipment.
- Smart technology means fast, efficient drilling and minimal user burden.

Valent Applications is the world leader in the development and manufacture of invasive technology. Over 20 year's experience in disposing of chemical and biological weapons has produced a suite of equipment that can reduce the complexity and cost of working with CBRN devices.

Our technology is safe, fast and flexible and is relied on by military and civilian operators all over the world to deal with hazardous targets regardless of size, shape or material.



Applications:

- **Clandestine laboratory and storage container operations**
- **Obtaining physical samples for attribution or conviction purposes**
- **Sampling & Investigation of Biological, Chemical & Radiological Agents**
- **Investigation and disposal of legacy CW munitions & remnants of conflict**

Fast

Targets accessed in under 2 minutes

Valent recognise that operations involving CBRN materials are high pressure environments where the requirement to understand and neutralise a threat needs to be done as quickly as possible.

Valent systems are designed to be set up, attached and drill in a fast but safe process. Once penetrated a physical sample of the contents can be extracted and analysed in minutes



Simple

Intuitive equipment - low training burden

Although our systems involve high technology they are simple and intuitive to use. This makes life a lot easier for the operator and reduces their physical and psychological fatigue.

We offer comprehensive training and back up to ensure that all operators are completely comfortable with the equipment. All our systems have been field proven by some of worlds leading organisations in the harshest of environments.



Safe

No release of target contents

The whole concept of our equipment is to ensure that a target can be accessed, sampled and emptied without allowing leakage of the contents. Self-sealing drilling, remote operations and other safety mechanisms ensure the our technology is as safe as possible.

We have multiple systems being used in operations all over the world ensuring that CBRN hazards are destroyed, safely and efficiently.



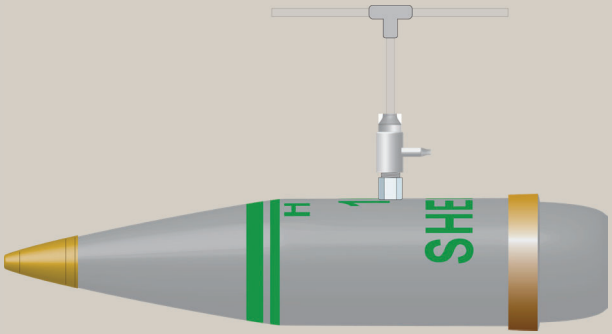
Viper Remote Access System - Emptying

Once Viper has accessed the target Valent offer the capability to extract a physical sample and/or empty/backflush the target. All operations are completed without any leakage.

Sampling is done using Valent's standard sampling syringe. This mates to the sampling port on either the mechnical head or through a sampling dipleg through the vacuum probe.

Valent's Viper Agent Transfer System (VATS) uses positive pressure or vacuum to either 'push out' the agent or 'suck in' decon solution (backflushing). This has been proven to be a more effective method than using pumps.

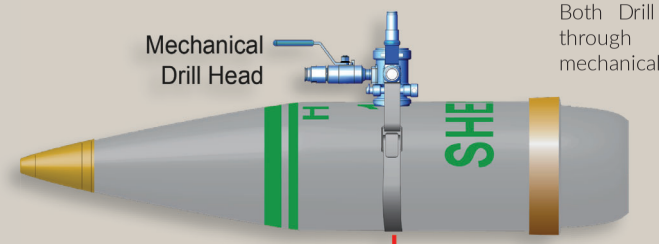
The VATS system has an agnostic output but Valent are working on two complimentary lightweight destruction technologies that are undergoing testing.





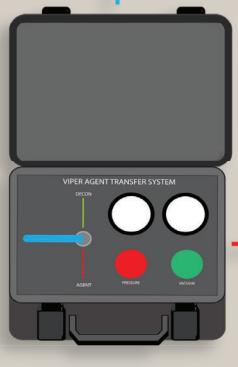
The Service Unit provides all power, air and vacuum for the VATS operation

Mechanical Drill Head



Both Drill Heads allow for emptying through the VATS system (only mechanical head shown connected)

Agent Transfer Unit



VATS is comprised of a reusable control unit and a disposable cassette. The cassette fits into the control system and is the only component exposed to agent



'Kill' Bag
Encapsulates & Destroys the Agent

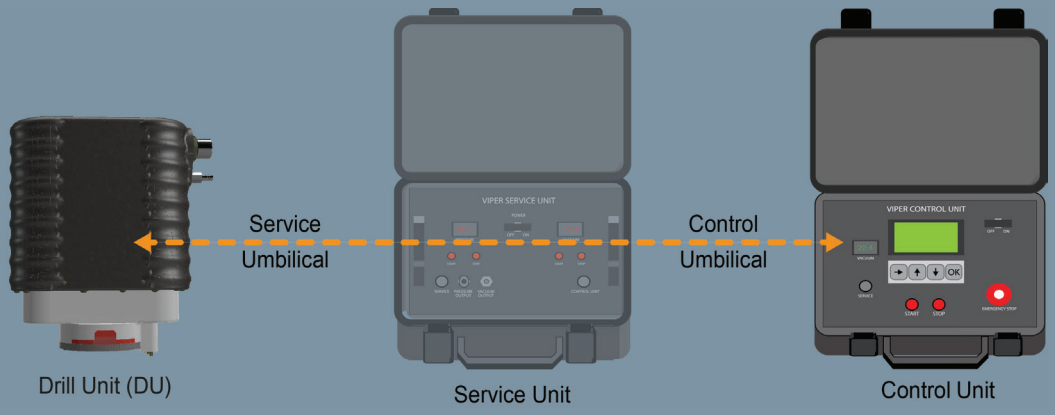


Viper was designed to have an agnostic output that can be tailored to suit an end users requirement.

Valent are working on 2 technologies that offer lightweight destruction techniques.

Valent also offer a high pressure destruction vessel that can handle pressures up to 1200psi

Viper Control:



- **Sensor communication between DU & MCU**
- **1 button operation**
- **Continuous system monitoring of the drill operation**
- **System information and drilling depth to 0.1mm**
- **Full pre-deployment Function Test**

Viper is not a dumb drilling system. A sensor package built into the Drive Unit continuously monitors the effectiveness of the drilling operation. This information is fed back to the MCU hundreds of times per second, and based on this alters downforce to keep the system working at its optimum. Plastics, stainless steel - no problem - Viper will automatically alter its drilling profile to suit. No need for the operator to intervene - push the START button and let Viper do the work. Allowing them to concentrate on the overall operation.

The MCU also provides system status, drilling depth (to 0.1mm) and sealing information via a clear LCD display. A pre-deployment test routine is incorporated into the unit which checks all the basic system functions - complete operator confidence.

Viper Sampling:

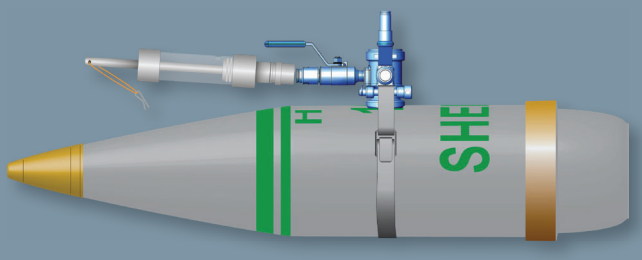


- **Sealed physical sampling**
- **Raman Spectroscopy compatible**
- **Repeat sampling**

Viper offers the ability to take repeat, leak-free physical samples of a target's contents through both Drill Head types. This is done using the standard Valent Sampling Syringe. The syringe can take up to a 10ml sample of either gas or liquid

The syringe's female connection end mates with the dry break coupler of the sampling ports on the DHs. This opens both couplers to allow up to a 10ml sample to be drawn. Once the couplers separate they seal automatically..

The body of the syringe is manufactured from a transparent, unbreakable PCTFE plastic. This allows the operator to see that a sample has been taken. It is aslo Raman transparent and has been successfully trialled with a number of common detectors. The sample can if required, be split using Valent Sample Download bottles for transport or further analysis.



Sampling Mechanical DH



Sampling Vacuum DH

Viper Remote Access System - Overview

Valent Applications is the world leader in the development and manufacture of invasive technology. Over 20 year's experience in disposing of chemical and biological weapons has produced a suite of equipment that can reduce the complexity and cost of working with CBRN devices.

Viper is our latest system, developed to offer a significant capability but in a compact, lightweight package capable of being carried in a single backpack. Valent has built on its experience to incorporate a number of advanced features to improve the efficiency & ease of use of the equipment

Drill Unit: This can run both Drill Head types. It is connected & disconnected using a simple click connector.

Sensors within the unit provide information on the drill head type and the drilling performance. Using this the MCU can drill more efficiently by optimising the downforce for different materials without any operator input.

Weight: 2.5kg

Service Umbilical: A a 5m long lead in which contains the electrical and compressed air services from the Service Unit to the DU.

It connects to the DU using a simple agnostic connection.

Weight: 2.0kg

Service Unit: All the electrical, compressed air & vacuum is supplied by this small unit. It powers both the DU & MCU.

It is powered by a COTS 18v battery which can be specified by the user if required or from an external 12v source such as a vehicle.

Weight: 4.9kg

The system has the add-on functionality of a wireless network, connecting the MCU, RCU tablet & HD camera. The MCU acts as a secure router and allows for the control of the Viper system and HD video feed from the camera.

The system has a line of sight range of approximately 100m from the MCU.

Weight: 1.56kg



Up to 100m



Mechanical Drill Head: this seals to the external circumference using either a stainless steel band clamp or ratchet strap.

- It can cope with elevated internal pressures
- Pre-test seal before drilling
- Drill into the liquid level

Weight: 0.6kg

Vacuum DH: works with a self sealing probe. It attaches using vacuum pads which require only a small area on the target surface.

- A dipleg can be inserted through the probe into the target for sampling & emptying
- The DH is reusable.

Weight: 1.0kg

An operator can control the Viper remotely using a cable link from the SU to the MCU of over 100m.

The compact cable reels come in lengths of 33m and reels can be daisy-chained together to form the required distance.

Weight: TBC

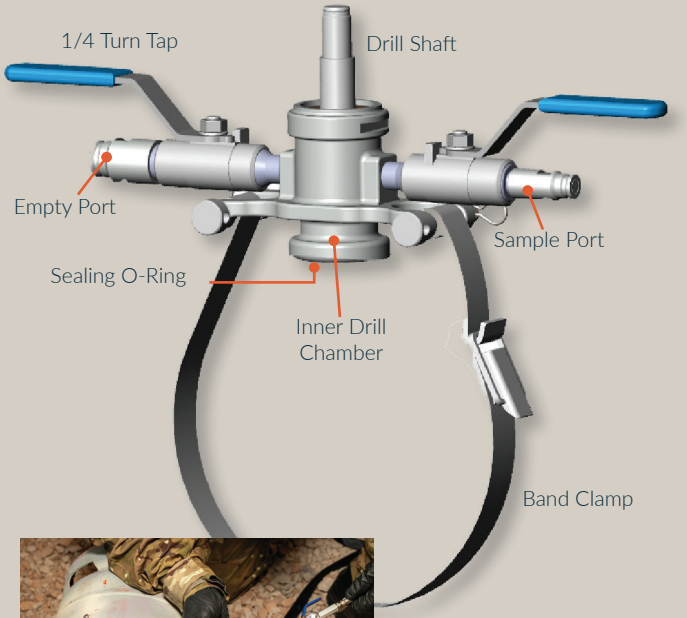
MCU: this allows the operator to control the drilling operation. It also gives system information, drilling depth and a functional test routine.

It comes in a compact peli case which also can incorporate the option wireless tablet RCU system.

Weight: 1.5kg

Viper Set Up & Drilling:

Viper offers the operator the choice of 2 different Drill Heads for maximum flexibility;



Mechanical Drill Head: This Drill Head consists of a stainless steel base with an internal 'drill chamber'.

- The chamber seats onto the target surface and seals via a chemically resistant o-ring. It is attached by either a stainelss steel band strap or ratchet strap.
- The chamber also connects to 2 ports;
    - o Sampling port: a self-sealing dry break coupler (DBC). The Valent syringe is attached to this for sampling. It can also be used to add or relieve pressure inside the target.
    - o Emptying Port: A larger DBC port through which the target contents can be emptied.
- The sampling port can also be used to test seal integrity. A special pump is used to pressurise the drill chamber once it is attached to the target. If it holds the required pressure then the seal is airtight to the tested pressure.
- This DH can also cope with elevated internal target pressures up to 200psi.
- Due to the way the DH seals to the surface the DH allows operators to drill directly into directly into the liquid level without any leakage



Mechanical DH - Pressure Test

Criteria	*Viper Specification*	*Criteria*	*Viper Specification*
Max Tgt Diameter	880mm	Min Wall Thickness	2mm
Min Tgt Diameter	120mm	Max Tgt Pressure	200psi
Max Wall Thickness	16mm	Max Flow Rate	5 l/min (CP1)

Vacuum Drill Head: This Drill Head consists of a stainless steel body with 2 integral vacuum pads attached to either side. The flexible pads can confrom to a wide range of target sizes. Disposable, closed foam vacuum seals are attached to the circumference of the pads which gives a very strong clamping force onto the target surface.

The Service Unit provides the vacuum required for attachment through the SU to DU umbilical.



- The DH is manufactured from 316 stainless steel and is designed to be reusable. It can also be deccontaminated if required.
- The DH can attach in any orientation (although Valent recommend drilling into the target ullage when possible)
- An annular drill probe is used in conjunction with this DH. The probe has internal and external chemically resistant PVDF seals. The backend is made of 316 stainless steel attached to a special profile HSS cutter front end. The probe automatically seals as it drills through the target wall.
- This system allows the target to be drilled from the top and a dipleg inserted through the probe into the liquid which can be used for sampling or emptying/backflushing.



Attaching to Target

Criteria	*Viper Specification*	*Criteria*	*Viper Specification*
Max Tgt Diameter	Flat	Min Wall Thickness	2mm (metals) 4mm (plastics)
Min Tgt Diameter	120mm	Max Tgt Pressure	80psi
Max Wall Thickness	16mm	Max Flow Rate	12 l/min (CP1)



REDUCING UNCERTAINTY

The **external walls** or shielding of any sealed vessel, such as a CBRN device, do a simple but crucial job; keeping the **hazard safely contained**.

Unfortunately they also **prevent the operator** from accessing the contents for investigation or remediation.

Operations that need to penetrate the target wall often require complex containment systems to cope with the **inevitable leakage** that occurs. This is in turn increases operator fatigue, time and costs.

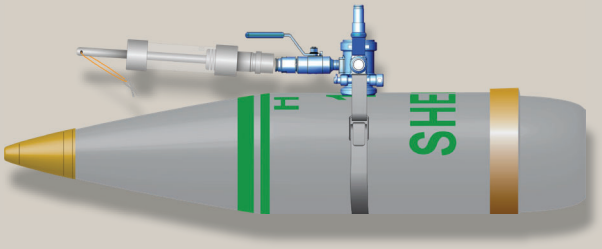
There is a better way...

Invasive technology offers the ability to penetrate a vessel wall without allowing the contents to escape. The equipment is capable of allowing sealed access through most common CBRN Devices, munitions & storage containers

Sealed Solutions

Valent invasive equipment is designed to create a gas tight seal either by the insertion of a self-sealing probe which penetrates the target casing or a sealed chamber on the target surface. It can deal with a wide range of materials including metal and plastics over a considerable range of wall thickness.

Once installed the systems give fully sealed access for sampling, extraction and in-situ neutralisation of the contents. This can be repeated as often as required. Power can be either electric, hydraulic or compressed air.



Safer – through invasive technology

Valent Applications invent, develop and manufacture specialist equipment for the investigation and remediation of toxic hazards found in defence and civilian sectors.

Our equipment is used in CBRN, HAZMAT and decommissioning operations across the globe.

We love to develop new solutions for specific needs.

Scan the QR code to get in touch

VALENT APPLICATIONS

Further Information:

To find out more please contact Valent Applications Ltd for full case studies and a portfolio of invasive technology

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