STOPKiT® VESSEL

ONLINE LEAK SEALING SOLUTION FOR EMERGENCY TANK AND PRESSURE VESSEL REPAIR
From -20°C (-4°F) to +80°C (+176°F)

OIL & GAS ONSHORE /OFFSHORE

TECHNICAL DATA SHEET

STOPKiT® VESSEL DESCRIPTION

Considered as an emergency repair, STOPKiT® VESSEL is a stop leak solution for pressure vessel and tank. It is the most efficient repair system applicable under pressure. This unique and revolutionary concept, patented by 3X ENGINEERING (3X), allows to fix high pressure leaks by tightening. Installation can be done without shutting down the line pressure.

Different sizes of STOPKiT® VESSEL are proposed to be suitable with tank/pressure vessel diameters from 58'' to 138'' (1.5m to 3.5m diameter).

STOPKiT® VESSEL technology is suitable for various applications and environments. It can be used for several fluids (oil, gas, water…) according to the strap and the technical patch (special applications on demand). STOPKiT® VESSEL is available for: Onshore and Offshore environment.

STOPKiT® VESSEL product can be used from –20°C to +80°C (-4°F to + 176°F).

Pressure up to 30 bars (435 psi) can be stopped for hole diameter inferior to 40 mm. STOPKiT® VESSEL can fix leaks for most hole shapes.

STOPKiT® VESSEL is a product without special specifications for the storage. STOPKiT® VESSEL is lightweight and does not add any mechanical stress to the tank. It is sold in ready-to-use kit.

The tank/pressure vessel surface must be without sharp edges, but the system can be applied on irregularity like welding wire or corrosion cankers, so it's the best system to repair damaged and leaking tank/pressure vessel.

To ensure the effectiveness of the STOPKiT® VESSEL technology, the product must be properly installed. STOPKiT® VESSEL installers must be trained by an authorized 3X Trainer. 3X Company and its agents should be contracted for all non-standard repairs.

STOPKiT® VESSEL FEATURES

USES

- Suitable on vertical/horizontal tank, pressure vessel
- Compatible with most common fluids and gas
- Stop leak up to 30 bars (435 psi)
- Hole diameter up to 40 mm
- Diameter from 1.5m to 3.5 m (58'' to 138'')
- Temperature from –20°C to +80°C (-4°F to + 176°F)

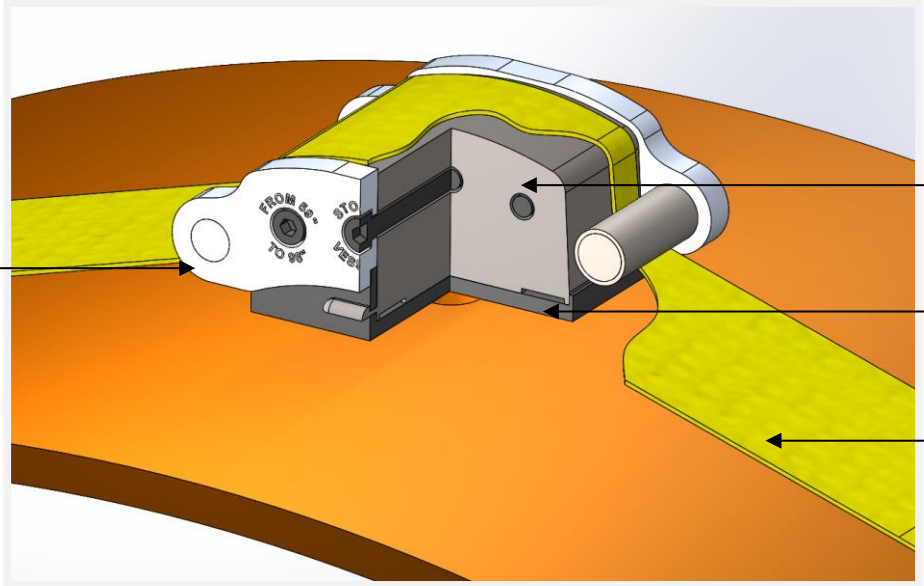
BENEFITS

- Installation in less than 10 minutes (2 persons)
- Light product
- No additional load on tank/pressure vessel
- Online sealing / No shutdown required
- Easy to store product
- Shelf-life: 5 years

STOPKiT® VESSEL CONCEPT

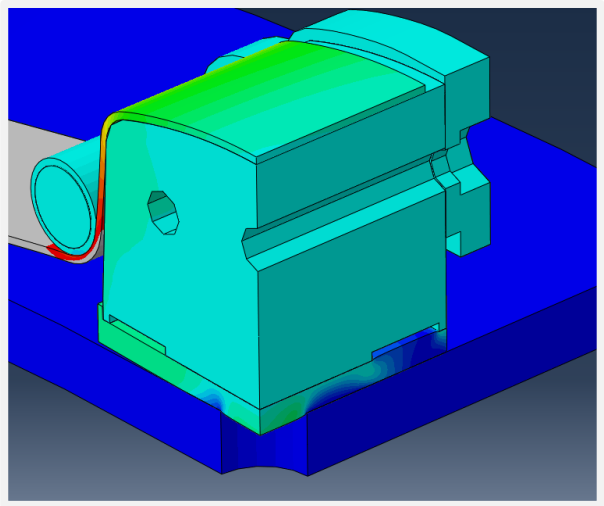
The system operates by concentrating all the needed stress in the tank at the defect location. The hoop stress needed to stop the leak is brought by the technical strap and the screws. The high-performance fibers of the strap are temperature and stress resistant.

STOPKiT® VESSEL patented concept:

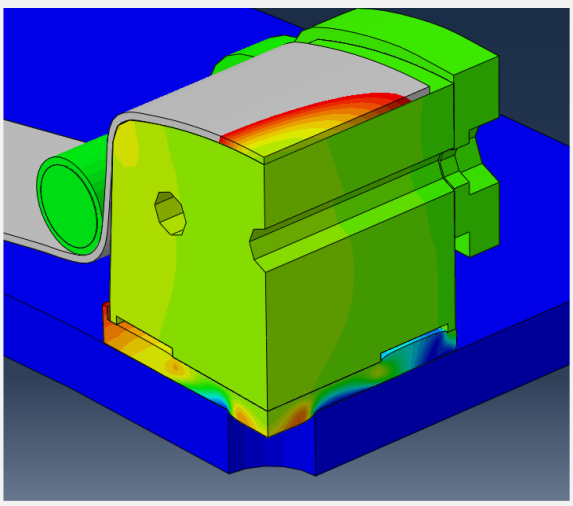


When the screws are tightened, the strap transfers the strain to the technical rubber patch in order to get the imperviousness. In fact, tightening the screws will induce a tension force in the belt, and this will perform the radial force on the leak point via the applicator. The applicator increases the pressure locally as a stress concentrator, on the sealing pad.

STOPKiT® VESSEL FEA study:



BEFORE TIGHTENING: LEAKING DEFECT



AFTER TIGHTENING: LEAK SEALED

STOPKiT® VESSEL COMPOSITION

STOPKiT® VESSEL is made of:

- 1 belt + tightening system (ratchet strap and screws)
- 1 rubber Patch 100mmx100mm
- 1 torque wrench
- 2 positioners and 1 centerer
- 5 additional patches
- 1 White marker
- 6 magnets and tightening system for vertical tank (strip + magnets)
- 1 protective canvas large dimension (for the belt + tightening system)
- Installation procedure

Depending on tank diameter, the length of belt is subject to change. Do not modify the composition of the STOPKiT® VESSEL for quality purpose. Do not try to adapt a STOPKiT® VESSEL on another tank / pressure vessel diameter than mentioned on the packaging.

STOPKiT® VESSEL versions can be used in most environments: Onshore and Offshore. Because the environment is more aggressive in offshore conditions, the composition of the belt and the tightening system is slightly different to make it more resistant.

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TECHNICAL SPECIFICATIONS FOR STOPKiT® VESSEL ONSHORE (2.5m & 3.5m)

STOPKiT® VESSEL ONSHORE version is dedicated for onshore environment such as refinery or inland tank.

The color of the belt is yellow.

DENOMINATION	STOPKiT® VESSEL 2.5	STOPKiT® VESSEL 3.5
USE	ONSHORE ENVIRONMENT – EMERGENCY REPAIR	
TANK DIAMETER	From 1.5m to 2.5m (58'' to 98')'	From 2.5m to 3.5m (99'' to 138'')
MIN. TEMPERATURE	-20°C / -4°F	
MAX. TEMPERATURE	+80°C / +176°F	
PATCH SIZE	100mm x 100mm	
MAXIMUM DEFECT SIZE	Ø≤ 40mm	
MAXIMUM PRESSURE	30 bars / 435 psi	

TECHNICAL SPECIFICATIONS FOR STOPKiT® VESSEL OFFSHORE (2.5m & 3.5m)

STOPKiT® VESSEL OFFSHORE version is dedicated for offshore environment such as platform in harsh environment. The belt of this STOPKiT® VESSEL is not only lighter and more flexible but is also very resistant to water/sea water. It will improve the long-term product efficiency. The color of the belt is red.

DENOMINATION	STOPKiT® VESSEL 2.5	STOPKiT® VESSEL 3.5
USE	OFFSHORE ENVIRONMENT – EMERGENCY REPAIR	
TANK DIAMETER	From 1.5m to 2.5m (58'' to 98')'	From 2.5m to 3.5m (99'' to 138'')
MIN. TEMPERATURE	-20°C / -4°F	
MAX. TEMPERATURE	+80°C / +176°F	
PATCH SIZE	100mm x 100mm	
MAXIMUM DEFECT SIZE	Ø≤ 40mm	
MAXIMUM PRESSURE	30 bars / 435 psi	

MATERIAL SPECIFICATIONS

Part	Material
Belt	PES / aramid
Nuts	ISO 4035 04 CLASS – Zinc plated
Screws	Black 12.9 STEEL
Washer	A1 Stainless Steel
O-ring spacer	Nitrile
E bar	CS 42CD4 + Zinc-Nickel
S bar	CS 42CD4 + Zinc-Nickel
Applicator	ABS
Flanges	AU4G / Stainless Steel
Screws	A2 Stainless Steel
Shouldered bars	S235 JR
Tube	304L Stainless Steel
Patch	HNBR
Ratchet	Steel zinc
Anti-friction sleeve	LDPE

CORROSION RESISTANT

Metallic material parts are corrosion resistant.

Elastomeric spacers are positioned to avoid the contact between metallic parts and the surface of the tank.

A specific grease is used to lubricate the threads to ensure an easy bolting to the necessary torque.

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CHEMICAL RESISTANCE

CHEMICAL	STOPKIT PATCH		CHEMICAL	STOPKIT PATCH
Acetic Acid	C		Hydrogen, Gas	A
Acetone	U		Iso-Butane	A
Acetylene Gas	A		Jet Fuel JP3	A
Aerozene 50 (50%Hydrazine, 50% UDMH)	U		Jet Fuel JP4	A
Alcohol (Methanol)	B		Jet Fuel JP5	A
Aluminum Hydroxide Solution	A		Jet Fuel JP6	A
Amines, primary (such as Methyl, Ethyl, Propyl)	U		JP3 (Fuel)	A
Ammonia (gas)	A		JP4 (Fuel)	A
Ammonia (liquid)	B		JP5 (Fuel)	A
Argon Gas	A		JP6 (Fuel)	A
Aromatic Fuels (up to 50% Aromatic)	A		JPX (Fuel)	A
Aromatic Hydrocarbons (100% Aromatic)	U		Kerosene	A
Asphalt, Emulsion	B		Machinery Oil (mineral)	A
ASTM Test Fuel A	A		Methane	A
ASTM Test Fuel B	A		Methanol	B
ASTM Test Fuel C	B		Mineral Oil	A/B
ASTM-Oil IRM 902	A		Muriatic Acid (HCl), diluted	B
ASTM-Oil IRM 903	A		Natural Gas	A
ASTM-Oil No.1	A		Neon Gas	A
ATM-Brake Fluid (Glycol based)	U		Nitrogen Gas	A
Automatic-Transmission Fluid	A		Octane	B
Automotive Gasoline	A		Olefin, crude	A
Battery Acid (Sulfuric Acid diluted)	U		Oleic Acid	A
Benzine (Gasoline)	A		Paraffin	A
Benzine 80/Benzene 20	B		Paraffin Oil	A
Benzol (Benzene)	U		Petroleum	A
Brake Fluids (based on mineraloil)	A		Petroleum Ether	A
Butane	A		Phenol	U
Chloric Acid	U		Phosphoric Acid 45%	B
Citric Acid	A		Potassium Hydroxide (Solution 50%)	B
Copper Sulfate (Blue Vitriol) Solution	A		Potassium Hypochlorite (Javelle water)	B
Crude Oil	B		Propane	A
Cyclohexane	A		Propanol	B
Diesel Fuel	A		2-Propanone (Acetone)	U
Diesel Oil	A		Sea Water	A
Domestic Fuel Oils	A		Silcone grease	A
Ethane	A		Silicone Oil	A
Ethylene Glycol	A		Silver Nitrate	B
Freon 11	A		Sodium Bicarbonate Solution	A
Freon 112	B		Sodium Chloride (Common Salt)	A
Gas Oil	A		Sodium Hydroxide, Caustic Soda	B
Gasoline/Alcohol Mix	B		Sulfur Dioxide (SO2)	U
Gasoline, 130 Octane	A		Sulfur Hexafluoride (SF6)	B
Gasoline, aromatic	A		Sulfuric Acid, diluted	B
Gasoline, Ethyl and Regular	A		Toluene (Toluol)	U
Gasoline, Refined	A		Transformer Oil	B
Gasoline, Sour	A		Waste Gas (cont. Carbon Dioxide)	A
Gasoline, with Mercaptan	A		Waste Gas (cont. Carbon Monoxide)	A
Generator Gas	A		Waste Gas (cont. Hydrogen Chloride)	B
Glycerol	A		Waste Gas (cont. Hydrogen Fluoride)	A
HEF-3	B		Waste Gas (cont. Sulfur Dioxide)	B
Helium Gas	A		Waste Gas (cont. Sulfuric Acid)	U
Heptane	A		Water to +80 °C / +176 °F	B
Hydrochlorique Acid (Muriatic Acid) 37%	U			

A Very good suitability and resistance. Elastomer shows little or no effectfromexposure. Littleeffect on performance and physical properties.

B Good suitability. Some effects from exposure with some loss of physical properties. Some chemical swelling

C Limited suitability. Significantswell and loss of physicalpropertiesafterexposure. Additional tests shouldbedone.

U The elastomer is unsuitable for application in this media.

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APPLICATION NOTES

REQUIRED TOOLS

The following tools are required for STOPKiT® VESSEL installation:

- Rags and acetone
- Personal Protective Equipment

INSTRUCTION

STOPKiT® VESSEL must be used only by trained and certified applicators.
Contact us for training. certificate.

USE

STOPKiT® VESSEL is reusable by changing the patch. All the components of the STOPKiT® VESSEL can be purchased separately.

SHELF-LIFE

5 years after manufacturing date mentioned on packaging (dd/mm/yy).

SAFETY

Each applicator should read and understand the Installation Procedure before to use 3X products. Before intervention, Hazards and measures must be assessed accurately to ensure the safety of installation and applicators (tank temperature, fluid or gas exposure, environment contamination...). Make sure the applicators wear appropriate PPE before leak sealing in accordance with risk assessment (chemical protective apparel, face shield, chemical or heat resistant gloves).

WARRANTY DISCLAIMER

Every reasonable effort is made to ensure the technical information and recommendations of this data sheet are true and accurate to the best of our knowledge at the date of issuance. However, improvements being continuously implemented to 3X products, this information is subject to change without notice. Please contact your 3X Distributor for the last updated product specifications. This 3X technical datasheet warrants the quality of this product when used according to directions. User shall determine suitability of the product for use and assumes all risk.

3X ENGINEERING
INNOVATIVE REPAIR SOLUTIONS FOR YOUR INSTALLATIONS