PROOPERATOR

HIGH PRESSURE CLEANING PROTECTION
UP TO 500 BAR

TST®

SAVING LIVES

OUR MISSION: SAVING LIVES

Our customers are not like other customers. At least their jobs aren't. Our customers' workplaces are often the complete opposite of a nice and cosy office, with a pleasant indoor climate, a comfortable office chair to sit on and coffee within arm's reach. Our customers spend their working days on oil platforms, alongside roads, in ports and in heavy industry. Often the environments are full of risks and the jobs are demanding, sometimes even highly dangerous.

Our mission is to make sure that they come home to their loved ones – every day. This is our reason for being and this is what drives us to go to work every morning. We're not sure if safety is in our genes or if it's developed because of Scandinavia's harsh climate, but safety has always been important in Sweden. Perhaps this is most evident in Swedish industry, which includes Volvo with its safe cars and Autoliv, the world's leading automotive safety supplier.

TST Sweden's motto is saving lives. This is not only our duty, it also makes us feel good. It would be difficult to find anything more meaningful to spend our time on.

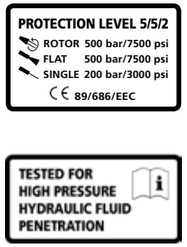
Jörgen Lillieroth, Founder and Managing Director, TST Sweden

PROOPERATOR

Until now there has been no adequate protection for High Pressure Cleaning or Hydraulic fluid leakage, and certainly not certified for High Visibility. Nothing that has been adapted to the power of today's equipment or user demands for comfort and functionality. Our experience from waterjetting with very high pressures (up to 3000 bar), and other types of personal protective equipment, has been the basis for this line of clothing. ProOperator - High Pressure Cleaning and Hydraulic Fluid Protection.

AREAS WITH PROTECTION

Striped fabric clearly identifies protected areas and the labels tell the level of protection. As high pressure cleaning and hydraulic fluid leakage is very dangerous, it is essential that the operator knows where and what he or she is protected for.



CERTIFICATION

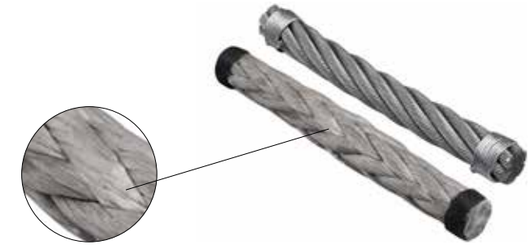
All of our protective products are CE-labelled.
We are also certified in accordance with ISO 9001:2015 and ISO 14001:2015 – important tools for ensuring the quality of our products and our work to lay the foundation for positive environmental development.

WATERPROOF

Outer material in a 2 layer laminate withstands water and dirt more effectively. This keeps the operator dryer and lighter, and the clothing is easy to clean. Several products also have waterproof zippers with overlapping flaps. Excellent for the toughest conditions!

THE STRONGEST FIBER IN THE WORLD!

Dyneema® is the world's strongest fiber (15 times stronger than steel on a weight for weight basis). This makes it possible to offer high levels of protection against waterjetting hazards even with lightweight fabric.



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HIGH VISIBILITY - EN ISO 20471:2013

There is a growing demand for High Visibility Personal Protective Equipment and therefore TST decided to develop and certify a series of clothes for that purpose. All the good protective qualities and functional details from the regular ProOperator products were kept, and the High Visibility details required were added. The result is extremely functional clothes, with excellent comfort! The great looks is a pleasant side effect - High Visibility High Pressure Cleaning and Hydraulic Fluid Protection.

IT'S ALL IN THE DETAILS

Thoughtful details are often the difference between good and excellence. We know that by working closely with the users.

Reinforcements on the knees / pockets for knee pads.

Openable ventilation in the armpits.

Pocket for ID card on the right sleeve.

Detachable hood with three adjustment possibilities and room for head protection.

JACKET WITH HOOD

2-layer functional jacket which is CE certified for protection against High Pressure Cleaning and tested for high pressure hydraulic fluid. Very smooth and flexible to wear. Lined for high comfort. Water- and dirt repellant outside. Thoughtful details as openable ventilation in the armpits, comfortable cuffs and adjustable spacious hood.

- Lined for highest comfort
- Waist adjustable with drawstrings
- Inside pocket with zipper
- Special pocket for phone
- Protection on the entire front and head
- Waterproof zippers with overlapping flaps
- Pocket for ID card on the right sleeve

SIZES	XS–3XL
ART. NO.	5622025 5000
WEIGHT	1.6 KG / 3.5 LBS. (SIZE L)

HIGH VISIBILITY

SIZES	XS–3XL
ART. NO.	5622025 5690
WEIGHT	1.6 KG / 3.5 LBS. (SIZE L)

TROUSERS

Adjustable elastical waist for perfect fit. Practical details such as knife pocket, leg pocket and dual loops for belt. Zippers down on the legs allows them to widen to facilitate donning the boots.

- Protection on the whole front
- Detachable braces (included)
- Leg pocket with waterproof zipper on left leg
- Pockets for knee pads
- Reinforcements on the knees
- Knife pocket on right leg
- Waterproof zippers with overlapping flap

SIZES	XS–3XL
ART. NO.	5632025 5000
WEIGHT	1.3 KG / 2.9 LBS. (SIZE L)

HIGH VISIBILITY

SIZES	XS–3XL
ART. NO.	5632025 5690
WEIGHT	1.3 KG / 2.9 LBS. (SIZE L)

OVERALL WITH HOOD

Excellent for the toughest conditions! Lined for high comfort. Water- and dirt repellant outside. Openable ventilation in the armpits, waterproof cuffs, adjustable hood,

- Lined for high comfort
- Inside pocket with zipper
- Special pocket for phone
- Protection on the entire front and head
- Elastical back waist
- Zippers at the bottom of the legs
- Knife pocket on right leg
- Pockets for knee pads
- Pocket for ID card on the right sleeve
- Reinforcements on the knees

HIGH VISIBILITY

3

STORLEKAR	XS–3XL
ART. NO.	5640025 5000
WEIGHT	2.5 KG / 5.5 LBS. (SIZE L)

STORLEKAR	XS–3XL
ART. NO.	5640025 5690
WEIGHT	2.6 KG / 5.7 LBS. (SIZE L)

VEST HIGH VISIBILITY

2

Comfortable vest with protection on both the front and the back. Water- and dirt repellant outside.

- Protection all around the Vest
- Good for warm environments
- Special pocket for phone

STORLEKAR	S–3XL
ART. NO.	5620025 5690
VIKT	1 KG / 2.2 LBS. (SIZE L)

APRON

The full area of the Apron has built-in protection. Good alternative in warm environments. The Apron is equipped with a new, cleverly designed shoulderband which improves the comfort of the operator. Properly adjusted, it distributes the weight extremely good. Easy to put on and take off.

SIZES	ONE SIZE
ART. NO.	5623025 5000
WEIGHT	0.8 KG / 1.8 LBS.

ARM PROTECTIONS

The Arm Protections have built in protection all the way round the arm, from the wrist to the upper arm. Elastic cuffs in both ends for easy donning and good fit. Developed and recommended for personnel working at test rigs for hydraulics. Tested to withstand high pressure hydraulic fluid according to the table on page 18. Sold in pairs.

SIZES	XS/M, L/2XL
LENGTH	XS/M: 40 CM L/2XL 50 CM
ART. NO.	5602025 5000
WEIGHT	0.35 KG / 0.8 LBS.

HEAD PROTECTION 20/30

Supplied with carrying bag

Helmet with Visor and Hearing Protectors. All parts are tested and certified for protection against liquids with pressure up to 3000 bar / 43500 psi. Helmet also meets the requirements for Industrial safety helmets. The interior is comfortable and can be adjusted to a very good fit.
The Visor meets the requirements for Eye protection. It is replaceable and can be set in folded up position.
Hearing Protectors are classified. They can be adjusted vertically and set in different positions against the head, for optimal protection and fit. A 3-point chin strap is supplied in the Head Protection kit.

SIZES	ART. NO.
ONE SIZE. 52-64	51K02168 90

TEST RESULTS FOR HEAD PROTECTION

The different levels of protection have been determined by CE-testing according to the table below.
Note! Different values (pressure, water flow, nozzle, distance, speed) can give significantly different results!

TECHNICAL DESCRIPTION

- The Head Protection is made of fiberglass reinforced polyamide
- Temperature range -30° to +150°
- Recommended life span 3-5 years

CE-marking, approved according to:

- Industrial safety helmets: SS-EN397:2012
- Eye protection: SS-EN166:2001
- Hearing Protection: SS-EN 352-3:2002

Protection level	Pressure bar (psi)	Flow l/min (gpm)	Nozzles		RPM	Distance mm (in.)	Linear Speed m/s (in./sec)	Result
			n	Dia. mm (in.)				
20/30	2000 (30000)	17.9 (4.7)	1	0.8 (.031)	-	75 (3)	0.5 (20)	NO PENETRATION
20/30	3000 (43500)	19.5 (5.2)	2	0.6 (.024)	3000	75 (3)	0.5 (20)	NO PENETRATION

PARTS CAN BE ORDERED SEPARATELY

HELMET	HEARING PROTECTION	VISOR HOLDER	VISOR (PACK OF 10)	CHIN STRAP
ART. NO.	ART. NO.	ART. NO.	ART. NO.	ART. NO.
5102168 5000	5105168 5000	5103168 5000	5104P10068	5102190 5000

PROTECTIVE GLOVES 500 BAR

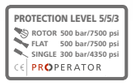
Waterproof Gloves with protection for up to 500 bar pressure. The Gloves have a rough, sand patterned surface and the material itself provides lots of friction, all for the best grip. Separate inner gloves in nylon for good comfort. The Gloves have also been tested and classified with the highest values for cut protection and for abrasion, tear, and puncture. Outside is dipped in nitrile rubber. Shelf life up to 3 years. Certified in accordance with the CE directive. The Gloves do not withstand high pressure hydraulic fluid.
Supplied in 12-pack.

SIZES	ART. NO.
9, 11	5600025 5000

PROOPERATOR BOOTS 500 BAR

Protective and waterproof Boots CE-certified for pressurized liquids and tested for high pressure hydraulic fluid up to 500 bar / 7500 psi pressure! The Boots are profesionally designed for hours and hours of hard work. Completely vulcanized rubber with reinforcement to withstand pressurized liquids on the foot (black parts.) Also fitted with steel toecap and steels inserts to withstand sharp objects from under. Textile inner lining for good comfort. The sole is designed for good grip. If extra grip is needed, eg in winter, it can be fitted with spikes. The boot shaft can be tightened with an adjustable strap. Sold in pairs.

SIZES	EUR 36–48
ART. NO.	5652025 5000



Note: Boots 500 withstands 300 bar / 4350 psi nozzle.

HOSE PROTECTION / SHROUD

The lance is held near vital parts of the body and hoses break, often near couplings and connections like on the lance.
Be safer with a Hose Protection/Shroud. The Hose Protection/ Shroud provides effective protection for the operator!
It has been tested for 500 bar / 7500 psi. An adjustable strap holds the Hose Protection/Shroud securely in place.
The Hose Protection/Shroud is very smooth and flexible.

HOSE PROTECTION Ø 41mm / 1.6 in.	
Length	Art. No.
750 mm/2.5 ft.	5660045 5920
1400 mm/4.6 ft.	5660045 5940

TST SPECIAL GREASE REMOVER

Grease Remover, specially formulated for TST clothing. Mixed with water and applied to the soiled garment with a brush.

SIZES	ART. NO.
0.5 LITRE	5092000 5010
2.5 LITRE	5092000 5020

PROOPERATOR OVERVIEW

NOTES

JACKET WITH HOOD

SIZES	XS–3XL
ART. NO.	5622025 5000

TROUSERS

SIZES	XS–3XL
ART. NO.	5632025 5000

OVERALL WITH HOOD

SIZES	XS–3XL
ART. NO.	5640025 5000

APRON

SIZES	ONE SIZE
ART. NO.	5623025 5000

JACKET WITH HOOD HIGH VISIBILITY

SIZES	XS–3XL
ART. NO.	5622025 5690

TROUSERS HIGH VISIBILITY

SIZES	XS–3XL
ART. NO.	5632025 5690

OVERALL WITH HOOD HIGH VISIBILITY

SIZES	XS–3XL
ART. NO.	5640025 5690

VEST HIGH VISIBILITY

SIZES	XS–3XL
ART. NO.	5620025 5690

ARM PROTECTIONS

SIZES	XS/M, L/2XL
ART. NO.	5602025 5000

HEAD PROTECTION 20/30

SIZES	ONE SIZE. 52-64
ART. NO.	51K02168 90

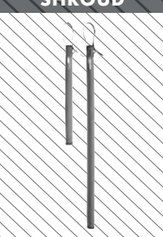
PROTECTIVE GLOVES 500 BAR

SIZES	9, 11
ART. NO.	5600025 5000

PROOPERATOR BOOTS 500 BAR

SIZES	EUR 36–48
ART. NO.	5652025 5000

HOSE PROTECTION / SHROUD



SIZES	ART. NO.
750 MM	5660045 5920
1400 MM	5660045 5940

TST SPECIAL GREASE REMOVER

SIZES	ART. NO.
0.5 L	5092000 5010
2.5 L	5092000 5020

PROTECTION UP TO 500 BAR/7500 PSI

TECHNICAL DESCRIPTION

Outer material: Coated for water- and dirt repellancy. Inner material: Polyester mesh. Protective material: Special fabric containing Dyneema® fiber. Seams are taped. Approved according to the directive 89/686/EEC.

TEST RESULTS – PROTECTION LEVELS CLOTHING

The different levels of protection have been determined by testing according to the table below. In High Pressure Cleaning mainly three types of nozzles/jets are used – 1 rotor, flat and single. The safety levels have been chosen to cover the most common working situations and to verify the quality of clothing and protective qualities. *Note! Different values (for example pressure, flow, nozzle, distance or speed) can give significantly different results!*

PROTECTION LEVEL 5/5/2
ROTOR 500 bar/7500 psi
FLAT 500 bar/7500 psi
SINGLE 200 bar/3000 psi
CE 89/686/EEC

Protection level	Pressure bar (psi)	Flow l/min (gpm)	Nozzle type	Distance (mm)	Speed (m/s)	Result
5/5/2	500 (7500)	16,9	Rotor - 1 Rotor jet	75	0,5	No penetration
5/5/2	500 (7500)	16,9	Flat - Single fan jet 15°	75	0,5	No penetration
5/5/2	200 (3000)	10,7	Single - Single round jet	75	0,5	No penetration

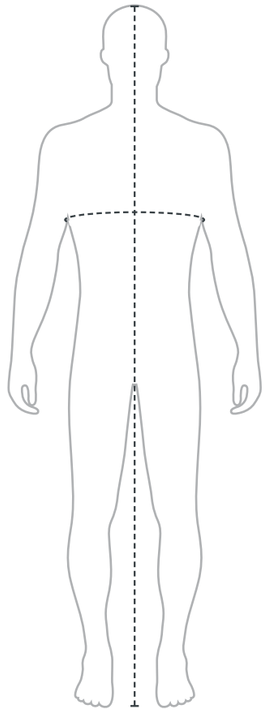
TEST RESULTS – HYDRAULIC FLUID

The different levels of protection against hydraulic fluid have been determined by testing according to the table below. The smallest Sapphire nozzle, only 0,15 mm, has been used to simulate a so called pin burst. The safety levels have been chosen to cover the most common working situations and to verify the quality of clothing and protective qualities. *Note! Different values (pressure, flow, burst size, distance, speed) can give significantly different results!*

TESTED FOR HIGH PRESSURE HYDRAULIC FLUID PENETRATION

Pressure bar (psi)	Nozzle type	Distance (mm)	Speed (m/s)	Break-through time (s)
250 (3750)	0,15 mm Sapphire - pin	5	0	> 60 s
350 (5100)	0,15 mm Sapphire - pin	5	0	35 s
500 (7500)	0,15 mm Sapphire - pin	5	0	4 s

SIZING TABLES / WASHING INSTRUCTIONS



HEIGHT

CHEST
Measure the circumference of your chest at its widest point.

SIZES (MENS)

Jacket Trousers Overall	Height cm (ft. in.)	Chest cm (in.)
XS	160-167 (5'3"-5'6")	84 (33")
S	168-175 (5'6"-5'9")	92 (36")
M	176-180 (5'9"-5'11")	100 (39")
L	181-186 (5'11"-6'1")	108 (43")
XL	187-192 (6'2"-6'4")	116 (46")
2XL	193-200 (6'4"-6'7")	124 (49")
3XL	201-206 (6'7"-6'9")	132 (52")

CONVERSION TABLE SHOE SIZES (MENS)

EUR	US	UK
36	4	3
37	5	4
38	5 1/5	4 1/2
39	6 1/2	5 1/2
40	7 1/2	6 1/2
41	8 1/2	7 1/2
42	9	8
43	10	9 1/2
44	10 1/2	10
45	11 1/2	10 1/2
46	12	11
47	13	12
48	14	13

CARE AND WASH INSTRUCTIONS

Zippers and hook&loops are sensitive for dirt and shall always be kept clean. Clothes can be hand washed with brush and TST Grease Remover or a soap solution. Allow to dry in a well ventilated area. Do not expose the garments to diesel or other solvents. Store the garments dry and not in direct sunlight.

Hand wash. Water temperature not above 40°C or 105°F

Do not tumble dry

Do not bleach

Do not dryclean

Do not iron

OUR VALUES

TRUSTWORTHINESS

Through our actions and our products we shall instil a high level of confidence in our customers, suppliers and business partners.

LONG-TERM APPROACH

In our internal and external relationships, we shall be considered a long-term partner. Our products shall be developed and marketed with a long-term profile, where we want to see customers and suppliers staying with us year after year.

DEVELOPMENTAL

By continuously developing our products and working on innovative new solutions, we will bring products to the market that are of the highest class. Collaborations with universities and suppliers at the forefront of textile materials and treatments are a matter of course for us.

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