



Personal Protective Equipment (PPE)



Rofi AS is based in Molde, Norway and has a history that goes back to 1914. In 1985, we became ROFI and started the journey to who and what we are today.

In the mid 1980's, we introduced the first tents, which today form a wide product range from traditional family tents to large tents for hospitals, accommodation, and many other purposes. Today we do tents based on metallic frames as well as inflating technology for rapid deployment. We have 35 years of practice in customizing our tents to fit the needs of the people living and working under difficult conditions, optimizing the work efficiency, comfort, and safety.

In the late 1980's we developed the first edition of body armor and mid 90's our first deminer vests and aprons. We have been cooperating with some of the world's leading demining organizations and are privileged in being a preferred supplier and partner of protection solutions to UN agencies, NGOs, and defense customers.

Beginning with January 2017 ROFI as is part of LANCO Group GmbH, a group of companies headquartered in Hannover, Germany and one of the main suppliers of rapid deployment mobile shelters - either inflatable or rigid frame ones, collective protection systems, decontamination systems and ballistics and demining individual protection equipment. The Group's 200+ employees carry out their activity in Germany, Italy, Romania, France, and Norway, in more than 200.000 square feet of production, administrative and warehouse spaces.

Throughout the past 35 years we have deployed our products in more than 60 countries worldwide and are proud to give our contribution in protecting people working and living under demanding conditions. This is why we have chosen "Protecting People" as our vision.

Our company is ISO 9001 certified and in 2023 we will also be ISO 14001 certified as a separate unit of the LANCO Group.



Experience and technical capacity

1995 Developed our first specially made protective vest for demining in cooperation with Håvard Bach at NPA in Angola, and we therefore named the model NPA vest. The vest had just frontal protection and accordingly very light compared with the vests that had been used until then. We also managed to design a unique protection over the shoulders, that several of our competitors have tried to copy during the years.



1996 Developed a vest for MGM (Menschen Gegen Minen) in Angola. The model was a continuation of the design of the NPA vest but with some specially made pockets and straps, and in orange color.



1997 Developed a vest in co-operation with NPA In Mozambique. The Velcro band around the waist was replaced with a band with snap locks, The vest got two collars and a specially designed "butterfly" protection for the groin.

1999 Developed an apron that we named Fender in co-operation with Danish Demining Group for use in Afghanistan. The design of the Apron was made in such way that it could be used in squatting position in steep hills, as well in upraised position when using a metal detector. The Apron was full scale tested by MAPA (United Nations) in Afghanistan with PNM mines and based upon these results we were chosen as the sole supplier of Aprons to the UN in Afghanistan. We have delivered more than 5000 units of the Fender Apron to Afghanistan and Sri Lanka.



2001 Developed vests solutions for DanChurchAid in Eritrea. The models were a continuation of the NPA vest, were we also made models with half back and full back protection. The vests were named Ravelin OB, HPB and PB.



2005 We were invited by Design Without Borders to take part in a development project named Re-thinking Protection, Design for Humanitarian Demining. They had received 1 mill. NOK in funds from Innovation Norway to develop the next generation of PPE, to make the manual demining more secure and effective by use of better and more comfortable PPE.

In this project we got the pleasure of working with representatives from NPA, GICHD, SINTEF, Norwegian Defense Research Establishment (FFI), various consultants and designers, and from this we learned a lot about ergonomics and psychological impact on the body such as sweat and external heat and how this affects concentration and performance.

The development took more than 2 years, and the result was a vest we named Armadillo and the Face Mask, due to its overlapping design. In our opinion, this is still the most comfortable PPE for demining in the market, and for this we have been awarded several international design awards.



reddot design award
winner 2008



product
design
award
2008



material
award
2008 gold



HONOURS AWARD FOR DESIGN EXCELLENCE
NORWEGIAN DESIGN COUNCIL



DESIGNPRISEN

2014 Developed the Ravelin MKII in cooperation with NPA. They wanted to have one model that could be used in all their demining programs. The model is a combination of the design from the Ravelin and the Armadillo. The vest has a hip belt to carry most of the weight and one large collar for improved protection and ventilation. The model fits well with both the face mask and the full-face visor.



2017 Developed the Lorica Vest in co-operation with NPA. The model is developed for being used in EOD clearance and during a potential evacuation of staff. It's made in protection level IIIA but can be upgraded to level IV by adding ceramic plates.



2022 Developed a bullet proof vest for ICRC, that they named Brynja. This model is made to protect humanitarian workers in conflict areas. The vest is in protection level IIIA with the possibility to increase the protection level to IV by adding ceramic plates. The vest is in just 3 sizes for easy logistics



Further References

Norwegian People's Aid
DanChurchAid
Danish Refugee Council
The Swedish Civil Contingencies Agency
The Tajikistan Mine Action Center
Afghan Technical Consultants
Fondation Suisse de Déminage
Organization for Mine Clearance and Afghan Rehabilitation
The International Committee of the Red Cross
Organization for Security and Co-operation in Europe
United Nations Mine Action Service
UNMHA
APOPO
HAMAP-Humanitaire
Handicap International
Among other.



Testing of PPE

We have performed several tests of our PPE for demining during the years, both outdoor live testing and in laboratories. In addition, we have received accident reports from clients that prove that our equipment is in accordance with IMAS 10.30.

In 2000 we performed several test in Kandahar in Afghanistan in co-operation with MAPA (United Nations) and ATC Afghan Tech. In the test we used live PMN mines triggered by remotely controlled detonators.



2007 test in Zimbabwe



2007 Laboratory testing of Face Mask at TNO in the Netherlands



2016 Test at CROMAC in Croatia



ctro d.o.o.
CENTAR ZA TESTIRANJE, RAZVOJ I OBUKU
CENTRE FOR TESTING, DEVELOPMENT AND TRAINING

45011-HAA
ROFI

Ref. No: 106-03-02/16-05
Zagreb, 7th June 2016

CONFIRMATION OF TRIAL RESULTS

For
ROFI FACEMASK WITH VISOR

Testing of which was ordered by ROFI AS, Gammelseterlia 23, NO-6422 MOLDE, NORWAY

Resilience of the personal protective equipment **ROFI FACEMASK WITH VISOR** against the blast of anti-personnel mines, type **PMA-1**, was tested on 12th May 2016 by the Croatian Mine Action Centre – Centre for Testing, Development and Training Ltd. (HCR-CTRO d.o.o.) at the test site Cerovac, Croatia, in line with the IMAS 10.30, Safety & Occupational Health – Personal protective equipment (PPE), in the context of PPE requirements, especially in the context of the Article 4.3 – “the Minimum PPE requirement”.

The trial was conducted with PMA-1 mines, which contain 200 g of TNT.

The following conclusions were drawn based on the trial results:

- 1 The ROFI FaceMask can withstand a blast of an anti-personnel mine PMA-1.
- 2 The visor used as an integral part of the ROFI FaceMask can withstand a blast of an anti-personnel mine PMA-1
- 3 The visor used as an integral part of the ROFI FaceMask did not crack upon the blast of anti-personnel mines PMA-1

Nikola Pavković, M.A.
Director

STANAG 2920 tests from Beshussamt Mellrichstadt and raw material suppliers

Beschussamt Mellrichstadt

Lohstraße 5, D-97638 Mellrichstadt
Tel.: 09776/70500, Fax: 09776/5457

Rofi AS
Gammelseterlia 23
N-6422 Molde

Test Report

Determination of the V-50 ballistic limit for body protection material according to STANAG 2920.

Report-no. : 16V022F01#, to order-no.: 8006
Test date : 03.02.2016
Tester : Volkheimer, Edelman

Applicant : Rofi AS
Manufacturer : Cato Composite Innovation
Sample : test specimen, Art. 61945
Part-no. : -6-

The V-50 ballistic limit is determined by the average of an equal number of highest partial penetration velocities and the lowest complete penetration velocities which occur within a specified velocity spread.



Bötsch

Mellrichstadt, 08.02.2016

The test results relate only to the tested samples described in this test report.
This test report loses its validity, if any alteration or modification to the manufacturing process, materials and/or quality management system could impact the product conformity.
This test report is only valid with the correspondence of the report numbers on all pages and with the official seal.
Duplication in extracts of this report is only allowed with written approval of the Beschussamt Mellrichstadt.

—SAATI

World Headquarters

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Ballistic test report

Product: STY 4363 WRT (Heracon fiber)
Layers: 15
Test date: 11/03/2022
Dimension: 400 x 400 cm
Method: STANAG 2920 / V50 test
Pack condition: DRY
Bullet type: 17 grains FSP
Shooting distance: 3.5 m
Backing: Aluminum plate
Temperature: 23°C Humidity: 60%

MEASURES

Shot	Speed (m/s)	Perforation	Angle (°)
1	479,7	Partial	0
2	495,1	Partial	0
3	505,2	Complete	0
4	498,1	Complete	0
5	495,6	Partial	0
6	503,8	Complete	0
7	490,6	Partial	0
8	501,0	Complete	0

RESULTS of TEST

Average Speed: 498.4 m/s
V50 Speed: 484.9 m/s

Test laboratories:

Beshussamt Mellrichstadt

The Bavarian Weights and Measures Office is divided into the Weights and Measures Offices in Mellrichstadt and Munich. Established initially in 1955 in Munich, in 1981, the current Beschussamt was put into operation on the northern outskirts of Mellrichstadt. Since then, in addition to the sovereign activities of weapons, ammunition and firearms testing for the civilian sector, a wide variety of attack-resistant protective materials have been tested.

In order to increase the testing capacities and to ensure an even higher safety standard, a completely new building was constructed for the Mellrichstadt firearms testing office between 2012 and 2016, which was opened on September 22, 2016 by the then Bavarian Minister of Economic Affairs, Ilse Aigner.

Due to qualified employees, special testing facilities, high quality requirements and professional competence, as well as due to its neutrality and independence as part of a state authority, the Beschussamt Mellrichstadt enjoys a very high reputation both nationally and internationally.

The test rooms are specially designed to meet the high demands of ballistic and mechanical testing. A multitude of custom-built test equipment according to specially created requirements can be found alongside common measuring and testing technology. The Beschussamt Mellrichstadt carries out weapons, firecracker, and ammunition testing as well as material testing.

The Beschussamt Mellrichstadt works closely with national and international authorities, police and security forces, the military, small and medium-sized arms manufacturers/importers, developers, and manufacturers from the field of attack-resistant materials, as well as sport shooters and hunters.

TNO Laboratory for ballistics research

For more than 70 years, TNO has worked on innovations that protect those who protect us. The new center offers state-of-the-art facilities that will enable us to take that development well into the future. In the Ballistics Test Facility, the latest in large- and small-calibre firepower – and the materials that protect against them – can be carefully studied and analyzed. With the position that ‘the best defense is mostly a strong offense’, it is a key objective to ensure that Dutch and NATO troops have the firepower they need to defend against adversaries in the most effective way possible.

We also aim to ensure that they wear the most advanced and effective gear to protect themselves from the opposing firepower. Making these materials stronger, lighter and more effective are among the primary goals. The Test Facility lab has been retrofitted with the latest equipment, including diagnostic and measurement technology that allows for better, more accurate analysis.

Quality and Environmental Management Systems

LANCO Group GmbH has all subsidiaries ISO certified and ROFlas is ISO 9001:2015 certified for the scope development, manufacturing, and distribution of tents with aluminum frame, steel frame or inflatable frame and ready-made products of technical textiles and decontamination systems. (Annex no. 1).

LANCO Group is also fully committed to the protection of the environment and has sustainability policies in place across all its subsidiaries and supply chains. (Annex no. 2) The group's main manufacturing unit is LANCO SRL from Romania and this was the first subsidiary to undergo the process of certification in compliance with ISO 14001:2015 (Annex no. 3). Rofi AS is currently in the process of accreditation which should be finalized within maximum 7 months.

Our vest and aprons for demining are made up from materials that are recyclable.

The vests and aprons are packed in LLDPE (Linear Low-Density Polyethylene) bags that are recyclable, and then into environmentally friendly cartons from Peterson Packaging [Bærekraft \(vpkgroup.com\)](http://Bærekraft (vpkgroup.com)).

All the aramid waist from our production is sent for recycling to:

YF International b.v

Burg. van Dorth tot Medlerstr. 34

6921 AZ Duiven Netherlands

All other waist from the production is delivered to the local recycling depot in Molde, Norway.

Production capacity

All our vests and aprons are designed, developed, and made in Norway. Last year we delivered more than 1300 vests and aprons, and this year we estimate that the quantity will increase to 1700. Our normal production capacity is approx. 50 vests/aprons per week.

Our Face Mask are manufactured in the Netherlands, and our Full-face visors are made by our partner Security Devices in Zimbabwe. The visors are handmade and, in our opinion, the best visors for demining in the market. Last year we delivered approx. 900 visors and this year we estimate to deliver 1400. Their production capacity is approx. 100 visors per week.

Export licenses

All body protection for demining is subject to export restrictions. Our company is responsible for applying for export licenses from The Norwegian Ministry of Foreign Affairs. The process for getting a license normally takes 2-3 weeks.



Protective vests/Aprons for Demining

RAVELIN MKI

Open back (OB), half protected back (HPB), protected back (PB)

The Ravelin Vest is designed, and field tested through use in demining programs in various climates and conditions. The design facilitates protection for the deminer when in upright position operating the metal detector, as well as in both squatting and kneeling position during prodding. The design secures the best possible comfort and protection to the user during operations.



- The protective clothing consists of a vest unit covering the front, abdomen, sides, shoulders, neck and back.
- The design allows optimum shoulder mobility without reducing the protection.
- The second collar functioning as connection between the clothing and the visor and is designed to make sure that the visor protecting the face in blast situations, avoiding the visor being blasted out of position.
- The lower part of the vest is designed to protect the arteries in torso and groin areas.
- The lower part of the vest has a “butterfly” design to ensure best possible mobility, and at the same time protecting the arteries.
- The ballistic inserts of the vest is easy to remove/ replace
- The outer cover can be washed in a washing machine at 40°C.

Specific characteristics:

Protective Level:	V ₅₀ 450 m/s STANAG 2920/ 1,1 g FSP
Ballistic Suppression:	Aramid fibre, water repellent
Outer Cover, replaceable:	Water resistant, PU-coated nylon, weight 230 g/ m ²



RAVELIN MKII

Open back (OB), protected back (PB)

The Ravelin MKII Vest is designed in cooperation with Norwegian Peoples Aid and field tested in Lebanon. The design facilitates protection for the deminer when in upright position operating the metal detector, as well as in both squatting and kneeling position during prodding. The design secures the best possible comfort and protection to the user during operations.



- The protective clothing consists of a vest unit covering the front, abdomen, sides, shoulders and neck, and a collar functioning as connection between the clothing and a visor or a Face Mask.
- The vest has a padded hip belt with a quick release buckle, which is designed to carry the main weight of the vest and accordingly reduce the weight on the shoulders.
- The backside of the vest is covered with a standoff liner, for increased ventilation and comfort.
- The lower part of the vest is designed to protect the arteries in torso and groin areas.
- The lower part of the vest has a “butterfly” design to ensure best possible mobility, and at the same time protecting the arteries.
- The design allows optimum shoulder mobility without reducing the protection.
- The ballistic inserts of the vest is easy to remove/ replace
- The outer cover can be washed in a washing machine at 40°C.

Specific characteristics

Protective Level:	V ₅₀ 450 m/s STANAG 2920/ 1,1 g FSP
Ballistic Suppression:	Aramid fibre, water repellent
Outer Cover, replaceable:	Water resistant, PU-coated nylon, weight 230 g/ m ²



OB front



OB back



PB front



PB back

ARMADILLO

Vest, Panty

The Armadillo Vest is designed in cooperation with Designers Without Borders and Kode Design.

The design facilitates protection for the deminer when in upright position operating the metal detector, as well as in both squatting and kneeling position during prodding. The design secures the best possible comfort and protection to the user during operations.



- The protective clothing is made in two parts, for optimal weight distribution and freedom of movement.
- The vest covering the front, abdomen, sides, shoulders and neck, and a collar functioning as connection between the clothing and Face Mask or a visor.
- The vest has a padded hip belt with a quick release buckle, which is designed to carry the main weight of the vest and accordingly reduce the weight on the shoulders.
- The backside of the vest is covered with a standoff liner, for increased ventilation and comfort.
- The lower part of the vest is designed to protect the arteries in torso and groin areas.
- The lower part of the vest has a “butterfly” design to ensure best possible mobility, and at the same time protecting the arteries.
- The design allows optimum shoulder mobility without reducing the protection.
- The ballistic inserts of the vest is easy to remove/ replace
- The outer cover can be washed in a washing machine at 40°C.
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Specific characteristics:

Protective Level:	V ₅₀ 450 m/s STANAG 2920/ 1,1 g FSP
Ballistic Suppression:	Aramid fibre, water repellent
Outer Cover, replaceable:	Water resistant, PU-coated nylon, weight 230 g/ m ²

Vest



Panty



Facial Protection for Demining

FACE MASK

ROFI Face Mask is now offered in a new improved design featuring a sun cap for increased comfort and working conditions.



- The main benefits of ROFI Face Mask are:
- Low weight
- Effective ventilation of exhaled air
- Visor is much closer to the eyes, reducing transparent area by 80% , reducing glare, irritation due to scratches and distortion
- Adjustable in size – one size fits all
- Direct ventilation of breath (heat, moisture and CO2)
- Protects face against the sun
- Reflects radiated heat
- Optical component protected and easily replaceable
- Protection level V50 335 m/sec. on the main part of and V50 250 m/sec. STANAG 2920 on the visor

FULL FACE VISOR

The visor with headband is made from 5 mm untreated polycarbonate and meet the IMAS 10.30 requirements.

The visors have a protection level of V50 of 250 m/s, according to STANAG 2920.

The weight of the Visors including protective bag is approximately 1 kg.

The Visor protective area is approximately 1222 cm².

Primary features

- The straps on the headframe are adjustable, therefore the Visor can fit any head size.
- The Visor is fitted with a removable washable sweatband, making it more comfortable to wear.
- The Visor has a replaceable scratch shield in 1 mm polycarbonate, which protects it during use, transportation, and storage.
- The scratch shield is cheaply and easily replaced when necessary.
- The design of the headframe allows maximum cooling and airflow to enhance comfort.



PLATINUM FULL FACE VISOR

The visor with headband is made from 5 mm untreated polycarbonate and meet the IMAS 10.30 requirements.

The visors have a protection level of V50 of 250 m/s, according to STANAG 2920.

The weight of the Visors including protective bag is approximately 1 kg.

The Visor protective area is approximately 1250 cm².

Primary features

- The straps on the comfort headframe are adjustable, therefore the Visor can fit any head size.
- The Visor is fitted with a removable washable sweatband, making it more comfortable to wear.
- The Visor has a replaceable scratch shield in 0,7 mm polycarbonate, which protects it during use, transportation, and storage.
- The scratch shield is cheaply and easily replaced when necessary.
- The design of the headframe allows maximum cooling and airflow to enhance comfort.



GOGGLE Bolle X1000 standard

This is a low-profile ballistic goggle that protects your eyes. The glasses have a completely unique ventilation system that guarantees very good anti-fog technology, and the glasses are made to withstand extremely high heat.

These splinter-proof glasses are approved in relation to military protection standards. They have a ballistic resistance (STANAG 2920 standard) which is approved by NATO and below you will find more information certification. The glasses also have an anti-fog and anti-scratch coating and are of course replaceable.

Clear glass: STANAG 2920: 795 km/h - 220.7 m/s. ANSIZ87.1-2010 GL-PD-10-12

Strap: Width: 35mm Anti-slip technology - Good for use in combination with a helmet, Easy to detach

Microfiber protection around the strap

In the box: 1xX1000 glasses with clear glass 1 x case



Ballistic vests

LORICA

The Lorica splinter- and bullet proof vest, is designed for multipurpose use. The vest can be used for demining, BAC, EOD clearance as well as a bullet proof vest. The Lorica Vest is designed for maximum comfort and has a waist belt for better weight distribution. Protection level in accordance with NIJ 0101.03 level IIIA as standard. The ROFI Lorica vest is suitable to both male and female users. The vest model is adjustable at the shoulders and waist for best possible comfort.

ROFI Lorica ballistic vests provide maximum protection and comfort, fitted with both front and back neck collar, and pelvic protector. The vest is equipped with pockets for upgrading ceramic inserts. Individual adjustments are possible at shoulder and waist for increased comfort to the user.



Key features:

- Adjustable to size, high comfort level
- Large protection areas
- With pockets in front and back, for ceramic inserts
- Protecting front, back, neck, shoulders, and groin
- High comfort with optimal weight distribution
- Possible upgrade of protection level IV by insert of ceramic plates.
- Washable outer cover

CONTENDER

The Contender bullet proof vest is designed to give the best possible user comfort and protection. The vest has a tight fit with flexible straps for maximum comfort for the user. The vest is delivered in protection level IIIA as standard and can be upgraded to level IV by use of ceramic plates.

Key features:

- Adjustable to size
- High comfort level
- Good protection area
- Protection level of choice
- With pockets in the front and back for ceramic inserts
- Pelvic protector.
- Washable outer cover



Accessories

BALLISTIC HELMET

PASGT helmet in protection level NIJ. Std. 01.01.06 level IIIA



KNEE PADS

For protection of knees during field work



ELBOW PADS

For protection of elbows during field work



SURFIRE EP3 Sonic Defender

Stops harmful sound levels without disturbing normal sounds.

Comfortable fit.



CARRY BAGS

For carrying and storing protective equipment

Can be delivered in various sizes.

