

UFF

UKRAINIAN FREEDOM FUND



**DURING CRISIS, VOLUNTEERS
ARE THE LIFEBLOOD OF A NATION**

PLEASE, DONATE TODAY AT
[HTTPS://UKRFREEDOMFUND.ORG](https://ukrfreedomfund.org)

SUPPORT UKRAINE'S LOCAL PRODUCTION OF BODY ARMOR!

The **Ukrainian Ministry of Defense (MoD)** is in urgent need of 300,000 body armor vests and yet worldwide supply of them is dwindling while prices abroad for body armor are rising above \$550/unit. Many of these vests are needed for Ukraine's **Territorial Defense Forces (TDF)**, which is the military reserve component of the Armed Forces of Ukraine.

The **Ukrainian Freedom Fund (UFF)** is committed to provide much needed protective equipment to Ukraine's TDF. The UFF has teamed with the **Lviv Defense Cluster (LDC)** to meet this need. If well-funded, the LDC will be able to fill a large portion of the government's request for 300,000 vests far more quickly than the current global supply chain - and at **up to a 60% cost savings!**

FUNDRAISING

THE FUNDRAISING GOAL FOR THE NEXT 6 WEEKS IS \$16 MILLION = 100,000 VESTS for the Ukrainian defender = \$160/VEST

All costs are for the procurement of the material.

The staff producing vests and managing production are volunteering their efforts and are not receiving any portion of the donations. **The vests will be provided to the Ukrainian MoD for free.** The Ukrainian MoD will provide a list of specific units and a priority level to LDC, and LDC will distribute the vests directly to those units. Should a donor have a specific unit that they would like to fund, please contact UFF for more information.

HOW CASH DONATIONS WILL BE DEPLOYED

As of March 22, LDC has enough fabric and steel to produce ~15,000 vests, which will allow production through April 5th.

Future donations will go towards maintaining continuous weekly deliveries of 1 weeks' worth of both fabric and steel inventory, which will cost about **\$250,000** and **\$850,000 USD**, respectively. Doing so will allow LDC to establish a minimum steady-state production rate of **15,000 vests/week**.

[CLICK HERE](#) TO MAKE A TAX-DEDUCTIBLE DONATION!

If you have any questions, please reach out to Nico directly at nico@ukrfreedomfund.org

ABOUT THE PROGRAM'S STAKEHOLDERS

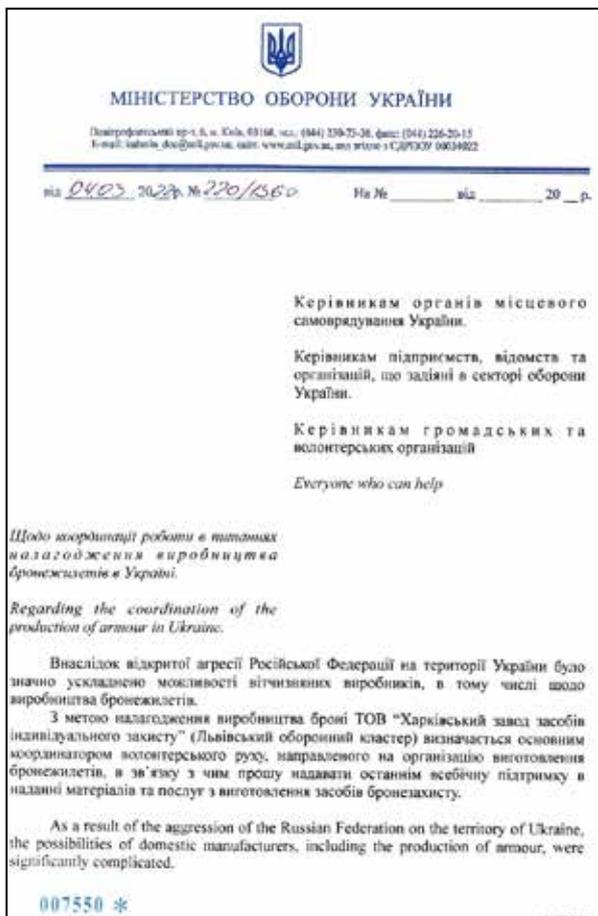
The Ukrainian Freedom Fund (UFF) – <https://ukrfreedomfund.org/>) is a group of Ukrainian and American volunteers. Its mission is to help create a free, independent and democratic Ukraine where Ukrainians and people of other nationalities will have the right to freely associate and express their will in an open civil society free from corruption.

UFF is able to achieve its mission through the collection of donations from people all over the world who care about the development of a free Ukraine and the preservation of human dignity. UFF attempts to satisfy specific needs where efforts of other charities are absent or insufficient such as the case with providing equipment to Ukraine's Territorial Defense Forces(TDF).

The Territorial Defense Forces (TDF) is the military reserve component of the Armed Forces of Ukraine, formed in 2014 at the onset of the War in Donbas, and consists of an organized, civilian guard that fights to protect individual cities. When war broke out on February 24, 2022, the TDF ballooned from 100,000 to over 200,000 volunteers. This commitment of Ukraine's citizenry is to be commended, though it has left the TDF with no supply to equip them with basic protection such as body armor. To that end, UFF is committed to provide much needed protective equipment to Ukraine's TDF

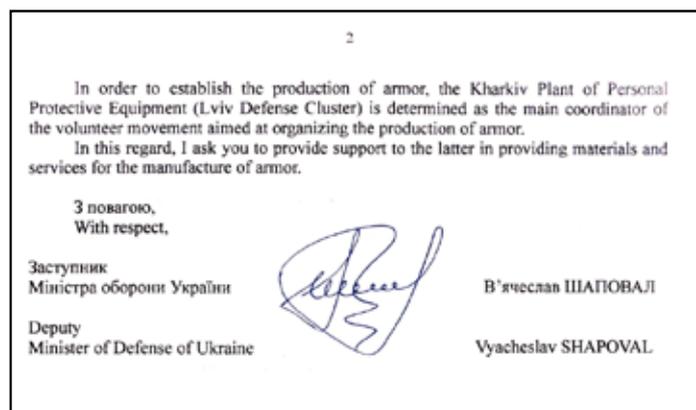
The Lviv Defense Cluster (LDC), a Ukrainian-based NGO, was created early in the war to bring together a body armor manufacture, steel cutters, and sewing fabrication plant with the purpose of providing superior quality body armor, quickly and cheaply to Ukrainian defenders.

LDC is led by Rarog.TM, a body armor manufacturer of 8 years based in Kharkiv, Ukraine but who relocated their team on the first day of the Russian invasion.



During the first two weeks of the war, Rarog assembled a collection of companies to form the LDC.

LDC has been authorized by Ukrainian Deputy Minister of Defense Shapoval to lead this volunteer movement aimed at organizing the production of armor.



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PRODUCTION PROCESS AND SITE VISIT

On March 14, a UFF member¹ personally toured LDC's entire production line. Every part of the manufacturing chain from the vest fabrication/sewing to the plate cutting/testing exists and is in full operation.

STEEL CUTTING AND TESTING

The production line is split into two: sewing of vests, and cutting/testing steel plates. We tested the current lot of 2.5T of steel following local testing criteria² and it showed sufficient protection.³



Left: 5 hits of 5.45x39 7n10 (common to AK-74), Right: 5 hits of 7.62x54 LPS (common to Dragunov rifle and PKM machine gun)

FABRIC VEST PRODUCTION



Our UFF member walked the vest fabrication production line where they are on track to have the capacity to produce 7800 vests within 4 weeks (more if overtime/surge production is authorized). The fabrication process uses elements of lean operations to ensure that it can scale in the coming weeks.

¹ Nico Woods is a U.S. navy veteran and certified nuclear engineer from the U.S. Department of Energy. He graduated last summer with his MBA from Stanford University and moved to Ukraine in February. At the beginning of the war, he joined UFF to help challenges in the humanitarian supply chain for Ukraine.

² Testing procedure was in accordance with State Standards of Ukraine [DSTU 8782:2018](#) where level 4 is the minimum protection required to stop the 5.45- and 7.62-mm rounds currently employed by the Russian military.

³ This batch met standards but was not certified because the State Standards of Ukraine was not conducting certifications. However, they have resumed and future steel orders will be certified to at least level 4 protection.

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BODY ARMOR PRODUCTION RATE

The completed body armor vest weighs about 7 kg. Currently, the bottleneck on both sides of the manufacturing chain is due to low raw material inventory. If there were enough raw material, LDC would have the capacity to produce:

By March 21: 2000 vests/day

By March 28: 3000 vests/day

By April 5: 5000+ vests/day

STEEL INFORMATION SHEET FOR BODY ARMOR MANUFACTURING IN UKRAINE

Procuring steel necessary for body armor production will become the bottleneck in the manufacturing process. **Steel procurement is a priority now!**

The following are commercial steel brands requested, in order of priority:

1. Armox 600, thickness from 5.5-8 mm
2. Armox 550, thickness 6.5-8 mm
3. Armox 500, thickness 7-8 mm
4. Miilux 600, thickness 6-8 mm
5. Miilux 550, thickness 7-8 mm
6. Miilux 500, thickness 7.5-8 mm
7. Hardox 600, thickness from 6-8 mm
8. Hardox 550, thickness from 7-8 mm
9. Hardox 500, thickness 7.5-8 mm
10. Ramor 500 thickness 7.5-8 mm
11. Ramor 550 thickness 6.5-8 mm
12. Ramor 600 thickness 6-8 mm
13. AMRSTAL 500 thickness 7.5-8 mm
14. AMRSTAL 550 thickness 6.5-8 mm
15. AMRSTAL 600 thickness 6-8 mm
16. RAEX 500 thickness 7.5-8 mm
17. RAEX 550 thickness 6.5-8 mm
18. RAEX 600 thickness 6-8 mm
19. MARS 500 thickness 7.5-8 mm
20. MARS 550 thickness 6.5-8 mm
21. MARS 600 thickness 6-8 mm

Producers: SSAB (Armox, Hardox, Ramor); Miilux; AMRSTAL; Raex; Arcelor Mittal (Mars)

**NOTE* the minimum thickness requirement will be different from Armox 600. If the steel manufacturer can model the "layering" technique used by Armox then, 5.5mm is suitable. If not, then the steel must be at least 8mm*

MECHANICAL PROPERTIES

Hardness (HBW): 570 – 640

Charpy-V⁴ 10x10 mm test specimen⁵ Minimum: 12 J / -40 C

Mechanical Testing

Brinell hardness test according to EN ISO 6506-1 on each heat treatment individual.

Charpy impact test according to EN ISO 148 on each heat and thicknesses from 6 mm.

Ultrasonic Testing

According to EN ISO 10 160 Class E3S3

Surface Properties

According to EN 10 163-2 Class B Subclass 3.

Shape

Tolerances according to EN 10 029.

Flatness

More restrictive than EN 10 029 Class N (steel type L).

Chemical Composition (ladle analysis)

C *) (max %)	Si *) (max %)	Mn *) (max %)	P (max %)	S (max %)	Cr *) (max %)	Ni *) (max %)	Mo *) (max %)	B *) (max %)
0.47	0.70	1.00	0.010	0.003	1.5	3.00	0.7	0.005

**) The steel is grain-refined. Intentional alloying elements.*

4 Average of three tests. Transverse to rolling direction. Single value min. 70% of specified average.

5 For plate thicknesses under 12 mm sub-size Charpy-V specimen are used. The specified minimum value is then proportional to the specimen cross-section.

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