



Estonian Business and Innovation
Agency

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Letter of support on technology developed by Kerogen OÜ within the framework of RUP application

The Ministry of Defence expresses its support in the technological advancements developed within the Kerox IV: Pilot for Strategic Chemical Production from Kerogen project. This initiative, led by Kerogen OÜ in collaboration with Tallinn University of Technology, focuses on scaling and validating a controlled oxidation process for converting kerogen, the organic component of oil shale, into high-value dicarboxylic acids (DCAs).

DCAs are essential feedstocks for plasticizer production, including in critical defence applications such as C-4-type plastic explosives, which typically consist of 90% RDX-type explosive and 10% plasticizer. They are also used to synthesize energetic plasticizers and binders for propellant and explosive formulations, improving the stability, flexibility, and shelf-life of energetic materials — key factors for the safety and reliability of ammunition, missiles, and solid rocket fuels. The biodegradability and low toxicity of certain DCAs also make them attractive for modern formulations that prioritize environmental safety and reduced hazardous residue on the battlefield. Additionally, DCAs are key precursors in the manufacture of high-performance polymers such as nylons, polyesters, and polyurethanes, which are widely used in defence applications including ballistic fabrics, parachutes, armour, and military vehicle components.

The Kerox initiative strengthens regional economic independence and supply security by utilizing raw materials sourced entirely within the European Union to produce crucial chemical intermediates for the defence sector. Local production of DCA-based plasticizers will strengthen Estonia's supply chain resilience, reduce reliance on external suppliers and align with NATO's objectives for increased regional defence preparedness. This initiative directly supports Estonia's national defence industry strategy and aligns with the government's broader efforts to establish a domestic explosives production capability. In June 2025, the state-owned company Hexest Materials AS was established to produce RDX-type explosive demonstrating Estonia's strategic focus on local production of a key component for munitions industry and improving domestic supply chains.

We fully support the Kerox initiative and are committed to fostering collaboration within Estonia's defence sector to advance the development of technologies for military applications—particularly in establishing domestic explosives and ammunition production capabilities. We welcome the opportunity to engage in strategic cooperation and discussions on the industrial-

scale implementation of this technology and its integration into defence industry supply chains.

Yours sincerely,
/signed digitally/

Siim Sukles
Undersecretary for Defence Industry and Innovation