DuPont Comments Regarding NMP Risk Management Proposal, 12/6/23

DuPont, a global multi-industrial company, delivers sustainable solutions to solve some of the world's most pressing challenges. DuPont is committed to ensuring the safety and health of our employees, contractors, customers, and communities while protecting the planet. As an industrial company, DuPont uses n-Methylpyrrolidone (NMP) in various ways including:

1. *A solvent in polymerization* (CoU: "Processing: as a reactant or intermediate in plastic material and resin manufacturing and other non-incorporative processing")
2. *A solvent in industrial formulations* used in adhesives and the semiconductor industry (CoU: "Processing: incorporation into a formulation, mixture or reaction product in multiple industrial sectors")
    - With end-user CoUs:
        - "Industrial and commercial use in adhesives and sealants including binding agents, single component glues and adhesives, including lubricant adhesives, and two-component glues and adhesives including some resins"
        - "Industrial and commercial use in paint additives and coating additives not described by other codes in computer and electronic product manufacturing for use in semiconductor manufacturing"
3. *A solvent in industrial cleaning operations* (CoUs: "Industrial and commercial use as a solvent (for cleaning or degreasing) use in electrical equipment, appliance and component manufacturing" and " Industrial and commercial use as a solvent (for cleaning or degreasing) in electrical equipment, appliance and component manufacturing for use in semiconductor manufacturing")
4. *A solvent in analytical and R&D* (CoU: "Industrial and commercial use in other uses in laboratory chemicals")

A few examples we presented today include:

A. Polymerization solvent for a para-aramid polymer:

Kevlar® is the DuPont brand name for a strong, heat-resistant para-aramid fiber. N-methyl-pyrrolidone (NMP) is used as a solvent to produce Kevlar® para-aramid polymer in Richmond, Virginia. NMP is not intentionally added to (not an ingredient in) the polymer. DuPont is the only US manufacturer of para-aramid polymer and fibers. A readily available alternative solvent does not exist to manufacture para-aramid polymer and research to find a suitable substitute is challenging and likely to take decades.

- Kevlar® is a critical component enabling superior performance in many industries. In Aerospace, DuPont™ Kevlar® fiber helps deliver durability, lightweight strength, stiffness, and thermal and fire protection in commercial and military aircraft composites, including the F-35 fighter jet. Kevlar® fiber has also proven that it is strong enough to survive the extreme forces and temperature fluctuations of space travel.

- In Defense, Kevlar® is used for ballistic resistance in body armor, military helmets, military shields, and ground vehicles. Approximately **8.5** million soldiers and law enforcement officers are currently protected with body amor made with Kevlar®.
- Kevlar® is used in Personal Protective equipment (PPE). **Fifty** million pairs of gloves/sleeves are made with Kevlar® each year to protect industrial workers, first responders, and soldiers. **One** million fire fighters and over **200,000** US military personnel in the US wear thermal protective apparel containing Kevlar®.
- In Automotive, Kevlar® is used to reinforce **33** million tires and **38** million sets of brakes each year.

The scale of Kevlar® in the US economy is significant for millions of wearers, millions of automotive components, and millions of air passengers.

DuPont has also invested more than 10 years of research to deliver the next generation of high strength fibers, Kevlar® EXO™. In conjunction with DPA Title 3 Office and PEO Soldier, supported by a Presidential Determination of criticality to national defense, the US government has invested $50 million dollars in this program to ensure our military always remains advantaged. Kevlar® EXO™ also uses NMP as the polymerization solvent.

Significantly, in times of military conflict or other crisis situations, having a US based production site manufacturing Kevlar® products for body armor, helmets and ground vehicles is a critical competitive advantage for the US government. As a manufacturer of critical defense materials from US based assets, DuPont is subject to the Defense Priorities & Allocation System, which ensures this support continues to be there when it is needed most.

To continue Kevlar® and Kevlar® EXO production, the TSCA Risk Management **Regulatory Action for the Condition of Use (non-incorporative processing - para-aramid polymer manufacturing)** for NMP must continue, with a demonstrated **Workplace Chemical Protection Program (WCPP)**

- DuPont has been safely using NMP to produce para-aramid polymer by protecting workers with engineering controls, exposure monitoring, training, procedures, and effective PPE.

DuPont will comply with an EPA Workplace Chemical Protection Program (WCPP) for NMP, when the WCPP conditions are published in early 2024.

Simply put, without being able to continue to use NMP (under a suitable Workplace Chemical Protection Program), the global supply of Kevlar® and next generation Kevlar® EXO™ will cease, putting the US at a military, worker safety and economic disadvantage.

B. NMP is used as a polymerization solvent when creating the polyimide polymers that make flexible circuits possible. These flexible circuits are critical to future technologies in electronics, communications, and transportation.

C. **NMP is a solvent used in the manufacture of automotive glass bonding adhesives** to meet Original Equipment Manufacturer (also known as “OEM”) and National Highway Traffic Safety Administration specifications.
D. **NMP is a solvent used in semiconductor chip manufacturing** that was selected to replace more hazardous chemistries. NMP provides properties that are essential to increasing yield and thus reducing waste and energy consumption from these processes.
E. **NMP is a solvent used in industrial cleaning of equipment parts** where the cleanliness of the manufacturing equipment correlates to being able to create defect free parts in the semiconductor industry.

We support continued use of NMP for these conditions under Workplace Chemical Protection Program or prescriptive controls. Prohibitions in these uses would impact industrial production of critical products which are used in multiple sectors. We also support inclusion of a de minimis value, similar to what is required per current hazard communication requirements.