The Good, The Bad, and the Uncertain:

Public Perception of the Chemical Enterprise

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The Dow Chemical Company

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Gone
More than 96% of all manufactured goods are directly touched by the business of chemistry. The business of chemistry is an $800 billion enterprise. Chemical companies invested $93 billion in research and development in 2015.
The business of chemistry supports nearly 26% of the U.S. GDP.

The business of chemistry accounts for 14% of U.S. exports, $184 billion in 2015, and is the largest exporter in the U.S.

A leader in production, the U.S. chemical industry provides over 15% of the world's chemicals.

American Chemistry Council
June 2016
For every job created by the business of chemistry, 6.3 are generated elsewhere in the economy, totaling nearly 6 million jobs.

The business of chemistry provides 810,000 skilled, good-paying American jobs.

The average annual pay in the business of chemistry is $94,000. That’s 47% higher than the average manufacturing pay.
Yield (pound per acre)

1920 1940 1960 1980 2000

source: USDA

corn
rice
wheat
If you ate today...
THANK A FARMER

If you're a farmer...
THANK A CHEMIST
NH₃

Ammonia
1. Carcinogenic to humans
2. Not classifiable as to carcinogenicity in humans
3. Possibly carcinogenic to humans
4. Probably not carcinogenic to humans
A Fresh Approach: CANVERA™ Polyolefin Dispersion

Technology

CANVERA™ Polyolefin Dispersions offers an excellent food and flavor protection profile, excellent adhesion, corrosion protection and flexibility without impact on flavor. This innovation eliminates material traditionally found in epoxy or alternative coating systems that are of concern for many consumers.
Incumbent Epoxy Resin

\[ \text{Na}^+ \text{Cl} \xrightarrow{\text{Cl}_2 + \text{NaOH}} \text{Cl}_2 + \text{NaOH} \]

chlorine sodium hydroxide

\[ \text{propylene} \xrightarrow{\approx 74\% \text{ yield from C3}} \text{allyl chloride} + \text{Cl}_2 + \text{H}_2\text{O} \xrightarrow{\text{aq}} \text{chlorine propylene dichlorohydrin} \]

hydrochloric acid

\[ \text{propylene dichlorohydrin} \xrightarrow{\text{NaO}^-} \text{epichlorhydrin} \]

\[ \text{epichlorhydrin} \xrightarrow{\text{epoxy resin}} \text{epoxy resin} \]

\[ \text{benzene} + \text{propylene} + \text{O}_2 \xrightarrow{\approx 80\% \text{ yield from C6}} \text{phenol} + \text{aceton} \]

\[ \text{bisphenol A (BPA)} \]}
$\text{C}_2\text{H}_6 \xrightarrow{\Delta} \text{CH}_2=\text{CH}_2 \rightarrow \begin{array}{c} \text{polyethylene} \\ (n) \end{array}$

>96% yield from ethylene
Thermal Paper Free of Chemical Developers

ROPAQUE™ NT-2900 Opaque Polymer for BLUE 4EST™ Thermal Paper

Conventional

<table>
<thead>
<tr>
<th>Thermal Head</th>
<th>Thermal Reactive Layer</th>
<th>Dye</th>
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<tbody>
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Voided Layer Technology

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2017 Presidential Green Chemistry Challenge Award
Joint with partner Koehler Paper Group
Thermal Paper Free of Chemical Developers

ROPAQUE™ NT-2900 Opaque Polymer for BLUE 4EST™ Thermal Paper

Before Printing

After Printing

2017 Presidential Green Chemistry Challenge Award
Joint with partner Koehler Paper Group
<table>
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<th>2025 Sustainability Goals</th>
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<tbody>
<tr>
<td><strong>Leading the Blueprint</strong></td>
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<tr>
<td>Dow leads in developing a societal blueprint that integrates public policy solutions, science and technology, and value chain innovation to facilitate the transition to a sustainable planet and society.</td>
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<td><strong>Delivering Breakthrough Innovations</strong></td>
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<td>Dow delivers breakthrough sustainable chemistry innovations that advance the well being of humanity.</td>
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<td><strong>Advancing a Circular Economy</strong></td>
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<td>Dow advances a Circular Economy by delivering solutions to close the resource loops in key markets.</td>
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<td><strong>Valuing Nature</strong></td>
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<td>Dow applies a business decision process that values nature, which will deliver business value and natural capital value through projects that are good for the company and good for ecosystems.</td>
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<td><strong>Increasing Confidence in Chemical Technology</strong></td>
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<td>Dow increases confidence in the safe use of chemical technology through transparency, dialogue, unprecedented collaboration, research, and our own actions.</td>
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<td><strong>Engaging Employees for Impact</strong></td>
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<td>Dow people worldwide directly apply their passion and expertise to advance the well being of people and the planet.</td>
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<td><strong>World-Leading Operations Performance</strong></td>
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<td>Dow maintains world-leading operations performance in natural resource efficiency, environment, health, and safety.</td>
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