

# Synventive Molding Solutions

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HSE Specialist

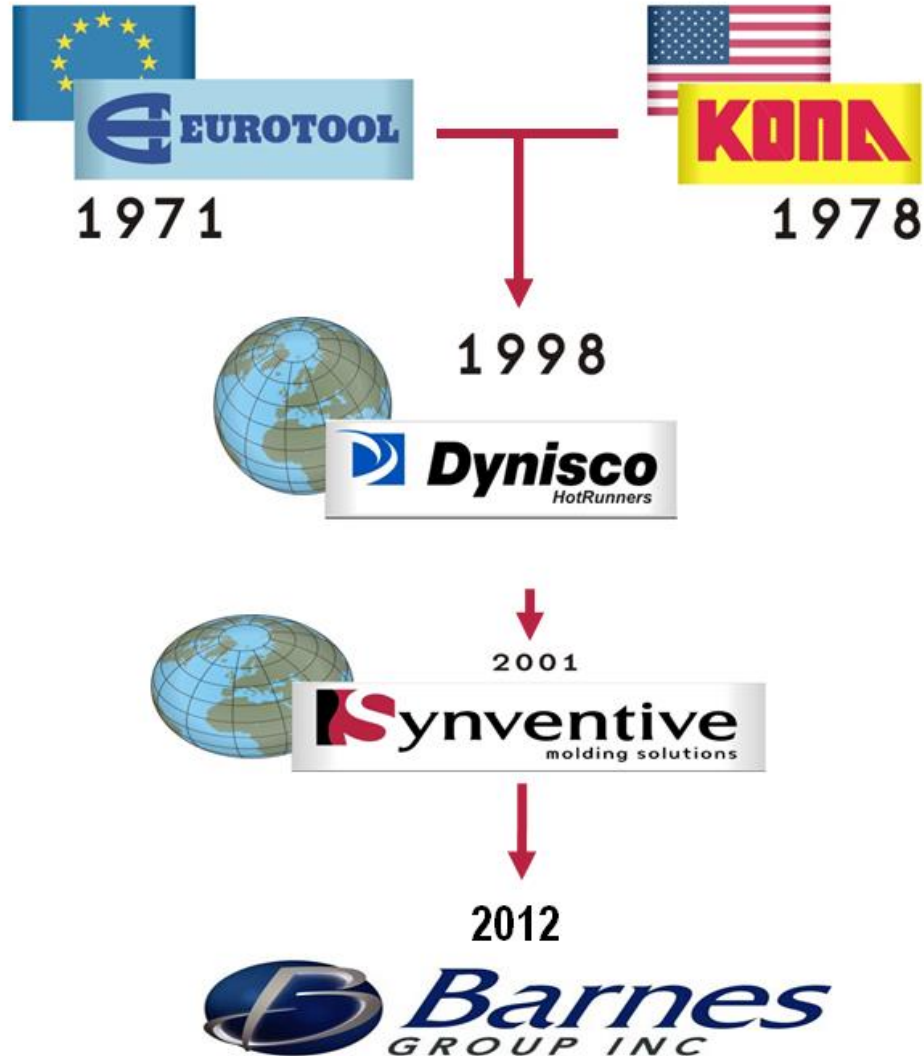
Synventive Molding Solutions

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# Company Overview



# When do we use Plastic?

Plastic Bottles and Lids



Plastic Utensils



Exterior Vehicle Parts



Interior Vehicle Parts



Chemical Containers



Plastic Syringes



Phones and Computers



Electrical Switches



Footwear

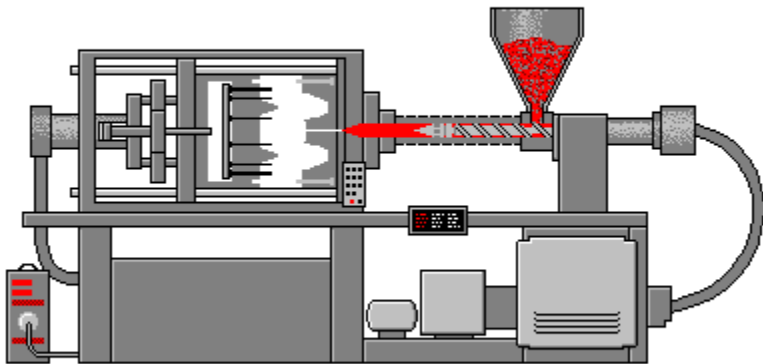


Toys



# WHAT IS INJECTION MOLDING?

Clamping Injection Cooling Ejection

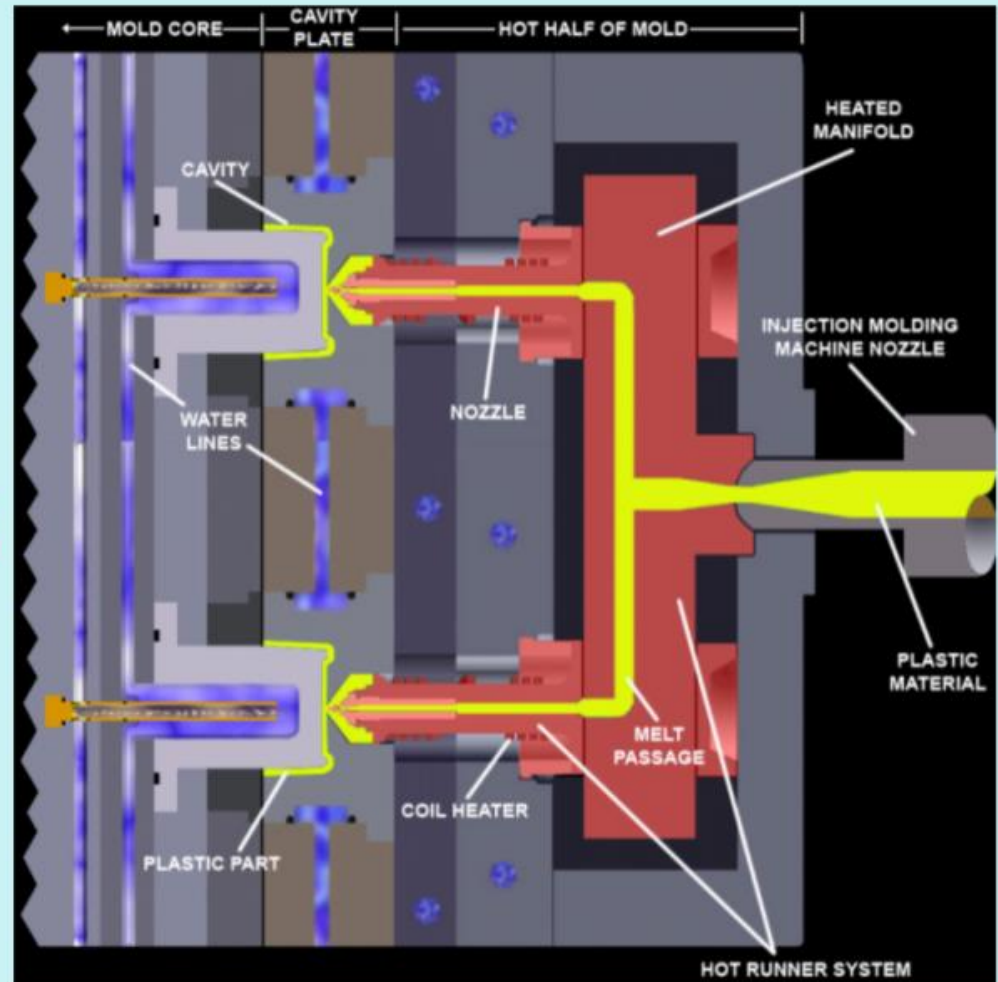


A manufacturing process for producing plastic parts by injecting material into a mold.

# WHAT IS A HOT RUNNER SYSTEM?

A system that evenly distributes heat to keep plastic hot and controls the flow of plastic material into the cavity (mold).

## Hot Runner System Plastic

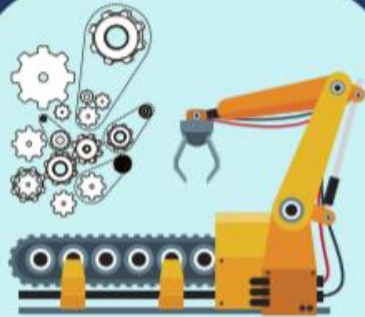


# PLASTIC INJECTION MOLDING

## EXAMPLE: BUMPERS!



SYNVENTIVE  
MAKES THE  
HOT  
RUNNER  
SYSTEM



THE MOLD  
MAKER PUTS  
THE MOLD  
TOGETHER



THE  
INJECTION  
MOLDER  
MAKES THE  
PARTS



THE CAR  
COMPANY  
ASSEMBLES  
THE CAR

# 1-Bromopropane/n-propylbromide (nPB)

## *EnSolv*<sup>®</sup> Spec 787

Preparation Date: May 1, 2015

### 1. Product and Company Identification

Product Name: *EnSolv*<sup>®</sup> Spec 787 Precision Cleaning Solvent  
Synonyms: None  
Product Description: Patented Stabilized n-Propyl Bromide Mixture. U.S. Patents 5616549, 5824162, 5938859, 6176942 & 6402857B2. Canadian Patent 2284792. Israeli Patent 132000. Australian Patent 720172. Mexican Patent No. 212927.  
Product General Use: Precision Vapor Degreasing, Ultrasonic Cleaning, Cold Wipe Cleaning  
General Description: Non-flammable Solvent Mixture  
  
Manufacturer: Enviro Tech International, Inc.  
1800 N. 25<sup>th</sup> Avenue  
Melrose Park, IL, 60160  
www.envirotechint.com

### 3. Composition and Ingredient Information

<b>n-Propyl Bromide</b> Molecular Formula: C <sub>3</sub> H <sub>7</sub> Br <b>Synonyms: 1-Bromopropane, nPB, 1-BP</b>	CAS: 106-94-5	> 92% by weight
Nitromethane	CAS 75-52-5	< 0.6% by weight
1,2-butylene oxide    Synonym: 1,2 epoxybutane	CAS 106-88-7	< 2.0 % by weight

Patented Stabilizer Package	< 8% by weight Other specific components and amounts of components comprise Trade Secrets per 1920.1200(i)(1)
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- N-Propyl bromide (nPB) or 1-bromopropane, is a solvent that is used in:
  - vapor degreasing,
  - metal cleaning, and dry cleaning;
  - as a solvent carrier in adhesives;
  - and as a chemical intermediate.

- Evidence linking NPB to a range of human health hazards.
- NPB added to the list of Toxic or Hazardous Substances subject to regulations under MA TURA
- NPB designated as a Higher Hazard Substance under TURA, (lowers the reporting threshold to 1,000 lb/year)

## Higher Hazard Substances

The Higher Hazard Substance (HHS) designation lowers the threshold for reporting, planning, and paying fees under TURA to 1,000 pounds per year.

As of January 2017, 14 chemicals or chemical categories have been designated as HHS (see Table 1). Persistent, bio-accumulative, and toxic (PBT) substances, identified by U.S. EPA, were automatically designated as HHS in 2007 (see note in Table 1).

## Lower Hazard Substances

The Lower Hazard Substance (LHS) designation does not affect reporting thresholds, but eliminates the per-chemical reporting fee. Reporting and planning requirements for these chemicals are unchanged. As of January 2017, 10 chemicals or chemical categories have been designated as LHS (see Table 2).

Table 1: Higher Hazard Substances (HHS)\*

Higher Hazard Substance	CAS #/ DEP Code	Designation effective for use in calendar year**
Trichloroethylene (TCE)	CAS 79-01-6	2008
Cadmium	CAS 7440-43-9	2008
Cadmium compounds	DEP Code 1004	2008
Perchloroethylene (PCE, or perc)	CAS 127-18-4	2009
Hexavalent chromium compounds	DEP Code 1216	2012
Formaldehyde	CAS 50-00-0	2012
Methylene Chloride	CAS 75-09-2	2014
1-Bromopropane (n-Propyl Bromide) (nPB)	CAS 106-94-5	2016
Hydrogen Fluoride	CAS 7664-39-3	2016
Cyanide Compounds	DEP Code 1016	2016
Dimethylformamide (DMF)	CAS 68-12-2	2016
2,4-Toluene Diisocyanate	CAS 584-84-9	2017
2,6-Toluene Diisocyanate	CAS 91-08-7	2017
Toluene Diisocyanate Mixed Isomers	CAS 26471-62-5	2017

\*Persistent, bio-accumulative, and toxic (PBT) substances, as defined by U.S. EPA, have had reporting thresholds lower than 1,000 pounds since 2000 or 2001. PBTs were automatically designated as HHS in 2007, and retain their lower PBT thresholds. EPA PBTs include: dioxin and dioxin-like compounds, lead and lead compounds, mercury and mercury compounds, PACs, benzo (g,h,i) perylene, hexachlorobenzene, PCBs, and tetrabromobisphenol A, among others. Complete list available [here](#).





The Office of Technical Assistance and Technology (OTA) is a non-regulatory agency within the Executive Office of Energy and Environmental Affairs. OTA provides free, confidential, onsite technical assistance to Massachusetts manufacturers, businesses, and institutions.

- Met with Synventive Team
  - Tour of facility
    - Current cleaning process
      - Talked to workers
  - Testing Plan
    - Filled out test request form
    - Discussed Samples
      - Hardest contaminant to remove
        - » Gundrill oil/coolant
      - Parts
        - » Copper and Steel Alloy
    - Went over cleaning parameters
      - Time
      - Equipment
      - Cost



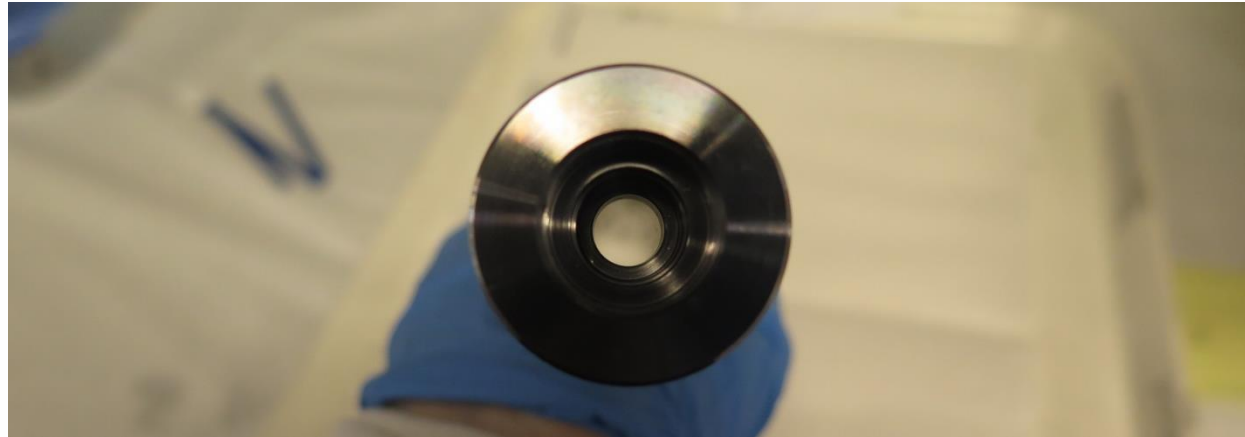
- Samples of cleaners
- Ultrasonic cleaner
  - Borrow equipment
- Worker Input
  - Feedback on cleanliness
    - Did not work on nozzles
    - Worked on copper heat pipe cells
  - Identified need for another cleaner
    - Working on identifying safer solvents for more complex parts



- Purchase a small ultrasonic cleaner for our heat pipe cell.
  - This eliminates many of our employees having to enter the degreaser room all together
  - Saves time
- Investigate alternative methods of cleaning parts with deep holes



- Buckeye Immersion Cleaner



- Cost Savings: \$20,000 in chemicals, \$5,000 in waste remove, \$6,000 in fees to state= approx. **\$31,000 a year**
- Buckeye Immersion Cleaner= approx. **\$2,000 a year**

## **Obstacles:**

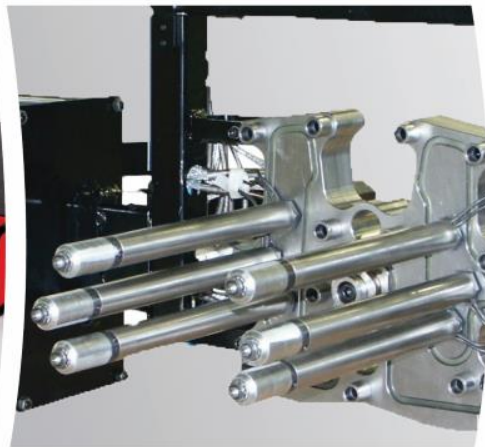
- It's easy to get lost in routine
- Something that works in one process, may not always work for another

## **Lesson Learned:**

- Empower employees to participate
- Change doesn't happen overnight

## **Next Steps:**

- Continue to work with TURI to Investigate alternative methods of cleaning parts with deep holes
  - Look into the potential for a recycling unit



**Synventive**<sup>®</sup>  
molding solutions  
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