

# Husky Preform Manufacturing Solutions

Complete PET preform workcells for every application and volume



## Benefits

- Highest capacity system with faster return on investment reduces total part cost
- Cavity-to-cavity and shot-to-shot repeatability ensures the most consistent, highest quality parts
- Preform lightweighting by enabling thinner-wall sections.
- Easy to operate fully integrated workcells reduce variability in the injection molding process
- Integrated systems get up and running faster and keep running more efficiently
- Newer generation Husky systems maintain backwards compatibility
- A complete manufacturing solution from Husky minimizes overall investment risk and reduces total cost of ownership

**Husky has been the leader in the preform manufacturing equipment industry for over 35 years having more than 4,000 systems running in the field. Our preform injection molding systems deliver the industry's lowest total production costs for the widest range of preforms and production volumes.**

As a trusted partner, Husky takes responsibility for the complete workcell, overseeing configuration, supply and start-up, as well as providing global support, service and parts. Husky also offers a diverse range of services, including preform prototyping, preform lightweighting, mold conversions and refurbishing.

Husky HyPET™ systems are available in various tonnages for molds between two and 144 cavities. All components of our HyPET system are specifically designed to work together as a fully integrated and optimized workcell. This makes it possible to achieve the most stable process and reliable operation, which results in the fastest cycles and leading preform quality.

Husky's High Performance Package (HPP) allows you to take the productivity and efficiency of your HyPET system to the next level. HyPET HPP provides preform lightweighting capabilities by enabling thinner-wall sections saving resin on every shot consistently for the life of the system. HyPET HPP also features a unique sustainable option for Recycled Flake (RF).

Husky's H-PET™ All-Electric (AE) system is an efficient, affordable solution for lower volume markets, offering exceptional value. When compared to other systems in its category, H-PET AE delivers the lowest part cost and best energy efficiency.

**HUSKY®**

*Keeping our customers in the lead*

## Preform systems features

### Leading preform quality

HyPET uses an integrated part cooling handling system called CoolPik™, which features up to four cycles of balanced cooling on the preform's inner and outer surface. When compared to alternate post-mold cooling systems, which only cool the outer surface, CoolPik results in faster cycles, better part quality, improved effectiveness in downstream equipment and superior bottle quality.

### Optimized technology

A wide range of extruders and clamp combinations are available to optimize systems for customer needs. HyFLO™ plasticizing screws minimize acetaldehyde (AA) generation and increase mixing and plasticizing performance.

### Polaris Controls

Husky has become the global leader in PET preform manufacturing solutions. This is a result of significant investment in the system controls. Husky's Polaris Controls simplify and integrate all functions of our PET molding systems. Optional packages to integrate auxiliaries and downstream part handling equipment make investing in highly skilled labour less of a requirement. Advantages include:

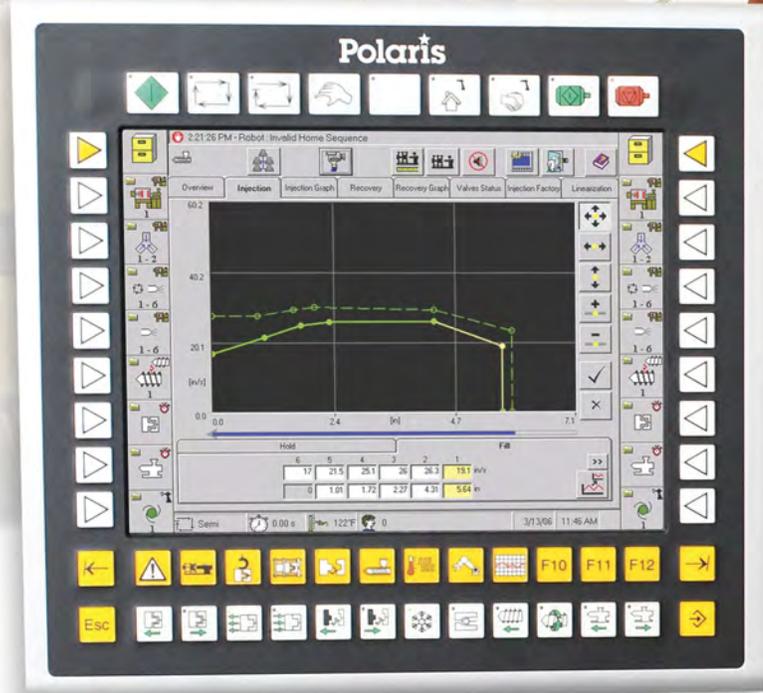
- Faster cycle times
- Highly repeatable shot-to-shot performance
- Remote connectivity through ServiceLink™
- Control of molding system and auxiliaries from a single interface

### PET auxiliaries and equipment

Resin dryers, chillers, dehumidifiers and material handling are designed specifically for the needs of PET and optimized as an integral part of the system. For PET auxiliaries, Husky will oversee configuration, supply and installation, as well as provide complete support, service and parts complemented by a comprehensive warranty.

A complete solution from Husky with auxiliaries has multiple benefits, including improved energy consumption, an enhanced controls interface and advanced feature capability. Auxiliaries are all centrally controlled through Husky's Polaris Control operator interface. Advantages of this integration include:

- Control of entire molding system from a single interface
- Remote connectivity through ServiceLink
- Integrated alarm handling and notification for easy troubleshooting
- Assured total process control through SPC



Choosing Husky PET auxiliaries provides improved energy consumption and enhanced controls together with advanced feature capability.

## HyPET systems

Husky's HyPET preform injection molding system offers industry-leading technology that is proven and reliable. The system is backed by Husky's more than 35 years of preform equipment experience and unmatched global knowledge of the PET market.

HyPET systems provide:

- Industry-leading preform quality
- Improved energy efficiency
- Faster cycle times for increased productivity
- Reduced lifecycle costs
- Simplified user interface and controls
- Cross-generation product compatibility

### HyPET flexibility

HyPET is a flexible preform injection molding system available in five sizes for molds between two and 144 cavities.

### System-level integration

All components of the HyPET system, including the hot runner, mold, machine, robot and post-mold cooling, are specifically designed to work together as a fully integrated workcell. This level of integration enables the industry's highest levels of efficiency, lowest energy consumption and lowest part cost, also reducing investment risk and total cost of ownership.

### Preform molds

Available from two up to 144 cavities, Husky's preform molds are designed and built to produce the highest quality preforms at the industry's best cycle times. To improve our ability to serve our global customer base and offer the best lead times, we continue to invest in our dedicated preform mold manufacturing facilities in the United States, Canada and Luxembourg.

### Benefits of HyPET

HyPET is the next step in system-level elimination of waste and variability, resulting in the delivery of greater overall value and bottom line improvements. Enhanced productivity with performance options allow customers to optimize the system for their specific needs.

- HyPET streamlines manufacturing processes reducing variability and increasing part quality
- Fully utilize your system and maximize your overall equipment efficiency
- Lowest energy consumption per part produced
- Easy to operate fully integrated workcells reduce variability in the injection molding process. Integrated systems get up and running faster and keep running more efficiently
- Newer generation Husky systems maintain backwards compatibility with your existing Husky molds, allowing you to save floor space while maintaining your ability

to manufacture your complete product range

- Productivity improvements come from system enhancements developed for and field proven in HyPET HPP
- High capacity system with fast return on investment helps to reduce total part cost

### Mold and machine integration

Husky's intelligent Mold ID integrates the machine, cold half, hot runner and post-mold cooling for optimized system parameters like tonnage and cycle. The Mold ID sets operating parameters for each tool and allows for porting of that optimized process from machine to machine. This results in correct start-up and operating procedures, eliminating potential human error.



Next generation HyPET system reinvented for superior part quality

## High Performance Package (HPP)

An extension of Husky's proven HyPET platform, Husky's HyPET HPP is specifically designed to provide industry-leading high output preform injection molding. Husky's HyPET HPP system provides:

- World's best preform quality and most robust system
- Further reduced cycle times for increased productivity
- Significantly improved energy efficiency
- Preform lightweighting by enabling thinner-wall sections
- Cross-generation product compatibility

### System-level integration

A result of refinements to the entire preform system, including mold, robot, injection unit, clamp and auxiliary equipment, this coordinated effort has made it possible to deliver industry-leading cycle times and increased energy efficiency, while maintaining the highest levels of reliability, repeatability and preform quality.

HyPET HPP offers several advantages, including greater process stability and superior part-to-part consistency. Enhanced system-level integration allows for a simplified start-up procedure, optimal operating tonnage and automatic maintenance alerts.

The productivity improvements offered by HyPET HPP further reduce the cost of PET packaging, making it competitive with glass, metal and carton alternatives.

### Increased energy efficiency

Recognizing the importance of streamlining operations, Husky has made several system refinements to enable improved energy efficiency and reduced maintenance. This is made possible through a modified vacuum pump, insulated barrel to reduce heat loss and electrification of the plasticizing screw for more efficient energy utilization.

### Lighter, thinner preforms

As a single source supplier, Husky has made system-level improvements to optimize management of the melt stream from pellet to part, resulting in higher preform quality and a significantly improved ability to mold thinwall preforms. For example, with a 500ml still water application, it is possible to manufacture a preform with a side wall as thin as 1.5 mm and thread wall of 0.8 mm. This helps to lower material costs and reduce the environmental footprint of PET packaging.

### Benefits of HyPET HPP:

- Highest capacity system with faster return on investment reduces total part cost
- Streamlined manufacturing processes to reduce variability and increase part quality
- Preform lightweighting by enabling thinner-wall sections. Save resin on every shot consistently for the life of the system
- Fully utilize your assets and maximize your overall equipment efficiency
- Lowest energy consumption per part produced
- 7% system-level energy savings versus first generation HyPET
- Easy to operate fully integrated work-cells reduce variability in the injection molding process. Integrated systems get up and running faster and keep running more efficiently. All systems are supported by a global spare parts supply
- Newer generation Husky systems maintain backwards compatibility with your existing Husky molds, allowing you to save floor space while maintaining your ability to manufacture your complete product range



## H-PET All-Electric (AE) system

### Better return on investment for low volume markets

H-PET AE is an extremely efficient and reliable low output PET system, which requires less capital investment. H-PET AE delivers lowest part cost in this segment through low maintenance requirements, energy efficiency, tight process controls, accurate mold tolerances and high quality auxiliaries.

Our systems, known for their quality, robustness and longevity, maintain optimal performance for years. H-PET AE is available in a range of configurations to match lower volume output and application needs. These combined benefits allow H-PET AE to provide the best return on investment for customers entering into or expanding their presence in the beverage packaging market.

### Complete turnkey solution

H-PET AE is a truly integrated complete turnkey solution. The system is optimized as a whole to maximize performance, increase quality, reduce waste and lower energy consumption. With Husky as the single source for the complete turnkey workcell, H-PET AE includes the machine, mold, hot runner, post-mold cooling, resin dryer, mold dehumidifier, chilled water system, piping and electrical distribution. H-PET AE is managed through Husky's integrated Polaris Control, centralizing operation of the complete workcell through a single interface. By taking responsibility for the complete workcell, Husky reduces the need for project management and drives faster set-up and installation. With a plug-and-play ready system like H-PET AE, Husky provides all complex interconnections. Only a water source, single power source and compressed air is needed to get up and running.

### System flexibility

H-PET AE's straightforward design provides a flexible configuration for preform and bottle producers who need to use a single machine for multiple applications. The system has been designed to allow for quick and easy mold changes, giving customers the ability to increase productivity and lower conversion costs when changing molds. The system's standard mold uses a common module size capable of molding threads up to 43 mm for all cavitations and machine sizes.

### Financially sound investment

Husky's H-PET AE system gives lower volume producers the ability to manufacture high-quality preforms at a price that fits any manufacturing budget. Every H-PET AE system uses a mold built to the same high quality Husky standards.

### Local expertise and support

Husky's extensive global network makes it possible to provide the most responsive local service, which includes a team of Husky PET sales and service specialists in more than 40 countries worldwide. Husky systems are renowned for producing the highest quality preforms in the industry and are used by the top global brands and PET preform manufacturers in the world.

### H-PET AE fully electric system features:

- Proven and reliable design
- Efficient, quiet and low maintenance
- Integrated take-out device using water cooled take-off tubes provides up to three stages of post-mold cooling
- Optimized standard auxiliary package, including resin dryer, mold dehumidifier, low temperature chiller, t-belt conveyor and complete workcell infrastructure
- Fully integrated through Polaris Control HMI, centralizing operation of the entire injection molding system through a single user interface



## Full suite of product services and support



Husky experts work with customers to ensure the highest level of equipment performance.

We take responsibility for supporting our customers from start-up through the life-cycle of the system. Husky offers the experience and resources to keep these systems running at peak efficiency and is the only supplier in this output range to provide a full suite of services and support.

### Preform molds

As the world's largest moldmaker, Husky is able to deliver global tooling programs for new molds or conversions of any size. Preform molds are produced at dedicated facilities in Canada, the United States and Luxembourg. Husky regularly invests in these state-of-the-art facilities to increase capacity, reduce lead times and maximize part quality.

Husky molds provide industry-leading productivity based on fast cycle times and high efficiency levels, and are manufactured with high quality materials and proven mold designs to ensure long mold life. Husky molds also feature the lowest cavity-to-cavity weight and dimensional variation as a result of best-in-class manufacturing machines and processes.

### Refurbishment, conversion and lightweighting

The success of preform and bottle producers depends, in part, on taking advantage of lightweighting opportunities, thread conversions and new preform and bottle

designs. Husky lightweighting and mold conversion services are designed to meet these needs in a timely and cost-effective way. Husky is the only moldmaker with the capacity to manage large-scale, market-wide programs while also responding to the needs of customers who want to convert a single mold.

Maintaining best-in-class preform quality requires regular mold maintenance and scheduled refurbishing programs. As a mold ages under regular operating conditions, preform quality begins to diminish. Husky offers a wide range of refurbishing services to address this issue, and our extensive network of refurbishing centers enables customers to quickly and easily convert or refurbish their molds, regardless of location.

### Manufacturing Advisory Services

The Husky Manufacturing Advisory Services team provides operational consulting, design and project management services to help customers increase the operating efficiency of their plastic injection molding facilities.

Husky's Manufacturing Advisory Services team focuses on areas such as:

- Operational effectiveness
- Energy reduction and management
- Tooling standards
- Machine layout
- Plant operating procedures
- Production monitoring systems
- Process infrastructure and automation

Husky design services are typically used by customers exploring the feasibility of plant expansion, relocation, consolidation or those who are looking to build a new facility.

Husky's factory planning and optimization study uses a structured approach to create a roadmap for a customer's molding business

that will help to maximize efficiencies and build in the flexibility necessary to meet future requirements. Services include:

- Workcell design
- Equipment standardization
- Resin handling and distribution
- Product handling and inventory
- Plant layout and design

### Bottle Development Center

Husky's Bottle Development Center (BDC) can help bring a customer's new package design from concept to complete bottle quickly and cost-effectively. It offers a complete range of confidential preform and bottle development services to ensure our customers' next preform designs are optimized for injection molding, performance, and tooling flexibility. We provide industry-leading solutions in optimized preform design, preform and bottle sampling, prototyping hardware, and quality testing.

Husky is also one of a select few manufacturers to have a testing facility approved by Coca-Cola. Preforms meeting specification and quality standards in Husky's facility do not require further testing by Coca-Cola. This designation represents an extremely high level of trust between Coca-Cola and Husky.

# Shotscope NX for PET preform manufacturing

## The industry's most advanced process and production monitoring system

Improve your bottom line by using Shotscope NX to help control your processes, increase your part quality and reduce your overall costs. Shotscope NX is the PET preform industry's only integrated process and production monitoring system that provides a wealth of "at a glance" information to help improve productivity while minimizing scrap and downtime.

## Real-time monitoring and analysis

Shotscope NX collects and saves data for each cycle on every machine in your operation. The system compares and analyzes process data against a job's process limits by using historical analysis capability and provides real-time and historical measurements of machine, yield, cycle efficiency and OEE (Overall Equipment Effectiveness).

## Process monitoring and control

Shotscope NX has the tools to help improve your part quality. By having increased control of your processes you are able to reduce variability – resulting in improved overall production costs and improved profitability.

## Intelligent SPC tool

Shotscope NX provides Statistical Process Control (SPC) capabilities. The system collects all of the shot variables from every cycle and retrieves them for later analysis using run charts, histograms, X-bars and R-charts and scatter diagrams.

The process analyzer allows for a quicker job set-up. Job reference profiles are stored and recalled when jobs are rerun. Shotscope NX will overlay reference curves (position pressure) with those from new jobs for easy machine adjustments. The process analyzer also helps troubleshooting by detecting common problems before they become serious issues.

## Benefits

- Provides better part quality by establishing process control and improving process stability
- Decreases cycle times and reduces machine downtime
- Boosts plant utilization through simplified reporting and expedited information
- Increases percentage of on-time deliveries through simplified plant scheduling

## Capabilities

- Automatically stores processing parameters on every shot in real-time
- Web-based architecture makes information available across existing internal network
  - Multi-plant capabilities
  - Job scheduling/Production planning
  - Predictive and preventative maintenance
  - Real-time information and alerts
  - Flexible production reporting
- Process monitoring tools
  - Shot profile/waveforms
  - SPC/SQC



Shotscope NX provides real-time, web-based information

## Broadest product range in the industry

		Applications						
		H-PET AE180	H-PET AE230	HyPET 120	HyPET 225	HyPET 300	HyPET 400	HyPET 500
		Cavitation output (mm/yr)						
	500 mL (17 oz.) Carbonated Soft Drink Neck finish: 28 mm PCO Weight: 21–25 g	32 59	48 85.9	32 85	48 163.0	72 236.6	96 312.1	144 485.3
	500 mL (17 oz.) Bottled Water Neck finish: 26 mm PCF Weight: 10–14 g	32 112.5	48 163.1	32 147.7	48 296.2	72 418.7	96 547.7	144 791.7
	500 mL (17 oz.) RTD tea / hotfill Neck finish: 28 mm Weight: 20–27 g	32 70.1	48 76.4	32 67.4	48 127.3	72 186.0	96 246.0	144 362.8
	473 mL (16 oz.) Dairy Neck finish: 30–38 mm Weight: 22–26 g	32 70.1	48 76.4	32 67.4	48 127.3	72 186.0	96 246.0	144 362.8
	500 mL (17 oz.) Aseptic juice Neck finish: 38 mm Bericap Weight: 18–24 g	32 70.6	48 102.9	24 64	32 108.7	72 236.6	96 312.1	128 407.4
	591 mL (20 oz.) Hotfill juice Neck finish: 38 mm VHS Weight: 29–32 grams	24 49.6	48 71.5	24 34.8	32 55.6	72 123.0	96 163.0	128 215.0
	1.5 l (51 oz.) Sparkling Water Neck finish: 25–30 mm Weight: 25–36 g	24 50.4	32 57.9	32 75.5	48 154.4	72 224.4	96 296.2	144 435.4
	330 mL (11 oz.) Beer Neck finish: 28 mm PCO Weight: 22–30 g	32 76.5	48 83.3	32 73.9	48 139.5	72 203.4	96 268.8	144 395.8
	946 mL (32 oz.) Food Jar Neck finish: 63 mm SP400 Weight: 37–40 g	12 25.2	16 33.6	8 13.1	16 33.6	24 49.3	32 65.3	48 96.7
	3–5 gal (384–640 oz.) Water Neck finish: HOD Standard Weight: 300–380 g	— —	— —	— —	8 4.8	16 9.6	16 9.6	24 14.5



H-PET AE



Next Generation HyPET



HyPET HPP

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