

Route sheet

Company Produce		Part name Part number	Plastic bottle LBP0101	Prepared by Date		
Laundry Detergent Bottle						
No.	Operation Description	Machine type	Tooling	Set-up time	Operation time	Materials & description
01	Polymer Selection	–	–	–	–	polypropylene (PP) in form of pallets
02	<i>Pellet Heating:</i> The raw plastic material, usually in the form of small pellets, is dried and fed into a heating chamber to soften or melt the polymer.	Injection Blow Molding Machine	Dryer	30 minutes to 2 hours	15-30 minutes	–
03	<i>Extrusion:</i> The molten plastic is pushed through an extruder to form a hollow tube called a parson. The parson is clamped between two mold halves, shaping the exterior of the bottle.	Injection Blow Molding Machine	Extruder	30 minutes to 2 hours	1-3 minutes for producing a parson	–
04	<i>Injection (Preform Creation):</i> Plastic is injected into a mold to create a preform, a thick-walled, test-tube-like shape that will later be inflated into a bottle. The preform needs to cool and solidify in the mold before it can be blown.	Injection Blow Molding Machine.	Mold carts or Hoists	30 minutes to 2 hours	5-15 seconds per preform	–
05	<i>Blow Molding:</i> The preform is heated and placed in a mold, then air is blown into it to stretch it into the bottle shape.	Injection Blow Molding Machine.	Air Compressor	30 minutes to 2 hours	5-15 seconds	–
06	<i>Cooling and Solidification:</i> The mold cools the plastic, setting it into the final shape of the bottle. Once cooled, the bottle is ejected from the mold.	Injection Blow Molding Machines Cooling Systems	–	30 minutes to 2 hours	10-30 seconds	–
07	<i>Trimming and Finishing:</i> any excess plastic from the molding process is trimmed off. The bottle may be polished, deburred, or treated to remove imperfections.	It can be done manually	-Trimming Tools -Sanders and Grinders -Hot Air Guns	–	5-10 seconds	–
08	<i>Quality Control and Testing:</i> Bottles are inspected for uniform	bottle Inspection Machine-Visual	Calipers and Micrometers	30 minutes	1-3 seconds per bottle	–

thickness, proper dimensions, and any defects like holes or weak spots.

Inspection
System

to 1
hour.

09	<i>Labeling and Packaging:</i> Bottles may have labels applied through direct printing, heat transfer, or adhesive labels. The bottles are packaged and prepared for shipping.	Self-Adhesive Labeling Machine	–	30 minutes to 1 hour.	0.5-2 seconds per bottle	–
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Company Produce	<u>Laundry Detergent Bottle</u>	Part name Part number	<u>Plastic Cap</u> <u>LCP0202</u>	Prepared by Date		
No.	Operation Description	Machine type	Tooling	Set-up time	Operation time	Materials &description
01	<i>Material Preparation:</i> Polypropylene is melted, mixed with red colorant, and prepared for molding.	Material Blender	Dryer Moisture Analyzer	15 to 30 minutes	15-30 minutes per batch	polypropylene (PP) in form of pallets
02	<i>Injection Blow Molding:</i> Injection Station: PP is injected into a preform mold, forming the initial shape. Blowing Station: Preform is transferred to a blow mold, where compressed air expands it to fit the final cap shape. Ejection Station: The finished cap is ejected from the mold.	Injection Blow Molding Machine	Thermocouples Mold Release Agents	30 minutes to 2 hours	5-15 seconds per cap	–
03	<i>Cooling and Solidifying:</i> Cooling helps to solidify the plastic and maintain dimensional accuracy.	Injection Blow Molding Machines Cooling Systems	–	30 minutes to 2 hours	10-30 seconds	–
04	<i>Trimming:</i> Removes excess plastic (flash) around edges for a smooth finish.	It can be done manually.	Deburring Tools Compressed Air Gun Quality Gauges	–	5-10 seconds	–

mold, then air is blown into it to stretch it into the bottle shape.

Molding Machine.

to 2 hours

06	<i>Cooling and Solidification:</i> The mold cools the plastic, setting it into the final shape of the bottle. Once cooled, the bottle is ejected from the mold	Injection Blow Molding Machines Cooling Systems	–	30 minutes to 2 hours	10-30 seconds	–
07	<i>Trimming and Finishing:</i> any excess plastic from the molding process is trimmed off. The bottle may be polished, deburred, or treated to remove imperfections.	It can be done manually	Trimming Tools Sanders and Grinders Hot Air Guns	–	5-10 seconds	–
08	<i>Quality Control and Testing:</i> Bottles are inspected for uniform thickness, proper dimensions, and any defects like holes or weak spots.	bottle Inspection Machine-Visual Inspection System	Calipers and Micrometers	30 minutes to 1 hour.	1-3 seconds per bottle	–
09	<i>Labeling and Packaging:</i> Bottles may have labels applied through direct printing, heat transfer, or adhesive labels. The bottles are packaged and prepared for shipping.	Self-Adhesive Labeling Machine	–	30 minutes to 1 hour.	0.5-2 seconds per bottle	–

Company	_____	Part name	<u>HDPE cap</u>	Prepared by	_____
Produce	<u>Toilet Cleaner Plastic Bottle</u>	Part number	<u>TCH0202</u>	Date	_____

No.	Operation Description	Machine type	Tooling	Set-up time	Operation time	Materials &description
01	<i>Material Preparation:</i> Polypropylene is melted, mixed with red colorant, and prepared for molding.	Material Blender	Dryer Moisture Analyzer	15 to 30 minutes	15-30 minutes per batch	High-Density Polyethylene (HDPE)

02	<i>Injection Blow Molding:</i> Injection Station: PP is injected into a preform mold, forming the initial shape. Blowing Station: Preform is transferred to a blow mold, where compressed air expands it to fit the final cap shape. Ejection Station: The finished cap is ejected from the mold.	Injection Blow Molding Machine	Thermocouples Mold Release Agents	30 minutes to 2 hours	5-15 seconds per cap	–
03	<i>Cooling and Solidifying:</i> Cooling helps to solidify the plastic and maintain dimensional accuracy.	Injection Blow Molding Machines Cooling Systems	–	30 minutes to 2 hours	10-30 seconds	–
04	<i>Trimming:</i> Removes excess plastic (flash) around edges for a smooth finish.	It can be done manually.	Deburring Tools Compressed Air Gun Quality Gauges	–	5-10 seconds	–
05	<i>Inspection and Quality Control:</i> Ensures each cap meets quality standards for dimensions, color, and strength.	Visual Inspection System	Calipers and Micrometers Tension and Compression Tester	15 to 30 minutes	1-2 seconds per cap	–
06	<i>Packaging:</i> Caps are organized, counted, and packed for distribution. Counts and organizes caps, places them into boxes, and prepares them for shipment.	Automatic Counting and Packaging Machine	–	20 to 45 minutes	5-10 seconds per batch	–

Company	_____	Part name	<u>Body</u>	Prepared by	_____
Produce	<u>Multi-Cleaner Plastic Bottle</u>	Part number	<u>MBH0101</u>	Date	_____

No.	Operation Description	Machine type	Tooling	Set-up time	Operation time	Materials & description
01	<i>Polymer Selection</i>	–	–	–	–	High-Density Polyethylene (HDPE) resin

02	<i>Plastic resin Heating:</i> The raw plastic material is dried and mix resin with additives to improve quality and durability.	Injection Blow Molding Machine	Dryer blender	30 minutes to 2 hours	30-60 minutes per batch	–
03	<i>Injection Molding:</i> The prepared plastic resin is heated and injected into a mold to create the cap body shape. The cap may include features like threads for sealing and a skirt for attachment.	Injection Blow Molding Machine	–	30 minutes to 2 hours	5-15 seconds per cap body	–
04	<i>Cooling & Ejection:</i> The molded cap body is cooled to solidify the plastic and maintain its shape. After cooling, the cap body is ejected from the mold cavity.	Injection Blow Molding Machines Cooling Systems	–	30 minutes to 2 hours	5-15 seconds	–
05	<i>Trimming and Finishing:</i> Any excess material, such as flash or burrs from the molding process, is trimmed away. The cap body may undergo additional finishing processes to ensure a proper fit and smooth edges.	It can be done manually.	Trimming Tools Hot Air Guns	–	5-10 seconds	–
06	<i>Quality Control and Testing:</i> Each cap body is inspected for uniformity in dimensions, proper sealing features, and any defects such as cracks or inconsistencies.	Inspection Machine- Visual Inspection System	Calipers and Micrometers	30 minutes to 1 hour.	2-5 seconds per cap body	–

Company	_____	Part name	<u>Piston</u>	Prepared by	_____
Produce	<u>Multi-Cleaner Plastic Bottle</u>	Part number	<u>MPH0201</u>	Date	_____

No.	Operation Description	Machine type	Tooling	Set-up time	Operation time	Materials & description
01	<i>Polymer Selection</i>	–	–	–	–	High-Density Polyethylene (HDPE) resin

02	<i>Plastic resin Heating:</i> The raw plastic material is dried and mix resin with additives to improve quality and durability.	Injection Blow Molding Machine	Dryer blender	30 minutes to 2 hours	30-60 minutes per batch	–
03	<i>Injection Molding:</i> The dried resin is heated and injected into a mold to create the piston shape. The design often includes features such as grooves for sealing or specific dimensions for compatibility with the bottle.	Injection Blow Molding Machine	–	30 minutes to 2 hours	5-15 seconds per piston	–
04	<i>Cooling & Ejection:</i> The mold typically has built-in cooling channels that circulate coolant to rapidly lower the temperature of the molded part. After cooling, the piston is ejected from the mold cavity.	Injection Blow Molding Machines Cooling Systems	–	30 minutes to 2 hours	5-10 seconds	–
05	<i>Trimming and Finishing:</i> Any excess material from the molding process is trimmed away. The piston may undergo additional finishing processes to ensure a proper fit within the bottle.	It can be done manually.	Trimming Tools Hot Air Guns	–	5-15 seconds	–
06	<i>Quality Control and Testing:</i> The pistons are inspected for uniformity in dimensions, proper sealing features, and any defects such as cracks or inconsistencies.	Inspection Machine- Visual Inspection System	Calipers and Micrometers	30 minutes to 1 hour.	2-5 seconds per piston	–

Company	_____	Part name	<u>Plunger</u>	Prepared by	_____
Produce	<u>Multi-Cleaner Plastic Bottle</u>	Part number	<u>MLH0301</u>	Date	_____

No.	Operation Description	Machine type	Tooling	Set-up time	Operation time	Materials &description
01	<i>Polymer Selection</i>	–	–	–	–	High-Density Polyethylene (HDPE) resin

02	<i>Plastic resin Heating:</i> The raw plastic material is dried and mix resin with additives to improve quality and durability.	Injection Blow Molding Machine	Dryer blender	30 minutes to 2 hours	30-60 minutes per batch	–
03	<i>Injection Molding:</i> The prepared plastic resin is heated and injected into a mold to create the plunger shape. The plunger typically includes specific features for sealing and proper fit within the bottle.	Injection Blow Molding Machine	–	30 minutes to 2 hours	5-15 seconds per plunger	–
04	<i>Cooling & Ejection:</i> The molded plunger is cooled to solidify the plastic and maintain its shape. After cooling, ejector pins or plates push the finished plunger out of the mold cavity.	Injection Blow Molding Machines Cooling Systems	–	30 minutes to 2 hours	5-10 seconds	–
05	<i>Trimming and Finishing:</i> Any excess material, such as flash or burrs from the molding process, is trimmed away. The plunger may undergo additional finishing processes to ensure a proper fit and smooth operation.	It can be done manually.	Trimming Tools Hot Air Guns	–	5-15 seconds	–
06	<i>Quality Control and Testing:</i> Each plunger is inspected for uniformity in dimensions, proper sealing features, and any defects such as cracks or inconsistencies.	Inspection Machine- Visual Inspection System	Calipers and Micrometers	30 minutes to 1 hour.	2-5 seconds per plunger	–

Company	_____	Part name	<u>Trigger</u>	Prepared by	_____
Produce	<u>Multi-Cleaner Plastic Bottle</u>	Part number	<u>MTH0402</u>	Date	_____

No.	Operation Description	Machine type	Tooling	Set-up time	Operation time	Materials & description
01	<i>Polymer Selection</i>	–	–	–	–	High-Density Polyethylene (HDPE) resin

02	<i>Material Preparation:</i> HDPE is melted, mixed with red colorant, and prepared for molding.	Material Blender	Dryer Moisture Analyzer	15 to 30 minutes	30-60 minutes per batch	–
03	<i>Injection Molding:</i> The prepared red-colored plastic resin is heated and injected into a mold to create the trigger shape. The trigger typically includes features such as a nozzle, lever, and locking mechanisms.	Injection Blow Molding Machine	–	30 minutes to 2 hours	5-15 seconds per trigger	–
04	<i>Cooling & Ejection:</i> The molded red trigger is cooled to solidify the plastic and maintain its shape. After cooling, the trigger is ejected from the mold cavity.	Injection Blow Molding Machines Cooling Systems	–	30 minutes to 2 hours	5-10 seconds	–
05	<i>Trimming and Finishing:</i> Any excess material, such as flash or burrs from the molding process, is trimmed away. The trigger may undergo additional finishing processes to ensure a proper fit and smooth operation.	It can be done manually.	Trimming Tools Hot Air Guns	–	5-15 seconds	–
06	<i>Quality Control and Testing:</i> Each red trigger is inspected for uniformity in dimensions, proper fit with the bottle, and any defects such as cracks or inconsistencies.	Inspection Machine-Visual Inspection System	Calipers and Micrometers	30 minutes to 1 hour.	2-5 seconds per trigger	–

Company	_____	Part name	<u>Pin</u>	Prepared by	_____
Produce	<u>Multi-Cleaner Plastic Bottle</u>	Part number	<u>MIH0502</u>	Date	_____

No.	Operation Description	Machine type	Tooling	Set-up time	Operation time	Materials & description
01	<i>Polymer Selection</i>	–	–	–	–	High-Density Polyethylene (HDPE) resin

02	<i>Material Preparation:</i> HDPE is melted, mixed with red colorant, and prepared for molding.	Material Blender	Dryer Moisture Analyzer	15 to 30 minutes	30-60 minutes per batch	–
03	<i>Injection Molding:</i> The prepared red-colored plastic resin is heated and injected into a mold to create the pin shape. The pin often includes specific features for attachment and functionality within the bottle assembly.	Injection Blow Molding Machine	–	30 minutes to 2 hours	5-15 seconds per pin	–
04	<i>Cooling & Ejection:</i> The molded red pin is cooled to solidify the plastic and maintain its shape. After cooling, the pin is ejected from the mold cavity.	Injection Blow Molding Machines Cooling Systems	–	30 minutes to 2 hours	5-10 seconds	–
05	<i>Trimming and Finishing:</i> Any excess material, such as flash or burrs from the molding process, is trimmed away. The pin may undergo additional finishing processes to ensure a proper fit and smooth operation.	It can be done manually.	Trimming Tools Hot Air Guns	–	5-10 seconds	–
06	<i>Quality Control and Testing:</i> Each red pin is inspected for uniformity in dimensions, proper fit with the bottle, and any defects such as cracks or inconsistencies.	Inspection Machine-Visual Inspection System	Calipers and Micrometers	30 minutes to 1 hour.	2-5 seconds per pin	–

Company	_____	Part name	<u>Nozzle Valve</u>	Prepared by	_____
Produce	<u>Multi-Cleaner Plastic Bottle</u>	Part number	<u>MNH0602</u>	Date	_____

No.	Operation Description	Machine type	Tooling	Set-up time	Operation time	Materials & description
01	<i>Polymer Selection</i>	–	–	–	–	High-Density Polyethylene (HDPE) resin

02	<i>Material Preparation:</i> HDPE is melted, mixed with red colorant, and prepared for molding.	Material Blender	Dryer Moisture Analyzer	15 to 30 minutes	30-60 minutes per batch	–
03	<i>Injection Molding:</i> The prepared red-colored plastic resin is heated and injected into a mold to create the nozzle valve shape. The nozzle valve typically includes features for sealing and attachment to the bottle.	Injection Blow Molding Machine	–	30 minutes to 2 hours	5-15 seconds per nozzle valve	–
04	<i>Cooling & Ejection:</i> The molded red nozzle valve is cooled to solidify the plastic and maintain its shape. After cooling, ejector pins or plates push the finished nozzle valve out of the mold cavity.	Injection Blow Molding Machines Cooling Systems	–	30 minutes to 2 hours	5-10 seconds	–
05	<i>Trimming and Finishing:</i> Any excess material, such as flash or burrs from the molding process, is trimmed away. The nozzle valve may undergo additional finishing processes to ensure a proper fit and smooth operation.	It can be done manually.	Trimming Tools Hot Air Guns	–	5-10 seconds per nozzle valve (manual)	–
06	<i>Quality Control and Testing:</i> Each red nozzle valve is inspected for uniformity in dimensions, proper sealing features, and any defects such as cracks or inconsistencies.	Inspection Machine- Visual Inspection System	Calipers and Micrometers	30 minutes to 1 hour.	2-5 seconds per nozzle valve	–

Company	_____	Part name	<u>Spray Container</u>	Prepared by	_____
Produce	<u>Multi-Cleaner Plastic Bottle</u>	Part number	<u>MRH0703</u>	Date	_____

No.	Operation Description	Machine type	Tooling	Set-up time	Operation time	Materials & description
01	<i>Polymer Selection</i>	–	–	–	–	High-Density Polyethylene (HDPE) resin

02	<i>Plastic resin Heating:</i> The raw plastic material is dried and mix resin with additives to improve quality and durability.	Injection Blow Molding Machine	Dryer blender	30 minutes to 2 hours	30-60 minutes per batch	–
03	<i>Injection Molding:</i> The heated plastic is injected into a mold to create a “preform” – a smaller version of the bottle shape.	Injection Blow Molding Machine	–	30 minutes to 2 hours	5-20 seconds per preform	–
04	<i>Blow Molding:</i> The preform is then transferred to a blow mold where the machine uses compressed air to expand the preform into the mold cavity. It is expanded into the final bottle shape.	Injection Blow Molding Machine.	Air Compressor	30 minutes to 2 hours	5-10 seconds per bottle	–
05	<i>Cooling and Ejection:</i> After the bottle is blown into shape, it is cooled to solidify and then ejected from the mold.	Injection Blow Molding Machines Cooling Systems.	–	30 minutes to 2 hours	2-5 seconds	–
06	<i>Trimming and Finishing:</i> any excess plastic from the molding process is trimmed off. The bottle may be polished, deburred, or treated to remove imperfections.	It can be done manually	Trimming Tools Sanders and Grinders Hot Air Guns	–	5-10 seconds per bottle	–
07	<i>Quality Control and Testing:</i> Bottles are inspected for uniform thickness, proper dimensions, and any defects like holes or weak spots.	bottle Inspection Machine- Visual Inspection System	Calipers and Micrometers	30 minutes to 1 hour.	2-5 seconds per bottle	–

Company	_____	Part name	<u>Plastic Tube</u>	Prepared by	_____
Produce	<u>Multi-Cleaner Plastic Bottle</u>	Part number	<u>MUH0803</u>	Date	_____

No.	Operation Description	Machine type	Tooling	Set-up time	Operation time	Materials &description
01	<i>Polymer Selection</i>	–	–	–	–	High-Density Polyethylene (HDPE) resin

02	<i>Plastic resin Heating:</i> The raw plastic material is dried and mix resin with additives to improve quality and durability.	Injection Blow Molding Machine	Dryer blender	30 minutes to 2 hours	30-60 minutes per batch	–
03	<i>Extrusion:</i> The prepared plastic resin is heated and extruded through a die to create the plastic tube. The tube may have specific dimensions and wall thickness to accommodate the bottle design.	Injection Blow Molding Machine	Extruder	30 minutes to 2 hours	5-10 seconds per tube	–
04	<i>Cooling:</i> The extruded plastic tube is cooled to solidify the plastic and maintain its shape. Water baths or air cooling systems used to rapidly cool the extruded tube.	Injection Blow Molding Machines Cooling Systems	–	30 minutes to 2 hours	10-20 seconds	–
05	<i>Cutting:</i> The cooled plastic tube is cut to the desired length for use in the bottle assembly.	Cutting Machine or Saw	Cutting knife	10-15 minutes	2-5 seconds per tube	–
06	<i>Trimming:</i> Any excess material, such as flash or burrs from the extrusion process, is trimmed away. The tube ends may undergo additional finishing processes to ensure a proper fit with the cap and bottle.	It can be done manually.	Trimming Tools Hot Air Guns	–	5-10 seconds	–
07	<i>Quality Control and Testing:</i> Each plastic tube is inspected for uniformity in dimensions, wall thickness, and any defects such as cracks or inconsistencies.	Inspection Machine- Visual Inspection System	Calipers and Micrometers	30 minutes to 1 hour.	2-5 seconds per tube	–