DURLON®
SEALING SOLUTIONS

www.durlon.com
info@durlon.com

SEALING SOLUTIONS FOR
Food and Beverage

Our Vision

Evolution isn't a choice in today's business landscape, it's the only way to succeed.

Progress relies on everything moving forward; from people to machinery to production. Everything must flow.

As we engineer our way to a better world, we are breaking down barriers, making sure each process is in place, always reflecting and improving. We are experts at delivering the best sealing solutions to help our customers unlock their highest potential.

Our global community of industry leading specialists drive our innovative production and materials to consistently raise the bar.

Whether through the stress of everyday use, or specialized applications and high-temperature environments, liquid or gas, our products deliver sustainable integrity.

At Durlon, we succeed when you succeed.

DURLON®
SEALING SOLUTIONS

Sealing Solutions for **Food and Beverage**

The global food and beverage industry is a vast and complex sector responsible for feeding the world's population, and a major contributor to the global economy, with a market value of over $5 trillion. This industry encompasses everything from growing and harvesting crops to processing and packaging food and drink products, and constantly evolving, driven by advances in technology and changing consumer preferences.

One of the biggest trends in the industry is the increasing demand for natural, organic, and non-GMO products. Consumers are becoming more conscious of the ingredients in their food and are choosing products that are free from artificial preservatives, colors, and flavors.

Another trend is the growing demand for convenience and ready-to-eat products. Consumers are looking for easy-to-prepare and quick-to-consume food and drinks, which is leading to an increase in the development of new packaging and preservation technologies.

The global food and beverage industry faces many challenges, including food safety, environmental sustainability, and economic competitiveness. The industry is under increasing pressure to reduce its environmental footprint, for example by reducing packaging waste and reducing the amount of energy and water used in production. Additionally, the industry must also strive to ensure the safety of its products by implementing strict regulations and quality control measures.

There are several challenges in the food and beverage industry when it comes to medium affecting piping and flange sealing systems. These include:

Corrosion: Many food and beverage products are acidic or alkaline, which can cause corrosion in piping and flange systems. Long-term exposures to certain ingredients can negatively impact equipment performance if the correct sealing materials are not used.

Sanitation: The food and beverage industry have strict sanitation requirements to prevent the growth of bacteria and other micro-organisms. In addition, the types of cleaners and sanitizers involved in the manufacturing process of certain products must also be considered, along with the frequency and duration of the cleaning process itself. Even when equipment is only briefly exposed to sanitizing chemicals, the chemicals and/or the cleaning process are typically basic solutions and can be highly aggressive.

Temperature: When it comes to the temperature conditions in which food and

beverages are processed, both extremes need to be considered. Elevated temperatures typically will accelerate chemical reactions and material attack. Steam used in the sterilization process is often more aggressive than the food or beverage product itself. Therefore, the material compatibility plan should consider the actual temperature conditions reached. On the other end of the temperature spectrum, extreme cold temperatures can cause seals to become brittle and crack, leading to failure and potential contamination issues.

Food safety: The food and beverage industry are highly regulated, and facilities must comply with a wide range of regulations and standards. Piping and flange systems must be designed, manufactured, and installed according to these regulations to ensure the safety and quality of the final product. This includes using sealing materials that are safe for food contact, are non-toxic, non-allergenic, and do not leach harmful chemicals into the food product.

Durlon® understands that the food and beverage processing industry face a range of challenges. Every product needs to meet strict international safety and hygienic regulations. The materials used in the processing equipment must not release any chemicals into the foodstuffs, and prevent leaks or other malfunctions that could expose products to contamination. Further, sealing materials used in the production process must be able to withstand aggressive media such as cleaning agents, greases and extreme high and low temperatures. That's why our sealing solutions provide exceptional performance in food and beverage applications, delivering unsurpassed product integrity, safety and reduced downtime.

Our range of Food & Beverage industry related sealing materials have achieved numerous certifications for WRAS approved Material, USP Class VI, FDA, API 6FB Fire Tests and conform to FDA 21 CFR 177.2600 rubber articles intended for repeated use.

Innovative products
Unparalleled service

Durlon® FDA Compliant Products

Durlon understands every product used in food and beverage applications needs to meet strict international safety and hygienic regulations. They are designed with CIP (Cleaning In Place) and SIP (Sterilization In Place) in mind, thus eliminating the need for different materials. They comply with a growing number of national and international rules and regulations, like FDA, USP, NSF and 3-A standards. They have achieved numerous certifications for WRAS approved Material, USP Class VI, FDA and conform to FDA 21 CFR 177.2600 rubber articles intended for repeated use.

Our Durlon® FDA compliant products are used in mixers, homogenizers and blenders along with other food processing machinery. All of our raw materials and finished products are tested in our In-House laboratory to ensure our materials meet our high quality standards throughout the production process. That's why our sealing solutions provide exceptional performance in food and beverage applications, delivering unsurpassed product integrity, safety and reduced downtime.

Our products are designed to reduce failures, thereby stopping contamination, loss of production and possible personal injury. Safety is our number one priority at Durlon. Our dedication is not only for our workers and factories, it is in the products we produce. Safety, truly is important at Durlon®.

Durlon® products listed below are compliant to FDA regulations as indicated.

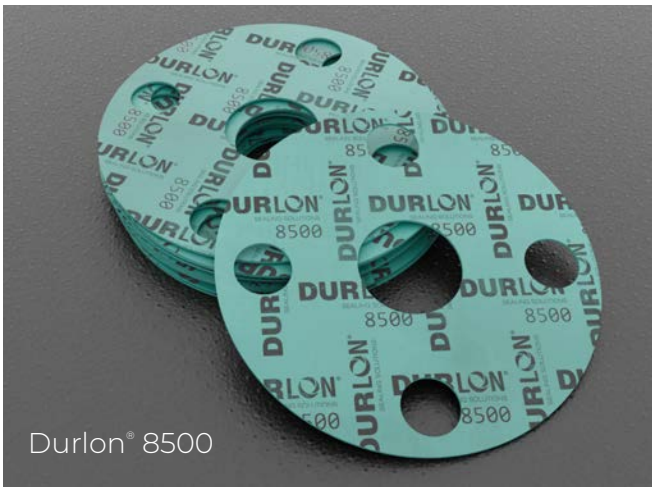
CFR Title 21 - Food and Drugs Part # Section #	Durlon® 9000, 9000N, 9002			Durlon® 9200			Durlon® 9600		
	Branding	Fillers	Finished Product	Branding	Fillers	Finished Product	Branding	Fillers	Finished Product
Part 175 - Indirect Food Additives: Adhesives and Components of Coatings Section 300 - Resinous and polymeric coatings	✔	N/A	✔	✔	N/A	✔	N/A[1]	N/A	N/A[1]
Part 177 - Indirect Food Additives: Polymers Section 1500 - Per fluorocarbon Resins	N/A	N/A	✔	N/A	N/A	✔	N/A	N/A	✔
Part 177 - Indirect Food Additives: Polymers Section 2600 - Rubber articles intended for repeated use	N/A	✔	✔	N/A	✔	✔	N/A	N/A	N/A
Part 178 - Indirect Food Additives: Polymers Section 3297 - Colorants for polymers	N/A	N/A	✔	N/A	N/A	✔	N/A	N/A	✔

✔ = Compliant to stipulated regulation **N/A** = not applicable to stipulated regulation
[1] = Durlon 9600 is supplied unbranded as standard offering

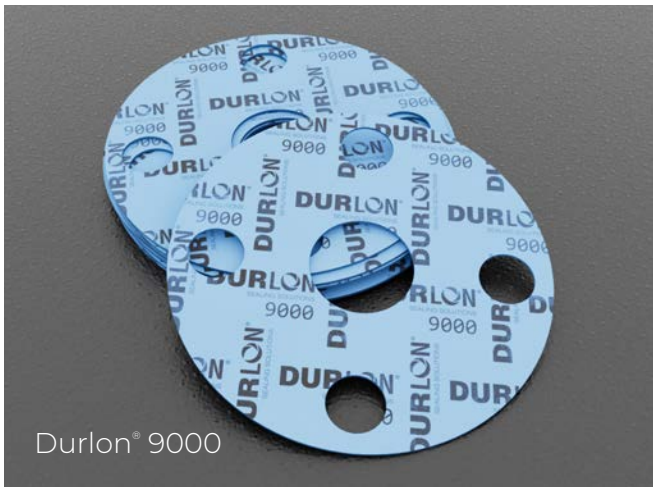
CFR Title 21 - Food and Drugs Part #177 - Indirect Food Additives: Polymers Section #1550 - Per fluorocarbon Resins Extraction Test (2 hours)	Durlon® 9000, 9000N, 9002		Durlon® 9200		Durlon® 9600	
	Fluoride Extractives	Total Extractives	Fluoride Extractives	Total Extractives	Fluoride Extractives	Total Extractives
Distilled Water	✔	✔	✔	✔	✔	✔
50% Ethanol	✔	✔	✔	✔	✔	✔
n-Heptane	✔	✔	✔	✔	✔	✔
Ethyl Acetate	✔	✔	✔	✔	✔	✔

✔ = Pass

Durlon® Product Recommendations

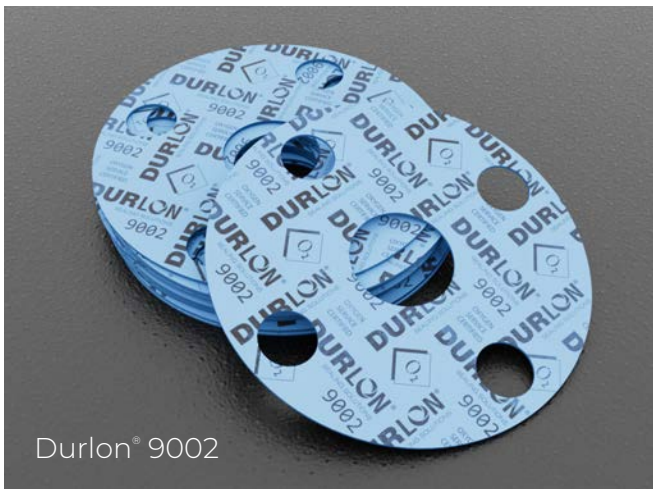


Durlon® 8500



Durlon® 9000

Durlon® 9000N



Durlon® 9002

Durlon® 9200


Durlon® 9600

Physical Properties & Certifications

Physical Properties	8500	9000/9000N	9002	9200	9600
Composition	Aramid-Inorganic NBR	Inorganic Filler / Pure PTFE Resins	Inorganic Filler / Pure PTFE Resins	Barium Sulfate Filler / Pure PTFE Resins	100% Pure Expanded PTFE
Color	Green	Blue/White	Blue	Granite White	White
Temperature: Min Max Continuous, Max	 -73°C (-100°F) 371°C (700°F) 287°C (548°F)	 -212°C (-350°F) 271°C (520°F) 260°C (500°F)	 -212°C (-350°F) 271°C (520°F) 260°C (500°F)	 -212°C (-350°F) 271°C (520°F) 260°C (500°F)	 -240°C (-400°F) 316°C (600°F) 270°C (518°F)
Pressure, max, bar (psi)	103 (1,500)	103 (1,500)	103 (1,500)	103 (1,500)	200 (2,900)
Density, g/cc (lbs/ft^3)	1.7 (106)	2.2 (138)	2.2 (138)	2.5 (156)	0.9 (56.2)
Compressibility, %	8-16	8-16	8-16	8-16	40-50
Recovery, %	50	40	40	35	14
Creep Relaxation, %	20	30	30	30	30
Tensile Strength, MPa (psi)	13.8 (2,000)	13.8 (2,000)	13.8 (2,000)	13.2 (1,920)	20 (2,800)
Sealability ASTM 2378 (Nitrogen)	 0.03 cc/min	 0.01 cc/min	 0.01 cc/min	 0.01 cc/min	 0.01 cc/min

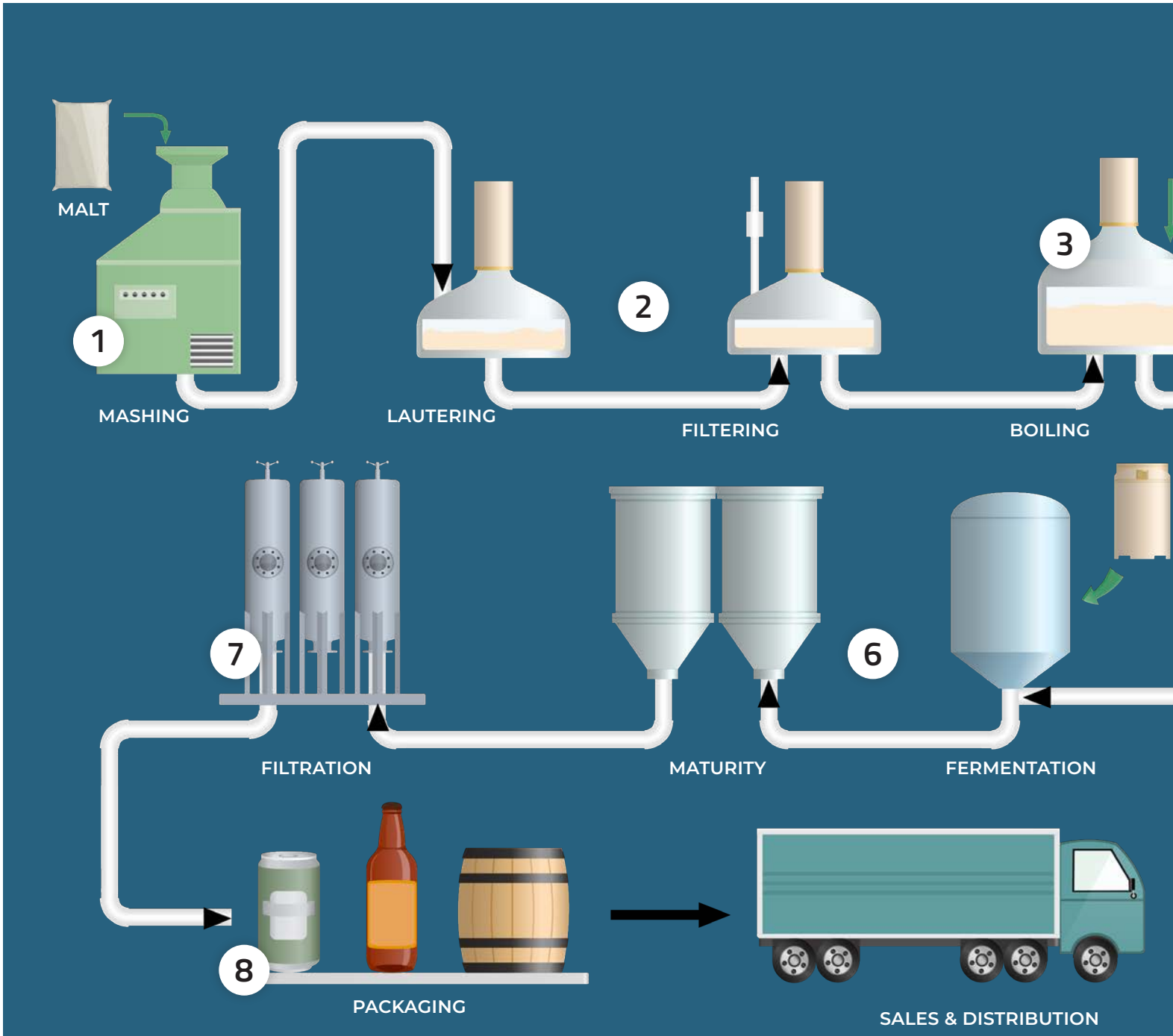
Style	Certifications
8500	California Proposition 65, RoHS Reach Declaration, API 6FB Fire Test with avg. temperature >650°C, 30 minutes, 40 bar, 1 ml (inch/min.) max allowable leakage, Conforms to the FDA requirements of 21 CFR 177.2600.
9000	RoHS Reach Declaration, ANSI/API 607 Fire Test 6th edition, Zero leakage (The test fixture was subjected to an external flame of 875°C (1607°F) average for 30 minutes. The measured leakage was 1.8 ml/min, where the max allowable limit is 1200ml/sec.), Approved material for WRAS (Water Regulations Advisory Scheme), USP Class VI 121°C (250°F) for 30 min., TA-luft (VDI Guideline 2440), ABS-PDA & Pamphlet 95, the chlorine institute, DNV-GL, (EC) 1935/2004 & EU (10/2011), and conforms to FDA requirements of 21 CFR 177.1550 for food and drug contact.
9000N	RoHS Reach Declaration, USP Class VI 121°C (250°F) for 30 min., Approved material for ABS-PDA, (EC) 1935/2004 & EU (10/2011), and conforms to FDA requirements of 21 CFR 177.1550 for food and drug contact
9002	BAM oxygen service: gaseous & liquid up to 260°C (500°F) at 52 bar (754 psi), and conforms to FDA requirements of 21 CFR 177.1550 for food and drug contact. Lox Mechanical Impact (ASTM G86 & ISO 21010) with zero reactions out of 20 at a test reaction frequency of 0%. RoHS Reach Declaration.
9200	RoHS Reach Declaration and approved material for ABS-PDA & Pamphlet 95, the chlorine institute, DNV-GL and TA-luft (VDI Guideline 2440). BAM oxygen service: gaseous & liquid up to 260°C (500°F) at 52 bar (754 psi), and conforms to FDA requirements of 21 CFR 177.1550 for food and drug contact.
9600	Conforms to FDA requirements of 21 CFR 177.1550 for food and drug contact. Approved material for ABS-PDA. California Proposition 65, RoHS Reach Declaration.

Durlon® 9000 9000N, and 9002 are made with Teflon™ fluoropolymer. Teflon™ is a trademark of The Chemours Company FC, LLC used under license by Triangle Fluid Controls Ltd.

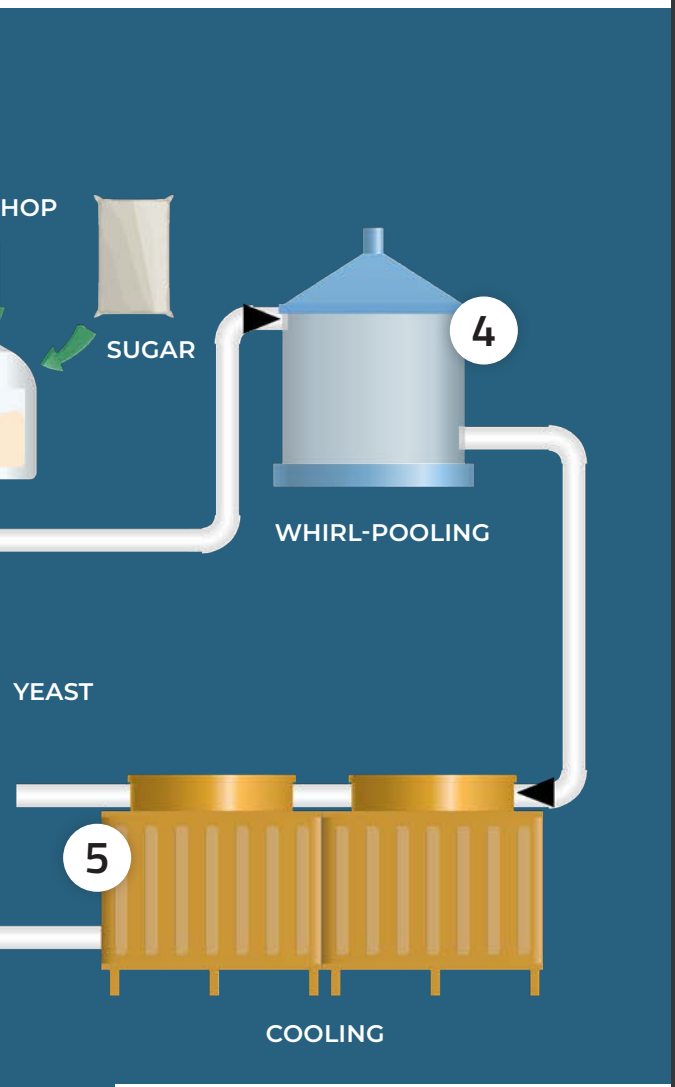
Note: ASTM properties are based on 1/16" sheet thickness, except ASTM F38 which is based on 1/32" sheet thickness. This is a general guide only and should not be the sole means of accepting or rejecting this material. The data listed here falls within the normal range of product properties, but should not be used to establish specifications limits nor used alone as the basis of design. For applications above Class 300, contact our technical department.

Warning: Durlon® gasket materials should never be recommended when both temperature and pressure are at the maximum listed. Properties and applications stated are typical. No applications should be undertaken by anyone without independent study and evaluation for suitability. Never use more than one gasket in one flange joint and never reuse a gasket. Improper use or gasket selection could cause property damage and/or serious injury. Data reported is a compilation of field testing, field service reports and/or in-house testing. While the utmost care has gone into publishing the information contained herein, we assume no responsibility for errors. Specifications and information contained within are subject to change without notice. This edition cancels and obsoletes all previous editions.

Beer Production Process Flow Diagram



NOTE: This is a graphical representation of a beer production process, showing the primary process flow path. It does not show the minor details of the process, rather it focuses on the equipment used, and other instruments that are present. It helps to illustrate how the major components of this type of process plant interacts with each other to bring about the desired effect.



Durlon® Product List

1. 8500
2. 8500
3. Process line: 9000/9000N or 9600
   Boiler: 8500
4. Process line: 9000/9000N or 9600
   Line that drains waste/solids: 8500
5. Process line: 9000/9000N or 9600
   Cooling tower/air-cooled chiller: 8500
6. Process line: 9000/9000N or 9600
7. Process line: 9000/9000N or 9600
8. Process line: 9000/9000N or 9600

8 Main Steps that make up the Brewing Process:

1. MASHING
The mashing process in beer production is where the starches in the grains are converted into sugars that can be used by the yeast to produce alcohol and carbon dioxide. This resulting sugar solution is known as wort.

2. LAUTERING
This process involves separating the liquid portion of the wort from the solid grain by flowing the wort through a filter bed. The filtered wort is then transferred to a boiling vessel.

3. BOILING
The wort is boiled in a large vessel called a kettle, which helps to extract bitterness and flavor from the hops that are added. During this process, the wort is circulated through a piping system that helps to distribute the heat evenly and prevent scorching.

4. WHIRL-POOLING
After boiling, the wort is circulated through a whirlpool vessel, where it is spun rapidly to create a vortex that helps to settle out solids and hops.

5. COOLING
The wort is then rapidly cooled, typically through a heat exchanger, to a temperature suitable for fermentation. During this process, the wort flows through a piping system that helps to transfer heat from the hot wort to a cooling medium, such as water.

6. MATURATION
After fermentation is complete, the beer is transferred to a maturation vessel, where it is aged to allow flavors to develop and clarify the beer.

7. FILTRATION
The beer is filtered through a series of filters to remove any remaining solids and yeast cells, and the clarified beer is then transferred to a packaging line..

8. PACKAGING
Finally, the beer is packaged in bottles, cans, or kegs, and is ready to be shipped and consumed.

The core of the Durlon® brand is to provide fluid sealing solutions that make sense, both financially and strategically. We accomplish this through process-oriented design, sector-specific knowledge, and extensive testing. Our goal is to ensure performance and safety while adhering to the quality management system registered to ISO 9001:2015.

At Durlon, we offer specially developed sealing solutions tailored directly to your specific needs.

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