



BAHRAIN RUBBER COMPANY W.L.L.
Engineering Rubbers for the Future....

ARCHITECTURAL RUBBER PROFILES



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ABOUT US

Bahrain Rubber Company (BRC) is one of the Major Rubber Companies in the GCC region for the manufacture of industrial rubber and polyurethane products. Bahrain Rubber Company is an ISO 9001: 2008 compliant company established in 1993 with a mission to serve regional oil, gas, steel and construction sector .

BRC was honored with the prestigious Prime Minister's Award for Excellence in 1998. As experts in supplying rubber products to a host of manufacturing and industrial businesses throughout the Middle East, BRC has built up an unparalleled portfolio of molded rubber, rubber lining, extrusion, polyurethane foam tyre filling and polyurethane casting products.

The principle factory is capable of handling the following process conveniently with precision.

1. Compression molding.
2. Injection molding.
3. Extrusion.
 - a. Hot feed.
 - b. CV line extrusion.
4. Rubber lining.
5. Polyurethane casting.
6. Polyurethane Spray.
7. Polyurethane tyre foam filling.

BRC is an approved vendor with major oil and gas companies like Saudi ARAMCO, SABIC, MARRAFIQ, SEECO, SWCC, SAUDI RAILWAYS & BAPCO. BRC serves different Industrial Portfolios like Oil, Aluminium, Marine, Petrol Chemical, Glass, Equipment, Steel, Pipe, Civil, Defence, & Power.

Bahrain Rubber Company is a premier service provider for the Rubber & Polyurethane products all over GCC

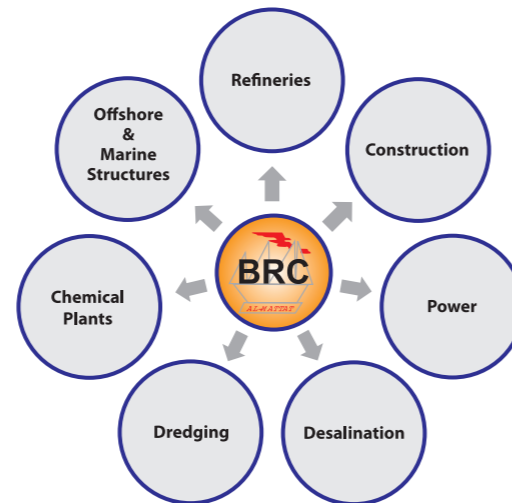
BRC's mission is to use the best solutions and install the best products to the highest standards and yet still continue to strive to improve.

BRC is a pioneering company offering speciality Rubber profiles for the aluminium architectural industry throughout GCC countries. As a custom extrusion company BRC caters world class solutions to all the leading manufacturers of Curtain wall ,facades, window and door systems.

BRC offers a wide range of Gaskets for Door and Window Systems, Curtain Walling Gaskets (both for Stick Systems and Unitized Systems), Seals for Patio and Swing Entrance Door Systems, Facade Systems, Skylights and Sliding Door and Window systems.

Our Ultramodern Plant and Production facilities consist of :

1. Internal mixing mills
2. Ultra High Frequency Extrusion Lines
3. Moulding Machines
4. R & D Lab equipped with state-of-the-art testing and laboratory equipments like Universal testing machine, Tensile Testers, Money Viscometer, Rheometer, Digital densimeter ,IRHD, SHORE 'A' & SHORE 'D' Hardness tester, profile projector, DIN Abrasion Tester, Compression set apparatus, Heat ageing tester
5. Well equipped Design Department



ABOUT US

Products

BRC has provided innovative solutions and high-quality products for a wide variety of markets for the past 15 years, has taken its decades of extruded polymer seal and gasket experience and put it to work to provide quality, custom-molded products. We can deliver a complete line of injection and compression molded parts, dense rubber, insert-molded and polyurethane products to meet your material and specification needs.

Markets

BRC has a branch office in Saudi Arabia with full functional marketing team. It has agents and support staff in Kuwait, Qatar & UAE.

Commitment to Customers

BRC is not just another rubber company; we believe in the power of innovation, and are committed to the exploration of new materials and manufacturing techniques that help us exceed the needs and expectations of our customers. BRC's global partnerships keep the company competitive in today's market and at the forefront of international trends, products and processes.



Mission Statement

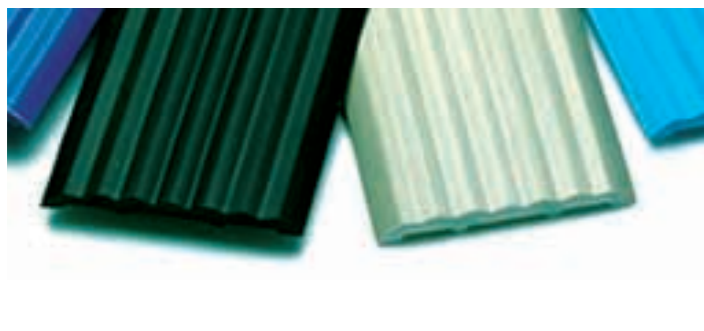
To be a successful and leading rubber manufacturing company in the middle east by effectively implementing the philosophies of high quality to guarantee customer satisfaction on a sustainable basis and to establish an atmosphere where every employee contributes, enjoys and excels in work .

Quality Policy

Bahrain Rubber Company will provide a quality system to meet or exceed customer requirements and expectations while ensuring continuous improvement of our products, processes and people.

Management Commitment Statement

Bahrain Rubber Company will establish, document, implement and maintain a Quality Management System and continually improve its effectiveness in accordance with the requirements of the ISO Standard.



PRODUCT RANGE

BRC offers a variety of rubber products for the Architectural Industry.

- ◆ EPDM Solid/Dense Rubber Profiles Stick and Unitized Systems.
- ◆ EPDM Sponge Rubber Profiles.
- ◆ Coloured EPDM Rubber Extruded products.
- ◆ Silicone Rubber Extruded products
- ◆ Coloured Silicone Rubber Extrusions.
- ◆ EPDM setting blocks
- ◆ Edge protectors
- ◆ U – Profiles
- ◆ EPDM Expansion Joints
- ◆ Moulded Corners

Rubber Gaskets

Gaskets are mechanical seals that prevent leaks between separate substrate sections. They are occasionally made of hard material because they must be durable enough to withstand extreme pressures and wear. These gaskets, can be made out of synthetic rubbers. These thick rubbers are robust enough to handle the kinds of extreme pressure and wear associated with gasket applications.

Why Rubber Gaskets?

- ◆ Meets functional parameters like easy fitment, insertion and retention force after fitment.
- ◆ Meets the design parameters like Compression load deflection force, required retention force at the time of operations.
- ◆ Seals the glazing with the aluminum flange firmly to avoid dust, water & air to leak inside the cabin.
- ◆ Maintains zero tolerance levels for conformance to dimensional specifications and perfect fitment are the primary reasons to use rubber gaskets in the modern building industry.

Types of Synthetic Rubbers Used in Gaskets

Many types of synthetic rubbers are used to manufacture rubber gaskets, primarily due to the multitude of different environments faced by different applications. Some rubbers will be needed to withstand both extreme cold as well as extreme heat, while others will be exposed to chemicals that may act as corrosives and could pose dangers to many types of rubber. This makes heat and cold resistance, weatherability, and a lack of absorption a premium for gasket rubber, but toughness, flexibility, and friction properties are not to be discounted.

The following list of materials is not intended to be comprehensive, but rather to represent some of the more common types of rubber used in rubber gasket production.

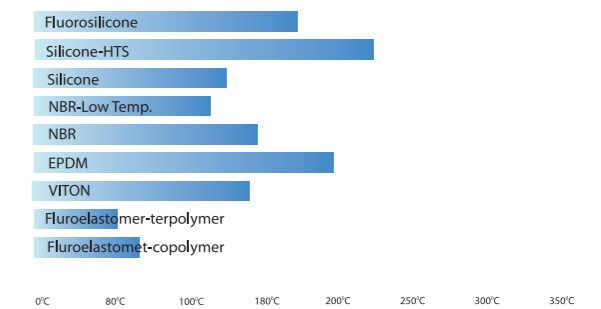
- ◆ Natural Rubber
- ◆ Silicone (Polysiloxane)
- ◆ EPDM (Ethylene-Propylene-Diene-Monomer)
- ◆ Neoprene (Polychloroprene)
- ◆ Nitrile (Acrylonitrile-butadiene)
- ◆ Fluoroelastomers
- ◆ SBR (Styrene-Butadiene-Rubber)

Choosing the Right material for the right application

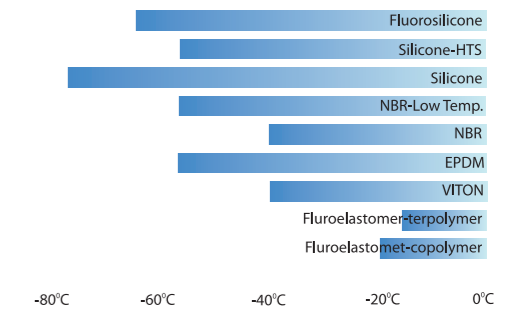
The selection of the right material for the right application begins with the analysis of the material to satisfy some radical properties .These properties fall on the broader spectrum of physical ,chemical and mechanical characteristics . Choosing the right Rubber is important in proper seal and gasket design. The below technical information will serve as a guide to comparing materials with their physical properties.

	Natural Rubber	SBR	EPDM	Neoprene	Nitrile	Silicone	FKM
Chemical Name	Polysoprene	Styrene Butadiene	Ethylene Propylene	Chloroprene	Acrylonitrile Butadiene	Polysiloxane	Fluorinated Hydrocarbon
Physical Properties							
Specific Gravity	0.93	0.94	0.86	1.23	1.00	0.95 to 1.20	1.40 to 1.95
Durometer, Range	30-100	40-100	30-90	40-95	30-90	25-90	55-90
Tensile Strength	E	F-G	VG	VG	VG	F-G	VG
Elongation	VG-E	G	G	G	G	VG-E	F-G
Compression Set	G	G	G	F-G	G	G-E	G-E
Heat Resistance	F	F-G	VG-E	F-G	G	E	E
Resilience or Rebound	E	F-G	G	VG	F-G	G	F
Impact Resistance	E	E	G	G	F	P-G	E
Abrasion Resistance	E	G-E	G-E	G-E	G-E	P-F	F-G
Tear Resistance	E	F	F-G	F-G	F-G	P-F	F
Cut Growth	E	G	G	G	G	P-F	P-F
Flame Resistance	P	P	P	G	P	F-G	VG-E
Impermeability, Gas	F	F	F-G	F-G	G	F-G	E
Weathering Resistance	P-F	F	E	VG	F-G	E	E
Low Temperature Limit	-10° to -50° F	0° to -50° F	-20° to -40° F	-10° to -50° F	-10° to -30° F	-65° to -100° F	+10° to -40° F
High Temperature Limit	170° to 225° F	170° to 225° F	300° to 350° F	225°	250°	400° to 550° F	400° to 450° F
Chemical Resistance Properties							
Acid	F-G	F-G	G	G	G	F	G
Alcohols	G	G	G	VG	F-G	G	F-E
Aliphatic Hydrocarbon Solvents	P	P	P	G	E	P-F	E
Alkali	F	F	VG	E	VG	P	F-G
Animal & Vegetable Oils	F	F	G	G	VG	G	E
Aromatic Hydrocarbon Solvents	P	P	P	P-F	F-G	P-F	E
Oil & Gasoline	P	P	P	F-G	G-E	P-F	E
Oxygenated Solvents	G	G	vG	P-F	P	F	P
Water	E	G-E	E	G	G-E	G-E	G

High-Temperature Limits of Various Sealing Elastomer



Low-Temperature Limits of Various Sealing Elastomer



EPDM Rubber

EPDM stands for Ethylene Polypropylene Diene Monomer (EPDM) and it is a synthetic hydrocarbon based organic rubber. EPDM is the fastest growing synthetic rubber and the largest non-tyre rubber, which finds its main applications in automotive (as profiles, hoses, and seals), in building and construction (as profiles, roofing foil, and seals), and in cable and wire (as insulation and jacketing).

EPDM exhibits outstanding resistance to ultra violet radiation in sunlight and ozone & heat resistance. EPDM is basically a thermoset rubber, which contains Ethylene and Polypropylene with a third Monomer.

EPDM is widely accepted as the perfect material for rubber profiles used in Structural Glazing by Aluminum Fabricators and Door Window Manufacturers. EPDM gaskets serve as sealing components used between the glass and aluminum sections.

Most common applications

Architectural

A wide range of Door and Window Sealing Systems, Curtain Walling Gaskets (both for Stick System and Unitized Systems), Seals for Patio and Swing Entrance Door Systems, Facade Systems, Skylight and Sliding Door and Door and Windows systems.

Vehicles

EPDM rubber is commonly used in weatherseals on all vehicles. This includes door seals, window seals, trunk seals, and sometimes hood seals. Frequently these seals are the source of noise due to movement of the door versus the car body. Additionally, EPDM can be used as charge air tubing on turbo charged engines. More specifically, it can be used to connect the cold side of the charge air cooler (aka "intercooler") to the intake manifold.

Safety Equipment

EPDM is also commonly used as a material for the face seals of industrial respirators, most frequently chosen where the use of silicone must be avoided, typically in automotive paint spray environments.

The typical properties of EPDM Rubber Gasket are follows:

Characteristics	Standard	Specifications
Hardness Shore A	ASTM-D2240	70+5
Tensile Strength (Kgf/cm ²)	ASTM-D412	70 Min.
Elongation at Break (%)	ASTM-D412	250 Min.
Tear Strength (Kgf/cm)	ASTM-D624	15 Min.
100% Modulus (Kgf/cm ²)	ASTM-D412	22 Min.
Specific Gravity	ISO-2781	1.20+0.05
Age Resistance at 70 °c for 70 Hrs	ASTM-D573	
Hardness	ASTM-D2240	+10,-5
Tensile Strength (%)	ASTM-D412	-25 Max.
Elongation at Break (%)	ASTM-D412	-35 Max.
Compression Set (%) at 70°C For 22 Hrs	ASTM-D395	50 Max.
Ozone Resistance		
O3 Concentration 50pphm		
Test Temperature 40°C		NO
Elongation 20%	ASTM-D1149	VISIBLE
Duration 72 Hrs		CRACKS

Solar Pool Panels

Extruded EPDM is used to make a solar heat collector for swimming pool and solar water heating systems.

Roofing

EPDM is used as a covering to waterproof roofs. It has the benefit that it does not pollute the runoff rainwater, which is of vital importance if the house owner wishes to use this water for personal sanitation/hygiene. Several houses equipped with rainwater harvesting thus make use of this type of roofing.

Playground/Pool Deck Surfacing

Coloured EPDM granules are used to create a non-slip, soft, porous safety surface for wet-deck areas such as pool decks or playgrounds. EPDM granules are mixed with Polyurethane binders and trowled or sprayed on to concrete, asphalt, screenings, interlocking brick, wood etc to create the surface.

Why EPDM for architectural profiles?

- ◆ Finds its main applications in automotive, Building and construction and cable & wire industries.
- ◆ EPDM is a highly valued material in the Building Construction Industry (primary Aluminum Fabrication Segment, Curtain-wall Industry, uPVC Doors & Windows Segment and Expansion Joint Segment), which represents 40% - 45% of world wide EPDM usage.
- ◆ Curtain walling systems is the largest application(40%).



Key Characteristics of EPDM

Ozone resistance	No cracks occur on EPDM gaskets due to Ozone consistence.
Wear Resistance	have high resistance against wear when compared with others.
Quality Stability	Good stability of unit weigh, and controlled tolerances of cross section dimensions.
Elasticity Feature	deformation is minimum when compared with others during effects of tightening, twisting,compression.
Durability	They with stand physical effects, ageing in heat and other laboratory conditions.

ARCHITECT'S GUIDE TO SELECTION OF MATERIALS

PROPERTIES		NATURAL RUBBER	SBR	BUTYL	EPDM	NBR	SILICONE	NEOPRENE	HYPALON
Tensile Strength (PSI)	Pure Gum	Over 3,000	Below 1,000	Over 1,500	Over 3,000	Below 1,000	Below 1,500	Over 3,000	Over 2,510
	Black Loaded	Over 3,000	Over 2,000	Over 2,000	Over 3,000	Over 2,000		Over 3,000	Over 3,000
Hardness Range (Shore A)		30-90	40-90	40-75	40-90	40-96	40-85	40-95	40-95
Specific Gravity	Base Materials	0.93	0.94	0.92	0.85	1.00		1.23	1.28
Adhesion to Metal		Excellent	Excellent	Good	Good	Excellent		Excellent	Excellent
Tear Resistance		Good	Fair	Good	Good	Fair	Poor	Good	Fair
Abrasion Resistance		Excellent	Good	Good	Good	Good	Poor	Excellent	Excellent
Compression Set		Good	Good	Fair	Good	Good	Fair	Fair	Fair
Rebound	Cold	Excellent	Good	Bad	Good	Good	Excellent	Very Good	Good
	Hot	Excellent	Good	Very Good	Good	Good	Excellent	Very Good	Good
Dielectric Strength		Excellent	Excellent	Excellent	Excellent	Poor	Good	Good	Excellent
Electrical Insulation		Good	Good	Good	Excellent	Poor	Excellent	Fair	Good
Permeability to Gases		Fair	Fair	Very Low	Poor	Fair	Fair	Low	Very Low
Acid Resistance		Fair	Fair	Excellent	Good	Good	Excellent	Good	Very Good
SOLVENT RESISTANCE	Aliphatics	Poor	Poor	Poor	Poor	Excellent	Poor	Good	Good
	Aromatics	Poor	Poor	Poor	Poor	Good	Poor	Fair	Fair
	Ketones	Good	Good	Good	Good	Poor	Fair	Poor	Poor
	Lacquer	Poor	Poor	Poor	Poor	Fair	Poor	Poor	Poor
RESISTANCE TO	Swell in Lubricating Oil	Poor	Poor	Poor	Poor	Very Good	Fair	Good	Good
	Oil & Gasoline	Poor	Poor	Poor	Poor	Excellent	Fair	Good	Good
	Animal & Vegetable Oils	Poor	Poor	Excellent	Good	Excellent	Fair	Good	Good
	Water Absorption	Very Good	Good	Very Good	Good	Fair	Good	Good	Very Good
	Oxidation	Good	Good	Excellent	Excellent	Good	Excellent	Excellent	Excellent
	Ozone	Fair	Fair	Excellent	Excellent	Fair	Excellent	Excellent	Outstanding
	Sunlight Aging	Poor	Poor	Very Good	Excellent	Poor	Excellent	Very Good	Outstanding
	Heat Aging	Good	Very Good	Excellent	Excellent	Excellent	Outstanding	Excellent	Excellent
	Flame	Poor	Poor	Poor	Poor	Poor	Fair	Good	Good
	Heat	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
	Cold	Excellent	Excellent	Good	Excellent	Good	Excellent	Good	Good



COMPOUNDING

The art of compounding is to determine the precise mix required for a given application, and then to add exactly the right quantity of each ingredient in the correct predetermined sequence. This mixing results in the inherent physical and chemical characteristics of the elastomer to be enhanced. Compounding of rubber is more "art" than "science".

Chemically speaking, rubber is an elastic material made up of long chain molecules known as polymers. Such polymers occur naturally in the sap of Hevea and Ficus trees, but for industrial purposes are now more often synthesised from a variety of other chemical compounds having short chain molecules, or monomers.

In their raw form polymers generally lack most of the properties required in finished rubber products. It is not until these polymers are mixed together with other materials, or compounded, that these properties are achieved.

There are four main ingredients essential to a finished compound:

The basic raw material, this being the polymer itself.

The Reinforcing - most commonly carbon, or in the case of coloured compounds silica. The reinforcing gives the compound its mechanical strength, and determines many of its characteristics.

Accelerators, or chemical catalysts that promote the cross-linking of the long chain molecules within the compound. It is this cross-linking which gives rise to the compound's ability to recover its initial form.

Additives, in the form of small quantities of oils, fatty acids and waxes. Additives enhance the performance of a compound in downstream manufacture, depending on its end use.

Process

After the recipe is determined it become imperative to use a mixing equipment that is versatile and equipped with features to maintain specific time, temperature and maintain the repeatability.

they are two types of mixers available for the batch and continuous mixing.

The mixing process initiates shear. As the temperature builds up, this helps disperse many of the ingredients. When all the materials have been thoroughly blended together the shear forces start to reduce again, and the compound is formed.

The compound then exits the mixer as a spherical mass, and is transferred on to a two-roll mill. This process has three key purposes:

- ◆ To finally complete the blending process.
- ◆ To cool the compound
- ◆ To simultaneously convert it into a usable form.

Extrusion

Extrusion is a process used to create objects of a fixed cross-sectional profile. A material is pushed or drawn through a die of the desired cross-section. The two main advantages of this process over other manufacturing processes are its ability to create very complex cross-sections and work materials that are brittle, because the material only encounters compressive and shear stresses. It also forms finished parts with an excellent surface finish.

Extrusion may be continuous (theoretically producing indefinitely long material) or semi-continuous (producing many pieces). be done with the material hot or cold.

Extrusion remains a popular choice for many manufacturers because of the neat, uniform way extruded rubber products can be produced. A great variety of shapes can be created for any industrial need, including hollow designs that greatly reduce material cost and create flexible, lightweight product.

Continuous Vulcanisation line- Extrusion

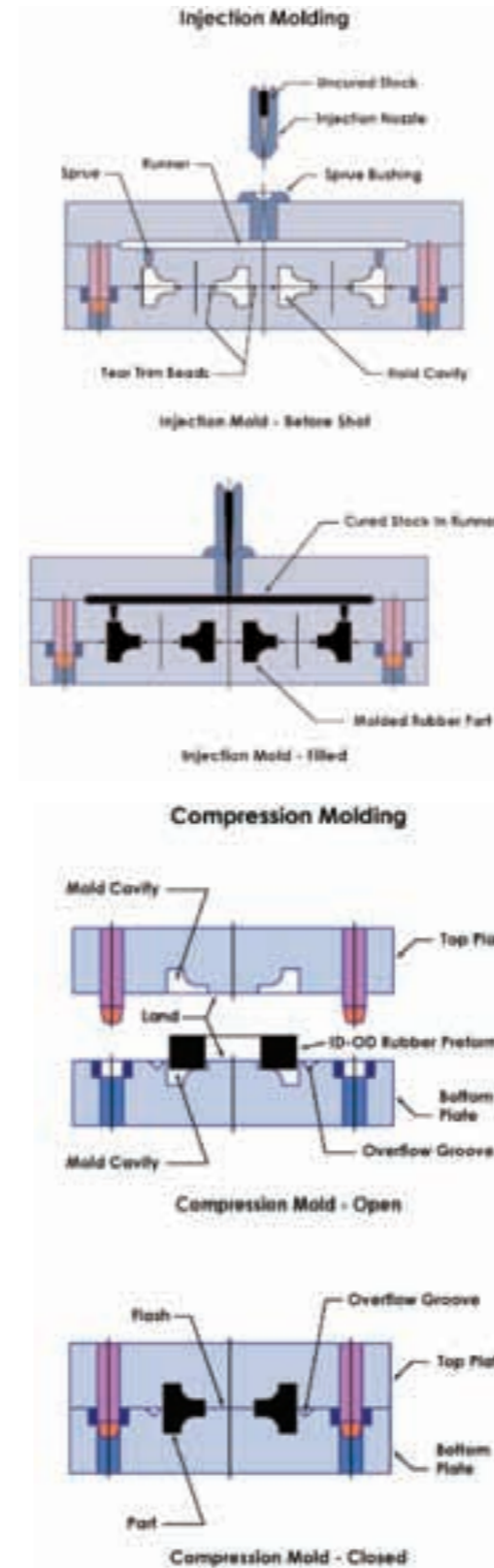
Continuous vulcanization has the advantage of combining processing and curing steps into one continuous operation on many extruded profiles. Traditionally, extruded profiles and hoses have been separately processed and vulcanized. During the processing step, the profile is extruded in a continuous operation, but the extrudate is accumulated for later batch vulcanization, in a steam autoclave.



Basically there are four stages to the continuous vulcanization process:

1. Formation of the profile
2. Heating to cure temperature
3. Curing
4. Cooling

Heat may be generated by heat transfer from the outside (Hot Air, Fluid Bed, Liquid Curing Media (LCM)). Curing is achieved by maintaining the temperature for the time needed to fully crosslink the rubber.



Injection Molding

Injection molding rubber was originally an extension from the plastics industry in the early to mid 1960s. After overcoming the initial issues of temperature (plastics is cooled when molding and rubber is heated) and pressure (rubber injection molding requires significantly more pressure per square inch of cavity surface), the process has become the most efficient way to mold rubber in most cases.

Injection molding start with more efficient material preparation. The material is mixed, typically in batches, and then stripped immediately after being mixed, into continuous strips. This strip is fed into a screw which charges a barrel as needed with a pre-defined amount of material. When the mold is closed, the material in the barrel is injected into the mold cavities and cured.

There are many advantages to this process:

1. Complete elimination of pre-forms, a labor-intensive step that can introduce variability in pre-form weight and shape resulting in variability of the finished product.
2. Complete elimination of operator placement of pre-forms. In many cases, the operator has to "strategically" place the pre-forms in either the cavity (compression molding) or the pot (transfer molding) to insure quality output.
3. The injection screw pre-heats the material before forcing it into the cavities. This decreases the viscosity of the material, allowing it to flow more easily into the cavities.

The other advantage is the potential for decreased cure time for two reasons:

- a. more rapid cavity filling due to lower viscosity
- b. the material is well on it's way to being cured as a result of the heat added during the screw charging

Compression Molding

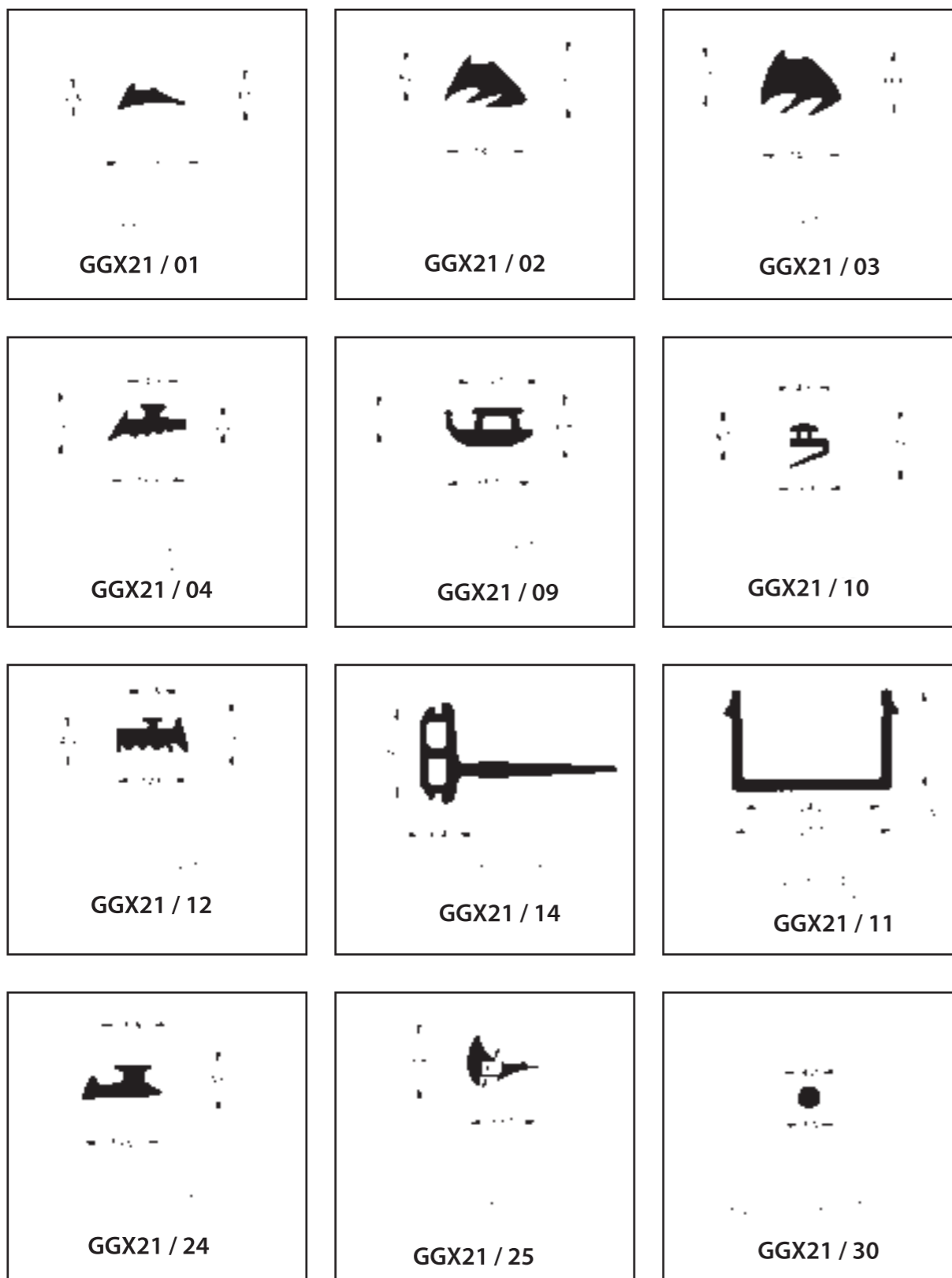
The first modern rubber product ever produced was compression molded in the home oven of Harvey Firestone in the 1890s. In many ways, not much has changed since for compression molding.

Compression molding involves taking rubber compound or mixed raw material and making "pre-forms" that are in the shape of the end product. These shapes are then loaded, typically by hand, into an open mold. The mold is closed, the rubber cured, and then demolded—typically by hand.

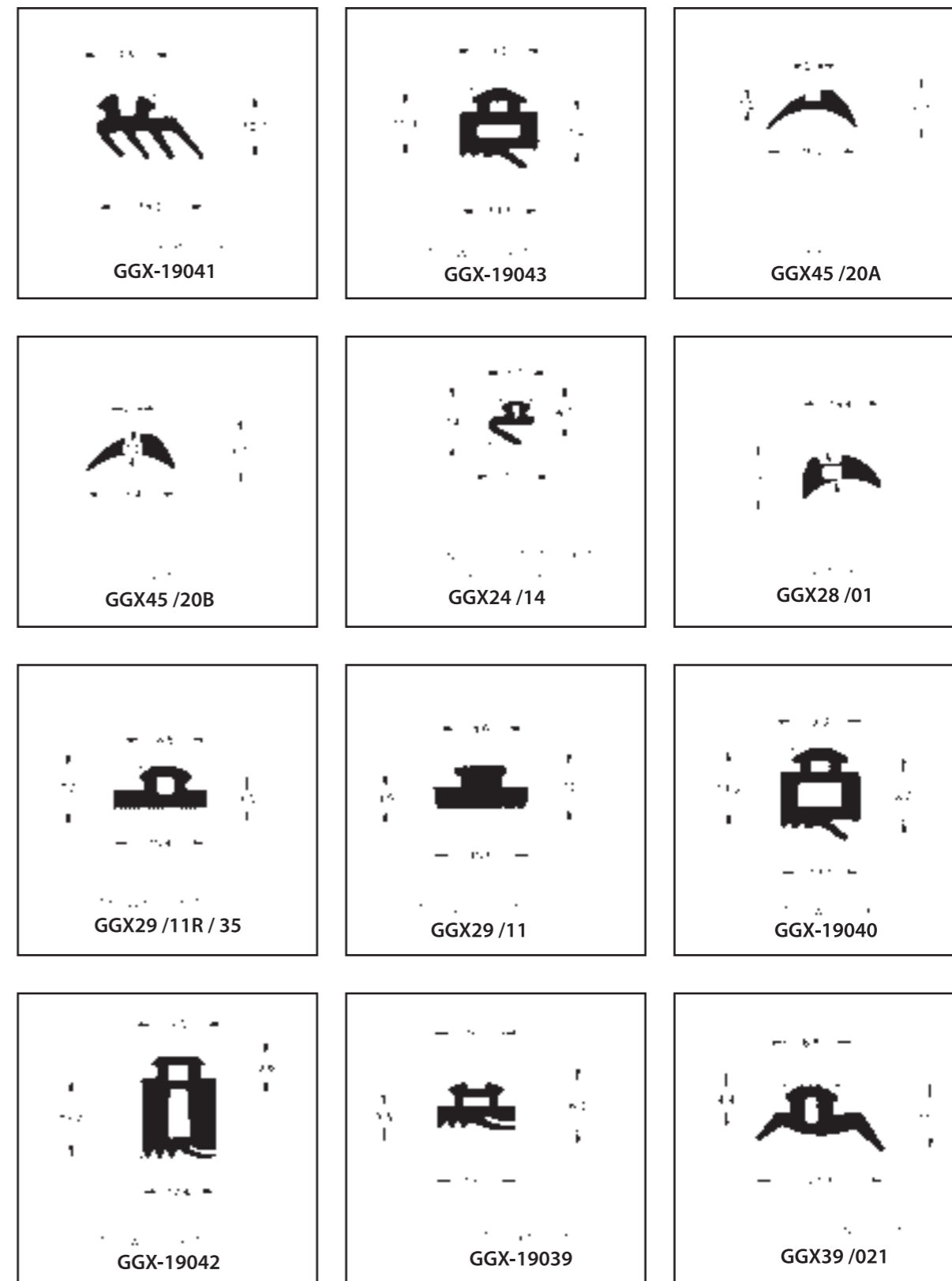
Compression molding can be cost effective if one or more of the following is true:

1. compression molding tooling already exists
2. the quantity required is very low
3. the part cross-section is very large and it requires a long cure time

BALEXCO EXTRUSION SYSTEMS



GULF EXTRUSION SYSTEMS



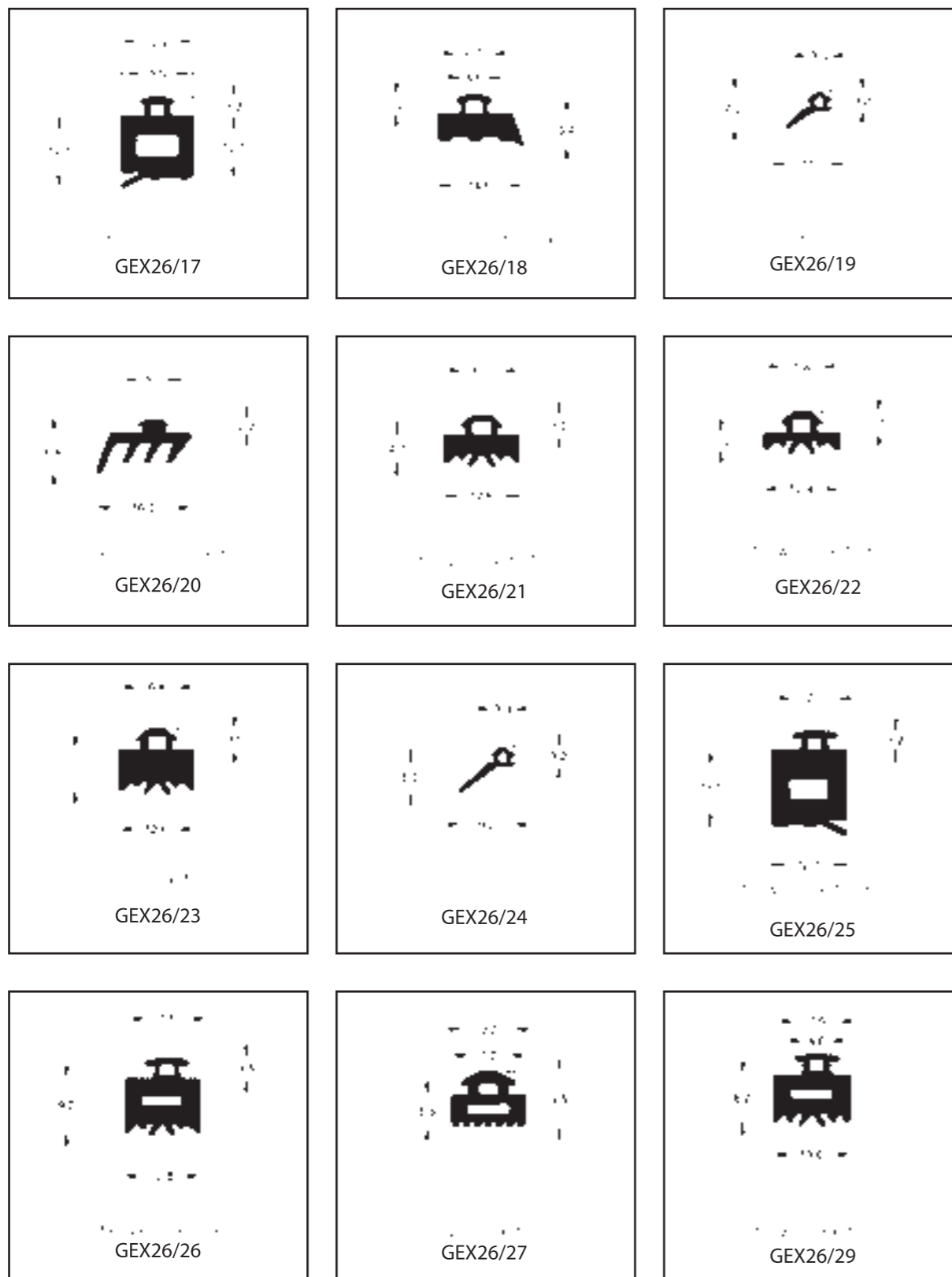
GULF EXTRUSION SYSTEMS



GULF EXTRUSION SYSTEMS



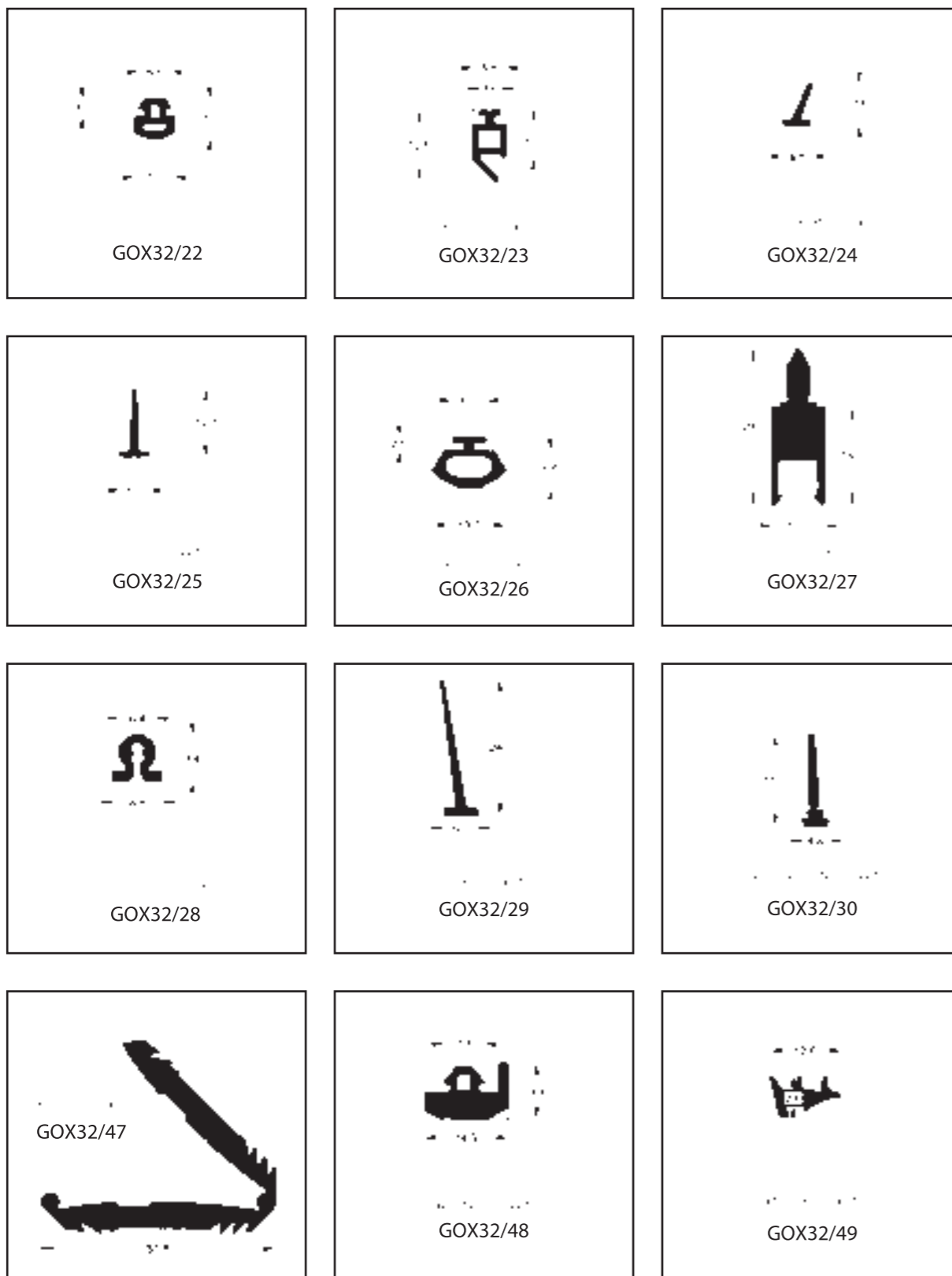
EMIRATES EXTRUSION SYSTEMS



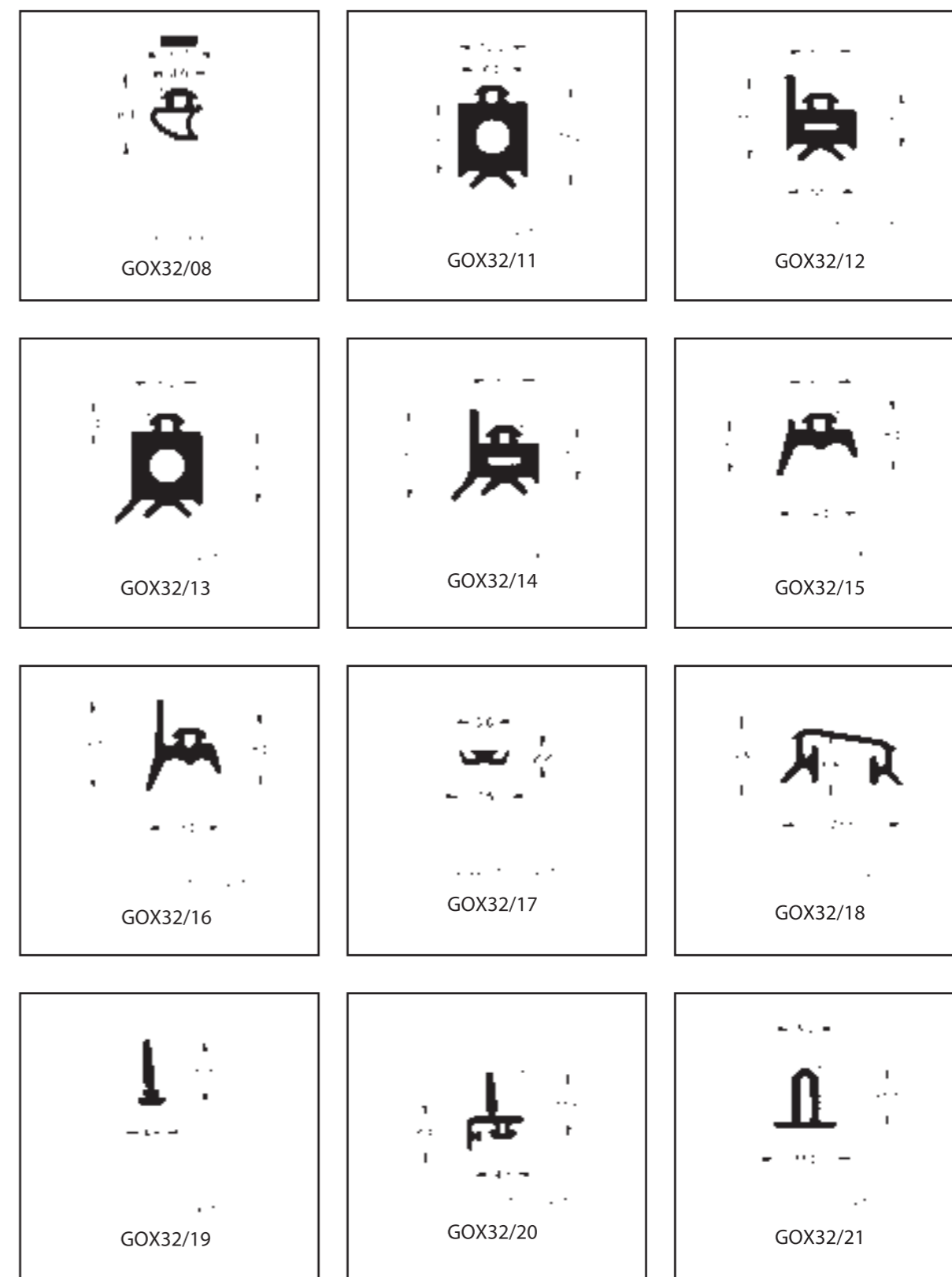
ALJABER EXTRUSION SYSTEMS



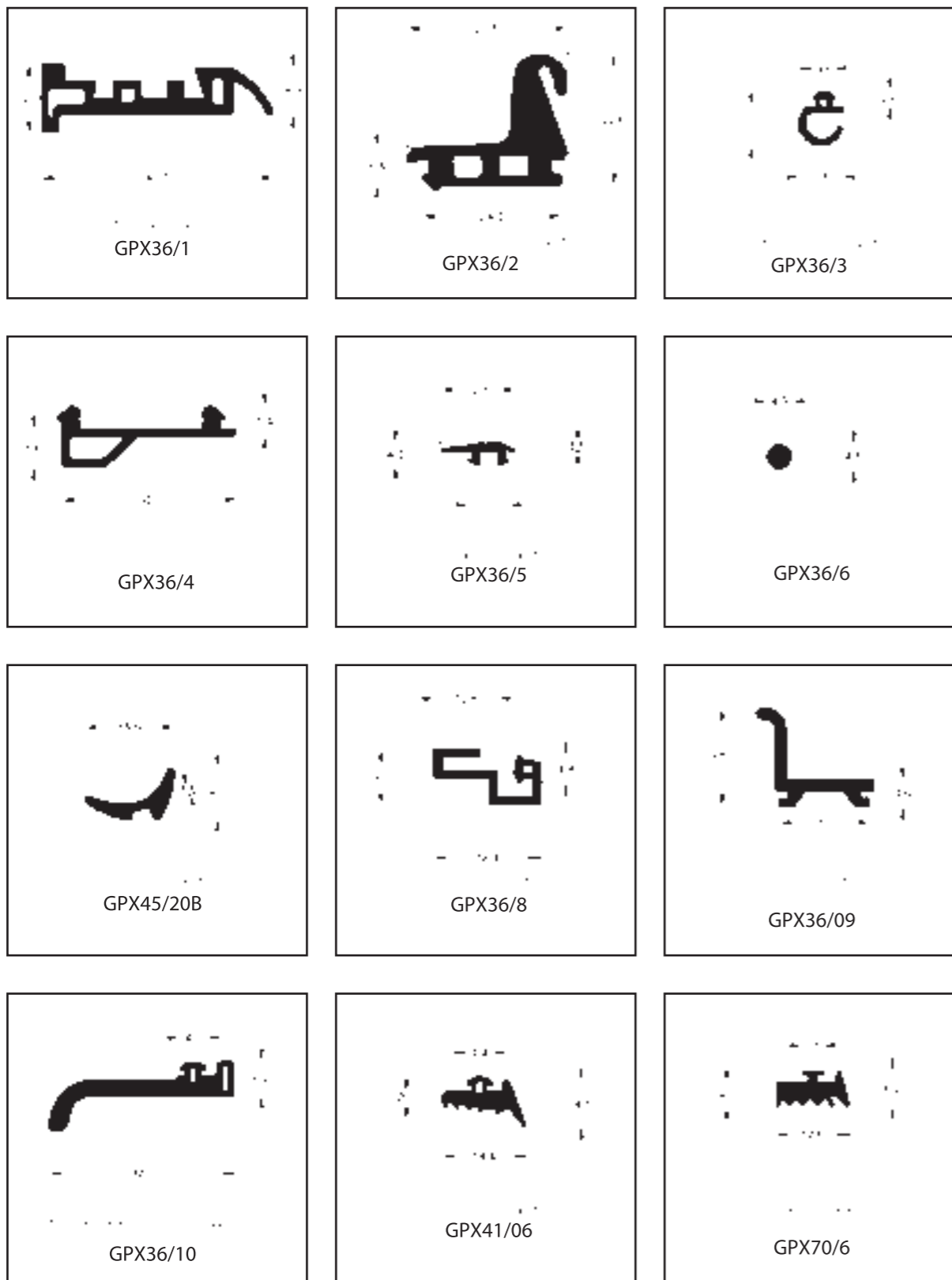
ALUMCO EXTRUSION SYSTEMS



ALUMCO EXTRUSION SYSTEMS



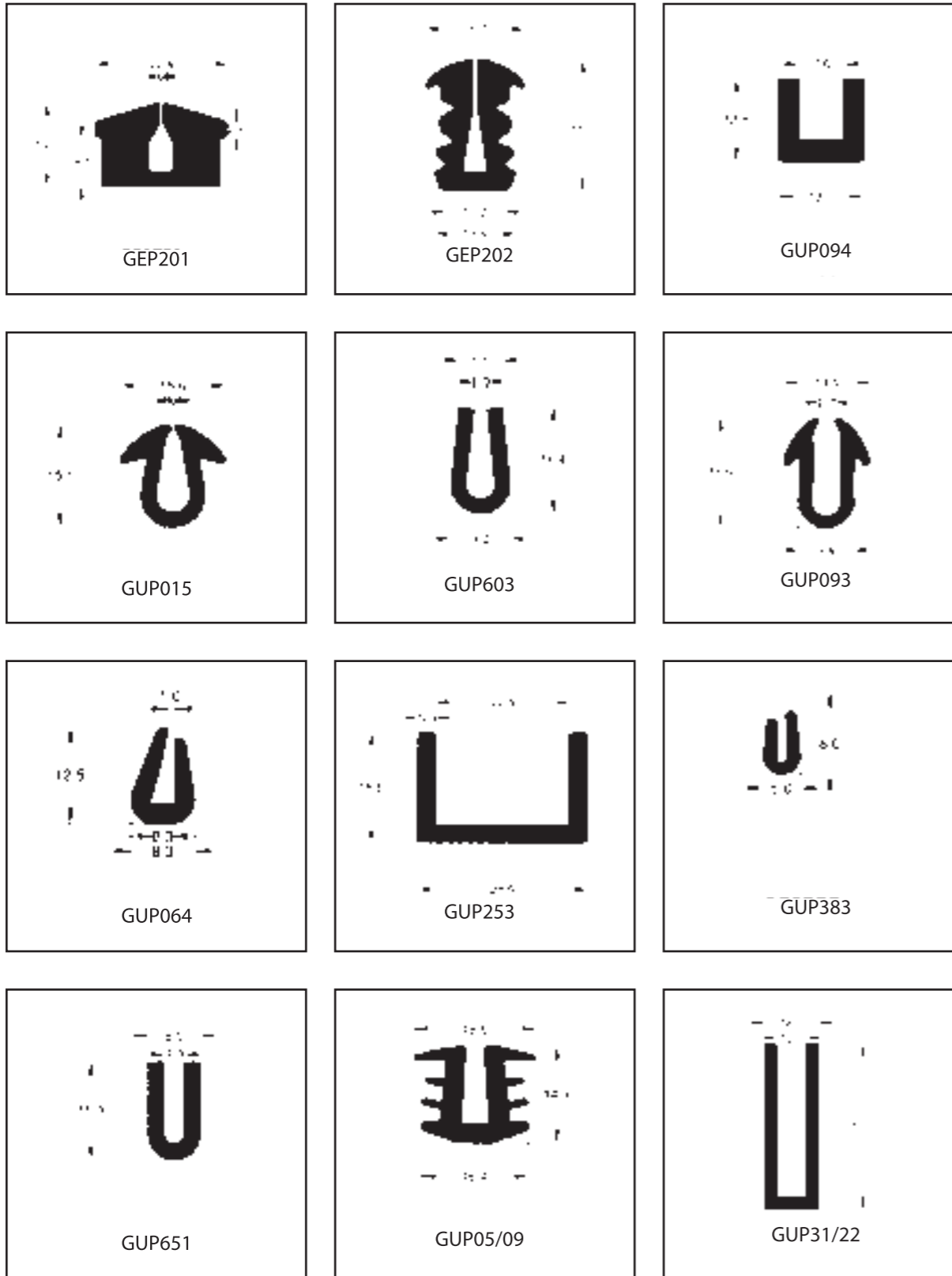
ALUPCO EXTRUSION SYSTEMS



ALUPCO EXTRUSION SYSTEMS



EDGE PROTECTORS & 'U' PROFILES



MOULDED CORNERS

The most leak susceptible area in any gasket system is at the corners. It is a standard practice to provide some type of corner treatment to attain an acceptable level of weather tightness. When a glazing system includes extruded gasket, the corners on the exterior side of the lite are treated to effectively create a continuous gasket around the entire perimeter of the lite. Treating the corners on the interior side of the lite is often desirable.

Advantages:

The advantages of molded corners are all in the process. An inherent weakness in vulcanized corners lies in the bonding of the two pieces of rubber at the mitered corner. Any stresses placed on the corner from thermal movement, handling, installation or any other reason, are directed right at the bond line. This gives rise to premature splitting of the corner which may result in air and water infiltration position of the bond in an molded corner.

Molded corner allows distribution of stress away from the bond line, while a vulcanized bond directs stresses at the bond line.



SETTING BLOCKS

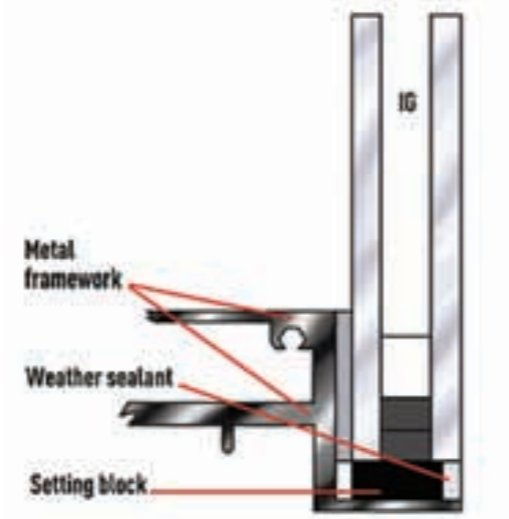
Function:

Setting blocks are installed inside the window sash, between the sash material and insulated glass unit. They protect the IG from the impact of opening and closing the sash. Setting blocks provide same stress relief as windows expand and contract over varying temperature conditions.

Application:

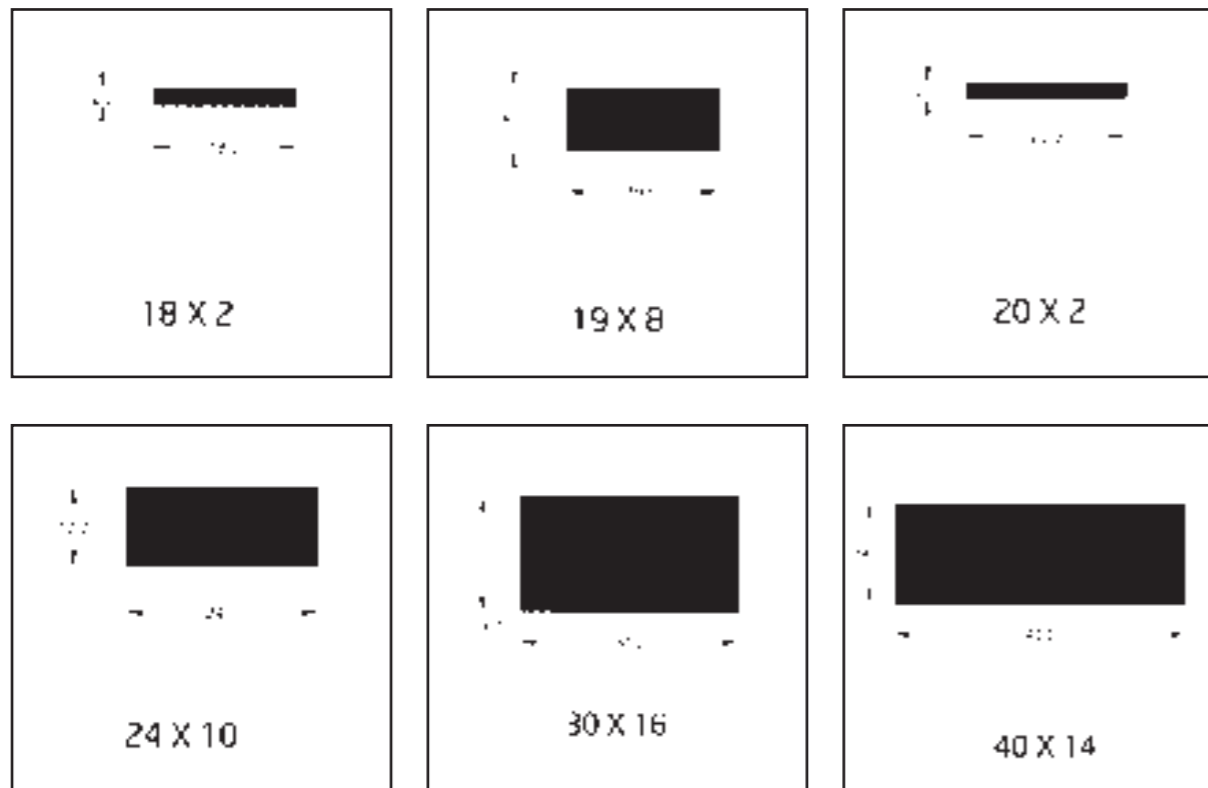
Setting blocks work best when they are spaced and sized appropriately. The larger the pane of glass, the longer the setting block should be. Setting Blocks are basically rectangular molded components made out of Synthetic Rubbers (Neoprene, EPDM or Silicon Rubber) by a permanent Vulcanization Process.

- ◆ The Setting Blocks are normally of 80 to 90 durometer hardness.
- ◆ The Setting Blocks are free of porosity, surface defects and dimensional irregularities that may affect serviceability.
- ◆ The Setting Blocks which are recommended by the manufacturer are being acceptable for use in the intended application of Non-Structural Glazing or Structural Glazing and these Setting Blocks have to be compatible with the glass and other glazing material with which they come into contact.
- ◆ These Setting Blocks not only perform well but they also blend well with frame. And of-course they are crack proof because of their Ozone Resistance properties.

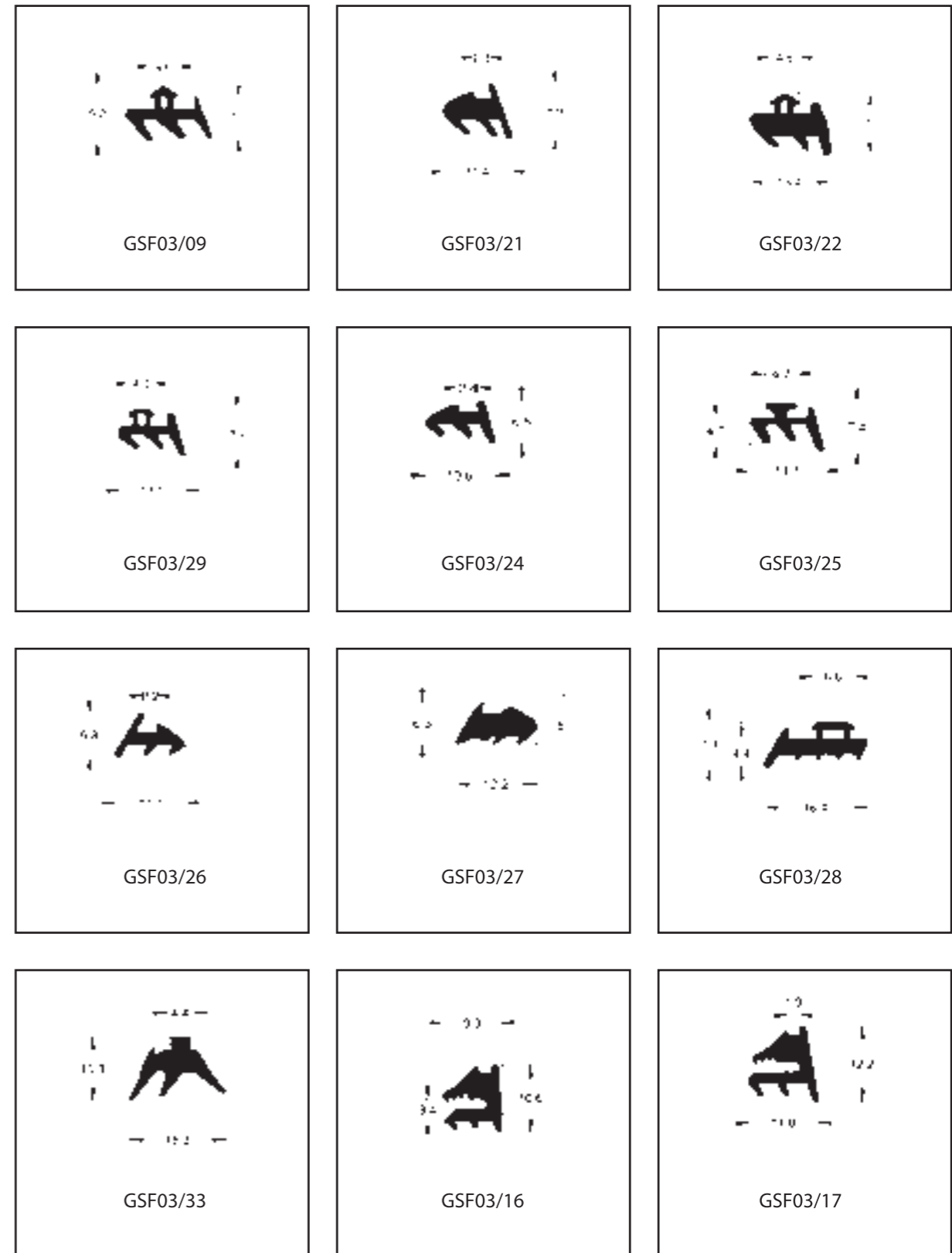


Setting blocks are typically installed in one of two fashions:

- ◆ With Adhesive:
- ◆ Without Adhesive:



GLAZED STOREFRONTS



Architectural Rubber Products

EXPANSION JOINTS

