Pneumatic Solutions

The Food Industry

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Parker

ENGINEERING YOUR SUCCESS.

Parker Hannifin Corporation

A global, Fortune 300 company with sales of $12 billion and over 400,000 customers in 46 countries, Parker Hannifin is the world's leading supplier of motion control components and system solutions serving the industrial, mobile, and aerospace markets.

Excellence is imprinted on our corporate DNA. We are the only manufacturer offering customers a choice of hydraulic, pneumatic, electromechanical, or computer motion control.

Total Systems Solutions
Parker's team of highly qualified applications engineers, product development engineers, and system specialists can turn pneumatic, structural extrusion, and electromechanical products into an integrated system solution. And our Selectable Levels of Integration™ program provides the components, subsystems, and controlled motion systems for the level of integration you choose.

1st in Delivery, Field Sales and Distribution
Parker boasts the industry's largest global distribution network, with more than 8,600 distributors worldwide.

With factories located strategically on five continents, we can maintain matchless on-time delivery rates. Expect industry's fastest response and delivery by customer request date when you contact Parker or one of its distributors. Plus, Parker's army of engineers works hand-in-hand with you and your local distributors during the design process to ensure the best products, services, and application performance. Parker Distribution offers the next level in premier customer service. Each location has significant onhand inventory to keep your down time to a minimum.

And many distributors have in-house design capability to support your system and subsystem requirements.

Training
Parker's best-in-class technology training includes hands-on classes, Web-based training, and comprehensive texts for employees, distributors, and customers. Parker also provides computer based training, PowerPoint presentations, exams, drafting and simulation software, and trainer stands.

www.parker.com
Industry's most comprehensive Web site is your single source for:
- Product information
- Downloadable catalogs
- 3-D design files
- Training materials
- Product configuration software
- RFQ capabilities

Parker world headquarters in Cleveland

Parker is committed to providing the Food Industry with world class pneumatic systems and components

Our understanding of today's highly demanding Food Processing & Packaging Industry, in conjunction with the experience that we have gained over the past decades provides us with the knowledge to meet all of your pneumatic requirements.

The Food Industry continues to develop with Directives and Standards that drive equipment manufacturers to use products that have been engineered to meet strict hygienic requirements, using specific design characteristics and materials.

With these Directives and Standards in mind, Parker continues to provide customers with innovative, highly reliable pneumatic products able to withstand aggressive environments and regular wash-down with strong cleaning agents.

EHEDG EUROPEAN HYGIENIC ENGINEERING & DESIGN GROUP SPONSOR 2008

Application Specialists...

At Parker we recognise that our future success will only be achieved by providing innovative, quality products coupled with 'Premier Customer Service'.

Wherever you are, you're close to a Parker Application Specialist with technical background not only in pneumatics but also in the specific demands of the Food Industry, ready to assist you in finding the optimum solution.

Parker supplying industry... worldwide

Parker Pneumatic benefits from having design and manufacturing 'Centres of Excellence' in Sweden, France, Holland, Germany, Italy, U.K., Japan, Brazil, Korea and the USA, providing a wide range of globally available pneumatic products for rapid delivery.

Directives and Standards

The Food Processing & Packaging Industry is subject to many directives and standards that influences the design of the machinery, ensuring the safety and suitability of equipment for use in these demanding environments.

98/37/EC
European Machinery Directive
This directive provides the regulatory basis for harmonisation of the essential health and safety requirements for machinery at European Union level. Essentially performing a dual function, the directive not only promotes the free movement of machinery within the Single Market, but also guarantees a high level of protection to EU workers and citizens.

852/2004/EC
European Food Hygiene Directive
This directive lays down the general rules for food business operators to ensure that all stages of production, processing and distribution of food under their control satisfy the relevant hygiene requirements. The implementation and maintenance of permanent procedures based on the HACCP system, forms an important part of this directive.

ISO 14159:2002
Safety of machinery. Hygiene requirements for the design of machinery.
This International Standard specifies the hygiene requirements of machinery that is produced by manufacturers, who must provide information for the intended use of the machinery to the end-user. It applies to all types of machines and associated equipment used in applications where hygiene risks to the consumer of the product can occur.

EN1672-2:2005
Food processing machinery. Basic concepts. Hygiene requirements.
Specifies the common hygiene requirements for the machinery that is used in preparing and processing food for human consumption to eliminate or minimise the risk of infection, illness or injury arising from the food that is produced. It identifies the hazards that are relevant to the use of such food processing machinery and describes design methods to eliminate or reduce these risks.

DIN 11483
Dairy Installations. Cleaning and Disinfection
Provides recommendations for correct cleaning procedures and disinfection of dairy equipment, as well as information regarding selecting suitable cleaning agents for these procedures.

Product requirements for specific areas

The European standard EN 1672-2:2005, defines three distinct areas and the hygiene requirements within these are the **Food Area**, **Splash Area** and the **Non-Food Area.**

Food Area
These include all surfaces which may come into contact with the food product and where there is a risk of the product returning to the food process.

Surfaces within the food area should be capable of being disinfected. For this purpose they should be smooth, continuous or sealed. In addition the materials should be corrosion resistant, non-toxic and non-absorbent. Surfaces should have a finish such that no particle of product can become trapped in small crevices, thus becoming difficult to dislodge and introducing a contamination hazard.

Food grade lubricants should be used where applicable.

Splash Area
This includes all surfaces with which the food product may come into contact, but where there is no risk of the product returning to the food process.

The splash area should be designed and constructed following the same principles as the food area, however as the food does not return to the food area, the technical design criteria may be less stringent provided that there is no adverse effect on the food.

Non-food grade lubricants may be used, provided there is no adverse influence on the food.

Non – Food Area
This includes all areas that are not covered by the food or splash areas. In addition to the general requirements, exposed surfaces used in the non-food area should be made of corrosion resistant material or material that is treated so as to be corrosion resistant.

These surfaces should be cleanable and where required, capable of being disinfected and should not have any adverse influence on the food.

Note: In addition to these general requirements, surfaces in non-food or splash areas should be considered as food areas where cross contamination occurs, for example: in cases where there is manual contact with food.

Hygienic Design and Materials in the Food Industry

When designing pneumatic components for the Food Industry, consideration of the design principles within EN1672-2:2005 is essential.

Corrosion durability classes

Class	Materials
Food Area	Acid proof and stainless steel. Plastics such as PVC, polythene, PTFE, silicone rubber.
Splash Area	Hard chrome plated steel. Steel such as AISI 420, 430F. Nickel plated steel and brass. Chemically nickel plated and anodised aluminium. Plastics such as Polyamide 6.6, POM rubbers PU Nitrile rubber, NBR, Perbunan.
Non-Food Area	Zinc plated steel, bronze, brass, zinc and plastics such as polycarbonate. Untreated aluminium.

Hygiene classes

Class	Design
Food Area	Hygienic design. Smooth surface, no pores or crevices. Radiused corners and edges. No dead spaces. Self draining.
Splash Area	Clean design. No dead spaces unless unavoidable. Self draining.
Non-Food Area	Standard design. Dead spaces not completely designed out. Reasonably cleanable.

Food Industry lubricant

Parker pneumatic cylinders use food grade lubricant. This must be used if there is any possibility of contact between the lubricant and the food product. Note: All Parker pneumatic cylinders are pre-lubricated and require no additional lubrication.

Cleaning

The Cleaning Process is a fundamental requirement of the Food Industry. To ensure that the consumer is protected, manufacturers of food product must use strict cleaning procedures within their facilities on a daily basis.

To guarantee that the external cleaning procedure of the machine is effective, the design characteristics along with the correct selection of materials and products within the machine, is absolutely vital when engineering an easy to clean hygienic solution. In conjunction with this, machines must be designed with cleaning methods and suitable detergents in mind.

For internal cleaning of Food processing systems, manufacturers design their machines suitable for CIP. ‘Cleaning in Place’ is an automatic process which runs throughout the circuit of a food processing machine, ensuring that all internal surfaces are clean, without the need to disassemble the machine.

Electrical Protection

The IP Code defined in the international standard IEC60529, classifies the degrees of protection provided against the intrusion of solid objects, dust, accidental contact, and water in electrical enclosures.

The first digit of the classification represents the level of protection against solid objects, whilst the second represents protection against liquid ingress. Generally the degrees of protection used within the Food Industry are IP65 and IP67, although the German standard DIN 40050 extends IEC60529 to the level of IP69k which covers the growing demand for high pressure water and steam jet cleaning.

Ingress Protection Rating			
Protection from solid objects		**Protection from moisture**	
6	Dust Proof – (no dust infiltration)	5	Protection from water projected from a nozzle
		6	Protection against powerful jets of water
		7	Protection against temporary immersion in water between 15cm – 1m
		8	Protection against continuous immersion in water
		9k	Protection from high pressure water and steam cleaning

HACCP

The ‘Hazard Analysis Critical Control Point’ is an internationally recognised and recommended system of food safety management within production facilities.

HACCP is a platform for international legislation and good manufacturing practices for all sectors of the food industry; it forms a key component of many certified compliance standards and is recognized as a main element of international trade in food products.

HACCP is a risk management tool recognized internationally for use in the proactive management of food safety issues. The HACCP system helps organisations focus on the hazards that affect food safety through hazard identification and to establish critical control limits at critical points during the production process.

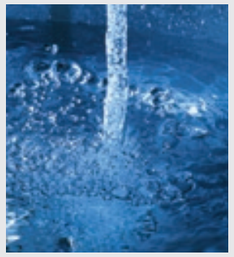
HACCP – seven established principles
Hazard Analysis – All food safety hazards are determined and classified. Preventative measures that can be used to control these hazards are identified
CCPs – The critical control points in the production process at which the food safety hazard could be prevented are established
Critical limits/values for each CCP are determined
Primarily the CCP should be removed, if this is not possible CCP monitoring activities are set-up to ensure the process is under control
Corrective action must be taken if the CCPs critical limits/value isn’t being met as indicated during monitoring
A method of record keeping must be established to ensure that all plants are documenting their HACCP system
Procedures must be put in place to verify that the HACCP system is working correctly

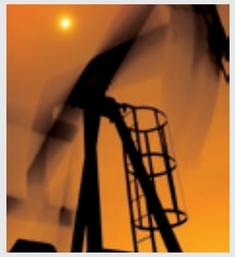
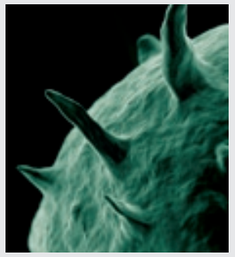
Compressed Air Quality

Where the food manufacturing process uses compressed air, the compressed air system must also be included in the hazard analysis process HACCP. Within a compressed air system, the hazards that require controlling come in the form of contamination.

There are 10 major contaminants found in a compressed air system, these are:

- **Water Vapour**
- **Condensed Water**
- **Water Aerosols**
- **Atmospheric Dirt**
- **Rust**
- **Pipescale**
- **Liquid Oil**
- **Oil Aerosols**
- **Oil Vapour**
- **Micro-organisms**



The largest quantity of contamination introduced into the compressed air system originates from the atmospheric air drawn into the compressor and not as often believed, introduced by the compressor itself. The most prolific and problematic of the contaminants is water which accounts for 99.9% of the total liquid contamination found in a compressed air system.

High efficiency compressed air filtration is not only used to remove particulate and oil, but more importantly it removes water aerosols and is key to operating an efficient and cost effective compressed air system.

Regardless of what type of compressor is installed, the same level of filtration is required.

To date, there is no legislation either internationally or by country, that covers the quality of compressed air that is used in the food industry. The absence of such legislation or air quality standards, led the British Compressed Air Society (BCAS) to produce a “Code of Practice” for Food Grade Compressed Air. The document was introduced in June 2006 and provides guidance on purity (air quality), testing and maintenance.

The Code of Practice states: The outlet compressed air must be designated as either Contact, Non-Contact or Non-Contact High Risk.

Definitions

- Contact - air that comes into direct contact with food or the food manufacturing process.
- Non-Contact - air that will never come into contact with food or the food manufacturing process.
- Non-Contact High Risk - air that is not supposed to come into contact with food or the food manufacturing process but may inadvertently do so.

Within the areas defined, compressed air shall meet or exceed the following recommendation;

Air Quality Recommendation	Dirt (Solid Particulate) Max Number of Particles per m^3			Humidity (Water Vapour)	Total Oil (Aerosol + Vapour)	ISO8573.1 Equivalent
	0.1-0.5 micron	0.5 - 1 micron	1 -5 micron			
Contact	100,000	1,000	10	-40°C PDP	< 0.01 MG/M^3	Class 2.2.1
Non-Contact	100,000	1,000	10	-3°C PDP	≤ 0.01 MG/M^3	Class 2.4.1
Non-Contact - High Risk	100,000	1,000	10	-40°C PDP	≤ 0.01 MG/M^3	Class 2.2.1

Note: The air purity requirements within the code of practice, provide air quality in accordance with ISO8573.1 : 2001 classification - The International Standard for Compressed Air Quality

Contaminant Removal

The table below highlights each of the purification technologies required to remove the different contaminants present in the compressed air system.

Purification Technologies	CONTAMINANTS							
	Bulk Condensed Water	Water Vapour	Water Aerosols	Atmospheric Dirt & Solid Particulate	Micro-organisms	Oil Vapour	Liquid Oil & Oil Aerosols	Rust & Pipescale
Water Separator	✓	×	×	×	×	×	×	×
Coalescing Filter	×	×	✓	✓	✓	×	✓	✓
Adsorption Dryer	×	✓	×	×	×	×	×	×
Refrigeration Dryer	×	✓	×	×	×	×	×	×

Industry Experience

Parker has been firmly established within the Food Industry for several decades as a leading supplier of pneumatic products and system solutions. During this time Parker has worked with many of the world's leading machinery suppliers within numerous sectors of the industry.

Today, Parker is working at the forefront of the Food Industry, playing an important role in the primary processing sectors of meat and poultry, providing leading manufacturers of material handling and transportation lines with solutions where reliability and speed is vital for successful production. In the further processing production areas, Parker's pneumatic products are used in the latest machinery for many application areas such as slicing, portioning and mixing.

Within the fish processing sector, slicing and belt grading are just two areas where Parker provides dependable solutions. This extremely demanding environment where machines are subject to on-going cleaning procedures requires pneumatic products and technical expertise of the highest quality.

Parker also has an extensive history of application success within the dairy sector, supplying products and system solutions for many customers that specialize in Milk, Butter, Cheese and Yogurt processing and production lines. For example, Parker works with leading suppliers of cheese production equipment, on applications such as cheese mould filling, pressing, de-moulding and slicing. Within this production environment, machinery can be subjected to a harsh atmosphere and cleaned with extremely aggressive detergents. To meet these demands, Parker continues to develop products using materials and design features suitable for the most challenging environments.

For food packaging machinery, the constantly changing demands of the consumer, drive machine builders to continuously evaluate and improve their designs to meet new requirements from end-users for flexibility, speed and hygiene. Parker works closely with packaging machine builders providing expertise and knowledge, ensuring that the correct pneumatic solution is achieved, meeting specific requirements wherever necessary. Our products and technical knowledge continues to be utilised in various areas of food packaging equipment, in many machinery sectors such as Form Fill & Seal, Filling & Dosing, and Wrapping & Bundling.

These are just some of the sectors of the Food Industry where Parker continues to successfully work within this challenging environment. Our product reliability and worldwide availability coupled with Parker's established international customer support network, provides end-users and machine builders with the perfect solution for all pneumatic products within the Food Industry.

No other manufacturer matches Parker's history of performance in motion control components, that's why for over 25 years, Parker has provided motion control technology to the most trusted and reliable names in the Food Industry.

Notes...

Parker's Motion & Control Technologies

At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion or control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further information call 00800 27 27 5374

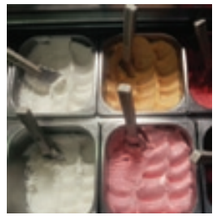
AEROSPACE

Key Markets

- Aircraft engines
- Business & general aviation
- Commercial transports
- Land-based weapons systems
- Military aircraft
- Missiles & launch vehicles
- Regional transports
- Unmanned aerial vehicles

Key Products

- Flight control systems & components
- Fluid conveyance systems
- Fluid metering delivery & atomization devices
- Fuel systems & components
- Hydraulic systems & components
- Inert nitrogen generating systems
- Pneumatic systems & components
- Wheels & brakes



CLIMATE CONTROL

Key Markets

- Agriculture
- Air conditioning
- Food, beverage & dairy
- Life sciences & medical
- Precision cooling
- Processing
- Transportation

Key Products

- CO^2 controls
- Electronic controllers
- Filter driers
- Hand shut-off valves
- Hose & fittings
- Pressure regulating valves
- Refrigerant distributors
- Safety relief valves
- Solenoid valves
- Thermostatic expansion valves

ELECTROMECHANICAL

Key Markets

- Aerospace
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Paper machinery
- Plastics machinery & converting
- Primary metals
- Semiconductor & electronics
- Textile
- Wire & cable

Key Products

- AC/DC drives & systems
- Electric actuators, gantry robots & slides
- Electrohydrostatic actuation systems
- Electromechanical actuation systems
- Human machine interface
- Linear motors
- Stepper motors, servo motors, drives & controls
- Structural extrusions

FILTRATION

Key Markets

- Food & beverage
- Industrial machinery
- Life sciences
- Marine
- Mobile equipment
- Oil & gas
- Power generation
- Process
- Transportation

Key Products

- Analytical gas generators
- Compressed air & gas filters
- Condition monitoring
- Engine air, fuel & oil filtration & systems
- Hydraulic, lubrication & coolant filters
- Process, chemical, water & microfiltration filters
- Nitrogen, hydrogen & zero air generators

FLUID & GAS HANDLING

Key Markets

- Aerospace
- Agriculture
- Bulk chemical handling
- Construction machinery
- Food & beverage
- Fuel & gas delivery
- Industrial machinery
- Mobile
- Oil & gas
- Transportation
- Welding

Key Products

- Brass fittings & valves
- Diagnostic equipment
- Fluid conveyance systems
- Industrial hose
- PTFE & PFA hose, tubing & plastic fittings
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects

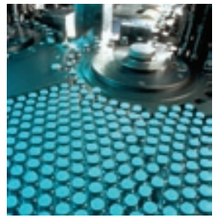
HYDRAULICS

Key Markets

- Aerospace
- Aerial lift
- Agriculture
- Construction machinery
- Forestry
- Industrial machinery
- Mining
- Oil & gas
- Power generation & energy
- Truck hydraulics

Key Products

- Diagnostic equipment
- Hydraulic cylinders & accumulators
- Hydraulic motors & pumps
- Hydraulic systems
- Hydraulic valves & controls
- Power take-offs
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects



PNEUMATICS

Key Markets

- Aerospace
- Conveyor & material handling
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Transportation & automotive

Key Products

- Air preparation
- Brass fittings & valves
- Manifolds
- Pneumatic accessories
- Pneumatic actuators & grippers
- Pneumatic valves & controls
- Quick disconnects
- Rotary actuators
- Rubber & thermoplastic hose & couplings
- Structural extrusions
- Thermoplastic tubing & fittings
- Vacuum generators, cups & sensors

PROCESS CONTROL

Key Markets

- Chemical & refining
- Food, beverage & dairy
- Medical & dental
- Microelectronics
- Oil & gas
- Power generation

Key Products

- Analytical sample conditioning products & systems
- Fluoropolymer chemical delivery fittings, valves & pumps
- High purity gas delivery fittings, valves & regulators
- Instrumentation fittings, valves & regulators
- Medium pressure fittings & valves
- Process control manifolds

SEALING & SHIELDING

Key Markets

- Aerospace
- Chemical processing
- Consumer
- Energy, oil & gas
- Fluid power
- General industrial
- Information technology
- Life sciences
- Military
- Semiconductor
- Telecommunications
- Transportation

Key Products

- Dynamic seals
- Elastomeric o-rings
- EMI shielding
- Extruded & precision-cut, fabricated elastomeric seals
- Homogeneous & inserted elastomeric shapes
- High temperature metal seals
- Metal & plastic retained composite seals
- Thermal management

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