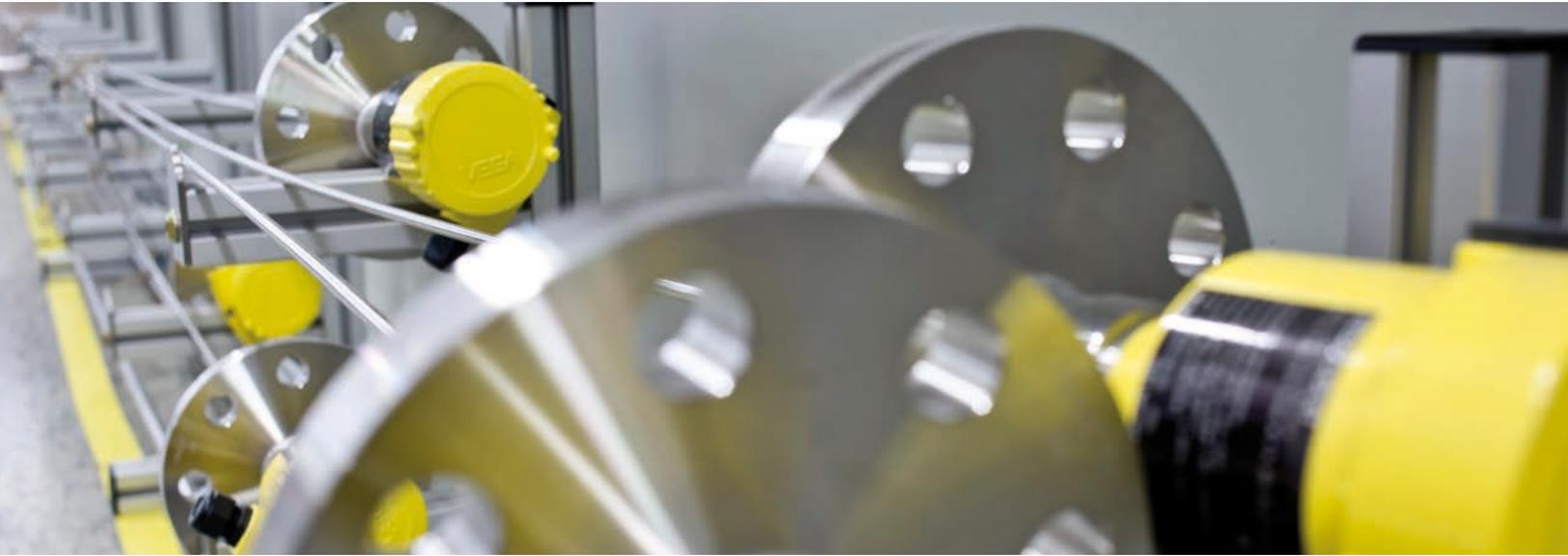




Continuous Level and Interface Measurement

# Guided Wave Radar Sensors for Liquid and Solid Level Measurement

Looking Forward **VEGA**



## Contents

Leadership in Guided Wave Radar	3
plics® – Easy is Better	4
VEGAFLEX 81 – Measurement of Liquids	6
VEGAFLEX 82 – Measurement of Solids	8
VEGAFLEX 83 – Measurement of Hygienic Liquids	9
VEGAFLEX 86 – The Specialist	10
MLI/Bridle Measurements	11

# Leadership in Guided Wave Radar

**VEGA is proud to be a leading provider of microwave radar measurement technology. When it comes to measuring the level of a wide spectrum of process and stored materials, the VEGAFLEX 80 Series of guided wave radar represents the most advanced technology available. With the VEGAFLEX 80 Series, VEGA has created intelligent guided wave radar.**

## Why Use Guided Wave Radar?

Guided wave radar technology is ideal for applications with a variety of process conditions, as it is impervious to shifts in pressure, temperature, or product-specific gravity. VEGAFLEX guided wave radar is used for continuous level measurement in a wide variety of industries and applications. The instruments can measure liquids and solids, and they are unaffected by foam, dust, and vapor. With no moving parts, the VEGAFLEX is ideal for retrofitting mechanical technologies.

VEGAFLEX 80 makes level measurement simpler and more self-sufficient by regulating complex processes, adapting to difficult conditions, and responding to changes automatically. The sensors never need recalibrating after initial configuration, translating into less time spent on setup, maintenance, and troubleshooting. Intelligent hardware, software, and signal processing allow VEGAFLEX 80 to provide reliable measurement data at all times, offering superior performance at a low cost.

### VEGAFLEX 80 Series

- Self-learning echo processing makes the measurement more reliable as time passes
- Guided setup procedure makes commissioning simple and safe
- Real time clock in the sensor enhances diagnostic capabilities and process insight
- Easy probe length modifications with automatic probe length determination offers purchasing flexibility and reduced inventory needs
- New features, such as automatic run time correction for measurement in high temperature steam environments and seals for ammonia measurement, answer industry-specific demands



## plics<sup>®</sup> – Easy is Better

### **Instrument Platform plics<sup>®</sup>: Level Measurement Made to Order**

Commercially available standard solutions for level measurement do not leave the user much leeway for truly optimal instrumentation. In contrast, the instrument platform plics<sup>®</sup> provides a variety of probe configurations, which are chosen based on application requirements. The plics platform allows for the most suitable combination of sensor, process fitting, electronics, and housing to be created. The result is an instrument that is highly reliable, economical, and user friendly. With sensors that offer reliable measurement using guided wave radar, and construction based on the plics principle, VEGA continues to lead the way in solving difficult and important applications.

## How We Earn Your Business

### **The Right Instrument for Every Application**

VEGA is committed to supplying instruments that work in all applications, not just those with ideal conditions. All new instruments are tested in extreme heat, dust, chemical, moisture, and cold environments before they are released. VEGA's goal is to enable customers to achieve operational efficiency with every measured process.

### **24 Hour Support**

The VEGA Field Service team is trained to provide telephone, email, or on-site customer service. Whether starting up, configuring, or troubleshooting the system, VEGA Field Service provides necessary steps to ensure the measuring device and its outputs run efficiently. Through service and training, VEGA supports all users throughout the life of the installed solutions.

### **Performance Guarantee**

To demonstrate our commitment to specifying the right instrument for each application, VEGA Americas offers a Performance Guarantee — if our recommended solution does not perform exactly as expected, we'll make it right.



**Indicating and Adjustment Module**



PLICSCOM



VEGACONNECT



DTM

**Electronics**



4 ... 20 mA/  
HART



Profibus PA



Foundation  
Fieldbus



Modbus

**Housing**



Plastic



Stainless steel



Aluminium



Plastic  
double chamber



Stainless steel  
double chamber



Aluminium  
double chamber

**Process Fitting**



Thread



Flange



Hygienic  
connection



Custom-  
design

**Antenna**



Cable



Rod



Coaxial



Bridle

# VEGAFLEX 81

## – Measurement of Liquids

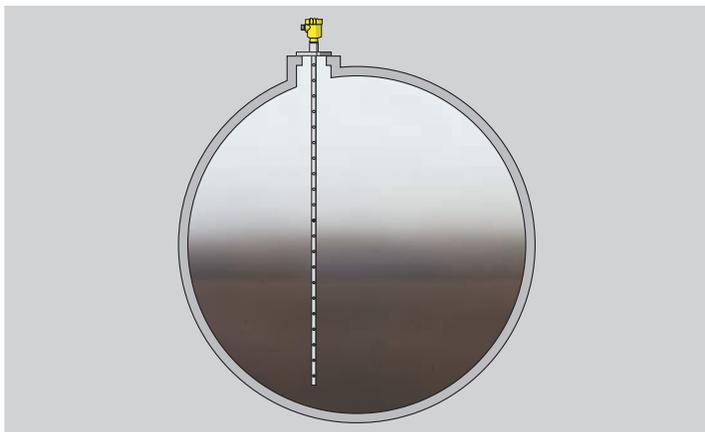
### Ideal for All Liquids:

#### VEGAFLEX 81

The VEGAFLEX 81 guided wave radar sensor is exceptional when it comes to measuring the level or interface of liquids. Guided wave radar is extremely versatile and can be found in almost every industrial sector. Whether bitumen or liquefied gas, in storage containers or standpipes, in a metering tank or in tank farms – VEGAFLEX 81 measures the level or interface (separation layers) of liquids with great reliability and accuracy.

#### VEGAFLEX 81

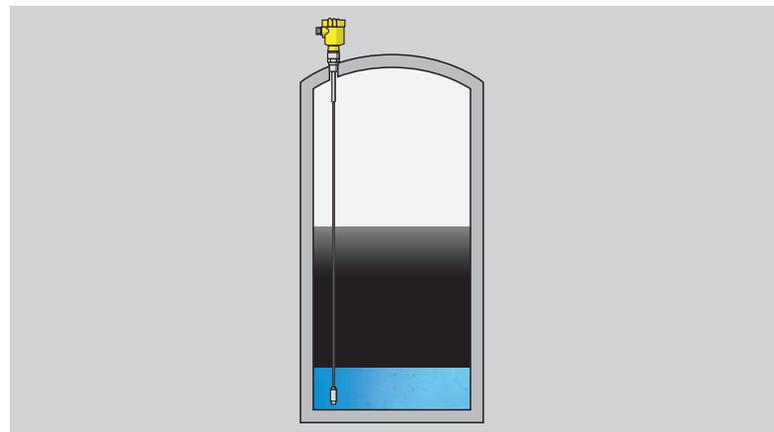
- Measuring range: Cable up to 246 ft (75 m), Rod up to 20 ft (6 m), Coaxial up to 20 ft (6 m)
- Pressure range: -14.5 ... +580 psi (-1 ... +40 bar)
- Temperature range: -40 ... +392°F (-40 ... +200°C)
- Accuracy:  $\pm 2$  mm
- Output signal: 4 ... 20 mA/HART, Foundation Fieldbus, Modbus, Profibus



#### Liquefied Gas Measurement

The VEGAFLEX 81 is the ideal instrument for measuring the level of liquefied gases in horizontal bullet tanks. The coaxial probe focuses microwave energy to the surface of the liquid and channels the reflected energy. This is important because liquefied gases often reflect microwave energy poorly. Measurement takes place inside the perforated tube of the VEGAFLEX 81, so the output is unaffected by tank conditions.

- Robust materials allow for measurement in extremely low temperatures
- Coaxial probe is suitable for products with poor reflective properties



#### Crude Oil

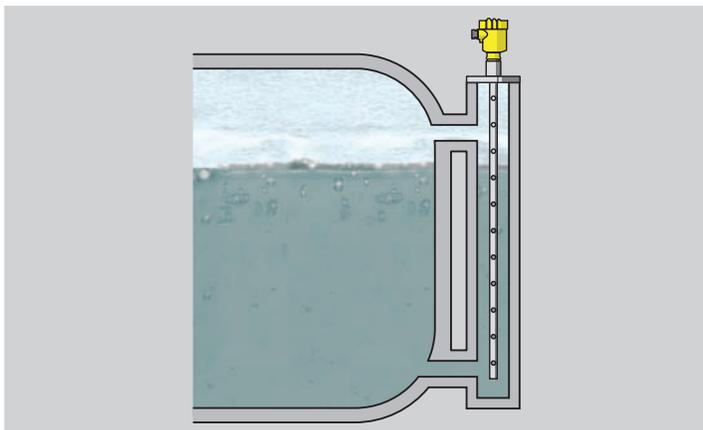
The VEGAFLEX 81 is ideal for measuring the level and water interface of crude oil at tank battery locations. The adjustable cable allows the user to adapt a single instrument to a variety of tank sizes. After shortening, the sensor only needs to be programmed with the new length to allow the output signal to correspond to the tank level. The VEGAFLEX 81 is immune to condensation and buildup and is suitable for use in metal or plastic vessels.

- Cable probe is easily shortened or exchanged, reducing inventory costs
- Insensitivity to vapor or buildup minimizes maintenance



### Technology highlight: Level or Interface

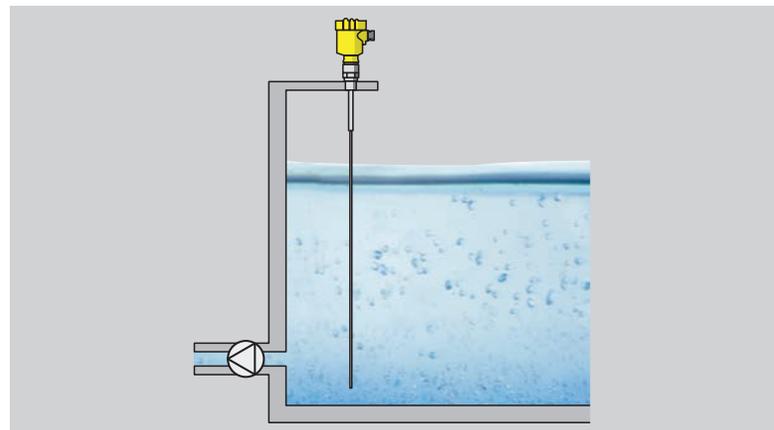
The VEGAFLEX 80 Series is classified by application type (liquid or solids) and allows for easy selection of the right instrument for each installation. By simply changing a setting, VEGAFLEX 80 sensors can measure either level or interface.



#### Ammonia

The VEGAFLEX 81 has everything needed to measure ammonia simply and reliably, regardless of temperature and process material diffusion. The glass process seal safely keeps ammonia in the vessel, creating freedom from maintenance and considerable savings. The coaxial probe easily installs in small containers or tall mounting nozzles. Mechanical obstructions inside the container do not affect the measurement.

- Easy installation with a small process connection ( $\frac{3}{4}$ " NPT) that fits practically anywhere
- Mounts easily on small containers and in nozzles with a coaxial probe



#### Cooling Tower Basin

Nozzles atomize and cool incoming hot water at the bottom of cooling towers. The heated water sprays inside the tower and warms the air, which expands and flows upward creating updraft that pulls cold air up through the slatted bottom. Draft eliminators inside the cooling tower cause the cooled water to form droplets and rain down into the cooling tower basin. The water level in the cooling tower basin must be monitored continuously to optimize use of the circulation pumps and the cooling process.

- Simple, maintenance-free measurement
- High measurement certainty, even in extremely wet conditions, independent of pressure fluctuations

# VEGAFLEX 82

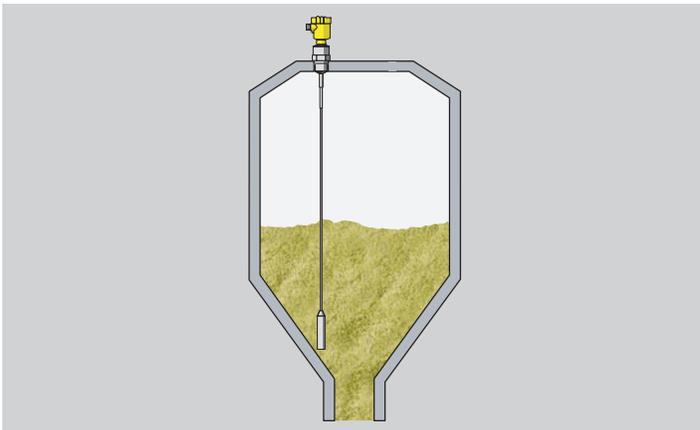
## – Measurement of Solids

### Bulk Solids Level Measurement: VEGAFLEX 82

Optimized for measuring bulk solids, the VEGAFLEX 82 guided wave radar sensor is ideal for use in many different industries – from chemicals to energy, cement plants to plastics manufacture, and even grain storage. It is reliable and accurate, even when deployed in the typically difficult conditions of bulk solids measurement, such as dust, noise, or varying dielectric constant.

### VEGAFLEX 82

- Measuring range: Cable up to 246 ft (75 m), Rod up to 20 ft (6 m)
- Pressure range: -14.5 ... +580 psi (-1 ... +40 bar)
- Temperature range: -40 ... +392°F (-40 ... +200°C)
- Accuracy: ±2 mm
- Output signal: 4 ... 20 mA/HART, Foundation Fieldbus, Modbus, Profibus



### Storage of Aggregates and Cement

The VEGAFLEX 82 is an ideal solution for continuous measurement in aggregate and cement silos. Guided wave radar measures bulk solid products without adjustments. The instrument comes factory-adjusted, so on-site setup only involves an electrical connection. Product quality, dust generation, and shape of the material heap have no influence on measurement.

- Non-moving parts are wear- and maintenance-free
- SIL2 design ensures high operational reliability
- Insensitive to dust and buildup, allowing for reliable measurement during filling and emptying of vessels

### Fluidized Bulk Material

Air in light or fluidized bulk materials reduces the reflectivity of microwave energy used to measure level. When this happens, the VEGAFLEX 82 stops looking to the product for a signal and measures using Probe End Tracking. The VEGAFLEX tracks the end of the probe and measures how far it is displaced from its known length. Thus, the VEGAFLEX 82 always provides reliable level measurement.

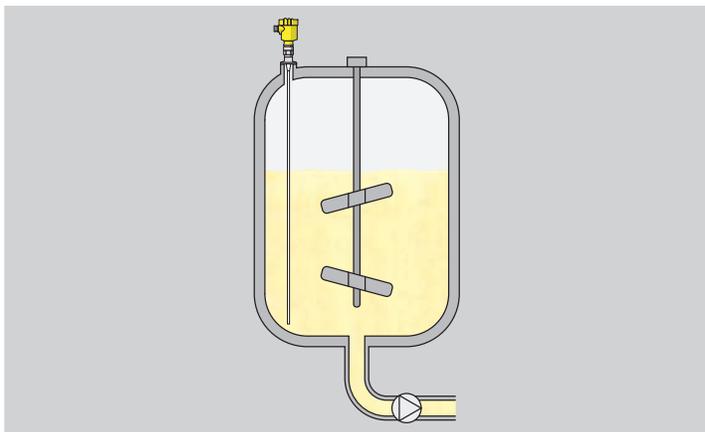
- Factory pre-adjustment expedites setup time
- Guided wave technology unaffected by dust, vapor, buildup, and condensation
- Probe End Tracking provides a reliable measurement, even when a direct reading is not possible

# VEGAFLEX 83

## – Measurement of Hygienic Liquids

### Sanitary Liquid Level Measurement: VEGAFLEX 83

The VEGAFLEX 83 guided wave radar sensor is ideal for level and interface (separation layer) measurement in tanks or sterile containers in the food and pharmaceutical industry. With its bare stainless steel probe, it meets the highest standards of hygiene and is the perfect solution for all hygienically sensitive media. The high-quality stainless steel probe easily withstands aggressive or corrosive liquids. Measurement is completely independent of product properties such as density or temperature, as well as foam formation or build-up.



### Food and Dairy Production

The VEGAFLEX 83 offers the ideal solution for level measurement in food and dairy production. The guided wave device is immune to temperature shocks and pressure changes. It performs reliably under the changing and sometimes foaming applications common in the food and dairy industries.

- High accuracy is not affected by foam generation
- Coated rod and cable design with sanitary connections enables easy cleaning for hygienic applications

### VEGAFLEX 83

- Measuring range: Cable up to 104 ft (32 m), Rod up to 20 ft (6 m)
- Pressure range: -14.5 ... +232 psi (-1 ... +16 bar)
- Temperature range: -40 ... +302°F (-40 ... +150°C)
- Accuracy:  $\pm 2$  mm
- Output signal: 4 ... 20 mA/HART, Foundation Fieldbus, Modbus, Profibus



### Storage of Base and Finished Products

Many different liquid raw materials and components are needed in the pharmaceutical industry. Intermediate and finished products have to be readied for the downstream processes. Acids also belong to these products because they serve as a catalyst for splitting bonds in chemical processes and are stored in different concentrations. Reliable level and limit level measurement are imperative for a dependable production supply and secure storage.

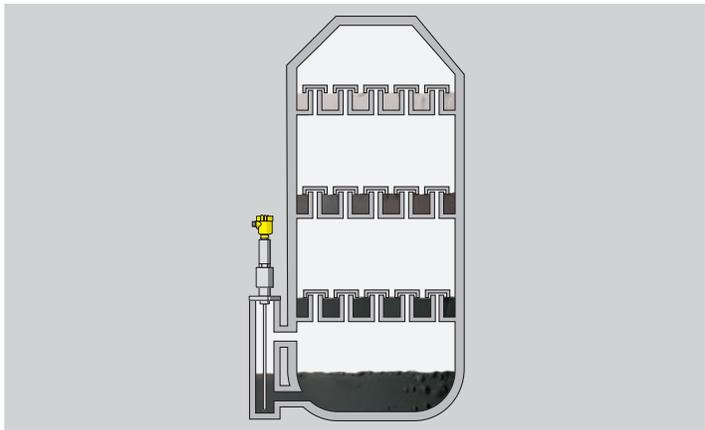
- Gap-free hygienic design ensures simple and reliable cleanability
- Maintenance-free operation increases the plant efficiency

# VEGAFLEX 86 and MLI/Bridle – The Specialists

## Versatile and Tough:

### VEGAFLEX 86

The robust guided wave radar sensor VEGAFLEX 86 measures the level and interface of liquids at high process temperatures and pressures in tanks of all types. It operates independently of media properties such as density or dielectric constant in widely different vessels, bypasses, or boilers. The robust mechanical design and second seal (second line of defense) protect the sensor while it performs demanding measurement tasks in the chemical, petrochemical, energy and oil/gas sectors.



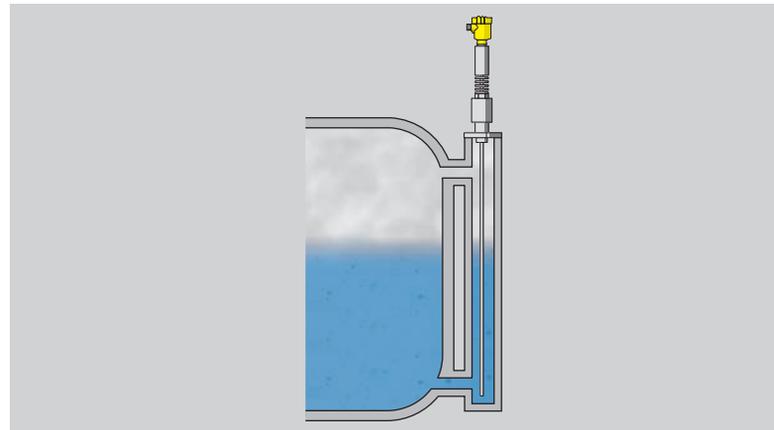
### Distillation Columns

The VEGAFLEX 86 is used for distillation columns in place of a less reliable displacer system in a chamber. Existing chambers can be used for the measurement, making mechanical modifications unnecessary. The VEGAFLEX 86 is an optimum solution for this measurement because of its high operating temperature and pressure capability.

- Easy retrofit allows use of existing bypass tubes without modification
- Guided wave principle is unaffected by existing process connections of the bridle

### VEGAFLEX 86

- Measuring range: Cable up to 246 ft (75 m), Rod up to 20 ft (6 m), Coaxial up to 20 ft (6 m)
- Pressure range: -14.5 ... +5,800 psi (-1 ... +400 bar)
- Temperature range: -321 ... +842°F (-196 ... +450°C)
- Accuracy:  $\pm 2$  mm
- Output signal: 4 ... 20 mA/HART, Foundation Fieldbus, Modbus, Profibus



### High Pressure Steam

Steam at high pressures behaves like a low DK liquid, causing the microwave pulse to propagate at a much slower rate than normal. The VEGAFLEX 86 with steam compensation is ideal for measurement in these conditions. Automatic transit-time correction with reference signal provides security and accuracy in saturated steam environments. The sensor constantly updates the pulse velocity used in the level measurement calculation.

- Automatically corrects measurement in saturated steam
- Unaffected by vapor and condensation, eliminating false readings



## Magnetic Level Indicator or Single Bridle Chamber: VEGAMAG or VEGAPASS

VEGA designs probes specifically for measuring in chambers, pipes, stilling wells, and bypass tubes. These probes are optimized for best performance when measuring in a pipe or when mounting on the top of a vessel is not possible. The choice of which probe to use is determined by the application parameters such as chemical compatibility, temperature, and pressure. VEGA has made considerations for ease of shipping, handling, and installation. Using rigid rod probes or flexible cables allow for application-specific customization.

### VEGAMAG and VEGAPASS

- Measuring range: Up to 50 ft (15 m); Consult factory for lengths over 50 ft
- Temperature range: -321 ... +842°F (-196 ... +450°C)
- Mounting options: NPT, flange
- Flag assembly: VEGAMAG – Yes, VEGAPASS – No



## VEGAFLEX Probe Configurations

- Rod
- Cable with Centering Weight



## VEGAFLEX Spacers

- Stainless Steel
- Plastic





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