



ADELPHI
PHARMA HYGIENE PRODUCTS

MIXING & BLENDING



ADELPHI

PHARMA HYGIENE PRODUCTS

A personal approach, on a global scale

About us

We are a leading supplier of high quality stainless steel process equipment ranging from standard buckets and beakers, to mixing and storage containers and custom designed bespoke vessels. All are made to pharmaceutical standards in 304 and 316L grade stainless steel, and are suitable for use in production areas, laboratories and kitchens, particularly where the highest standards of hygiene are required.

Quality Guarantee

Our customers operate to exacting standards, and our products must meet the highest standards of hygiene and reliability, whatever the production environment. All our products are manufactured from FDA approved materials, and are fully certified where required.

Sustainability

At PHP we take our environmental responsibilities very seriously. We strive to ensure that every aspect of our supply chain meets the exacting standards of our environmental policy.

Practical Advice

Our experienced and knowledgeable support team are waiting to help you, and are available Monday to Friday, between 9am and 5pm. They know our product range inside out, so can pinpoint the exact part you need or find the right solution to meet your requirements.

Pharma Hygiene Products

+44 (0)1444 472300

info@pharmahygieneproducts.com

www.pharmahygieneproducts.com

Olympus House • Mill Green Road
Haywards Heath • West Sussex
RH16 1XQ • UK



Pharma Hygiene Products Ltd
is part of the Adelphi Group
of Companies

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What's YOUR Mixing Challenge? Are you looking to achieve:

- Faster mixing, for greater productivity and higher revenue potential?
- A more consistent mix than can be achieved manually, for higher product yield from the same constituent ingredients?

Pharma Hygiene Products (part of the Adelphi Group of Companies) designs and manufactures high quality, hygienic stainless steel Mixing & Blending solutions, for even the most demanding environments in the pharmaceutical & laboratory, food & beverage, cosmetics & personal care, and chemical industries.

Our customers know their own products inside and out, but may not be aware of the very latest technologies available to them. Working side by side with your team, we can deliver solutions to increase output, maximise flexibility and ensure infallible hygiene throughout your processes.

ISO 9001:2015 certification guarantees the quality of our products and procedures, and our award-winning team manufacture solutions to meet GMP requirements, as well as European and US quality standards.

Take advantage of our 70+ years' experience and challenge our team of experts today; we will be pleased to advise the most cost-effective solution for your business.

Chris Wilson
Managing Director, Adelphi Group of Companies



Single Wall Skin Mixing Containers

Ideal for: Sauces and condiments, colour cosmetics, dermatological creams and more.

Manufactured from your choice of 316L (pharmaceutical) or 304 grade stainless steel, our Single Skin Wall Mixing Containers can be supplied in sizes from 5L to 2,500L, to mix volumes from laboratory samples to bulk production. They can be specified with either a High Shear Mixer, Propeller Mixer or agitator solution - of varying powers and speeds - to precisely suit the characteristics of your product(s).

In the heavily regulated industries we work with, hygiene is paramount. High level pit and crevice free finishing - to an exceptional average surface finish of 0.4 micrometers Ra - leaves no pits or crevices for bacteria to store during the mixing process. Stainless steel can be cleaned with alcohol-based disinfectants, and can be used in industrial dishwasher/autoclaves.

Full material traceability is available upon request for all our mixing containers, for international pharma-quality compliance.

This includes:

- Material Grade certification
- Surface Finish certification
- TSE certification

Customisation options include:

- Flat, flat sloping, cone or dished container bottom
- Additional ports and/or manways
- Heated, cooled or insulated jackets
- Mobile frames



“Pharma Hygiene Products were superb, from concept to implementation. Very supportive all the way.”

Ayo Ajani, GW Pharmaceuticals

Jacketed Mixing Containers

Ideal for: Food products being processed at 85°C or above, to pasteurize; also for wax-based cosmetics such as lipsticks, flavourings for nutritional supplements and more.

Jacketed Mixing Containers are suitable for products which require heating, cooling or maintaining a consistent product temperature whilst mixing. Manufactured from 316L pharmaceutical grade stainless steel, with a 304 grade water jacket, our standard solutions (1L - 50L) are available in as little as 2-3 weeks.

Jacketed Mixing Containers at a glance:

- Custom sized solutions from 0.3L to 2,500L.
- Min. temperature: approx. 30 degrees Celsius
- Max. temperature: approx. 85 degrees Celsius

Customisation options include:

- Heated, cooled or insulated jackets
- Flat, flat sloping, cone or dished container bottom
- High shear, propeller or agitator mixing solutions of varying power and speed
- Low pressure jacket for temperature control
- Insulation jacket for health and safety compliance above 65°C
- Recirculating temperature control unit or vented immersion heater.



Recommended By:



2,500L Jacketed Mixing Container (above left) by Pharma Hygiene Products, mixing fruit flavourings into nutritional supplement drinks. Read the full Case Study on page 18.



ATEX Compliant Mixing Containers

Ideal for: Safely blending high ethanol-content or hazardous products such as spirits, perfumes and aftershaves, E-liquids, tablet coatings, household and industrial chemicals, and more.

CAT IIB 2DGc T4 (135 degrees Celsius) equipment, with an Air Motor Mixer suitable for use in category 2 & 3 areas (Zone 1 & Zone 2).

For vapour mixtures with ignition energy of either A or B, and with auto-ignition temperatures suitable for 135 degrees Celsius or higher.

Manufactured from your choice of 316L (pharmaceutical) or 304 Containers can be supplied in sizes from 25L to 400L. For complete production security and compliance peace of mind, appropriate technical files are lodged with an approved body.

Full material traceability is available upon request for all our mix containers, for international pharma-quality compliance. This includes:

- Material Grade certification
- Surface Finish certification
- TSE certification

Customisation options include:

- Flat, flat sloping, cone or dished container bottom
- Additional ports and/or manways
- Heated, cooled or insulated jackets
- Mobile frames



Recommended By:

A global E-Liquids manufacturer (NDA protected), for whom Pharma Hygiene Products created the 100L ATEX Compliant Mixing Container (above), with 3 x 8L satellite vessels for decanting product components.

Read the full Case Study on page 22.



Complete production solutions from the Adelphi Group of Companies: our sister company Adelphi Manufacturing supplies high quality, high output filling machinery, including ATEX certified. Email info@adelphi.uk.com to find out more.



Low Pressure Vessels

Ideal for: Matching the pressure of other laboratory equipment such as a heater/chiller unit.

Pharma Hygiene Products manufacture pressure vessels suitable for laboratory scale/small batch production environments, up to 25L capacity.

The types of pressure vessel we offer are:

- Vessel with internal pressure
- Vessel with internal vacuum pressure
- Pressurised heating or cooling jacket, with liquid in the jacket, with no pressure in the vessel
- Pressurised vessel with pressurised liquid heating jacket

Options include a sensor to ensure that product volume never falls below a certain level, and a mobile frame for more efficient transportation to your cleaning station.

Please note that to fall within the necessary Sound Engineering Practice specifications, Volume multiplied by Pressure must be equal to or less than 50.

Polypropylene Mixing Containers

Ideal for: Mixing products with high chloride content.

Pharma Hygiene Products can supply a range of mobile polypropylene vessels for products that cannot come into contact with stainless steel.

These vessels have welded seams and are supplied with drop on lids. An external stainless steel band can be added with two carrying handles to aid moving when empty. A mobile frame set on four castors (two braked) is an optional extra.

Propeller or high shear mixers can also be supplied, and the vessels are available in various sizes. Please enquire for further information.



RATED EXCELLENT

“Quality products and great customer service. Pharma Hygiene Products are very helpful with all orders that I place and always follow up promptly with any queries that I have. Their processes are very quick and delivery is swift. Products are of a high quality and always as described.”

David Mills





High shear mixer

High Shear Mixing

Ideal for: Mixing oils and waters to form emulsions.

- As standard, this unit operates at 2,900rpm.
- Suitable for products with a viscosity up to 2,000cP (mPas).
- Batch sizes from 20L to 100L (dependent on viscosity).
- 1 kW (up to 200L batch size at 1 cP) or 2.2 kW (up to 300L batch size) mixer options, dependent on batch size and viscosity.

Options include:

- Variable speed
- 3 phase or single phase
- 1.1kW
- Motor shroud

Can be supplied with wheels for mobility.

Propeller Mixing

Ideal for: Mixing liquids with free-dissolving powders.

- As standard this unit operates at 1,400rpm.
- Suitable for products with a viscosity up to 2,000cP (mPas).
- Batch sizes from 20L upwards (maximum diameter of base vessel 800mm).
- 0.37 kW (up to 100L batch size) or 0.75 kW (up to 300L batch size) mixer options, dependent on batch size and viscosity.

Options include:

- Variable speed
- 3 phase or single phase
- 0.37kW
- 0.75kW

Can be supplied with a mobile frame for mobility.



Propeller mixer



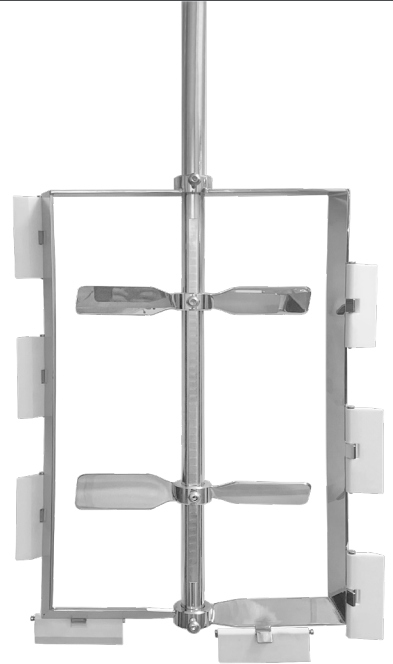
Gate Stirrer

Ideal for: Slow stirring of medium to high viscosity products, including creams and thick sauces.

- Close tolerance stirrer to match vessel shape.
- Specifically designed to suit vessel shape and application to ensure good mixing coverage.
- Low speed, low shear stirrer, typically 50-100rpm, depending on application.
- For use with high viscosity products (10,000-100,000 cP) such as creams or pastes.
- Product contact parts stainless steel 316 (and PTFE if wall scrapers included).
- Product contact parts fully polished, 0.4µm Ra, welds ground.

Options include:

- Pivoted PTFE wall scrapers to clean vessel walls or aid heat transfer
- Height adjustable central mixing blades
- Motor to suit customer application
- Integration into Pharma Hygiene Products supplied mixing vessel system



Spiral Stirrer

Ideal for: Gentle stirring of medium to high viscosity products and products that are very delicate. For example, to create a homogenous solution or keeping particles in suspension, as opposed to blending powders and liquids.

- Close tolerance stirrer to suit vessel shape and application, to ensure good mixing coverage.
- Low speed, low shear stirrer, typically 50-100rpm.
- Ideal for medium-high viscosity products (1,000-10,000 cP).
- Hygienic 316L stainless steel product contact parts.
- Product contact parts fully polished, 0.4µm Ra, welds ground.

Options include:

- Sizes to suit customer application
- Motor to suit customer application
- Integration into Pharma Hygiene Products supplied mixing vessel system



Standard, Custom & Bespoke Process Equipment

Pharma Hygiene Products can meet your needs precisely.

Adapting one of our standard products often provides a cost-effective solution, but we also design and build vessels and other equipment to your precise specifications.

Please let us know if you have a project you wish to discuss and we will arrange a discussion with one of our specialist engineers.

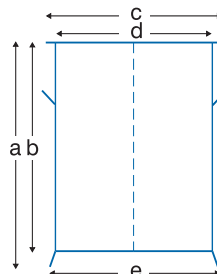


Pharma Hygiene Products offer a wide range of standard storage, mixing and transport vessels, from small bowls up to larger 200 litre tanks.

Storage & Transportation Containers

Manufactured from 316L and 304 grade stainless steel, these containers can be supplied either plain or graduated and come complete with side handles and skirtband. They have crevice- and pit-free interiors and are polished throughout. An optional lid is available for all sizes, and most can be integrated with a mixer.

Please also see our Customised Process Equipment section on page 15 for more bespoke solutions.



Item code	Capacity (litres)	a	b	c	d	e	Skirt	Handle	Grad.	Weight (kg)	Lid code	Lid weight (kg)
VES4020P	20	390	380	350	265	275	YES	SIDE	-	3.4	VEL4020P	0.6
VES*020G	20	390	380	350	265	275	YES	SIDE	5-20/5	3.4	VEL*020P	0.6
VES4025P	25	390	380	380	300	305	YES	SIDE	-	3.8	VEL4025P	0.8
VES*025G	25	390	380	380	300	305	YES	SIDE	5-25/5	3.8	VEL*025P	0.8
VES4030P	30	460	445	380	300	305	YES	SIDE	-	4.4	VEL4030P	0.8
VES*030G	30	460	445	380	300	305	YES	SIDE	5-30/5	4.4	VEL*030P	0.8
VES4050P	50	560	535	435	350	355	YES	SIDE	-	6.4	VEL4050P	1
VES*050G	50	560	535	435	350	355	YES	SIDE	5-50/5	6.4	VEL*050P	1
VES4075P	75	625	600	480	400	405	YES	SIDE	-	8.5	VEL4075P	1.3
VES*075G	75	625	600	480	400	405	YES	SIDE	5-75/5	8.5	VEL*075P	1.3
VES4100P	100	675	650	520	445	455	YES	SIDE	-	12	VEL4100P	1.6
VES*100G	100	675	650	520	445	455	YES	SIDE	10-100/10	12	VEL*100P	1.6
VES4150P	150	675	650	620	550	555	YES	SIDE	-	16	VEL4150P	2.3
VES*150G	150	675	650	620	550	555	YES	SIDE	10-150/10	16	VEL*150P	2.3
VES6240P	240	890	850	730	600	625	YES	SIDE	-	26	VEL6240S	3

- Notes:
1. Graduations: 5-20/5 = graduated from 5 litres to 20 litres in 5 litre intervals.
 2. In the data table, replace the * with 4 if 304 grade is required, or with 6 if 316L grade is required.
 3. Where no * occurs in the item code, material is 304 grade.

Options:               

(see key to symbols on pp 19-20)

Recommended By:

An international Fragrance & Essential Oils manufacturer (NDA protected), for whom Pharma Hygiene Products etch a box onto containers, so operators know where to place formulation stickers, and add a handle for ease of pouring.

“Although we pay a premium up front [for PHP’s high grade equipment], in the long-term it’s a sound investment. We have deviated to another supplier in the past who were cheaper, but we found that the quality was not as good.”

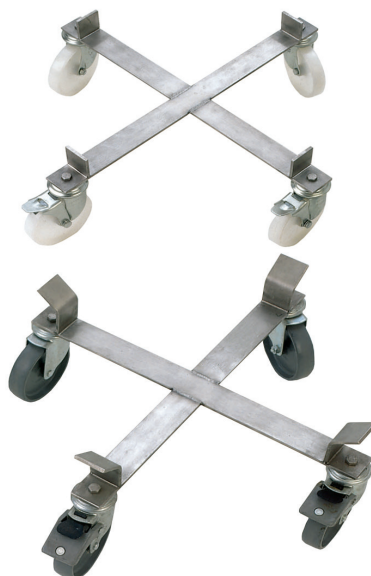
Read the full Case Study on page 20.



Mobile Frames

Manufactured from 304 grade stainless steel, these mobile frames are ideal for moving our mixing and storage vessels smoothly and safely, without lifting or carrying.

Supplied with four castors, two with brakes, they are available with straight or angled locating flanges.



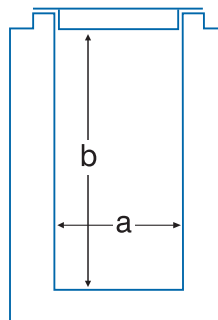
Item code	Suit vessel capacity (litres)
FRA4020*	20
FRA4025*	25
FRA4030*	30
FRA4050*	50
FRA4075*	75
FRA4100*	100
FRA4150*	150
FRA4200*	200

Water Jacketed Storage Containers

These stainless steel water jacketed vessels are available in 316L stainless steel, with a 304 stainless steel 0.1 bar low pressure water jacket. They are suitable for use with a non-pressurised water supply with hot or cold water for heating or cooling. These vessels are supplied with a 1/4" BSP water inlet at the bottom of the jacket and a 1/2" BSP outlet at the top. They have crevice- and pit-free interiors and are polished throughout.



Item code	Capacity (ltr)	a (mm)	b (mm)
VEJ6002P	2	130	170
VEJ6005P	5	175	230
VEJ6006P	6	175	270
VEJ6008P	8	200	270
VEJ6010P	10	220	270
VEJ6015P	15	267	275
VEJ6020G	20	265	390
VEJ6025G	25	300	390
VEJ6030G	30	300	445
VEJ6050G	50	350	535



Recommended By:

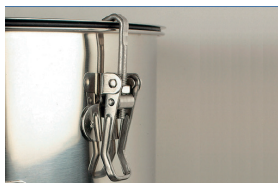


400L Jacketed Storage Containers by Pharma Hygiene Products, to maintain a hygienic temperature of their sauces and dressings between mixing and filling stations. Read the full Case Study on page 19.



Optional modifications for storage, mixing and transport containers

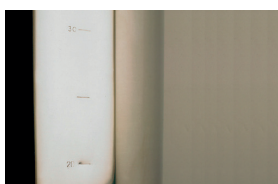
Your key to our range of optional fitted modifications for product ranges in the preceding pages, where red symbols identify the modifications available. If you require modifications that are not listed below, please contact us to discuss them. Please note that separate Butterfly Valves and Ball Valves, supplied unfitted, can be found on pages 22–23.



T

Toggle clamps.

Available to secure lids. When used with O-ring seals can provide a spill proof and airtight seal.



▶10

Graduations.

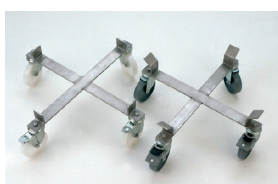
Can be added to items not graduated as standard. Stamped from the outside to maintain crevice- and pit-free interior. (Note: these graduations are normally accurate to $\pm 3\%$).



E

Special etching.

Any combination of letters and numbers can be etched into the surface of any item to show serial number, contents, location, etc. Logos or other graphics can also be etched.



⚙

Mobile frames.

Ideal for moving vessels smoothly and safely without lifting and carrying. Supplied with four castors, two of which are braked. Available with straight or angled flanges.



✕

Butterfly valves (fitted).

316L grade. Available in a variety of sizes detailed on page 20.



⊞

Ball valves (fitted).

316L grade. Available in a variety of sizes, as detailed on page 20.



⌚

Taps (fitted).

316L grade. Available in a variety of sizes, as detailed on page 20.



⌚

Bibs (fitted).

316L grade. Available to add to ball valves, in a variety of sizes, as detailed on page 20.



Hose connectors (fitted).

316L grade. Available to add to ball valves, in a variety of sizes, as detailed on page 20.



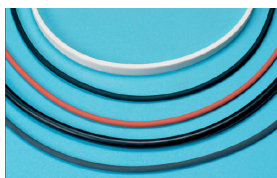
Pouring spout.

To aid pouring, spouts can be added to our standard vessels and cans. If a lid is required, this can be extended to cover the spout. With the addition of a pouring spout, a bottom steadying handle is recommended.



Handles.

Swing and side handles can be added or removed from standard items to suit.



O-ring seals.

Can be used in conjunction with our toggle clamps to create an airtight seal to our vessels, cans and pails. All seals are FDA approved and available in Nitrile, Viton® and Silicone.



Hole in lid.

To provide access for tubes, probes, mixer shafts etc. A 25mm hole with swing-aside cover is available as standard. Other sizes available on request.



Skirt band removal.

The skirt band can be removed from items that usually have one, to ensure contact between the base of the container and a hot-plate, for example.

Fitted valves, taps, bibs and hose connectors

We can fit a variety of outlets to our containers in a range of sizes. Please refer to the table below for part references. All contact parts are made from 316L grade stainless steel. Other sizes and types of outlet are available on request.

Size	0.25"	0.375"	0.5"	0.75"	1"	1.5"	2"	2.5"	3"	4"
Butterfly Valve	-	-	-	-	BVA6001P	BVA61.5P	BVA6002P	BVA62.5P	BVA6003P	BVA6004P
Ball Valve	-	-	BVA600.5P	BVA600.75P	-	-	-	-	-	-
Tap unit	TAP6.25P	TAP6.38P	TAP6.50P	TAP6.75P	TAP6001P	TAP61.5P	TAP6002P	-	-	-
Bib	BIB6.25P	BIB6.38P	BIB6.50P	BIB6.75P	BIB6001P	BIB61.5P	BIB6002P	-	-	-
Hose Connector	HTC6.25P	HTC6.38P	HTC6.50P	HTC6.75P	HTC6001P	HTC61.5P	HTC6002P	-	-	-

Notes:

- For pharmaceutical applications the fitting of a ball valve or butterfly valve is recommended. These hygienic outlets include Tri-Clamp fittings for easy removal and cleaning.
- Butterfly valves and ball valves include the valve, clamp, ferrule welded to the container, and seal (PTFE as standard on the Ball Valve, EPDM as standard on the Butterfly Valve). Alternative seals are available on request.
- With tap units, 'Size' refers to the BSP size. With Ball and Butterfly Valves, 'Size' refers to the pipe size.
- For valves supplied individually (unfitted), please refer to pages 22–23.

Seals

Our seals are designed to work in conjunction with our toggle clamps to create a spillproof and airtight seal to our containers, lidded cans and pails. We offer the listed O-ring seals as standard. Other profiles and materials are available to special order. All seals are FDA approved.

	Nitrile (NBR)	Viton®	Silicone
Colour	Black	Black	White or red
Temperature range	-40°C to +110°C	-25°C to +204°C	-55°C to +204°C
Recommended product uses	Greases & oils Water Fuels Alcohols Ethylene glycol fluids	Vacuum Most acids and chemicals Lube oils and greases	Dry heat Odourless and non-toxic products
Not recommended for	Ketones Halogenated hydrocarbons Brake fluids Acetone	Ketones Brake fluids	Ketones Acids Brake fluids
Common industry applications	Oil and gas Automotive fuels and oils	Chemical processing Automotive fuels and oils	Pharma and life science projects Food and beverage applications
Mechanical Properties	Good wear resistance Good compression set resistance Good permeation resistance Good chemical and acid resistance	Good wear resistance Excellent compression set resistance Excellent permeation resistance Excellent resistance to weathering	Poor wear resistance Good compression set resistance Good permeation resistance Excellent permeation resistance

Note: To order seals please specify the seal type, container type and container capacity in litres. For 'Mixing and storage containers' use V. For 'Cans with lids' use C. For 'Pails' use P. For example:

Nitrile V50 = Nitrile seal for 50 litre container.

Silicone C6 = Silicone seal for 6 litre can with lid.

Viton P10 = Viton® seal for 10 litre pail.

304 or 316L stainless steel

Stainless steel is a durable, versatile and hygienic material that is resistant to corrosion and looks good.

There are over 200 different types of stainless steel, each with a different range of properties. However, five types account for the bulk of usage, and Pharma Hygiene Products supply product ranges in two types, known as 304 and 316L grade.

304 is an excellent general grade of stainless steel, suited to a range of uses. 316L is, however, recommended for pharmaceutical, cosmetic, food and dairy applications, as it has an even better corrosion resistance than 304 grade. All 316L grade items supplied by Pharma Hygiene Products are tested in-house using an X-ray analyser (see image), which confirms the grade of stainless steel, providing reassurance of the highest quality. Certificates confirming the grade and composition of stainless steel can be supplied on request at an additional cost.

Stainless steel has outstanding resistance to corrosion and attack from a wide range of chemical-based products. It is also more environmentally friendly than plastic disposable equipment, which has been favoured by the industry in recent times. In the face of growing pressure to integrate more sustainable, durable equipment into their processes, manufacturers are looking to stainless steel for a longer lasting solution.

X-ray analyser



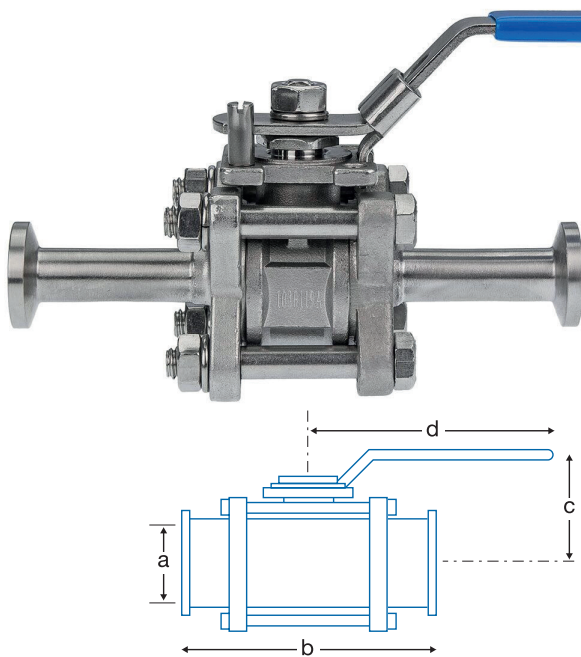
TRI-CLAMP FITTINGS

Easy to assemble and breakdown, Tri-Clamp fittings often form part of our mixing and blending solutions, and are ideal for applications requiring an easy method of cleaning to maintain optimum levels of hygiene. Their smooth crevice- and pit-free interiors offer non-contaminating, superior corrosion resistance and long service life.

Pharma Hygiene Products' Tri-Clamp fittings comprise a series of pipes and unisex joints, which are available welded or as separate elements. A gasket is sandwiched between joints and the union is completed with a clamp to create a leak-tight seal.

Our range includes 316L grade stainless steel fittings with outside pipe diameters from ½ inch to 4 inches. Gaskets are available in Silicone, Viton® and EPDM, and full material certification is available on all PHP Tri-Clamp fittings.

Please note that the Tri-Clamp items shown here on pages 13–17 are supplied as individual components.



Tri-Clamp Ball Valves

Manufactured from 316L grade stainless steel, with a PTFE seal/stem seal, PHP Tri-Clamp ball valves are 100% air tested under water at 100 psi in open and closed positions.

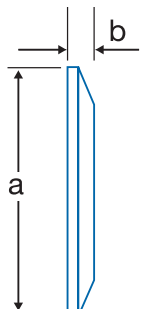
Item code	Nominal pipe size (in)	Flange (mm)	a (mm)	b (mm)	c (mm)	d (mm)
BAL60.5	0.5	25	9.5	132	55	132
BAL60.75	0.75	25	15.9	144	60	131.5
BAL61	1	50.5	22.2	157	69	165
BAL61.5	1.5	50.5	35	183	84	194.3
BAL62	2	64	47.6	199	92	194.3
BAL62.5	2.5	77.5	60.3	240	126.8	252
BAL63	3	91	73	272	136	252
BAL64	4	119	97.4	285.7	242.7	333

Item code	Nominal pipe size (in)	a (mm)	b (mm)
B21732012	0.5	25	5.6
B21732012	0.75	25	5.6
B21732100	1	50.5	7
B21732100	1.5	50.5	7
B21732200	2	64	7
B21732212	2.5	77.5	7
B21732300	3	91	7
B21732400	4	119	9



Tri-Clamp Blank Caps

Manufactured from 316L grade stainless steel and to BS4825, PHP Tri-Clamp blank caps are designed to blank off Ferrule Ends, when used with our Tri-Clamp gaskets and clamps. They are crevice- and pit-free and polished throughout.



Tri-Clamp Butterfly Valves

Manufactured from 316L grade stainless steel, PHP Tri-Clamp plain butterfly valves include a 12-position lockable open or close handle and four bolts to dismantle for easy cleaning.

Item code	Nominal pipe size (in)	Flange (mm)	a (mm)	b (mm)	c (mm)
BF42900100	1	50.5	22.1	33	79
BF42900112	1.5	50.5	34.8	33	85
BF42900200	2	64	47.5	35	105
BF42960212	2.5	77.5	60.2	35	112
BF42980300	3	91	72.9	38	125
BF42900400	4	119	97.4	38	157

Valves supplied as standard with an EPDM seal. Also available with a silicone seal. Please add '-SS' to the end of the part number if a silicone seal is required.

Tri-Clamp Butterfly Valve Gasket Seals

Manufactured from silicone, Viton® or EPDM, PHP butterfly valve gasket seals are designed for use with Tri-Clamp butterfly valves.



Item code	Nominal pipe size (in)
GVB*1	1
GVB*1.5	1.5
GVB*2	2
GVB*2.5	2.5
GVB*3	3
GVB*4	4

Note: in this table, replace the '*' with 'S' if silicone gasket is required, 'V' if Viton® is required or 'E' if EPDM is required.

Tri-Clamp Clamps

Manufactured from 316L grade stainless steel, these clamps are supplied with a double hinge for heavy duty use. They are designed to hold the ferrule ends firmly together to create a leak-tight seal.

As a general rule, we would advise that if the clamp, once in use, requires repeated tightening, this may indicate that the gasket should be replaced.



Item code	Nominal clamp size (in)	Flange size (mm)
CL1703012	0.5	25
CL1703012	0.75	25
CL1703100	1	50.5
CL1703100	1.5	50.5
CL1703200	2	64
CL1703212	2.5	64
CL1703300	3	91
CL1703400	4	119

Tri-Clamp Concentric Reducers

Manufactured from 316L grade stainless steel, PHP concentric reducers provide the perfect solution to connecting existing Tri-Clamp connections to newer or changing ones. Available in a range of Tri-Clamp sizes, they have crevice- and pit-free interiors and are polished throughout.

Item code	Nominal size (in)	Item code	Nominal size (in)	Item code	Nominal size (in)
COR61-0.5	1 x 0.5	COR62-1	2 x 1	COR63-2	3 x 2
COR61-0.75	1 x 0.75	COR62-1.5	2 x 1.5	COR63-2.5	3 x 2.5
COR61.5-0.5	1.5 x 0.5	COR62.5-1	2.5 x 1	COR64-1	4 x 1
COR61.5-0.75	1.5 x 0.75	COR62.5-1.5	2.5 x 1.5	COR64-1.5	4 x 1.5
COR61.5-1	1.5 x 1	COR62.5-2	2.5 x 2	COR64-2	4 x 2
COR62-0.5	2 x 0.5	COR63-1	3 x 1	COR64-2.5	4 x 2.5
COR62-0.75	2 x 0.75	COR63-1.5	3 x 1.5	COR64-3	4 x 3



Tri-Clamp Elbows

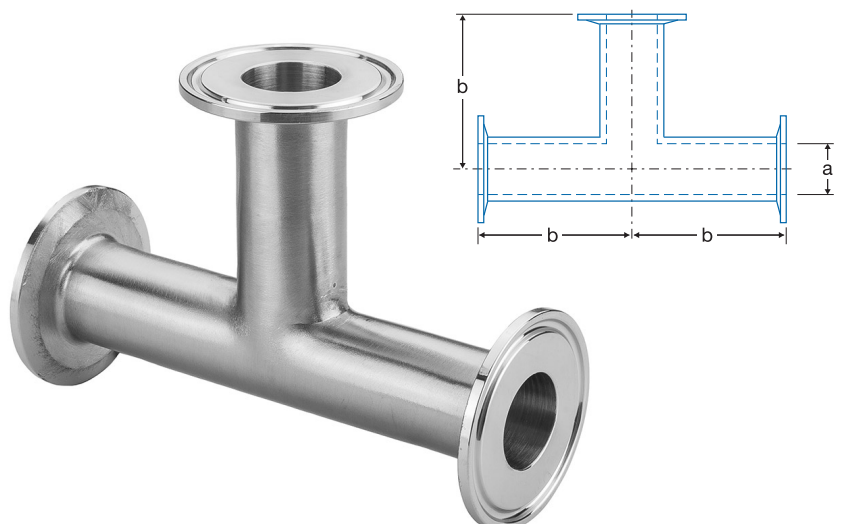
Manufactured from 316L grade stainless steel. PHP 90° Tri-Clamp elbows come with ferrule ends, have crevice- and pit-free interiors and are polished throughout.

Item code	Nominal pipe size (in)	a (mm)	b (mm)
BN22117100	1	22.1	50.8
BN22117150	1.5	34.8	69.9
BN2117200	2	47.5	88.9
BN2117250	2.5	60.2	108
BN2117300	3	72.9	127
BN2117400	4	97.38	168.2

Tri-Clamp Equal Tees

Manufactured from 316L grade stainless steel, PHP Tri-Clamp equal tees come with ferrule ends, have crevice- and pit-free interiors and are polished throughout.

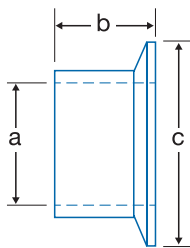
Item code	Nominal pipe size (in)	a (mm)	b (mm)
TEE61	1	25.4	60.3
TEE61.5	1.5	38.1	69.9
TEE62	2	50.8	88.9
TEE62.5	2.5	63.5	88.9
TEE63	3	76.1	95.3
TEE64	4	101.6	114.2



Tri-Clamp Ferrule Ends

Manufactured from 316L grade stainless steel, PHP Tri-Clamp ferrule ends are supplied polished and ready for welding to our range of stainless steel pipes. Sizes supplied in 21.5mm, 28mm or 44.5mm lengths.

In the item codes, replace * with 'S' for a 21.5mm length, 'M' for a 28mm length, and 'L' for a 44.5mm length.



Item code	Nominal pipe size (in)	a (in)	b (mm)	c (mm)
TR*1722012	0.5	9.5	21.5, 44.5	25
TR*1722034	0.75	15.85	21.5, 44.5	25
TR*1722100	1	22.2	21.5, 28, 44.5	50.5
TR*1722112	1.5	34.9	21.5, 28, 44.5	50.5
TR*1722200	2	47.6	21.5, 28	64
TR*1722212	2.5	60.3	21.5, 28	77.5
TR*1712300	3	73	21.5, 28	91
TR*1722400	4	97.6	21.5, 28	119

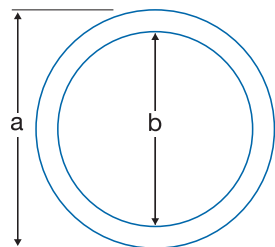


Silicone, Viton® or EPDM gaskets

Item code	Nominal pipe size (in)	a (mm)	b (mm)
**1707012	0.5	22	9.52
**1707034	0.75	22	15.87
**1707100	1	50.5	22.2
**1707112	1.5	50.5	34.9
**1707200	2	64	47.6
**1707212	2.5	77.5	60.3
**1707300	3	91	73
**1707400	4	119	97.6

Tri-Clamp Ferrule End Gaskets

Manufactured from silicone, PTFE, Viton and EPDM to BS4825, PHP Tri-Clamp ferrule end Gaskets are designed to form a seal between ferrule ends when used in conjunction with our Tri-Clamp clamps.



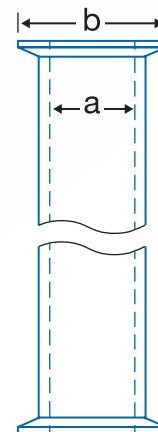
In the item codes shown in the table to the left, replace ** with SS for silicone gaskets, VI for Viton® gaskets or ES for EPDM gaskets. If PTFE material is required, quote the item codes shown in the table to the left.

Tri-Clamp Straight Pipes

Manufactured from 316L grade stainless steel, PHP Tri-Clamp straight pipes have crevice- and pit-free interiors and are polished throughout.

Item code	Nominal pipe size (in)	a (in)	b (mm)
STR60.5-***	0.5	9.5	25
STR60.75-***	0.75	15.85	25
STR61-***	1	22.2	50.5
STR61.5-***	1.5	34.9	50.5
STR62-***	2	64	64
STR62.5-***	2.5	60.3	77.5
STR63-***	3	73	91
STR64-***	4	97.6	119

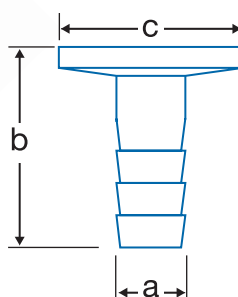
Note: In the item code replace *** with the required length of pipe.



Tri-Clamp Hose Tail Connectors

Manufactured from 316L grade stainless steel, PHP Tri-Clamp hose tail pipes have crevice- and pit-free interiors and are polished throughout.

Item code	Nominal pipe size (in)	a (in)	b (mm)	c (mm)
HTC21772012	0.5	12.7	32	25
HTC21772034	0.75	19	32	25
HTC21772100	1	26	40	50.5
HTC21772150	1.5	38.1	40	50.5
HTC21772200	2	50.8	60	60
HTC21772250	2.5	63.5	60	77.5
HTC21772300	3	76.2	60	91



Bespoke mixing solution removes the need for holding-tanks, increasing productivity for Nelsons Spatone



Nelsons is an internationally acclaimed manufacturer of natural health products. With a production facility situated in the heart of the Snowdonia mountains, Nelsons use the iron-rich natural waters from Trefriw Wells Spa to create their range of health supplements.



The Challenge:

Nelsons had previously invested in a bespoke 2,500L vessel from Pharma Hygiene Products, to maintain the temperature of their large product batches whilst mixing. Increased demand for their 'Spatone' range of liquid food supplement sachets meant that the one vessel could no longer keep up, and this presented an opportunity to for Nelsons to streamline their processes.

The Solution:

Money saved – no production time is wasted

Cold, iron rich waters from Trefriw Wells Spa are collected at a slow rate overnight into Nelsons' now two 2,500L vessels. No production time is wasted; production never has to stop as the vessels each include a sensor – when just over 2,000L is reached, water collection shuts off automatically, instead of having to be manually shut off by an operator. Whilst the water is being collected, it is warmed by a heated jacket around the vessel, and a stirrer keeps the water moving to ensure a consistent temperature throughout. Once the water is warmed, it is mixed with a fruit flavouring to a batch size of 2,500L. The mixed product is then drained from a vessel outlet directly to a sachet filler, ready to be filled and packed for sale.

The Verdict:

A cost-effective solution

The purchase of this second vessel has increased productivity by removing a time-consuming step from Nelsons' production process; it has alleviated the need to transfer the water into holding tanks before packing on the sachet filler, as the collection of water can be moved to the second vessel if required. This has become crucial to ensure Nelsons can keep up with the increased demand for their Spatone products.

Investing in 316L grade stainless steel vessels is a cost-effective solution for Nelsons, as 316L grade contains 2% molybdenum, to help resist corrosion and wear; these vessels will be fully operational for years to come. 316L grade also guarantees impeccable levels of hygiene for ingestible products. The surface-roughness finish of the vessels is an exceptional 0.4 micrometers RA. This high level finishing is fully compliant with hygiene regulations, giving security that bacteria will not be stored, and also allows the most thorough cleaning with alcohol-based disinfectants in the cleaning process. This means that Nelsons are free from the risk of potentially costly batch recalls.



Hygienic temperature controlled mixing and storage solutions for AAK BD Foods



The Challenge:

To keep sauces and condiments at the correct temperature whilst they are being mixed, and then transferred between mixing and filling.

The Solution:

Durable & Hygienic Vessels in 316L Stainless Steel. AAK BD Foods utilise Pharma Hygiene Products' 400L jacketed vessels to maintain a hygienic product temperature throughout all stages of production, ensuring that bacteria cannot affect their products.

The vessels' 316L – pharmaceutical grade – stainless steel construction ensures superior resistance against damage, deterioration or corrosion, which would compromise AAK BD Foods' products. This high grade material also guarantees a longer service life for the equipment, which equates to a significantly higher return on investment.

Mobile frames were added for ease of transportation, and to improve operator safety and comfort.

A Positive Environmental Statement:

Stainless steel is a more hygienic, durable and environmentally friendly option than plastic vessels, which compliments the ethical considerations at the heart of AAK BD Foods' practice. Making stainless steel takes around 6-15MJ (1665 to 4170 watt-hours) of energy, whereas making plastics takes on average 62-108MJ (17200 to 31950 watt-hours).



Guaranteed durability means 24/7 production security for international Fragrance & Essential Oils manufacturer

The Challenge:

An international Fragrance & Essential Oils manufacturer need extremely high quality, durable storage and transportation containers, which can be flexibly used to receive product formulations as they pass through their filling machines; sit underneath mixers while products are blended; and act as a product feed-tank from which the finished oils are filled into customers' vessels. Production runs varying in size from 1 kilo of a customer's pre-production product up to 50 kilo orders, so the containers help keep track of orders.

The Solution:

Pharma Hygiene Products etch a box onto all their containers, so operators know where to place formulation stickers. Other modifications include handles for ease of pouring, and special wheeled mobile frames to reduce noise on their warehouse floor; key to ensuring a positive working environment for valued employees.

No False Economy

"Although we pay a premium up front [for PHP's high grade equipment], in the long-term it's a sound investment", enthuses the Director. "We have deviated to another supplier in the past who were cheaper, but we found that the quality was not as good."



Durable & Hygienic

According to the company's Director, "stainless steel containers, rather than lower grade metal or plastic, are crucial", as they remove the worry about damage, deterioration or corrosion, which could compromise their products. The full range of PHP's pharmaceutical grade stainless steel process equipment is designed to be pit and crevice free, to avoid bug traps, and these containers have a surface finish roughness average of 0.4 micrometers Ra. They are also suitable for cleaning without damage in the company's industrial dishwasher.

Quick Delivery; No Production Downtime

"Our production never stops", says the company Director. "We continue overnight, and keep a supply of extra PHP containers to ensure we are prepared for anything; our production is never hand-to-mouth". Vessels are available off-the-shelf, with quick delivery times worldwide. The company now own an inestimable number of PHP containers in sizes from 8L to 150L, which are visible as far as the eye can see in their warehouse!

Manufacturing dermatological creams: Bespoke solution enables more consistent product blend, for higher yield from ingredients and less waste

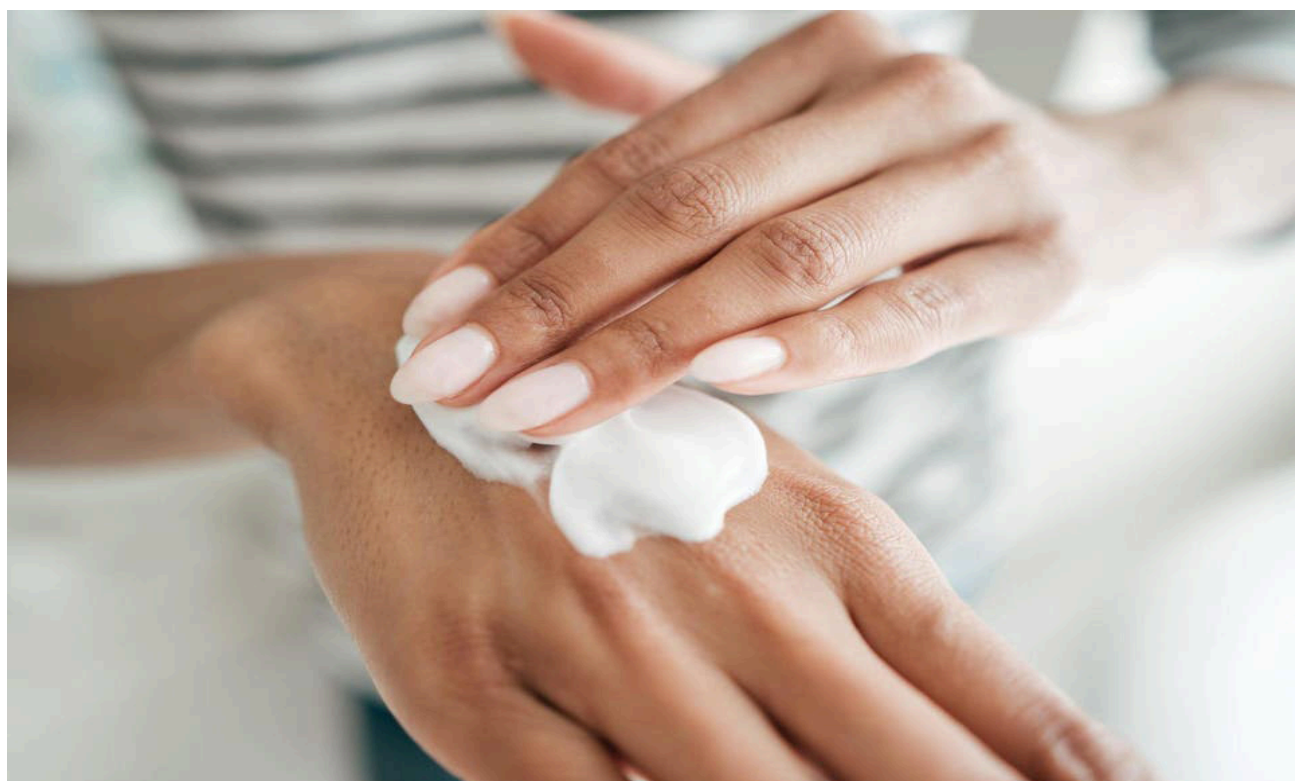
The Challenge:

The production of dermatological creams and ointments includes emulsifying waxes, emollients and lubricants, and then mixing in stabilising and thickening agents, preservatives and in some cases, colourants.

Manual mixing for our pharmaceutical manufacturing customer was resulting in problematically inconsistent blends of their ingredients, whilst excess product was being wasted as it was stuck to the container wall.

The Solution:

- A 316L pharmaceutical grade hygienic mixing container, with an internal surface finish of just 0.4 micrometers Ra – leaving nowhere for bacteria to collect and store.
- A high shear mixer enables fast, efficient mixing to form a stable emulsion.
- A water jacket surrounding the vessel was added to work with temperature-sensitive ingredients and accelerate dispersion.
- An inbuilt scraper was created to ensure that material does not build up on the vessel wall and waste.
- The active ingredient is now consistently dispersed in a way that could not be achieved manually, to maximise yield and guarantee consistent product effectiveness for customers.



Hygienic, certified quality mobile vessel ensures complete production compliance for international E-Liquid manufacturer

The Challenge:

The request of our customer in Canada was:

1. To mix E-Liquid & CBD oils (in a 100L vessel)
2. To ensure the highest pharmaceutical standards, to avoid any risks of cross-contamination
3. To provide a guarantee about the grade of stainless steel used



The Solution:

The 316L pharmaceutical grade stainless steel 100L mixing vessel (pictured below), includes three 8L satellite vessels on top, from which the component parts of the customer's product are drip-fed into the main container. It also features a water-jacketed base for heating or cooling the products as they blend, with a hygienic tri-clamp outlet valve for decanting once the product mixing is complete.

For ingestible products such as E-Liquids, a hygienic manufacturing process is paramount; the underside of this vessel was designed to be dished in shape, so that any product drips will drain to the side rather than pooling, which would have been unhygienic. The surface roughness finish of this container is 0.4 micrometers RA, as it is with all of PHP containers, and certification was provided to verify the grade of material (using X-ray testing), as well as a TSE certificate to confirm that no animal fats were used for the surface polishing.

The mobile frame surrounding the vessel ensures that our customer's production arrangement can be easily adapted, while the viewing portal that was included for the operator allows simple, instant visual checking of our customer's mixing whilst it is in-progress.



Manufacturing fruit flavoured soft drinks: A bespoke mixing solution to reduce waste, guarantee infallible hygiene and increase production speeds

The Challenge:

To incorporate artificial sweeteners such as Aspartame, Acesulfame K and Saccha, thickening agents such as CMC, and stabilising ingredients such as gums, starches and alginates. Many of these do not dissolve easily, and can leave floating residue on the surface of the liquid even after mixing.

Our fruit drinks manufacturing customer also needed to guarantee the level of hygiene of their equipment, to pass an essential industry quality inspection.



The Solution:

The Pharma Hygiene Products Technical Team worked with our customer to create a custom solution, with a powerful mixer to improve both the quality and consistency of their mix. The result was an almost total elimination of ingredient residue, and a much higher batch yield from their ingredients.

Constructed from 316L stainless steel, the mixing vessel was accompanied by X-Ray certification to guarantee the quality of the material, Surface Finish Analysis certification to prove surface smoothness (an exceptional 0.4 micrometers Ra, which leaves nowhere for bacteria to collect and store), as well as TSE certification to show that no animal fats were used in the polishing process. This is vital to guarantee that no cross-contamination from BSE or CJD diseases occurs. certificate to confirm that no animal fats were used for the surface polishing.

Maximised production space and output for medicated confectionery manufacturer

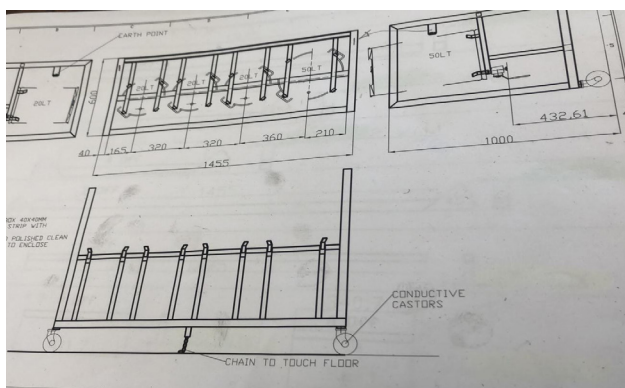
The Challenge:

To decant four product component parts (one flammable), in a way that takes up as little space as possible, for a medicated confectionery manufacturer with a space-restricted site. As the finished product is ingested by customers, the highest standards of hygiene needed to be assured, with no possibility of cross-contamination.



The Solution:

A set of eight ATEX Zone 1 Category IIB 2G c T5 (100C) compliant vessels, of which four are in use at a time (one for each product component), set on a mobile frame.



Maximised Production Space

To make the frame narrower, all the vessel handles have been rotated 30-45 degrees, so they don't clash. The trolley is mobile for ease of moving between the dispensary room and the cleaning room.

Saves Time & Money – Production Never has to Stop for Cleaning

The four vessels represent one full day's worth of production. At the end of the production day these four used vessels can be removed, and four new ones inserted, so production never has to stop. One set of vessels is being sterilised, whilst one set is in use.

The advantage of stainless steel for this project is that it can be cleaned with alcohol-based disinfectants, and can be used in industrial dishwashers/autoclaves without risk of damage or corrosion. The high level of finish (crevice and pit-free vessel interiors, with a surface roughness of 0.4 micrometers RA) gives security that surface bacteria will not be stored. TSE certification also guarantees that no animal fats have been used in the polishing process; this is vital to guarantee that no cross-contamination from BSE or CJD diseases occurs.

Seamless Link with Filling Machinery

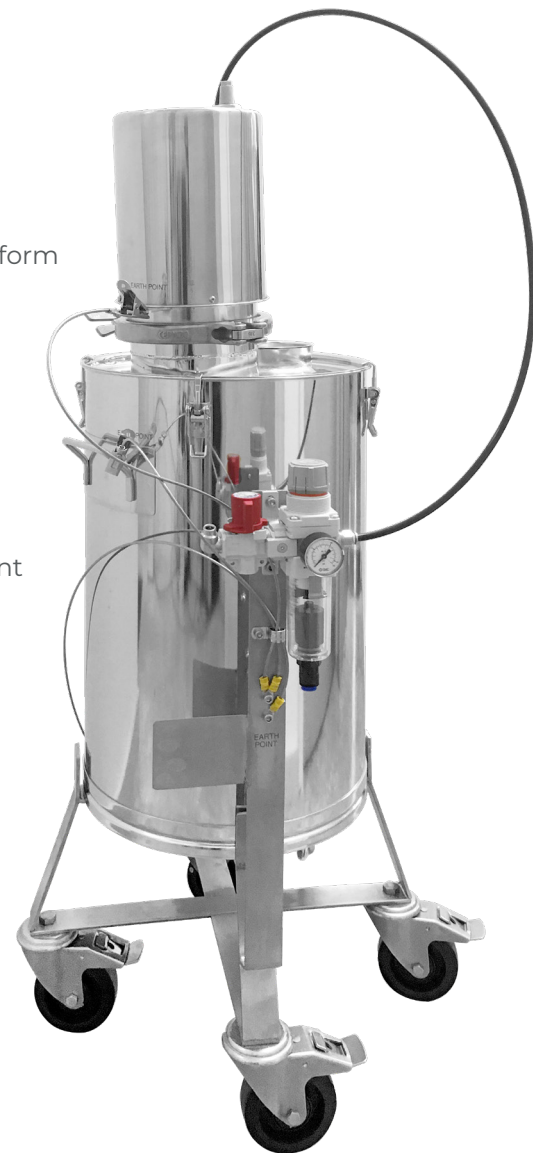
A larger 50L vessel is positioned to the right of the frame. This contains a flammable liquid, which is kept further away from the pumps. ½" valve outlets have been added at the base of all vessels, to quickly and easily decant for filling.

Sauces, Dressings & Vinaigrettes: Perfectly blending water, sugar, vinegar, salt and seasonings

A recent solution for an international food and beverage manufacturing brand, to perfectly blend ingredients such as water, sugar, vinegar, salt and seasonings and dispersing stabilisers, thickening agents, flavourings, preservatives and colourings.

Created in just 8 weeks:

- A 200L ATEX compliant mixing vessel, in 316L grade stainless steel to conform to strict industry hygiene policies.
- Material traceability certification supplied to confirm the grade of stainless steel, for our customer's auditors.
- Faster mixing than could be achieved previously, for higher revenue potential; the process is now running at 1,400rpm using a 0.75 kW motor.
- A more consistent mix, for higher product yield from the same constituent ingredients, and a higher quality customer experience of the products.
- Supplied with a mobile frame, so that the production team can easily transfer the vessel between mixing and cleaning stations.





RATED EXCELLENT

“Great service, fast delivery and good prices. Definitely recommend, thanks!”

Fil, Surepharm Services



RATED EXCELLENT

“Quality products and great customer service. Pharma Hygiene Products are very helpful with all orders that I place and always follow up promptly with any queries that I have. Their processes are very quick and delivery is swift. Products are of a high quality and always as described.”

David Mills



RATED EXCELLENT

“Pharma Hygiene Products were superb, from concept to implementation. Very supportive all the way.”

Ayo Ajani, GW Pharmaceuticals



ADELPHI

PHARMA HYGIENE PRODUCTS

INDUSTRIES WE SERVE

Pharmaceutical and Healthcare

We have excellent knowledge of the strict regulations that pharmaceutical manufacturers must adhere to, and of GMP standards. Stainless steel mixing and storage containers can all be supplied in 316L pharmaceutical grade stainless steel. The use of an X-ray analyser enables us to provide full traceability on all material, along with the relevant certification.

Cosmetics and Personal Care

Whether the products are exclusive to a luxury spa or hotel, or part of a high-volume range sold through multinational supermarkets, cosmetics and personal care product manufacturers can rely on us to supply the highest quality stainless steel process equipment.

Food and Beverage

All of our stainless steel products are manufactured with food hygiene in mind. Most of our stainless steel containers are crevice- and pit-free to avoid bug traps. Our range of process equipment is ideal for food production environments where manufacturers require stainless steel of the highest quality. We also provide equipment for use in catering environments.

Research and Laboratory

Our products are perfectly suited to use by researchers and laboratory technicians developing and producing liquid-based drugs. All our products conform to strict pharmaceutical regulations, and come with the necessary certification. Customers in this area cover the spectrum of life sciences and clinical diagnostics, striving to improve global healthcare, to create new life-saving treatments for hospitals, or to advance veterinary medicine.

E-Liquid

Manufacturing and mixing processes in the production of E-liquids will benefit from the use of our high quality stainless steel mixing containers and utensils. These products are fully compliant with all new regulations applying to the mixing and blending of vaping oils with flavourings.

PHARMA HYGIENE PRODUCTS

Olympus House • Mill Green Road • Haywards Heath • West Sussex RH16 1XQ • UK

+44 (0)1444 472300

info@pharmahygieneproducts.com

www.pharmahygieneproducts.com



Pharma Hygiene Products Ltd is part of the Adelphi Group of Companies

The Adelphi Group of Companies

Adelphi Manufacturing

Adelphi Manufacturing offers manual and semi-automatic equipment designed to aid the efficient opening, filling, closing and inspecting of a variety of containers such as capsules, ampoules, vials, syringes, tubes and bottles. It also offers a range of pharmaceutical dispensing equipment, and is the sole UK agent for TGM tube fillers and ROTA ampoule fillers.

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Pharma Hygiene Products

Pharma Hygiene Products is a leading supplier of high quality stainless steel process equipment, from standard utensils and containers, to custom designed mixing vessels to suit a number of manufacturing industries. All are made to pharmaceutical standards in 304 and 316L grade stainless steel.

info@pharmahygieneproducts.com
www.pharmahygieneproducts.com



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