PICKERING
LABORATORIES

Pickering Test Solutions

Artificial Body Fluids for Product Testing Applications

ARTIFICIAL ECCRINE PERSPIRATION

The Artificial Eccrine Perspiration we offer is a ready-to-use solution and is the closest mimic to true human eccrine sweat. It consists of nineteen amino acids, the seven most abundant minerals, and the four most abundant metabolites at a pH of 4.5. All concentrations closely match experimentally determined values for adult human eccrine sweat.

The stabilized solution is preserved with a fungicide and bactericide for two years of shelf life at room temperature. The non-stabilized product is kept frozen and has a shelf life of one year. Custom formulations at varying pH (2-9) can be made as either the stabilized or non-stabilized solutions.

ARTIFICIAL SEBUM

Sebum is an oily secretion produced by sebaceous glands, which spreads over the hair and skin for waterproofing purposes. Pickering Laboratories, Inc. manufactures an artificial sebum formulation according to ASTM designation D4265-14 or D4265-98. It is ready-to-use and provides the reliability, reproducibility and convenience needed for testing. This formulation can be used according to AATCC Standard Test Method 130-2010 for evaluating the efficacy of home laundry products and conditions to remove stains from fabric.

ECCRINE PERSPIRATION-SEBUM EMULSION

Inspired by the ASTM D4265-98 method for staining, Eccrine Perspiration is emulsified with Artificial Sebum. Prepared without dust/dirt for a more universal application, this emulsion mimics non-exercise induced skin surface film liquids (SSFL). As SSFL, it can be used to test any topical use product or the stability of any article that will come in contact with human sweat. This product requires refrigeration to remain in solution and prevent rancidity.

ARTIFICIAL ECCRINE PERSPIRATION LIST OF INGREDIENTS

METABOLITES	Uric Acid	Urea	
	Lactic Acid	Ammonia	
MINERALS	Sodium	Iron	Nitrate
	Calcium	Copper	Sulfate
	Magnesium	Potassium	
	Zinc	Chloride	
AMINO ACIDS	L-Glycine	L-Histidine	L-Serine
	L-Alanine	L-Isoleucine	L-Threonine
	L-Arginine	L-Leucine	L-Tyrosine
	L-Asparagine	L-Lysine	L-Valine
	L-Aspartic acid	L-Methionine	L-Taurine
	L-Citrulline	L-Ornithine	
	L-Glutamic acid	L-Phenylalanine	

ARTIFICIAL ECCRINE PERSPIRATION

CATALOG NO.	DESCRIPTION	QTY
1700-0022	Artificial Eccrine Perspiration	200 mL
1700-0020	Artificial Eccrine Perspiration - Stabilized	200 mL
1700-0024	Artificial Eccrine Perspiration - Stabilized	5 mL
1700-0531	Artificial Eccrine Perspiration - Stabilized	950 mL
1700-0023	Artificial Eccrine Perspiration, custom pH	200 mL
1700-0021	Artificial Eccrine Perspiration, custom pH - Stabilized	200 mL

D4265-14 ARTIFICIAL SEBUM

CATALOG NO.	DESCRIPTION	QTY
1700-0700	Artificial Sebum	25 g
1700-0702	Artificial Sebum	200 g

ECCRINE PERSPIRATION-SEBUM EMULSION

CATALOG NO.	DESCRIPTION	QTY
1700-0547	Artificial Eccrine Sweat-Sebum Emulsion	250 mL

INDUSTRY SPECIFIC ARTIFICIAL PERSPIRATION

Pickering Laboratories created our Artificial Eccrine Perspiration to universally standardize across all industries; it is the only formula that can satisfy all test challenges. Although it is the most complete formulation available, we also offer the following industry-specific artificial perspiration formulations.

All offered artificial perspirations are shipped ready-to-use. The stabilized solutions are preserved with a fungicide and bactericide for two years of shelf life at room temperature. Non-stabilized formulations are kept frozen and have a shelf life of one year.

Custom pH (2-9) is offered for most of our industry-specific artificial perspirations and can be made as either the stabilized or non-stabilized solutions.

BS EN 1811:2011 ARTIFICIAL PERSPIRATION

FOR RELEASE OF NICKEL

This pH 6.5 formulation is used to stimulate the release of Nickel from all post assemblies which are inserted into pierced ears and other pierced parts of the human body, and for articles intended to come into direct and prolonged contact with the skin. Spectacle frames and sunglasses are excluded from the scope of this European Standard. (Custom pH and stabilized versions available)

BS EN 1811:2011 ARTIFICIAL PERSPIRATION

CATALOG NO.	DESCRIPTION	QTY
1700-0009	BS EN 1811:2011 Artificial Perspiration	200 mL
1700-0506	BS EN 1811:2011 Artificial Perspiration - Stabilized	200 mL
1700-0521	BS EN 1811:2011 Artificial Perspiration, Custom pH	200 mL
1700-0515	BS EN 1811:2011 Artificial Perspiration, Custom pH - Stabilized	200 mL
1700–0566	BS EN 1811:2011 - Stabilized	Carboy 19.8 L

ISO 3160 ARTIFICIAL PERSPIRATION

CORROSION RESISTANCE FOR GOLD ALLOY

This formulation is used to determine corrosion (tarnishing, oxidation and surface penetration) resistance for gold alloy coverings on watch cases and accessories, including bracelets when they are permanently attached to the case. The solution is at pH 4.7 per ISO 3160 specifications. (Custom pH and stabilized versions available)

ISO 3160 ARTIFICIAL PERSPIRATION

CATALOG NO.	DESCRIPTION	QTY
1700-0026	ISO 3160 Artificial Perspiration	200 mL
1700-0511	ISO 3160 Artificial Perspiration - Stabilized	200 mL
1700-0520	ISO 3160 Artificial Perspiration, Custom pH	200 mL
1700-0526	ISO 3160 Artificial Perspiration, Custom pH - Stabilized	200 mL
1700-0532	ISO 3160 Artificial Perspiration – Stabilized	950 mL
1700-0545	ISO 3160 Artificial Perspiration , Custom pH – Stabilized	950 mL

DIN 53160-2: 2010-10 ARTIFICIAL PERSPIRATION

COLORFASTNESS OF ARTICLES FOR COMMON USE

This solution is used to determine the colorfastness of articles for common use to perspiration. This test establishes whether coloring materials can migrate from the articles of daily use to the skin. The test method is applicable to all articles of daily use, independent of the coloring procedure applied (dyeing, staining and coating). This method doesn't apply to articles intended for contact with foodstuffs, nor does it apply to parts of daily-use articles whose function is the release of coloring materials. Examples include wax crayons and colored pencil leads. Possible mechanical wear is not taken into account, such as the exposure of a colored layer after mechanical abrasion to a finishing coat. The formulation is offered at pH 6.5. (Custom pH and stabilized versions available)

DIN 53160-2: 2010-10 ARTIFICIAL PERSPIRATION

CATALOG NO.	DESCRIPTION	QTY
1700-0008	DIN 53160-2: 2010-10 Artificial Perspiration	200 mL
1700-0505	DIN 53160-2: 2010-10 Artificial Perspiration - Stabilized	200 mL
1700-0529	DIN 53160-2: 2010-10 Artificial Perspiration, Custom pH	200 mL
1700-0530	DIN 53160-2: 2010-10 Artificial Perspiration, Custom pH - Stabilized	200 mL

DIN EN 60068-2-70 & IEC 60068-2-70 ARTIFICIAL PERSPIRATION

ABRASION RESISTANCE OF MARKINGS AND LETTERINGS CAUSED BY RUBBING OF FINGERS AND HANDS

This formulation is used to determine the resistance of markings and letterings on flat or curved surfaces against abrasion as it may occur by manually operating actuators and keyboards. This formulation can also be used to determine resistance against fluid contamination as it may occur under normal use.

DIN EN 60068-2-70 & IEC 60068-2-70 ARTIFICIAL PERSPIRATION

CATALOG NO.	DESCRIPTION	QTY
1700-0542	DIN-EN/IEC60068-2-70 Sweat - Non-stabilized	200 mL
1700-0543	DIN-EN/IEC60068-2-70 Sweat - Stabilized	200mL

AATCC TEST METHOD 15 AND TEST METHOD 125 ARTIFICIAL PERSPIRATION

COLORFASTNESS OF FABRIC TO PERSPIRATION OR TO A COMBINATION OF LIGHT AND PERSPIRATION

This pH 4.3 solution is used to determine the colorfastness of textiles to the effects of acid perspiration according to Test Method 15. The same formulation is also used to determine colorfastness to a combination of light and perspiration according to Test Method 125. It is applicable to dyed, printed or otherwise colored textile fibers, yarns and fabrics of all kinds. This formulation can also be used for the testing of dyestuffs as applied to textiles. (Custom pH and stabilized versions available)

AATCC TEST METHOD 15 ARTIFICIAL PERSPIRATION

CATALOG NO.	DESCRIPTION	QTY
1700-0012	AATCC Test Method 15 Artificial Perspiration	200 mL
1700-0015	AATCC Test Method 15 Artificial Perspiration - Stabilized	200 mL
1700-0527	AATCC Test Method 15 Artificial Perspiration, Custom pH	200 mL
1700-0528	AATCC Test Method 15 Artificial Perspiration, Custom pH - Stabilized	200 mL
1700-0541	AATCC Test Method 15 Sweat pH 4.3 - Stabilized	4x950 mL
1700-0555	AATCC Test method 15 - Stabilized	19.8 L

ANSI-BHMA A156.18 ARTIFICIAL PERSPIRATION

FOR TESTING BUILDERS HARDWARE AND FINISHES

This artificial perspiration formulation is used to test finishes on various base materials as per the builder's hardware association. This formulation is not offered in a stabilized format. (Custom pH available)

ANSI-BHMA A156.18 ARTIFICIAL PERSPIRATION

CATALOG NO.	DESCRIPTION	QTY
1700-0504	ANSI-BHMA A156.18 Artificial Perspiration	200 mL
1700-0512	ANSI-BHMA A156.18 Artificial Perspiration, Custom pH	200 mL

ARTIFICIAL PERSPIRATION FOR LEATHER

RESISTANCE TO PERSPIRATION; COLORFASTNESS FOR LEATHER

These two formulations challenge leather with artificial perspiration. ISO 11641 Artificial Perspiration determines colorfastness to perspiration of leather at all stages of processing, particularly to gloving, clothing and lining leathers, and uppers of unlined shoes. This alkaline perspiration has a greater effect on the color of leather and is used to simulate the most demanding conditions. ASTM method D2322-00 determines the resistance to grain cracking, area loss, and flexibility of shoe upper leather to artificial perspiration. (Custom pH and stabilized versions available)

ISO 12870 ARTIFICIAL PERSPIRATION

OPHTHALMIC OPTICS – SPECTACLE FRAMES

This solution is used to determine the resistance to perspiration of unglazed spectacle frames designed for use with all prescription lenses and also to rimless mounts, semi-rimless mounts and folding spectacle frames. This is also applicable to frames made from natural organic materials, but not to custom-made spectacle frames or to products designed specifically to provide personal eye protection. (Custom pH and stabilized versions available)

ISO 105-B07 AND ISO 105-E04 ARTIFICIAL PERSPIRATION

COLORFASTNESS OF TEXTILES TO EITHER A COMBINATION OF LIGHT AND PERSPIRATION OR JUST PERSPIRATION

These test solutions are for all kinds of textiles and textiles in all forms. Textiles are wetted with either the acidic or alkaline solution to test the combined effect of perspiration solution and exposure to light according to ISO 105-B07, and to perspiration only according to ISO 105-E04. The pH of the acidic solution is 5.5 and that of the alkaline solution is 8.0. (Custom pH and stabilized versions available)

GMW14334 ARTIFICIAL PERSPIRATION

Chemical resistance of automotive trim materials and components. Acid and alkaline perspiration solutions are formulated according to test procedure GMW14334 and are designed to test chemical resistance of automotive trim materials and components.

ISO 11641 ARTIFICIAL PERSPIRATION

CATALOG NO.	DESCRIPTION	QTY
1700-0013	ISO 11641 Artificial Perspiration	200 mL
1700-0509	ISO 11641 Artificial Perspiration - Stabilized	200 mL
1700-0518	ISO 11641 Artificial Perspiration, Custom pH	200 mL
1700-0524	ISO 11641 Artificial Perspiration, Custom pH - Stabilized	200 mL

ASTM D2322-00 ARTIFICIAL PERSPIRATION

CATALOG NO.	DESCRIPTION	QTY
1700-0548	ASTM D2322-00 Artificial Perspiration	200 mL

ISO 12870 ARTIFICIAL PERSPIRATION

CATALOG NO.	DESCRIPTION	QTY
1700-0014	ISO 12870 Artificial Perspiration	200 mL
1700-0510	ISO 12870 Artificial Perspiration- Stabilized	200 mL
1700-0519	ISO 12870 Artificial Perspiration, Custom pH	200 mL
1700-0525	ISO 12870 Artificial Perspiration, Custom pH - Stabilized	200 mL

ISO 105-B07 AND ISO 105-E04 ARTIFICIAL PERSPIRATION

CATALOG NO.	DESCRIPTION	QTY
1700-0010	ISO 105-B07 / ISO 105-E04 Artificial Perspiration, pH 5.5	200 mL
1700-0011	ISO 105-B07 / ISO 105-E04 Artificial Perspiration, pH 8.0	200 mL
1700-0507	ISO 105-B07 / ISO 105-E04 Artificial Perspiration, pH 5.5 - Stabilized	200 mL
1700-0508	ISO 105-B07 / ISO 105-E04 Artificial Perspiration, pH 8.0 - Stabilized	200 mL
1700-0516	ISO 105-B07 / ISO 105-E04 Artificial Perspiration, Acidic Custom pH	200 mL
1700-0517	ISO 105-B07 / ISO 105-E04 Artificial Perspiration, Alkaline Custom pH	200 mL
1700-0522	ISO 105-B07 / ISO 105-E04 Artificial Perspiration, Acidic Custom pH - Stabilized	200 mL
1700-0523	ISO 105-B07 / ISO 105-E04 Artificial Perspiration, Alkaline Custom pH - Stabilized	200 mL

GMW 14334 ARTIFICIAL PERSPIRATION

CATALOG NO.	DESCRIPTION	QTY
1700-0533	GMW 14334 – Acidic	200 mL
1700-0534	GMW 14334 – 2-Part Alkaline	200 mL

INDUSTRY SPECIFIC ARTIFICIAL SALIVA AND URINE

In addition to artificial perspiration products, Pickering Labs also offers other artificial bodily fluids for product testing and research. We manufacture several formulations of artificial saliva and artificial urine based on official testing methods as well as published scientific data. To increase the stability of some products during storage, several Pickering Labs artificial saliva formulations come as 2-part formulations that need to be combined before use.

Custom formulations to accommodate specific pH or ingredient requirements are also available upon request.

FUSAYAMA/MAYER ARTIFICIAL SALIVA

FOR TESTING OF PRODUCTS FOR CORROSION, COLORFASTNESS AND DISCOLORATION

This ready-to-use solution closely resembles the mineral composition of natural saliva and can be used for testing a wide variety of products, including dental metal alloys. This formulation is at pH 4.9 and should be stored refrigerated.

AFNOR NF S91-141 ARTIFICIAL SALIVA

FOR TESTING BIODEGRADABILITY OF DENTAL METAL ALLOYS

Artificial Saliva is prepared according to AFNOR NF S91-141 standard procedure and is intended for testing biodegradability of dental metal alloys. The formulation consists of two parts that are mixed right before use. This minimizes changes in the solution during storage and allows for a longer shelf life. The pH of the solution after mixing is 7.8. The Artificial Saliva should be stored refrigerated both before and after mixing. Premixed, ready-to-use solution is available upon request.

DIN 53160-1:2010-10 ARTIFICIAL SALIVA

TO DETERMINE COLORFASTNESS OF PRODUCTS INTENDED TO BE TAKEN INTO THE MOUTH

Artificial Saliva is prepared according to DIN 53160-1:2010-10 standard procedure. DIN 53160 specifies the method to determine colorfastness of products intended to be taken into the mouth. The formulation consists of two parts that are mixed right before use. This minimizes changes in the solution during storage and allows for a longer shelf life. The solution should be stored frozen both before and after mixing. The pH of the solution after mixing is 6.8.

ARTIFICIAL SALIVA FOR PHARMACEUTICAL RESEARCH

Artificial Saliva is formulated according to literature for pharmaceutical research such as studies of drug dissolution and drug delivery through oral mucosa. This is a ready to use formulation that should be stored refrigerated. The pH of the solution is 6.8.

ARTIFICIAL SALIVA FOR MEDICAL AND DENTAL RESEARCH

This Artificial Saliva is formulated according to literature references for medical and dental research. This formulation has similar composition to commercially available products used to treat dry mouth and other conditions. This ready-to-use solution contains Sodium Carboxymethyl Cellulose to increase viscosity of the solution and make it behave similar to natural human saliva. This formulation can be stored at room temperature and has pH of 6.8. This solution is only intended for product testing and research, and not for medical use.

ARTIFICIAL SALIVA

CATALOG NO.	DESCRIPTION	QTY
1700-0301	Fusayama / Meyer Artificial Saliva	200 mL
1700-0302	AFNOR NF S91-141 Artificial Saliva	200 mL
1700-0303	DIN 53160-1:2010-10 Artificial Saliva	200 mL
1700-0304	Artificial Saliva for pharmaceutical research	200 mL
1700-0305	Artificial Saliva for medical and dental research - Stabilized	200 mL
1700-0306	Saliva Fusayama/Mayer Custom pH - Stabilized	200 mL
1700-0307	Saliva Fusayama/Mayer Custom pH	200 mL
1700-0308	Artificial Saliva for pharmaceutical research, Custom pH	200 mL
1700-0309	Artificial Saliva, Fusayama/Meyer - Stabilized	200 mL

DIN EN 1616:1999 ARTIFICIAL URINE

FOR TESTING STERILE URETHRAL CATHETERS

Artificial Urine is prepared according to DIN EN 1616:1999 standard procedure. DIN EN 1616 specifies the method to test sterile urethral catheters. This ready-to-use solution should be stored frozen to avoid bacteria growth. The pH of the solution is 6.6.

ARTIFICIAL URINE FOR CORROSION TESTING OF UROLOGICAL IMPLANTS, STABILIZED

This artificial urine is designed for testing metallic biomaterials used to produce urological implants and catheters. This convenient product is a ready-to-use solution. The formulation contains non-toxic preservative to avoid bacteria growth and can be stored at room temperature. The pH of the final solution is 6.0.

ARTIFICIAL URINE MEDIUM FOR GROWING UROLOGICAL PATHOGENS

This ready-to-use solution closely resembles composition of human urine and can be used for clinical studies as well as for product testing. This formulation supports growth of wide range of urinary pathogens and it is also capable of forming crystals similar to these found in natural urinary tract infections. It can be used as negative controls in laboratory testing. pH of the Artificial Urine Medium is 6.5. This product is stored frozen.

ARTIFICIAL URINE STABILIZED

This ready-to-use solution has the same composition as Artificial Urine Medium and closely resembles human urine. This formulation contains non-toxic preservative to avoid bacteria growth and can be stored at room temperature. The pH of Artificial Urine Stabilized is 6.5.

ARTIFICIAL URINE

CATALOG NO.	DESCRIPTION	QUANTITY
1700-0017	DIN EN 1616:1999 Artificial Urine	200 mL
1700-0016	Artificial Urine for Corrosion Testing of Urological Implants - Stabilized	200 mL
1700-0018	Artificial Urine Medium for Growing Urological Pathogens	200 mL
1700-0600	Artificial Urine - Stabilized	200 mL

ARTIFICIAL CERUMEN

Cerumen, also known as ear wax, is a waxy substance secreted in the ear canal that protects and lubricates the ear canal and assists in cleaning by trapping dirt and dead skin cells. Pickering Laboratories offers artificial ear wax that can be used for testing of hearing aids, ear buds and other electronic devices meant to be used in the ears.

ARTIFICIAL CERUMEN

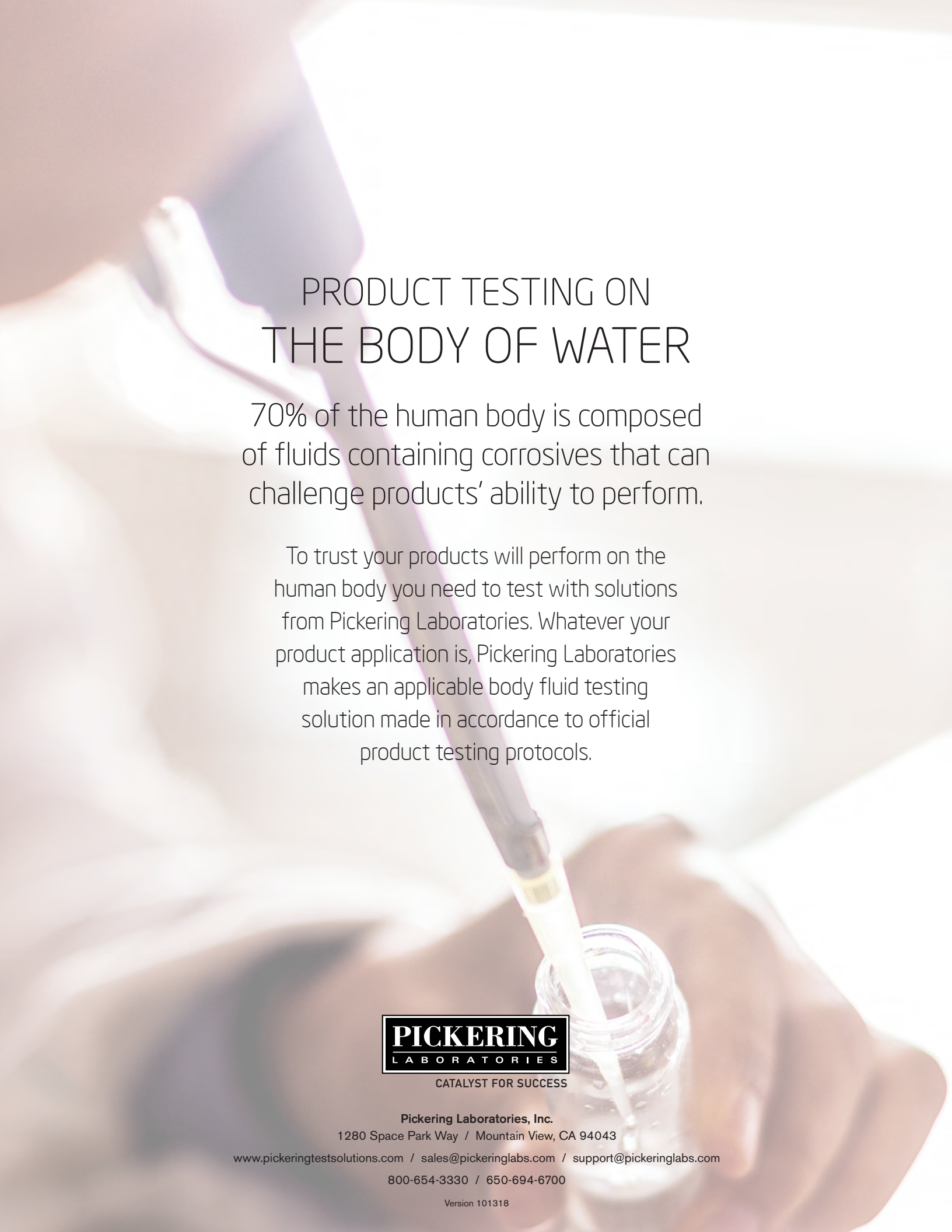
CATALOG NO.	DESCRIPTION	QTY
1700-0701	Artificial Cerumen	50 g
1700-0711	Artificial Cerumen	200 g

SIMULATED LUNG FLUID

Artificial lysosomal fluid (alf) and gamble's solution were used to simulate different interstitial conditions in the lung. Alf is analogous to the fluid with which inhaled particles would come into contact after phagocytosis by alveolar and interstitial macrophages in the lung. Gamble's solution represents the interstitial fluid deep within the lung. Citrate was used instead of proteins to avoid foaming and acetate instead of organic acids. Gamble's solution has a ph of 7.4, whereas alf has a ph of 4.5 and has a much higher organic content than gamble's solution.

SIMULATED LUNG FLUID

CATALOG NO.	DESCRIPTION	QTY
1700-0800	Simulated Lung Fluid - Gamble's Formulation	200 mL



PRODUCT TESTING ON THE BODY OF WATER

70% of the human body is composed of fluids containing corrosives that can challenge products' ability to perform.

To trust your products will perform on the human body you need to test with solutions from Pickering Laboratories. Whatever your product application is, Pickering Laboratories makes an applicable body fluid testing solution made in accordance to official product testing protocols.

PICKERING LABORATORIES

CATALYST FOR SUCCESS

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