Film Types for Corning® Flexible Packaging Systems

Technical Sheet

CORNING

Introduction

Corning® flexible packaging systems are available in multiple formats with eight different types of film. Each film type is hand-picked to provide a high quality, cost effective, flexible container. Depending on the application, Corning can customize the bag's components, e.g., film type, configuration, and connectors to preserve the physical, chemical, and functional characteristics of the sterile fluids.

As the industry attempts to replace steel, glass, and hard plastic containers, these flexible packaging systems reduce the risk of cross-contamination while eliminating cleaning and cleaning validation. The purpose of this report is to demonstrate the suitability of Corning flexible packaging systems for research and product development use in biotechnology and pharmaceutical applications.

The content below describes the biocompatibility and other tests used to rigorously assess Corning film types. In addition, you'll find detailed physical specifications for each film.

Film types and film layering (containing tie layers, fluid contact layers, as well as outer-layers to support use requirements) are classified by their fluid contact layer.

Films

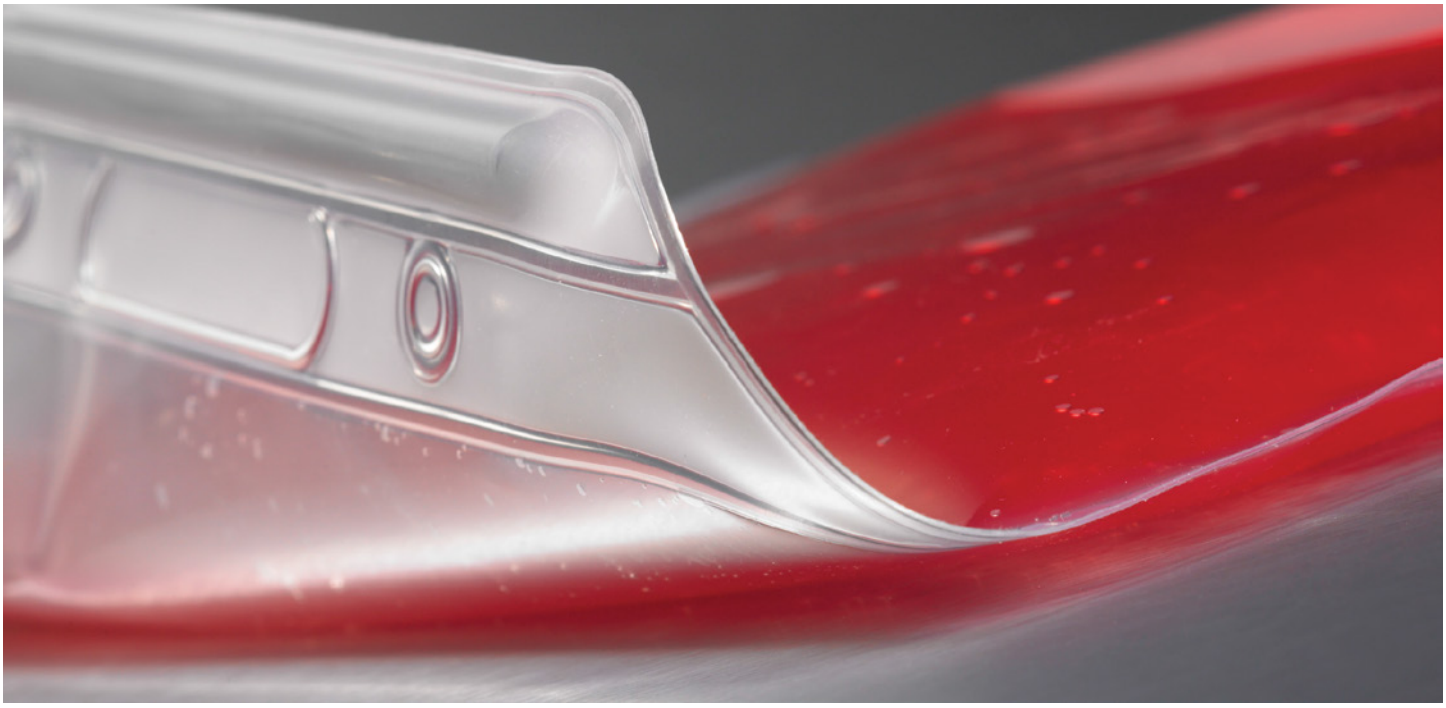
EVA, ULDPE blend, Metallocene, Polyolefin/EVA, EVA/LDPE, Polyolefin, LLDPE, PE

Features and Benefits for Corning Flexible Packaging

- Meets USP Class VI requirements
- Gamma irradiated
- Non-animal origin components
- Gas and moisture barriers minimize transmission of oxygen, carbon dioxide, and water vapor
- Eliminates costs associated with washing, sterilization, and SIP/CIP validations
- Eliminates the risks associated with cross-contamination

Biocompatibility

Our film for flexible packaging products undergoes a range of biocompatibility tests to ensure there are no adverse effects on any biological material that it comes in contact with. USP <88> Class VI tests for *in vivo* reaction to the material, while <87> tests for in vitro reactions (cytotoxicity). USP <661> tests for harmful extractables that may affect a process solution. USP <85> tests for the presence of bacterial endotoxins.



Methods Used

USP <88> Biological Reactivity Test, *In Vivo*, for Class VI

The USP Biological Reactivity Tests, *in vivo*, for Class VI-50°C Plastics are described in the United States Pharmacopoeia, and include:

- Injection of extracts of plastic materials
- Implantation of the solid material into animal tissue

The four extracting media listed in the USP simulate parenteral solutions and body fluids. These include 0.9% Sodium Chloride for Injection:

- 1-in-20 Solution of Ethanol in Sodium Chloride Injection
- Polyethylene Glycol 400
- Vegetable oil (sesame or cottonseed oil)

Samples of gamma-irradiated (at 50 kGy) film and molded connection piece were extracted with these solutions at 50°C ± 2°C for 72 hours ± 2 hours.

The extracts were then used in the following tests to determine the Biological effects they have:

Acute Systemic Injection Tests

An Acute Systemic Injection test was performed to evaluate the potential of a single injection of an extract to produce systemic toxicity. Extracts in Sodium Chloride Injection and 1-in-20 Solution of Ethanol in Sodium Chloride Injection were injected intravenously. Cottonseed oil extract and Polyethylene Glycol 400 extracts were injected intraperitoneally.

Intracutaneous Tests

An Intracutaneous test was performed to evaluate the potential of a single injection of an extract to produce tissue irritation. All four of the extracts listed above were used for these tests.

Implantation Tests

Implantation tests were performed in order to subject the film material of construction to the most stringent conditions included in the USP.

USP <87> Biological Reactivity Tests, *In Vitro* (Cytotoxicity)

The purpose of this study was to assess cytotoxicity (i.e., the effect of extractable from test material on the test cells) as per USP <87> guidelines (elution method). An extract of the test article, Corning film gamma-irradiated to 50 kGy, was prepared using single strength minimum essential medium supplemented with 5% serum and 2% antibodies (1X MEM). This test extract was placed onto two separate monolayers of L-929 mouse fibroblast cells propagated in 5% CO_2. Two separate monolayers were prepared for the negative control (high density polyethylene) and the positive control (tin stabilized polyvinylchloride). All monolayers were incubated at 37°C in the presence of 5% CO_2 for 48 hours and were examined microscopically after 48 hours to determine any change in the cell morphology. After 48 hours, both the negative and positive controls performed as anticipated, whereas the 1X MEM test extract showed no evidence of causing cell lysis or toxicity and thus met the requirement of the USP <87> standards.

Physiochemical Test for Plastics - Chapter <661>

Plastic containers that are intended for packaging products for parenteral use must meet the requirements of Physicochemical Testing — Plastics found in the current USP. These tests are designed to measure the properties of impurities extracted from plastics when leached with extraction medium over a specified period and temperature. The value of these tests becomes important to insure the efficacy of product within the container. Irradiated samples (at a dose of 50 kGy) from the Corning flexible packaging containers and the molded connection pieces were extracted at 70°C for 24 hours in purified water and isopropyl alcohol. Samples of the liquids are then tested for the following under USP <661> guidelines:

Non-volatile residue (NVR) — Measures organic/inorganic residues soluble in extraction media.
Residue on ignition — Performed when the NVR is greater than 15 milligrams.
Buffering capacity — Measures the alkalinity or acidity of the extract.
Heavy Metal Content — Detects the presence of metals such as lead, tin, and zinc.

USP <85> - Bacterial Endotoxin Testing

Limulus Amoebocyte Lysate (LAL) testing is done routinely to quantify the presence of bacterial endotoxins on a sample after gamma irradiation.

Shelf Life Studies

Samples of Corning flexible packaging containers with and without exposure to 50 ± 5 kGy gamma irradiation were subjected to a leak test, a tensile strength test on the outer welds, a drop test, and a sterility test on samples as-received and samples after 0, 6, 12, 24, and 36 months equivalent of accelerated aging and 6 months real-time aging. The tests indicate that both functionality and sterility of the bags remained intact after 24, 36, and 48 months (dependent upon film type) of equivalent accelerated aging, and 6 months real-time aging, respectively. The results for longer periods real-time aging will be shared as they become available over time.

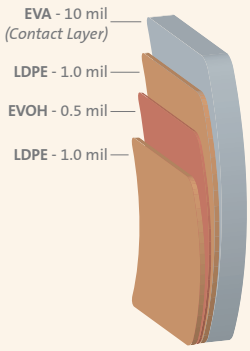
Extractables/Leachables Study

The purpose of this study was to quantify and characterize the components/chemicals that may be extracted/leached out from typical Corning® flexible packaging containers when exposed to different solutions and different storage intervals. The results after 30 and 91 days indicated that the extractables/leachables levels in tested contact fluids were extremely low and were close to the detection limit of the sophisticated analytical techniques applied (with most concentrations in the ppb -1 ppm range). For more information, please make a special inquiry.

Based on the findings from this study, we can say that the 30 days and the 91 days test results revealed only extractable chemical entities that were expected, with the level of extractables/leachables in tested contact fluids being extremely low (most concentrations in the ppb-1 ppm range). All results indicate that extractables/leachables are low and near the detection limit of the analytical techniques. Actual process conditions may impose different parameters, such as different time, temperature, and process fluid composition. Therefore, evaluation under actual process conditions is also recommended. For more information, please make a special inquiry.

Ethyl Vinyl Acetate (EVA) Film

Composition



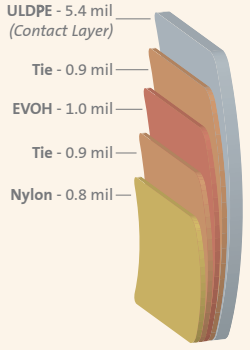
12.5 mil co-extrusion film.

Biocompatibility Tests	Result	Test Protocol
USP intracutaneous reactivity test	Pass	USP <88>
USP acute systemic injection test	Pass	USP <88>
USP intramuscular implantation test	Pass	USP <88>
USP MEM elution method	Non-cytotoxic	USP <87>
Hemolysis	Non-hemolytic	ISO 10993-4
Bacterial endotoxin	< 0.015 EU/mL	LAL test

Physical Properties	Result	Test Protocol
H_2O transmission (g/100 in^2/24 hrs)	0.011	ASTM F-1249
CO_2 transmission (cm^3/100 in^2/24 hrs)	0.58	MOCON Test Method
O_2 transmission (cm^3/100 in^2/24 hrs)	0.28	ASTM F-3985
Ultimate tensile	3100 psi	ASTM D-638
Ultimate elongation	> 650%	ASTM D-638
100% modulus	1000 psi	ASTM D-638
Tear strength	550 lbs/in	ASTM D-1004
Low pressure brittleness	> -75°F	ASTM D-1290
Puncture resistance	22.4 lbs	FTMS 101 B

Metallocene Film

Composition



9.0 mil co-extruded blend of cross-linked polyethylene, EVOH and Nylon.

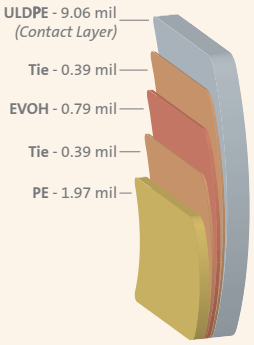
Biocompatibility Tests	Result
Cytotoxicity	Pass
Bacterial endotoxin	< 0.005 EU/mL
Hemolysis	Pass
Heavy metals	< 1 ppm
Buffering capacity	< 1 mL
Non-volatile residue	< 1 mg
Residue on ignition	< 1 mg
Appearance	Pass
Acidity and alkalinity	Pass
Absorbance	0.04 units
Oxidizable substance	< 0.1 mL
Transparency	Pass

Physical Properties	Result
O_2 transmission rate	0.148 cm^3/m^2/24 hours (23°C,100% R.H. inside and 50% R.H. outside)
CO_2 transmission rate	<1.0 cm^3/m^2/24 hours (23°C,50% R.H. outside)
H2O transmission rate	0.455 g/m^2/24 hours (23°C,100% R.H.)
Ultimate tensile strength	3094 (psi)
Elongation	416 (%)
Yield strength	1972 (psi)
Seam strength	18 pounds
Temperature range	-80° to 60°C
Sterilization	SAL 10^{-6}

Low Density Polyethylene (LDPE)/Ethylene Vinyl Acetate (EVA) Film

Single-ply multi layer structure with inert PE fluid contact layer. Contains no animal derived ingredients.

Composition

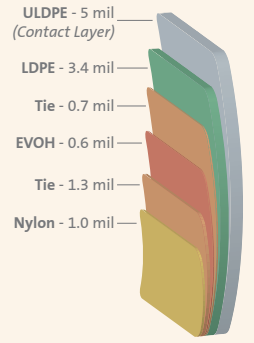


Physical Properties	Result	Test Protocol
Haze (%)	5	ASTM D-1003
Clarity (%)	98	ASTM D-1003
Transmittance (%)	93	ASTM D-1003
Tensile strength at break (Mpa)	14	ASTM D-882
Elongation at break (%)	280	ASTM D-882
Elastic Modulus (Mpa)	370	ASTM D-882
Break at cold temperature (°C)	below -45°C	ISO 8570
Density (g/cm^3)	0.9	ASTM D-792
H_2O transmission rate (g/(m^2.day))	0.4 (23°C)	ASTM F-1249
O_2 permeability (cm^3/(m^2.day.bar))	0.1 (23°C, 0% RH)	ASTM D-3985
CO_2 permeability (cm^3/(m^2.day.bar))	<0.2 (23°C, 0% RH)	Mocon Permatran C-IV
Film thickness	0.325 mm	--
Film width	850 mm	--
Recommended sealing method	Heat sealing	--
Recommended sterilization method	Gamma	--

Ultra-Low Density Polyethylene (ULDPE) Film

Fluid contact layer is 5.0 mil, ultra-low density polyethylene. Outer film is 5-layer, 7 mil co-extrusion film.

Composition



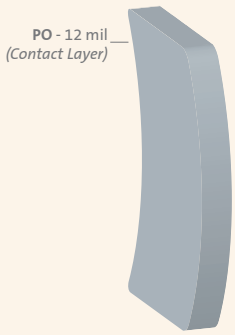
Biocompatibility Tests	Result	Test Protocol
USP intracutaneous reactivity test	Pass	USP <88>
USP acute systemic injection test	Pass	USP <88>
USP intramuscular implantation test	Pass	USP <88>
USP MEM elution method	Non-cytotoxic	USP <87>
Physiochemical test for plastics	Pass	USP <661>

Physical Properties	Result	Test
H_2O transmission (g/100 in^2/24 hrs)	0.017	ASTM F-1249
CO_2 transmission (cm^3/100 in^2/24 hrs)	0.129	ASTM F-2476
O_2 transmission (cm^3/100 in^2/24 hrs)	0.043	ASTM F-1927

	Average Force	Average MOE	Average Elongation	Test Protocol
Tensile	32.73 lbs	25110 psi	1080%	ASTM D 882-02
	Min Force	**Average Force**	**Max Force**	
Tear resistance	6.77 lbs	7.21 lbs	7.74 lbs	ASTM D1004-07
Puncture resistance	16.42 lbs	18.61 lbs	19.51 lbs	FTMS 101C

Polyolefin Film

Composition



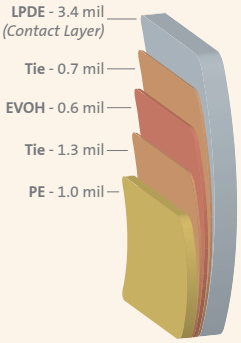
Single-web, 12 mil polyolefin mono layer designed for extremely low temperatures.

Biocompatibility Tests	Result	Test Protocol
USP Class VI	Pass	USP <88>
Cytotoxicty	Pass	USP <87>
Hemolysis	Pass	ISO 10993-4
Heavy Metals	Pass	ISO 3826-1; USP <661>
Buffering Capacity	Pass	USP <661>
Non-Volatile Residue	Pass	USP <661>
Residue on Ignition	Pass	ISO 3826-1; USP <661>
Local Effects After Implantation	Pass	ISO 10993-6
Irritation and Delayed-type Sensitivity	Pass	ISO 10993-10
Systemic Toxicity	Pass	ISO 10993-11
Bacterial Endotoxin	<20 EU/device	USP <85>

Physical Properties	Result	Protocol
O2 Transmission Rate $cm^3/100in^2/24$ Hrs. @25˚C, 0% RH	180	ASTM D3985
CO2 Transmission Rate $cm^3/100in^2/24$ Hrs. @25˚C, 0% RH	1477	ASTM F2476
H2O Transmission $g/100in^2/24$ Hrs. @25˚C	1.1	ASTM F1249
Tensile Strength (Mpa)	17	ASTM D882
Elongation at Break, MD/TD (%)	560/700	ASTM D882
Elastic Modulus (Mpa)	17	ASTM D882
Break at Cold Temperature (˚C)	Below -80˚C	ISO 8570
Glass Transition Temperature (Tg)	-48˚C	DSC
Density (g/cm^3)	0.92	ASTM D792
Low Temperature, (Remains Flexible)	-196˚C	--

Polyethylene (PE) Film

Composition



7 mil co-extrusion film.

Biocompatibility Tests	Result	Test Protocol
USP intracutaneous reactivity test	Pass	USP <88>
USP acute systemic injection test	Pass	USP <88>
USP intramuscular implantation test	Pass	USP <88>
USP MEM elution method	Non-cytotoxic	USP <87>
Physiochemical test for plastics	Pass	USP <661>

Physical Properties	Result	Test
H_2O transmission ($g/100\ in^2/24$ hrs)	0.044	ASTM F-1249
CO_2 transmission ($cm^3/100\ in^2/24$ hrs)	0.145	ASTM F-2476
O_2 transmission ($cm^3/100\ in^2/24$ hrs)	0.278	ASTM F-3985

	Average Force	Average MOE	Average Elongation	Test Protocol
Tensile	30.79 lbs	51670 psi	611%	ASTM D 882-02
	Min Force	**Average Force**	**Max Force**	
Tear resistance	4.86 lbs	5.20 lbs	5.45 lbs	ASTM D1004-07
Puncture resistance	13.89 lbs	15.29 lbs	17.12 lbs	FTMS 101C

Glossary of Terms

ASTM — American Society for Testing and Materials

ASTM D638 — Tensile strength tests measure the force required to break a specimen and the extent to which the specimen stretches or elongates to that breaking point. Tensile tests produce a stress-strain diagram, which is used to determine tensile modulus. This test method covers the determination of tensile properties of plastics in the form of thin sheeting and films (less than 1.0 mm (0.04 in.) in thickness). Since the physical properties of many materials (especially thermoplastics) can vary depending on ambient temperature, it is often times appropriate to test materials at temperatures that simulate the intended end use environment. This test method is designed to produce tensile property data for the control and specification of plastic materials. These data are also useful for qualitative characterization and for research and development.

ASTM D2240 — This test method is based on the penetration of a specific type of indentor when forced into the material under specified conditions. The indentation hardness is inversely related to the penetration and is dependent on the elastic modulus and viscoelastic behavior of the material. This test method covers twelve types of rubber hardness measurement devices known as durometers. The procedure for determining indentation hardness of substances classified as thermoplastic elastomers, vulcanized (thermoset) rubber, elastomeric materials, cellular materials, gel-like materials, and some plastics is also described.

ASTM D792 — These test methods describe the determination of the specific gravity (relative density) and density of solid plastics in forms such as sheets, rods, tubes, or molded items. The specific gravity or density of a solid is a property that is conveniently measured to identify a material, to follow physical changes in a sample, to indicate degree of uniformity among different sampling units or specimens, or to indicate the average density of a large item.

ASTM D790 — These test methods cover the determination of flexural properties of unreinforced and reinforced plastics, including high-modulus composites and electrical insulating materials in the form of rectangular bars molded directly or cut from sheets, plates, or molded shapes. These test methods are generally applicable to both rigid and semi- rigid materials. Flexural properties as determined by these test methods are especially useful for quality control and specification purposes.

ASTM D1238 — This test method covers the determination of the rate of extrusion of molten thermoplastic resins using an extrusion plastometer. After a specified preheating time, resin is extruded through a die with a specified length and orifice diameter under prescribed conditions of temperature, load, and piston position in the barrel. This test method is particularly useful for quality control tests on thermoplastics.

ASTM D1646 — These test methods cover procedures for measuring a property called Mooney viscosity. Mooney viscosity is defined as the shearing torque resisting rotation of a cylindrical metal disk (or rotor) embedded in rubber within a cylindrical cavity.

ASTM D3985 — This test method covers a procedure for determination of the steady-state rate of transmission of oxygen gas through plastics in the form of film, sheeting, laminates, coextrusions, or plastic-coated papers or fabrics. It provides for the determination of (1) oxygen gas transmission rate (OTR), (2) the permeance of the film to oxygen gas (PO2), and (3) oxygen permeability coefficient (P'O2) in the case of homogeneous materials. The OTR is an important determinant of the packaging protection afforded by barrier materials. It isn't, however, the sole determinant, and additional tests, based on experience, must be used to correlate packaging performance with OTR.

ASTM F2476 — This test method covers a procedure for determination of the steady-state rate of transmission of carbon dioxide gas through plastics in the form of film, sheeting, laminates, coextrusions, or plastic-coated papers or fabrics. It provides for the determination of carbon dioxide gas transmission rate (CO2TR). Carbon dioxide gas transmission rate (CO2TR) is an important determinant of the packaging protection afforded by barrier materials. It isn't, however, the sole determinant, and additional tests must be used to correlate packaging performance with CO2TR.

ASTM F1249 — This test method covers a procedure for determining the rate of water vapor transmission through flexible barrier materials. The method is applicable to sheets and films up to 3 mm (0.1 in.) in thickness, consisting of single or multilayer synthetic or natural polymers and foils, including coated materials. It provides for the determination of (1) water vapor transmission rate (WVTR), (2) the permeance of the film to water vapor, and (3) for homogeneous materials, water vapor permeability coefficient. The purpose of this test method is to obtain reliable values for the WVTR of plastic film and sheeting. WVTR is an important property of packaging materials and can be directly related to shelf life and packaged product stability.

ASTM F1980 — This test method is a guide which provides information for developing accelerated aging protocols to rapidly determine the effects, if any, due to the passage of time on the sterile integrity of the sterile barrier system, as defined in ANSI/AAMI/ISO 11607– 1:2006 and the physical properties of their component packaging materials. Information obtained may be used to support expiration date claims for medical device sterile barrier systems.

ASTM F1929 — Harmful contaminants may enter a disposable container through leaks. These leaks are frequently found at seals between bag seals of the same or dissimilar materials. Leaks may also result from a pinhole in the packaging material. This test method defines materials and procedures that will detect and locate a leak in package edge seals formed between a transparent material and a porous sheet material. A dye penetrant solution is applied locally to the seal edge to be tested for leaks. After contact with the dye penetrant for a specified time, the package is visually inspected for dye penetration.

Glossary of Terms, continued

ASTM D543 — These tests cover the evaluation of all plastic materials for resistance to chemical reagents. These tests include provisions for reporting changes in weight, dimensions, appearance, and strength properties. Standard reagents are specified to establish results on a comparable basis. Provisions are made for various exposure times, stress conditions, and exposure to reagents at elevated temperatures. The choice of types and concentrations of reagents, duration of immersion or stress, or both, temperature of the test, and properties to be reported is necessarily arbitrary. The tests provide a basis for standardization and serves as a guide to investigators wishing to compare the relative resistance of various plastics to typical chemical reagents.

DSC — This test method covers the assignment of the glass transition temperatures (Tg) of materials using differential scanning calorimetry. Differential scanning calorimetry provides a rapid test method for determining changes in specific heat capacity in a homogeneous material or domain. The glass transition is manifested as a step change in specific heat capacity. For amorphous and semi-crystalline materials the determination of the glass transition temperature may lead to important information about their thermal history, processing conditions, stability of phases, and progress of chemical reactions. This test method is useful for research, quality control, and specification acceptance.

USP — United States Pharmacopoeia

USP <88> — These tests are a set of in-vivo screening tests to characterize the basic biocompatibility of the plastic under investigation. Six classes of plastics are defined, based on responses to a series of in-vivo tests for which extracts, materials and routes of administration are specified. The following three in-vivo tests make up the test set:

Acute Systemic Toxicity Test — *In-vivo* systemic tests evaluate the impairment or activation of a system – rather than the impairment of individual cells or organs. In acute systemic toxicity tests, the test material (extract) is tested for systemic toxic effects as a result of a single, acute exposure.

Irritation Test-Intracutaneous Injection Test — The irritation tests are in-vivo screening tests to evaluate the potential of test materials or their extracts to cause irritation on the exposed part of the body. This test for intracutaneous irritation is performed to assess inflammatory reactions after applications of extracts of the test article.

Implantation Test — Implant studies evaluate the local pathological effects on living tissue, at both the gross and microscopic level of a test article that is surgically implanted into an appropriate implant site. The implantation evaluates local effects of implanted test articles on living tissue.

USP <87> — The tests are designed to determine the biological reactivity of mammalian cell cultures following contact with the elastomeric plastics and other polymeric materials with direct or indirect patient contact or of specific extracts prepared from the materials under test. The tests include the Agar Diffusion Test, the Direct Contact Test, and the Elution Test. The decision as to which type of test or the number of tests to be performed to assess the potential biological response of a specific samples or extract depends upon the material, the final product, and its intended use.

USP <661> — These tests are used to define the packaging properties that will maintain the highest level of product quality. Tests performed under USP 24 <661 — Polyethylene> characterize high density and low density polyethylene containers. This includes analysis of the container's resistance to light and a determination of heavy metals and extractables. The following physical tests are performed:

Multiple Internal Reflectance — This test is performed to ensure that the material of the container falls within the range of HDPE or LDPE as specified in the test.

Thermal Analysis — This standard determines endotherms and exotherms temperatures. These temperatures should fall within the ranges specified by the standard.

Light Transmission — These tests are intended to provide protection from light as specified by the standard.

Water Vapor Permeation — These tests are intended to provide protection from moisture permeation as specified by the standard. Water vapor permeation tests are performed using aluminum foil for sealing the open end of the bottle if it is used with a closure.

Heavy Metals — Under these tests, containers must meet the requirements for heavy metals under Physicochemical Tests — Plastics.

Nonvolatile Residue — Under these tests the container must meet the requirements for nonvolatile residue under Physicochemical Tests — Plastics, and also has test procedures for Polyethylene Terephthalate (PET) and Polyethylene Terephthalate G (PETG).

USP <85> — This test evaluates the amount of bacterial endotoxins in the sample product using kinetic LAL. This test is used to detect or quantify bacterial endotoxins that may be present in or on the sample of the article(s) to which the test is applied. It uses Limulus Amebocyte Lysate (LAL) obtained from the aqueous extracts of circulating amebocytes of horseshoe crab (Umulus polyphemus or Tachypleus tridentatus) which has been prepared and characterized for use as an LAL Reagent.

ISO — International Organization for Standardization

ISO 10993-4 — Biological evaluation of medical devices -- Part 4: Tests for interactions with blood. Specifies test methods for evaluating a materials interaction with blood, based on the intended use and duration of contact as defined in ISO 10993-1.

ISO 8570 — This specifies a method for assessing the brittleness of plastic film and sheeting at low temperature. This method characterizes a finished product of given thickness and texture, but not its raw-material composition.

Beginning-to-end Solutions for

Cell Culture

www.corning.com/lifesciences/solutions

At Corning, cells are in our culture. In our continuous efforts to improve efficiencies and develop new tools and technologies for life science researchers, we have scientists working in Corning R&D labs across the globe, doing what you do every day. From seeding starter cultures to expanding cells for assays, our technical experts understand your challenges and your increased need for more reliable cells and cellular material.

It is this expertise, plus a 160-year history of Corning innovation and manufacturing excellence, that puts us in a unique position to offer a beginning-to-end portfolio of high-quality, reliable cell culture consumables.

For additional product or technical information, please visit cellgro.com or call 1.800.235.5476.

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Ordering Information

Cat. No.	Description	Film Type	Size	Qty/Pk
Collection Bags				
91-200-01	Collection Bag	EVA	1L	1
91-200-02	Collection Bag	EVA	2L	1
91-200-05	Collection Bag	EVA	5L	1
91-200-10	Collection Bag	EVA	10L	1
91-200-20	Collection Bag	EVA	20L	1
91-200-36	Collection Bag	EVA	10L	1
91-200-39	Collection Bag	EVA	20L	1
91-200-41	Collection Bag	EVA	500 mL	1
91-200-42	Collection Bag	EVA	1L	1
91-200-43	Collection Bag	EVA	5L	1
91-200-45	Collection Bag	EVA	10L	1
91-200-47	Collection Bag	EVA	20L	1
91-200-48	Collection Bag	EVA	50L	1
91-200-82	Collection Bag	ULDPE Blend	100L	1
91-200-83	Collection Bag	ULDPE Blend	200L	1
91-002-MX	Collection Bag	Metallocene	10L	1
91-001-MB	Collection Bag	Metallocene	25L	1
91-100-30	Collection Bag	Metallocene	50L	1
91-100-35	Collection Bag	Metallocene	100L	1
Cell Expansion Bags				
91-200-84	Cell Expansion Bag	Polyolefin	500 mL	1
91-200-85	Cell Expansion Bag	Polyolefin	1L	1
91-200-86	Cell Expansion Bag	Polyolefin	3 L	1
91-200-87	Cell Expansion Bag	Polyolefin	5L	1
Cryopreservation Bags				
91-200-88	Cryopreservation Bag	Polyolefin/EVA	50 mL	1
91-200-89	Cryopreservation Bag	Polyolefin/EVA	250 mL	1
91-200-90	Cryopreservation Bag	Polyolefin/EVA	500 mL	1
91-200-91	Cryopreservation Bag	Polyolefin/EVA	750 mL	1
Rocker Cell Culture Bags				
91-200-80	Rocker Cell Culture Bag	LDPE/EVA	2L	1
91-200-79	Rocker Cell Culture Bag	LDPE/EVA	10L	1
91-200-78	Rocker Cell Culture Bag	LDPE/EVA	20L	1
91-200-92	Rocker Cell Culture Bag	LDPE/EVA	22L	1
91-200-81	Rocker Cell Culture Bag	LDPE/EVA	50L	1
Single-use Bags for Corning® HYPERStack® Vessels				
91-200-75	Trypsin Bag	ULDPE	5L	1
91-200-76	Quench Bag	ULDPE	5L	1
91-200-77	Media Bag	ULDPE	20L	1
Tank Liners				
91-300-15	Gusseted Tank Liner	LLDPE	50L	1
91-300-25	Gusseted Tank Liner	LLDPE	100L	1
91-300-35	Gusseted Tank Liner	LLDPE	200L	1
91-300-20	Non-gusseted Tank Liner	LLDPE	130L	1
91-300-30	Non-gusseted Tank Liner	LLDPE	200L	1
91-300-80	Non-gusseted Tank Liner	LLDPE	1090L	1

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