DOWEX™ HCR-S/S
High Capacity Cation Exchange Resin

For Domestic Softening Applications

Description

DOWEX™ HCR-S/S Cation Exchange Resin is a high capacity resin with excellent kinetics and good physical, chemical and thermal stability. DOWEX HCR-S/S can be used for domestic softening applications.

Typical Physical and Chemical Properties

Physical form		White to amber translucent spherical beads
Matrix		Styrene-DVB gel
Functional group		Sulfonic acid
Ionic form as shipped		Na^+ form
Total exchange capacity, min.	eq/L kgr/ft^3 as $CaCO_3$	1.9 41.5
Bead size distribution range 300–1,200 µm, min. < 300 µm, max.	 % %	 90 1
Moisture retention capacity	%	48–52
Whole uncracked beads	%	90–100
Color throw, as packaged, max.	APHA	20
Acidity range	pH	7.0–10.5
Total swelling ($Ca^{++} \rightarrow Na^+$)	%	5
Particle density	g/mL	1.3
Shipping weight**	g/L lbs/ft^3	800 50

Test methods are available on request.

For additional particle size information, please refer to Particle Size Distribution Cross Reference Chart (Form No. 177-01775).

**As per the backwashed and settled density of the resin, determined by ASTM D-2187

Suggested Operating Conditions

Maximum operating temperature	120ºC / 250ºF
pH range	0–14
Bed depth, min.	800 mm (2.6 ft)
Flow rates: Service/fast rinse Backwash Regeneration/displacement rinse	 5–50 BV*/h (0.6–6.2 gpm/ft^2) See Figure 1 1–10 m/h HCl (0.4–4 gpm/ft^2)
Total rinse requirement	3–6 BV*
Regenerant	8–12% NaCl

*1 BV (Bed Volume) = 1 m^3 solution per m^3 resin or 7.5 gals per ft^3 resin

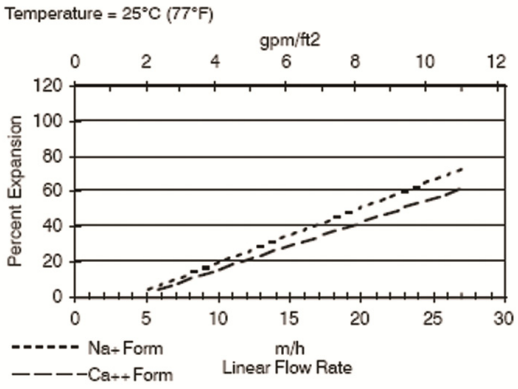
Packaging

25 liter bags or 1 cubic foot bags

Hydraulic Characteristics

Figure 1 shows the bed expansion of DOWEX™ HCR-S/S Cation Exchange Resin as a function of backwash flow rate and water temperature. Figure 2 shows the pressure drop data for DOWEX HCR-S/S as a function of service flow rate and water temperature. Pressure drop data are valid at the start of the service run with clear water and a correctly classified bed.

Figure 1. Backwash Expansion Data

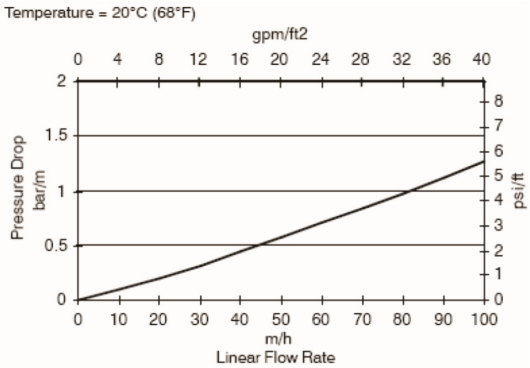


For other temperatures use:

$F_T = F_{77°F}$ [1+ 0.008 ($T_{°F}$ -77)], where F ≡ gpm/ft^2

$F_T = F_{25°C}$ [1+ 0.008 (1.8$T_{°C}$ - 45)], where F ≡ m/h

Figure 2. Pressure Drop Data



For other temperatures use:

$P_T = P_{20°C} / (0.026\ T_{°C} + 0.48)$, where P ≡ bar/m

$P_T = P_{68°F} / (0.014\ T_{°F} + 0.05)$, where P ≡ psi/ft

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

Note

These resins may be subject to drinking water application restrictions in some countries. Please check the application status before use and sale.

Warning: Oxidizing agents such as nitric acid attack organic ion exchange resins under certain conditions. This could lead to anything from slight resin degradation to a violent exothermic reaction (explosion). Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.

DOWEX™ Ion Exchange Resins
For more information about DOWEX™ resins, call the Dow Water & Process Solutions business:
North America: 1-800-447-4369
Latin America: (+55) 11-5188-9222
Europe: (+32) 3-450-2240
Pacific: +60 3 7958 3392
Japan: +813 5460 2100
China: +86 21 2301 1000

Form No. 177-02274-0311, Rev. 0

The Dow Chemical Company
U.S.A.

Effective Date: February 14, 2017
Supersedes: October 22, 2015

FOOD ADDITIVE STATUS

Product

DOWEX™ HCR-S/S (Na) Cation Exchange Resin

Food and Drug Administration (FDA)

This product complies with the U.S. Food and Drug Administration's Food Additive Regulation 21 CFR § 173.25(a)(1).

Use of this product is subject to good manufacturing practices and any limitations which are part of the regulations. The regulations should be consulted for complete details.

If you have any questions or require further information, please contact us via our web site at http://dowwater.custhelp.com/ (Answer Center, Ask an Expert tab).

DOWEX™ HCR-S/S CATION RESIN EXCHANGE RESIN

00003789

Application

Resin is suitable for drinking water applications using recommended pre-treatment. This resin may be subject to drinking water application restrictions in some countries. Please check the application status before use and sale.

Physical and Chemical Information

Strong acid cation ion exchange resin.

Manufacturing and Quality Information

The resin is manufactured in accordance with a certified Quality Assurance System at a dedicated ISO 9001:2008 certified production facility.

Animal Derived Components

This product is not manufactured using materials that are derived from animal sources. Therefore, we can state that Bovine Spongiform Encephalopathy (BSE)/Transmissible Spongiform Encephalopathy (TSE) should not be a concern.

Food Allergens

This product has been evaluated for the source of the raw materials used in its production. In the production process there are no raw materials, including additives, used that are listed as allergens in EU Directive 2000/13/EC or its amendments that have their origin in cereals containing gluten, crustaceans, eggs, fish, peanuts, soybeans, milk, nuts, celery, mustard, sesame, molluscs, and/or lupin. Nor does the product contain sulphur dioxide or sulphites at concentrations of more than 10 mg/kg as SO2. Based on this examination of the ingredients and their sources, this product is free of the specified known allergy stimulating substances.

Natural Rubber or Latex

This product is not intentionally manufactured or formulated with natural rubber or natural latex; however, we do not analyze for these specific substances or compounds.

Melamine

Neither melamine nor its hydrolysis products, cyanuric acid, ammeline, ammelide, are used in the manufacture or processing of these products, nor are there credible chemical routes for their formation. While analysis for the presence of melamine and its hydrolysis products is not done on these products, there is no reason to believe that there is any melamine, cyanuric acid, ammeline, or ammelide present in these products.

Materials from Genetically Modified Organisms

This product is synthetic in origin. None of the raw materials used in the production are from genetically modified origins. Therefore, this product is not produced using Genetically Modified Organisms (GMO).

EU Directive 2002/95/EC (RoHS) as amended by 2008/385/EC

For information on the components of our products and their concentrations, please refer to the Safety Data Sheets (SDSs) and the Sales Specifications. Any hazardous constituent above 1% (by weight) and carcinogens above 0.1% will appear in the ingredients section of the SDSs for these products. In addition, consult the Hazardous Decomposition Products section of the SDSs and the Sales Specifications for further information.Dow does not routinely analyze for additional materials that are not listed in the SDS or Sales Specifications. The materials referenced in the EU Directive 2002/95/EC and its successor 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS); lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE), are not intentionally added to or used in the production of this product.

REACH

Dow ion exchange and adsorbent resins are polymers. Relevant monomers and reactants present at >2% w/w need to be registered.

Reach compliance letters can be obtained by the following route:

- Self service center on link:

CIG Contact

For information on Dow Water and Process products please check the internet site:

www.dowwaterandprocess.com.

The Dow Chemical Company

Dow Water & Process Solutions

Customer Information Center

P.O. Box 1206

Midland, MI 48642-1206

Telephone: 1-800-447-4369

Fax: 989-832-1465

www.dowwaterandprocess.com.

Product Stewardship

The Dow Chemical Company and its subsidiaries ("Dow") has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our Product Stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take the appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products—from the initial concept and research, to manufacture, use, sale, disposal and recycle of each product.

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Medical Applications Policy

NOTICE REGARDING MEDICAL APPLICATION RESTRICTIONS: Dow will not knowingly sell or sample any product or service ("Product") into any commercial or developmental application that is intended for:

a. long-term or permanent contact with internal bodily fluids or tissues. "Long-term" is contact which exceeds 72 continuous hours;
b. use in cardiac prosthetic devices regardless of the length of time involved ("cardiac prosthetic devices" include, but are not limited to, pacemaker leads and devices, artificial hearts, heart valves, intra-aortic balloons and control systems, and ventricular bypass-assisted devices);
c. use as a critical component in medical devices that support or sustain human life; or
d. use specifically by pregnant women or in applications designed specifically to promote or interfere with human reproduction.

Dow requests that customers considering use of Dow products in medical applications notify Dow so that appropriate assessments may be conducted. Dow does not endorse or claim suitability of its products for specific medical applications. It is the responsibility of the medical device or pharmaceutical manufacturer to determine that the Dow product is safe, lawful, and technically suitable for the intended use. **DOW MAKES NO WARRANTIES, EXPRESS OR IMPLIED, CONCERNING THE SUITABILITY OF ANY DOW PRODUCT FOR USE IN MEDICAL APPLICATIONS.**

Disclaimer

NOTICE: No freedom from infringement of any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, the Customer is responsible for determining whether products and the information in this document are appropriate for the Customer's use and for ensuring that the Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Dow assumes no obligation or liability for the information in this document. **NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.**

For additional information, not covered by the content of this document, contact us via our web site http://www.dow.com/products_services/.

DOW EUROPE GMBH encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Identification of the substance/preparation and of the company/undertaking

Product Name
DOWEX™ HCR-S/S Cation Exchange Resin

Identified uses
An ion exchange resin -

COMPANY IDENTIFICATION
DOW EUROPE GMBH
BACHTOBELSTRASSE 3
8810 HORGEN
SWITZERLAND

Customer Information Number: (31) 115 67 2626
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 00 41 447 28 2820
Local Emergency Contact: 00 31 115 69 4982

2. Hazards Identification

Not classified.

3. Composition/information on ingredients

Component	Amount	Classification:	CAS #	EC #
Sulfonated polymer of styrene, ethylstyrene and divinylbenzene in the sodium form	>= 48.0 - <= 52.0 %	Not classified.	69011-22-9	Polymer

Water	>= 48.0 - <= 52.0 %	Not classified.	7732-18-5	231-791-2

4. First-aid measures

Description of first aid measures

General advice: If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Inhalation: Move person to fresh air; if effects occur, consult a physician.
Skin Contact: Wash skin with plenty of water.
Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist. May cause injury due to mechanical action.
Ingestion: No emergency medical treatment necessary.

Most important symptoms and effects, both acute and delayed
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed
No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Suitable extinguishing media
Water. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers.

Special hazards arising from the substance or mixture

Hazardous Combustion Products: Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: Sulfur oxides. Organic sulfonates. Hydrocarbons. Carbon monoxide. Carbon dioxide. Benzene compounds.
Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Soak thoroughly with water to cool and prevent re-ignition. Cool surroundings with water to localize fire zone.
Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Spilled material may cause a slipping hazard. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Sweep up. Recover spilled material if possible. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling

General Handling: Static electricity can accumulate on dry beads. Leave room for expansion as dry resin swells upon wetting and/or changing ionic form. Equipment construction material should be compatible with feed, regenerant, ionic form and effluent of the ion exchange process. Avoid contact with eyes. Avoid generating and breathing dust. Wash thoroughly after handling. Keep container closed. Good housekeeping and controlling of dusts are necessary for safe handling of product.

Storage

Store in a dry place. Keep container tightly closed when not in use. Preferred storage temperature is in the lower half of the range given below.

Shelf life: Use within 36 Months
Storage temperature: 0 - 50 °C

8. Exposure Controls / Personal Protection

Exposure Limits

None established

Personal Protection

Eye/Face Protection: Use safety glasses (with side shields). Safety glasses (with side shields) should be consistent with EN 166 or equivalent. If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles. Chemical goggles should be consistent with EN 166 or equivalent.

Skin Protection: No precautions other than clean body-covering clothing should be needed.

Hand protection: Chemical protective gloves should not be needed when handling this material. Consistent with general hygienic practice for any material, skin contact should be minimized.

Respiratory Protection: Under intended handling conditions, no respiratory protection should be needed.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations.

9. Physical and Chemical Properties

Appearance	
Physical State	Beads
Color	White to yellow
Odor	Odorless to mild

Odor Threshold	No test data available
pH	Not applicable
Melting Point	Not applicable
Freezing Point	Not applicable
Boiling Point (760 mmHg)	Not applicable.
Flash Point - Closed Cup	Not applicable
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	No
Flammable Limits In Air	**Lower**: Not applicable **Upper**: Not applicable
Vapor Pressure	Not applicable
Vapor Density (air = 1)	Not applicable
Specific Gravity (H2O = 1)	1.30 *Literature*
Solubility in water (by weight)	insoluble in water
Partition coefficient, n-octanol/water (log Pow)	No data available for this product.
Autoignition Temperature	Not applicable
Decomposition Temperature	No test data available
Kinematic Viscosity	Not applicable
Explosive properties	no data available
Oxidizing properties	no data available
Molecular Weight	No test data available

10. Stability and Reactivity

Reactivity
No dangerous reaction known under conditions of normal use.

Chemical stability
Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions
Polymerization will not occur.

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose.

Incompatible Materials: Avoid contact with oxidizing materials. Oxidizing agents such as nitric acid attack organic exchange resins under certain conditions. Before using strong oxidizing agents, consult sources knowledgeable in handling such materials. The severity of the reaction with oxidizing materials can vary from slight degradation to an explosive reaction.

Hazardous decomposition products
Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aromatic compounds. Hydrocarbons. Organic sulfonates. Sulfur oxides.

11. Toxicological Information

Acute Toxicity
Ingestion
Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. Typical for this family of materials. LD50, rat > 5,000 mg/kg
Aspiration hazard

Based on physical properties, not likely to be an aspiration hazard.

Dermal

No adverse effects anticipated by skin absorption.
The dermal LD50 has not been determined.

Inhalation

Vapors are unlikely due to physical properties. No adverse effects are anticipated from inhalation. For respiratory irritation and narcotic effects: No relevant data found.
As product: The LC50 has not been determined.

Eye damage/eye irritation

May cause slight eye irritation. Solid or dust may cause irritation or corneal injury due to mechanical action.

Skin corrosion/irritation

Essentially nonirritating to skin.

Sensitization

Skin

No relevant data found.

Respiratory

No relevant data found.

Repeated Dose Toxicity

No relevant data found.

Chronic Toxicity and Carcinogenicity

No relevant data found.

Developmental Toxicity

No relevant data found.

Reproductive Toxicity

No relevant data found.

Genetic Toxicology

No relevant data found.

12. Ecological Information

Toxicity

Not expected to be acutely toxic, but material in pellet or bead form may mechanically cause adverse effects if ingested by waterfowl or aquatic life.

Persistence and Degradability

This water-insoluble polymeric solid is expected to be inert in the environment. Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected.

Bioaccumulative potential

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Mobility in soil

Mobility in soil: In the terrestrial environment, material is expected to remain in the soil., In the aquatic environment, material will sink and remain in the sediment.

13. Disposal Considerations

Any disposal practice must be in compliance with all local and national laws and regulations. Do not dump into any sewers, on the ground, or into any body of water.

14. Transport Information

ROAD & RAIL
NOT REGULATED

OCEAN
NOT REGULATED

AIR
NOT REGULATED

INLAND WATERWAYS
NOT REGULATED

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

European Inventory of Existing Commercial Chemical Substances (EINECS)
The components of this product are on the EINECS inventory or are exempt from inventory requirements.

Classification and User Label Information
Not classified.

16. Other Information

Product Literature
Additional information on this product may be obtained by calling your sales or customer service contact.

Revision
Identification Number: 80051 / A305 / Issue Date 04/15/2013 / Version: 2.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline

WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation

DOW EUROPE GMBH *urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.*

Ko® Kosher Service

www.kokosher.com

Kosher Certification 2017 תעודת כשר

תחת ועד הכשרות לערת הרבנים דפילאדעלפיא ארה"ב לשנת ה'תשע"ז

עד יום יג טבת ה'תשע"ח התעודה תוקפה עד 31, דצמבר 2017 למספרם.

Issue date: ח' כסלו תשע"ז through December 31, 2017.

The following company has been approved to produce/distribute kosher certified products under Ko Kosher Service and are Pareve unless otherwise noted.

Dow Italy S.R.L.

Fombio Italy
Website: www.dow.com

All the following are Pareve:

DOWEX™ 88
DOWEX™ 88 H
DOWEX™ 88 MB Na
DOWEX™ 88 MB H
DOWEX™ CM-15
DOWEX™ FPC16UPS Na
DOWEX™ FPC16UPS H
DOWEX™ HCR-S
DOWEX™ HCR-SS
DOWEX™ HCR-SS FF
DOWEX™ MAC-3
DOWEX™ MAC-3 LB
DOWEX™ MAC-3 PS
DOWEX™ MAC-3 XP
DOWEX™ MARATHON™ C
DOWEX™ MARATHON™ C H
DOWEX™ MARATHON™ C-10 Na
DOWEX™ MONOSPHERE™ 650C H
DOWEX™ MONOSPHERE™ 88
DOWEX™ MONOSPHERE™ 99 310 Ca
DOWEX™ MONOSPHERE™ 99 310 K
DOWEX™ MONOSPHERE™ 99 320 Ca
DOWEX™ MONOSPHERE™ 99 320 K
DOWEX™ MONOSPHERE™ 99 350 K
DOWEX™ MONOSPHERE™ C350
DOWEX™ MONOSPHERE™ C400
DOWEX™ MONOSPHERE™ C-600B
DOWEX™ UPCORE™ MONO C-600 H
DOWEX™ MARATHON™ C-10 Na
DOWEX™ MARATHON™ MSC

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אבד"קק פעלשטין פאדאליע ופילאדעלפיא
נכד הצח"ק ר' לוי יצחק
ברדיטשובער רבי
ונכד הה"צ ר' משה מרדכילי זצוקללה"ה טוועפסקי
מאקאריווער רבי
ונכד הה"צ ר' יחיאל זצוקללה"ה העשעל
קרילויויצער רבי
ונכד הה"צק ר' יהושע זצוקללה"ה רוקח
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אבד"קק פעלשטין פאדאליע ופילאדעלפיא

Member-affiliate of IFT and NPA

Founded in 1940 by
Rabbi David S. Novoseller ,זצ"ל,
Rabbi Moshe Schnall,זצ"ל,
Rabbi Dr. Shalom Novoseller,זצ"ל.

Ko™ Kosher Service, is an innovative "Orthodox Kashrut Service Group" with a network of Rabbinic supervisors providing Worldwide Service dedicated to facilitating the availability of kosher products & services.

Signature of Dow Italy S.R.L. representative

רב המכשיר

מנהל ראשי ומנהל כשרות

Digitally signed by RA and RM
DN: cn=RA and RM gn=RA and RM c=United States l=US o=Adas ou=Ko e=amiel@kokosher.org
Reason: LOC Kosher
Location: Pennsylvania
Date: 2016-12-08 11:24-05:00