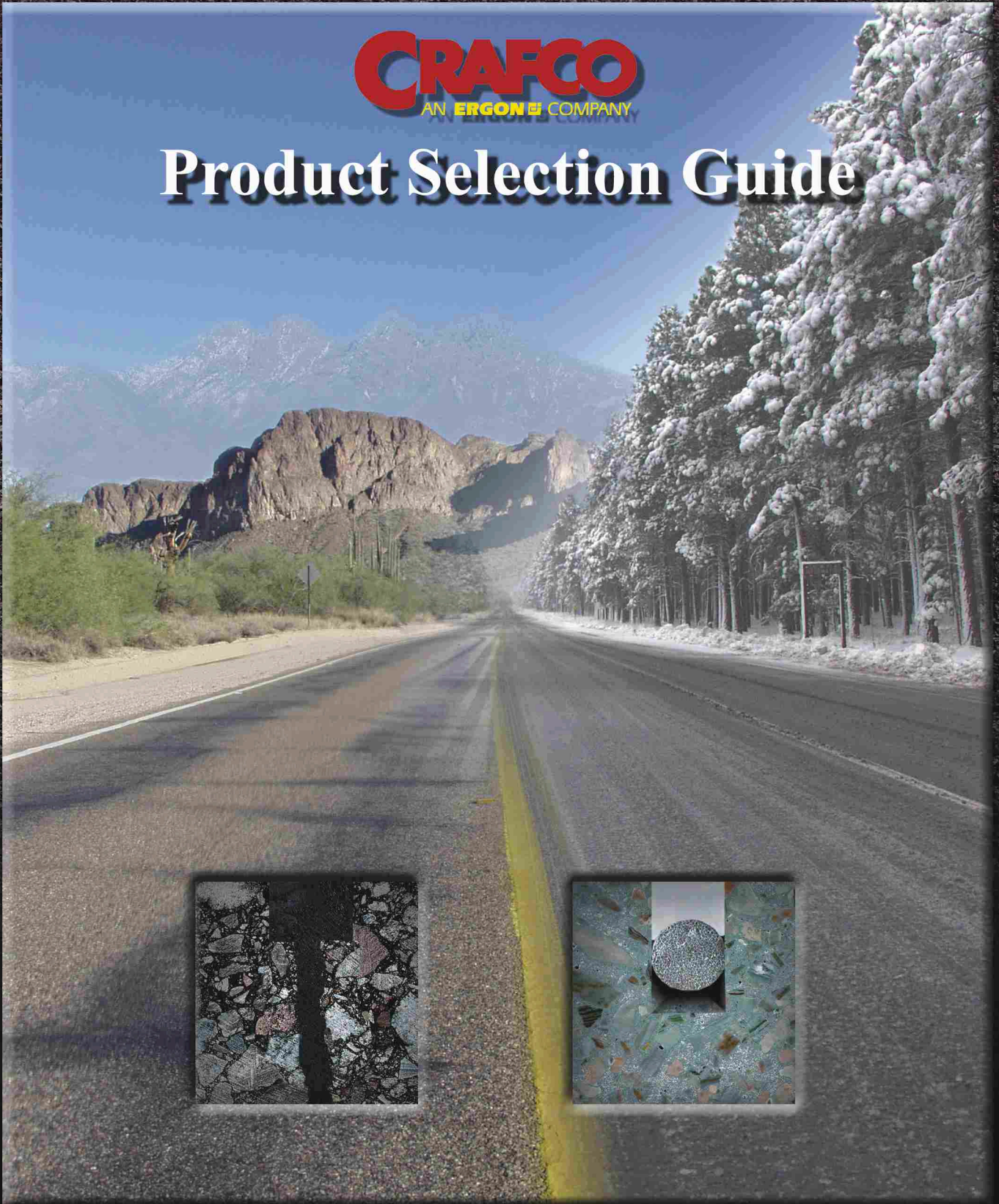




Product Selection Guide



People • Products • Knowledge

Pavement Preservation Materials

quality from start to finish

PEOPLE

Crafco employees are dedicated to maintaining the highest of standards in every area of service and manufacturing. Our staff is greatly respected in the industry for their innovation. This innovation is the direct result of listening to our customers' requests and needs. Our manufacturing and engineering facilities formulate products that you can rely on to satisfy your individual requirements. Our pleasant customer service, along with our vast network of trained professionals, nationally and internationally, make sure you get the product you need when you need it, hassle free.

PRODUCTS

Crafco formulates only products that perform. All products produced are guaranteed to meet high quality standards. All products are quality controlled from the refinery to the end product. These products are available through the Crafco distributor network worldwide. Crafco products include:

- Over Sixty Hot-Applied Asphalt Sealants
- Fuel Resistant Joint Sealants
- Silicone Sealants
- Specialty Adhesives
- Roofing Compounds
- High Performance Patching Products.

KNOWLEDGE

Crafco is the leader and innovator in the pavement industry. This leadership comes from our vast knowledge of pavement and the challenges that come with the never-ending efforts to preserve them. Crafco works closely with State and Federal Highway Administrations, Airport Authorities and Town and County Road Departments to recommend and advise them on the best product for their pavement conditions. ASTM, AASHTO, FHWA and other groups rely on our experience to help write quality specifications. All our knowledge is available to our customers through the products they purchase from us.



Crack Sealant Performance Fillers Joint Sealant

People, Products and Knowledge to satisfy all of your pavement preservation challenges.

Crafco Product Selection Made Easy

Overview

The Federal Highway Administration (FHWA) has completed one of the most extensive highway research projects in history. The project known as LTPP (Long Term Pavement Performance) had the goal of improving pavement design, pavement performance and pavement preservation processes.

As part of this research, pavement temperature data from thousands of locations across the United States and Canada were collected. This information has been compiled in a database called LTPPBind. This information is commonly used in the Super Pave binder selection process.

Crafco has used this data to develop a product selection process for sealant to be used in pavement preservation treatments. Coupled with a treatment selection process you now have the ability to accurately determine the right Crafco product, for the right process, for the right pavement at the right time.

Product Selection Process

- 1- Evaluate pavement and determine pavement preservation treatment.
 - A) Crack Sealing
 - B) Performance Crack Filling
 - C) Joint Sealing
- 2- Determine pavement temperature
- 3- Select appropriate Crafco product for your application.

Step 1: Evaluating Pavement

A) Crack Sealing: This process should be performed on pavements that are in good condition. That is defined as a pavement with a sound base and exhibits distress in the form of thermal or working cracks with greater than 1/8 inch movement. The procedure generally consists of sealing transverse cracks spaced 20 feet apart or more in order to prevent moisture from entering and deteriorating the subbase and incompressible material from interfering with thermal movement. See the Crafco Application Instructions for your chosen sealant to get specific directions on preparation and application. Generally, all crack seal operations include mechanically widening the crack. The expected life of this procedure is 5 to 9 years in most cases.

B) Performance Crack Filling: This procedure consists of filling cracks with low (<1/8 inch) movement in order to stop moisture from penetrating to the subbase of the pavement. If moisture is not checked, catastrophic pavement failure such as potholes will form. Another reason for crack filling is to stop crack raveling. Crack filling is a very cost-effective method of pavement repair that will add years to its life. Crack fill pavements that are in fair to poor condition on a regular basis to maintain or slightly improve their condition. A life of 6 to 8 years can be expected in most instances.

C) Joint Sealing: The sealing of concrete pavement joints is required to stop moisture from entering and deteriorating the subbase of the pavement. The most cost-effective method of ensuring optimum performance of a PCC pavement is by constructing a sound joint seal system that will last. For detailed information see the Crafco joint seal Product Data Sheet and Application Instructions.

Step 2: Determine Temperature Extremes

Find the area of the country you are interested in on the map titled High Temperature. The dot will correlate to a temperature zone listed on the legend. For extreme traffic conditions (heavy, slow moving, pedestrian, parking lots) when crack filling the high temperature extreme should be increased one or two grades. Next, locate your zone on the Low Temperature map. When this is done you will have two Celsius numbers that represent a range of temperatures. The hot or highest number is always first. Please note that some of the -10°C areas on the low temperature map do not actually get that cold, and will classify as a -4°C area. This can be determined from the LTPPBind program.

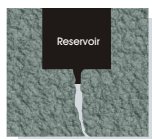
Step 3: Select Crafco Product

Using the temperature range numbers determined in step one above, go to the **Product Selection Grids** corresponding to the treatment process you selected in step two above. These grids list the highly recommended products for specific temperature ranges. There are letters listed in the cell correlating to the hot and cold ranges you selected. Use the Product Summary page to match the letters to a specific Crafco product. Many products may also be used in other climates, as listed on the Product Data Sheets. Use the Product Summary page to check the specifications, and other characteristics such as if the product is thick or thin or if it has any other unique properties. If you have any further question your Crafco representative will be glad to assist you.

For a more detailed explanation of the selection process, refer to Crafco Product Selection Procedures, Product Data Sheets, and Application Instructions. Items contained in the grids are the most commonly used. Agency specified products are also available.

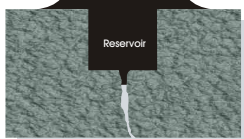
Pavement preservation product selection made easy!

Crack Sealing & Filling Configurations



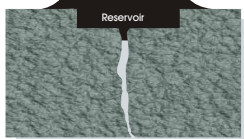
Configuration A

Standard Reservoir and Flush



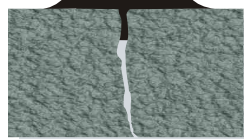
Configuration B

Standard Recessed Band-Aid



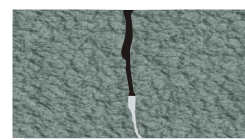
Configuration C

Shallow Recessed Band-Aid



Configuration D

Overband



Configuration E

Flush Fill

Crack sealing is a commonly used technique for maintaining asphalt concrete pavements. The procedure consists of preparing the pavement crack and then installing an appropriate sealant material. When performed correctly, crack sealing is a cost-effective preventive maintenance procedure which extends the service life of asphalt concrete pavements.

The FHWA Report's recommendation include the following:

For long-term crack seal performance, between five and eight years, a standard or low-modulus rubberized asphalt sealant installed in either a standard or shallow recessed band-aid configuration should be used. These materials provide a high level of flexibility and adhesiveness to accommodate annual crack movement. Moreover,

the combination of a reservoir and an overband helps to maximize sealant performance. Life cycle costs show that by utilizing either crack sealing configuration B or C, the cost of crack sealing is 50% less than that of using configuration D.

Summary from crack seal studies show:

1. Proper crack sealing will last five to eight years.
2. Routing and sealing with a band-aid configuration will extend the life of the sealant more than 50%.
3. The use of a high quality sealant is mandatory if you want extended pavement life.

Refer to Crafcro product application instructions for details on reservoir and overband configurations.

Additional Crafcro Products

Crack Sealing Equipment

Crafcro is the industry standard with the broadest line of hot-applied sealant/adhesive applicators, random crack routers, crack cleaning vacuums and other pavement preservation equipment. A wide variety of Super Shot and E-Z Pour melter applicators and optional features make

Pavement Joint Adhesive

Crafcro Joint Adhesive is a unique polymerized asphalt product that is applied to the longitudinal cold joint interface between hot mix asphalt paving passes. A thin layer applied to the interface bonds less dense or segregated material together and waterproofs the joint apex, which prevents raveling and crack formation.

ThermoFix

Crafcro ThermoFix repair system is a gray colored, hot-applied, self-leveling and self-adhesive material specifically engineered to repair spalls and other voids in Portland

PolyPatch

Crafcro PolyPatch is a unique blend of polymer modified asphalt and select aggregate specifically designed for repairing pavement distresses too large for crack sealing and too small for re-paving.

Spray Injection Patcher

The Crafcro Spray Injection Patchers are the most cost effective repair systems for pothole repair today. Distressed pavements are cleaned, tack coated, and filled in minutes by one continuous operation. This system can be used year round and is an ideal addition to your pavement

Loop Sealant

Crafcro Loop Sealant is widely accepted for use in sealing traffic intersection loop detectors. Crafcro Loop Sealant provides 100% encapsulation of the sensor wires. Applicator equipment also available.

Marker Adhesive

Both Crafcro Standard and Flexible Marker Adhesive materials assure marker buttons and lane reflectors stay where they are placed. Standard and Flexible Marker Adhesives are hot-applied bituminous based products that are accepted worldwide. Applicator equipment is also

Roofing & Waterproofing

Crafcro supplies a variety of bulk and packaged asphalt material used in the production of asphalt shingles, in the construction of built up roofing systems and for structural waterproofing.

TechCrete

Crafcro TechCrete is the flexible solution for concrete repair and is a proven hot pour repair that is different from all conventional rigid repair methods. Once in place TechCrete will move with the pavement and will not de-bond or crack. With Crafcro TechCrete it's a one time fix.

Crack and Joint Sealant

Crafcro formulates a wide variety of joint and crack sealants that meet and exceed Federal and State specifications. All Crafcro Sealants are guaranteed from start to finish. Crafcro has the broadest line of sealant in the industry making Crafcro your "one-stop shop" for all your sealant requirements. With four manufacturing facilities across the United States Crafcro guarantees efficient and timely shipping,

www.crafcro.com

For more information on Crafcro products contact your local Crafcro Distributor or call:

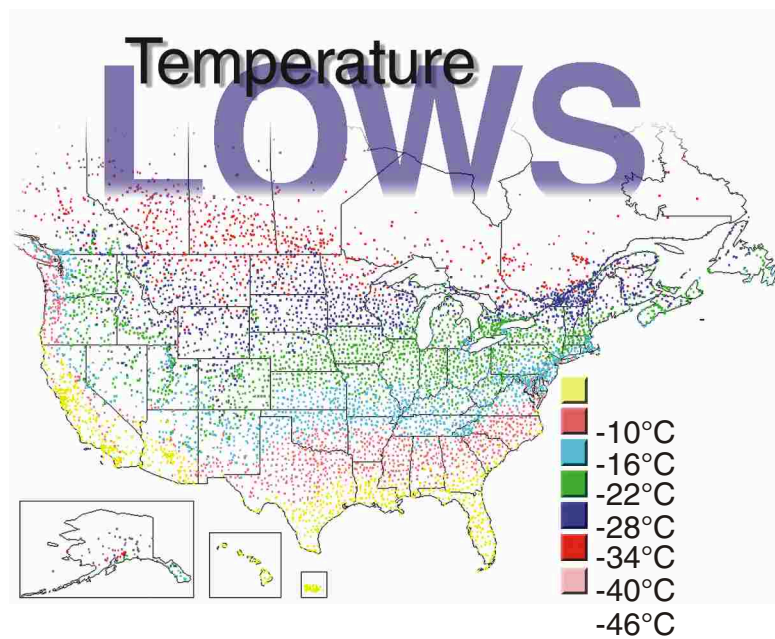
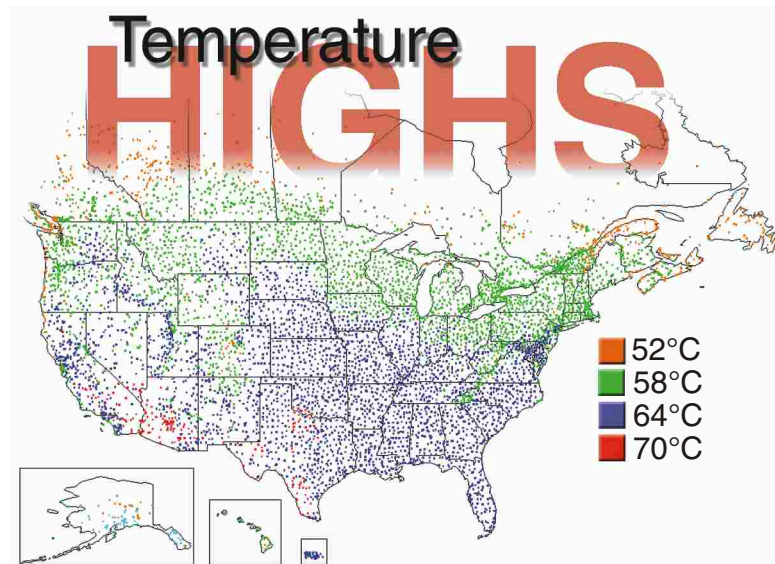
800-528-8242

420 N. Roosevelt Ave.
Chandler, Arizona 85226
Phone 602-276-0406
Fax: 480-961-0513



Select Your Temperature Models

The maps below have been developed by FHWA to show high and low pavement temperatures for U.S. and Canada weather stations. They will help you select the pavement high and low range used to determine the proper sealant or performance filler listed on the selection grids. Locate your position on the maps. Note your high temperature and your low temperature. This is your LTPP temperature range and will be used to determine your recommended pavement preservation products. These temperature extremes are determined at 98% confidence to provide highly reliable results.



Climate =
 Low High

Product for Sealing Product for Filling

* For exact area temperatures download the LTPP program at www.ftfrc.gov/pavement/ltppltpbind.htm

Product Selection Grids for Highly Recommended Products

Crack Sealing

°C	58	64	70	76	82
-4	O	C,O,S	C,O,S	C	
-10	M	C,D,M,S	C,D,S	C	
-16	E,I	D,E,I	D		
-22	B,F,G,J,L	B,F,G,J,L			
-28	B,F,G,J,L	B,F,G,J,L			
-34	PH	PH			
-40	PH	PH			

All the products listed in the temperature grid are recommended for use in the specific climate. Some sealant may be thick or thin or meet a specific specification requirement.

Refer to the **Product Summary** for the properties and specifications. For product details we highly recommend that you obtain from Crafcro the appropriate Product Data Sheet.

Crack Filling

°C	58	64	70	76	82
-4	O,Q	O,Q	A,Q,R,T	A,R,T	A,T
-10	M,O,N	O,N	A,T	A,T	A,T
-16	M,K,N	D,K,N	D,A,T	A,T	A,T
-22	C,E,I	C,D,E,I,S	C,D,S		
-28	B,C,F,G,J,L	B,C,F,G,J,L,S	C,S		
-34	B,F,G,J,L	B,F,G,J,L			
-40	P	P			
-46	P	P			

All the products listed in the temperature grid are highly recommended for use in the specific climate.

Some fillers may be thick or thin, others may contain fibers or meet a specific specification requirement.

Refer to the **Product Summary** for the properties and specifications. For product details we highly recommend that you obtain from Crafcro the appropriate Product Data Sheet.

PCC Joint Sealing

°C	58	64	70	76	82
-4	U,V,Y	U,V,Y	U,V	U,V	U,V
-10	U,V,Y,X	U,V,Y,X	U,V,Y,X	U,V	U,V
-16	E U,V,Y,X,W	E U,V,Y,X	U,V,Y,X	U,V	U,V
-22	FG,L U,V,W	FG,L U,V,W	U,V	U,V	U,V
-28	FG,L U,V,W	FG,L U,V,W	U,V	U,V	U,V
-34	PH U,V	PH U,V	U,V	U,V	U,V
-40	PH U,V	PH U,V	U,V	U,V	U,V
-46	U,V	U,V	U,V	U,V	U,V

All the products listed in the temperature grid are highly recommended for use in the specific climate.

Refer to the **Product Summary** for the properties and specifications. For product details we highly recommend that you obtain from Crafcro the appropriate Product Data Sheet.

Product Summary

- A 34200** Self-leveling stiff and flow resistant. Suited for pedestrian & slow moving traffic areas within the recommended climates. Applied using a pressure feed melter/applicator or pour pot. (Parking Lot Sealant)
Crafco Specification
- B 34201** Not self-leveling. Contains vulcanized rubber and polymers. Use on highways, streets and airfields. Applied using a pressure feed melter/applicator. (RoadSaver 201)
ASTM D6690 Type II, AASHTO M301
- C 34202** Free flowing, self-leveling. When applied it is a stiff, flow resistant yet flexible product. Suited for pedestrian & slow moving traffic areas within the recommended climates. Applied using a pressure feed melter/applicator or pour pot. (Parking Lot Sealant Type I)
Crafco Specification
- D 34203** Medium viscosity. Good multi use sealant when used within recommended temperature limits. Applied using either a pressure feed melter/applicator or pour pot. (RoadSaver 203)
ASTM D6690 Type I, AASHTO M173
- E 34211** Free flowing, self-leveling. Resists cracking in winter and flow and pick up in summer temperatures. Applied using either a pressure feed melter/applicator or pour pot. (RoadSaver 211)
ASTM D6690 Type I, AASHTO M173
- F 34221** Free flowing, self-leveling. Flexible compound that resists cracking in winter and is resistant to flow and pick up at summer temperatures. Applied using either a pressure feed melter/applicator or pour pot. (RoadSaver 221)
ASTM D6690 Type II, AASHTO M301
- G 34222** Free flowing, self-leveling. Flexible compound that resists cracking in winter and is resistant to flow and pick up at summer temperatures. Applied using either a pressure feed melter/applicator or pour pot. (RoadSaver 222)
ASTM D6690 Type III, AASHTO M301
- H 34231** Free flowing, self-leveling. High degree of elongation at low temperatures while resistant to flow at summer temperatures. Due to softness it is not recommended for parking lots or areas with high levels of foot traffic. Applied using either a pressure feed melter/applicator or pour pot. (RoadSaver 231)
ASTM D6690 Type IV
- I 34241** High viscosity, non self-leveling product. Contains 18% rubber by weight of asphaltic components. Resists cracking in winter and flow at summer temperatures. Applied using a pressure feed melter/applicator. (Asphalt Rubber Plus)
ASTM D6690 Type I, AASHTO M173
- J 34244** High viscosity, non self-leveling product that resists sags into joints and cracks. Contains 18% rubber by weight of asphaltic components. Resists cracking in winter and flow at summer temperatures. Applied using a pressure feed melter/applicator. (Asphalt Rubber Plus Type 2)
ASTM D6690 Type I, AASHTO M173-Modified
- K 34250** High viscosity, non self-leveling, contains polyester fiber (Polyfiber). High adhesive and flexible product that resists cracking in winter and flow at summer temperatures. Polymer content improves both high and low temperature properties. Applied using a pressure feed melter/applicator. (Poly-Fiber Type 3)
Crafco Specification
- L 34515** Free flowing, self-leveling. High adhesive and flexible product that resists cracking in winter and flow at summer temperatures. Applied using a pressure feed melter/applicator. Best performance SHRP tests. (RoadSaver 515)
ASTM D6690 Type I, AASHTO M173-Modified
- M 34516** Medium viscosity product that flows and penetrates cracks. Highly adhesive and flexible product that resists cracking in winter and flow at summer temperatures. Improved summer temperature pick-up resistance, quick set-up time and improved low temperature flexibility. Easier application. Applied using a pressure feed melter/applicator or pour pot. (Poly Flex Type I)
ASTM D5078
- N 34517** Free flowing, self-leveling. High heat resistant, can stand up to 288°C without degradation. Highly adhesive and flexible product that resists cracking in winter and flow at summer temperatures. Can be heated in direct-fired single walled kettles. (Crafco DF)
ASTM 50D78
- O 34518** Medium viscosity product that flows and penetrates cracks. Low viscosity for easy application, quick set-up time, and improved low temperature flexibility. Highly adhesive and flexible product that resists cracking in winter and flow at summer temperatures. Applied using a pressure feed melter/applicator or pour pot. (Poly Flex Type 2)
ASTM 507D8, AASHTO D5978
- P 34522** Free flowing, self-leveling. Highly adhesive and flexible product that has a high degree of elongation at low temperatures while resisting flow at summer temperatures. Not recommended for parking lots or pedestrian areas. Applied using a pressure feed melter/applicator or pour pot. (RoadSaver 522)
Crafco Specification
- Q 34521** Medium viscosity product that flows and penetrates cracks. Low viscosity for easy application, quick set-up time, and improved low temperature flexibility. Highly adhesive and flexible product that resists cracking in winter and flow at summer temperatures. Applied using a pressure feed melter/applicator or pour pot. (Poly Flex Type 3)
Crafco Specification
- R 34526** Medium viscosity product that flows and penetrates cracks. Highly resistant to tracking or pick up by vehicle tires in hot weather. Easy application, improved summer pick up resistance, quick set up time and improved temperature flexibility. Applied using a pressure feed melter/applicator. (Poly Flex Type 4)
Crafco Specification
- S 34532** Free flowing, self-leveling. Highly adhesive and flexible product that resists cracking in winter and flow at summer temperatures. Applied using a pressure feed melter/applicator or pour pot. Can be melted in a double boiler or small direct-fired melter. Premium product (Superflex)
Crafco Specification
- T 34533** Low viscosity, self-leveling, easily penetrates narrow cracks. Resistant to cracking in winter. Highly resistant to tracking or pick up by vehicle tires in hot climate. Applied using a pressure feed melter/applicator or pour pot. Can be melted in a double boiler or small direct-fired melter. Premium product. (Superflex HT)
Crafco Specification
- U 34902** Non-sag product, jet blast resistant, applied using bulk dispensing system units. 10+ year life. (RoadSaver Silicone)
ASTM D5893
- V 34903** Low modulus, jet blast resistant, self-leveling silicone. Applied using bulk dispensing system units. 10+ year life. (RoadSaver Silicone SL)
ASTM D5893
- W 34656** Hot-applied single component, self-leveling, fuel resistant product. 10+ year life. (SuperSeal Low-Mod)
Crafco Specification
- X 34655** Hot-applied, self-leveling, fuel resistant product. 6+ years life. (SuperSeal 1614A)
ASTM D3581, ASTM D1854, SS-S-1614A
- Y 34651** Hot-applied, self-leveling, fuel resistant product. 6+ years life. (SuperSeal 444/777)
ASTM D3569, ASTM D3406, AASHTO M282

Detailed specifications and application instructions on these and other Crafco products are available from Crafco Inc. or your local Crafco Distributor.