E. CONCRETE

New and existing concrete subfloors must meet the requirements of the latest edition of ASTM F710, "Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring" available from the ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428; 610 832 9500; http://www.astm.org.

NOTE: Regardless of the type of concrete or other cement-like material used as a base for resilient flooring, in the event of underlayment failure, the responsibility for warranties and/or performance guarantees rests with the concrete or cement-like material manufacturer and not with the manufacturer of resilient flooring.

1. Concrete Floors and Moisture

Any concrete subfloor can be a source of moisture-related flooring failures, including above-grade concrete floors. By its very nature, concrete starts as a water-saturated mass which must cure and then dry sufficiently to allow the installation of flooring. Above-grade floors normally have only the mix water with which to contend, although rain, spills, and water leaks can add more water. Roughly one-half of the mix water is consumed by hydration of the cement during the curing period, with the rest slowly reduced by evaporation. Once dry enough for installation, there is little chance of future moisture-related problems on above-grade concrete slabs. Concrete for on-ground or below-ground floors not only has the mix water to consume and dissipate, also has a potentially inexhaustible source of moisture from the ground. When covered with resilient flooring, a slab that is constructed directly on sub-grade soil will become approximately as moist as the soil on which it is placed.

To reduce this ingress of moisture, a well-designed floor system will have a capillary break and an effective and intact moisture vapor retarder in place. Slabs on and below grade can be affected by both water vapor and capillary rise. Below-grade slabs are closer to the water table, have poorer ventilation for drying and have the added risk of hydrostatic pressure. On-ground concrete slabs and below-grade slabs must have an effective and functional vapor retarder directly beneath the concrete to prevent ingress of moisture from the sub-base and sub-grade soil.

Resilient flooring products, whether sheet, plank, or tile, function as moisture vapor retarders on top of the floor slab. If more moisture is rising from beneath the concrete than can be accommodated by the flooring and adhesive, failure of the installation is inevitable.

Too much ground moisture can create problems for on-grade and below-grade areas of commercial and residential buildings over and beyond those relating to the installation and use of resilient flooring. These problems vary from merely slight but unpleasant dampness to actual structural damage. Moisture near the surface of a concrete slab varies as the weather changes and moisture within the slab usually approximates the dampness of the subsoil.

NOTE: The water-cement ratio is the most important factor regarding moisture migration, permeability, and the drying rate of a concrete slab. Water-cement ratios in the range 0.45 to 0.5 are practical and recommended by the concrete construction industry for slabs to receive resilient flooring. A water-cement ratio of 0.5 is an achievable and reasonable requirement for slabs on or below grade. Significantly higher water-cement ratios may lead to slower drying and problems with moisture movement through the slab, causing flooring failures.

2. Below-Grade Concrete Floors

a. The floor classification must be per the current edition of the American Concrete Institute (ACI) "Guide for Floor and Slab Construction," ACI 302.1R:

   1) For residential and light commercial: Class 2 (except minimum compressive strength must be 3500 psi)

   2) For commercial and institutional: Class 4

b. The concrete slab should have a minimum compressive strength of 3500 psi.

c. The concrete slab must be dry, clean, smooth, structurally sound, and free of foreign materials that might prevent an adhesive bond as described in ASTM F710, "Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring."

d. The concrete slab must be protected from ground moisture with an effective and intact vapor retarder that conforms to the requirements of ASTM E1745, "Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs."

e. The concrete slab must be placed directly on the vapor retarder.

f. The concrete must be wet cured with a moisture-retaining curing cover. Do not use spray-on curing compounds because these reduce the drying rate of concrete and can interfere with the adhesive bond.

g. Before installing the finished flooring, moisture, alkali, and bond testing must be conducted.

   1) Moisture testing must be performed in accordance with ASTM F2170 "Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes" (preferred method) or in accordance with ASTM F1869 "Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride." See section E-10 on Moisture Testing for more details.

   2) The surface of the concrete must have a pH of 9 or less when tested according to the method described in ASTM F710.

   3) Bond testing must be performed to determine compatibility of the adhesives to the concrete slab.

3. On-Grade Concrete Floors

a. The slab must be of good quality, standard density concrete with low water/cement ratios consistent with placing and finishing requirements, having a maximum slump of 4", a minimum compressive strength of 3500 psi, and following the recommendations of ACI Standard 302.1R for Class 2 or Class 4 floors and the Portland Cement Association's recommendations for slabs on ground.

b. The concrete slab must be dry, clean, smooth, structurally sound, and free of foreign materials that might prevent an adhesive bond as described in ASTM F710 "Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring."

c. The concrete slab must be protected from ground moisture with an effective and intact vapor retarder that conforms to the requirements of ASTM E1745 "Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs."

d. The concrete slab must be placed directly on the vapor retarder.

e. The concrete must be wet cured with a moisture-retaining curing cover. Do not use spray-on curing compounds because these reduce the drying rate of concrete and can interfere with the adhesive bond.

f. Before installation of the finished flooring, moisture, alkali, and bond testing must be conducted.

   1) Moisture testing must be performed in accordance with ASTM F2170 "Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes" (preferred method) or in accordance with ASTM F1869 "Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride." See section E-10 on Moisture Testing for more details.

   2) The surface of the concrete must have a pH of 9 or less.

   3) Bond testing must be completed to determine compatibility of the adhesives to the concrete slab.

4. Above-Grade Concrete Floors

a. Above-grade concrete is usually protected from most sources of moisture except the moisture initially in the mix and water vapor in the atmosphere. As with concrete placed on and below grade, above-grade concrete must be kept damp during the curing process to permit hydration to occur. Concrete poured on a metal deck is often produced with lightweight aggregate that can retain excess water longer than normal-weight aggregate. Because drying is only possible from the top surface, such construction usually takes additional drying time.

b. Floors on metal decks or above-grade structural concrete floors must be dried and must meet the same requirements as described in sections E-2 and E-3 for slabs on and below grade.

c. Before installation of the finished flooring, moisture, alkali, and bond testing must be conducted.

1) Moisture testing must be performed in accordance with ASTM F2170 “Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes” (preferred method) or in accordance with ASTM F1869 “Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.” See section E-10 on Moisture Testing for more details.

2) The surface of the concrete must have a pH of 9 or less.

3) Bond testing must be completed to determine compatibility of the adhesives to the concrete slab.

5. Concrete Compressive Strengths

Because of traffic loads anticipated for commercial and institutional environments, concrete slabs should meet the requirements for ACI* Class 2 or Class 4 floors. For these environments, all concrete slabs, including lightweight slabs, must have a compressive strength of 3,500 psi or greater.

6. Lightweight Concrete

a. Armstrong resilient flooring may be acceptable over lightweight aggregate concretes having dry densities greater than 90 lbs. per cubic foot and cellular concretes having plastic (wet) densities over 100 lbs. per cubic foot (94 lbs. dry weight), providing the surface is troweled to a smooth, even finish. This is a **minimum** requirement for the application of resilient floor covering. Concrete slabs with heavy static and/or dynamic loads should have higher design strengths and densities calculated to accommodate such loads.

b. Because lightweight concrete can retain significant amounts of moisture within the slab, it is imperative that lightweight floors be tested for moisture in accordance with ASTM F2170 “Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.” DO NOT TEST LIGHTWEIGHT CONCRETE FLOORS USING ASTM F1869 “Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.” This test method does not indicate the moisture condition deep within a slab and can be especially misleading when used on lightweight concrete slabs.

7. Preformed Concrete Plank or Sections

Because of the joints between the sections, this type of subfloor requires finishing with a concrete topping before resilient flooring is installed. The topping prevents the finished floor from cracking or loosening from the subfloor due to movement of the concrete. Trowelable underlayments are not satisfactory for smoothing preformed concrete subfloors. Concrete toppings on precast concrete must be tested for moisture as for ordinary concrete floor slabs.

** ACI 302.1R-96, Guide For Concrete Floor And Slab Construction, pp. 5 and 22.*

8. Floor Fills, Underlayments, and Toppings

There are numerous products available for use as floor fills, patches, self-leveling underlayments and trowelable underlayments. They include proprietary blends of compounds such as Portland Cement, calcium aluminates, and gypsum-based products. These are recommended by their manufacturers for smoothing rough or uneven subfloors, enhancing acoustical and fire characteristics of structures, or as substrates to receive resilient floor covering for otherwise unsuitable subfloor conditions. When using these products, be sure to follow the manufacturer's recommendations regarding application, drying time, and moisture testing.

Do not install Armstrong floors over gypsum-based products which have been applied to on- or below-grade concrete or damp, suspended concrete for commercial and institutional environments. The floor fill, topping or underlayment **must** also have a minimum compressive strength of 3500 psi. Armstrong S-184 or S-194 meet or exceed this requirement as underlayments.

All recommendations and guarantees regarding their suitability as substrates for resilient flooring are the responsibility of the manufacturer and installer of the substrate.

9. Curing, Sealing, Hardening, or Parting Compounds

"Curing compounds leave a film that can interfere with the adhesion of other materials to the treated surface. … Their use should be avoided on surfaces that will later be covered with resilient floor coverings. … Where applicable, a letter of compatibility should be obtained from the manufacturer before the use of a curing compound on a floor receiving a subsequent finish." (Quote from American Concrete Institute, ACI, publication 302.1R-04, Guide for Concrete Floor and Slab Construction, Chapter 9.2, Methods of Curing.) Any letter of compatibility must come from the manufacturer of the compound.

When curing, sealing, hardening, or parting compounds have been used, the following general statements can be made:

a. If they contain soap, wax, oil, or silicone, the compounds must be removed before a resilient floor can be installed.The compounds can be removed by using a terrazzo or concrete grinder, by sanding with a drum sander or by using a polishing machine equipped with a heavy-duty wire brush.

b. There are many materials that do not contain soap, wax, oil, or silicone and are advertised as being compatible with resilient flooring adhesives. No specific statement can be made regarding their use or need for removal. Conduct bond tests to determine the need for removal. If the bond fails after 72 hours, the compound must be removed.

Curing agents are applied to concrete slabs to retard the escape of water during the initial curing process. Such compounds can remain on the surface of a slab and continue to retard the escape of water during the drying process, and they may break down after the floor covering has been installed and the building is in use. This can occur on above-grade slabs as well as those in contact with the ground.

The elimination of excessive free water from the concrete is essential for the formation of a bond between the adhesives, the flooring materials, and the concrete. In the presence of excessive free water, water-based adhesives will not set up and solvent-based adhesives will not adhere. In the case of adhesives already bonded to the concrete, the adhesive will be displaced by water if the availability of water is sustained.

NOTE: In the event of adhesion failure, the responsibility for warranties and/or performance guarantees rests with the compound manufacturer and not with the manufacturer of the resilient flooring and/or adhesives.

10. Moisture Testing

Moisture testing is an essential part of determining the suitability of a concrete slab to receive a resilient floor covering. Moisture testing must be performed on all concrete slabs, regardless of their age or grade level, including areas where resilient flooring has already been installed. Moisture testing should be conducted with the area or building at service conditions, (i.e., fully enclosed, weather-tight, and with the permanent or temporary HVAC in operation). In general, moisture testing should be conducted on concrete surfaces that exhibit the final prepared stage before the installation of the flooring material and before installation of smoothing or leveling compounds.

Armstrong recommends the following test methods:

a. **Percent Relative Humidity (RH) in Concrete Slabs - Preferred Method**
Testing for internal relative humidity of concrete slabs must be conducted in strict accordance with the latest edition of ASTM F2170 "Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes."

b. **Moisture Vapor Emission Rate (MVER) Test**
MVER tests must be conducted in accordance with the latest edition of ASTM F1869 "Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride." When performing these tests, it is important to remove any curing agents or residues down to the bare concrete. The calcium chloride tests are to be performed only on ordinary concrete floors and are not applicable on lightweight concrete, smoothing or leveling compounds, gypsum underlayments, or other fills.

Following are Armstrong's maximum allowable moisture and pH limits.

Commercial Resilient Products	Adhesive	% Internal Relative Humidity	MVER Pounds Per 1000 ft² Per 24 Hours	pH
MEDINTECH, MEDINTONE, MEDLEY, ROYAL, SOLID	S-599 and S-240	80	5	5 to 9
	S-543 High Moisture	90	5	5 to 11
REJUVENATIONS (TIMBERLINE, StoneRun, Ambigu)	S-599 and S-240	80	5	5 to 9
	S-543 High Moisture	90	5	5 to 11
Abode	S-288 and S-289	80	5	5 to 9
POSSIBILITIES Petit Point, Connection CORLON	S-599 and S-240	80	5	5 to 9
	S-543 High Moisture	90	5	5 to 11
Linoleum	S-240	80	5	5 to 11
	S-780	85	5	5 to 11
Commercial Vinyl Composition Tile (VCT)	S-700 and S-750	80	5	5 to 9
	S-515 High Moisture	90	7	5 to 11
	S-525 High Moisture	85	7	5 to 11
SAFETY ZONE	S-700, S-750 and S-240	80	5	5 to 9
	S-515 High Moisture	90	7	5 to 11
	S-525 High Moisture	85	7	5 to 11
Bio-Based Tile	S-525 High Moisture	85	7	5 to 11
	S-700	80	5	5 to 9
NATURAL CREATIONS LVT	S-288 and S-240	80	5	5 to 9
	S-543 High Moisture	90	7	5 to 11
LUXE PLANK	Floating S-288	80	5	5 to 9
EXCELON SDT	S-202	75	3	5 to 9
RUBBER TILE, STAIR TREADS and TRANSITION STRIPS	S-240	80	3	5 to 9

Residential Resilient Products	Adhesive	% Internal Relative Humidity	Pounds Per 1000 ft² Per 24 Hours	pH
Residential Felt-Backed	S-235 and S-254	80	5	5 to 9
Residential Vinyl-Backed (StrataMax)	S-288 and S-289	80	5	5 to 9
Residential Fiberglass-Reinforced	S-288 and S-289	80	5	5 to 9
Residential Tile - Urethane No-Wax and Vinyl No-Wax	S-700 and S-750	80	5	5 to 9
	S-515 High Moisture	90	7	5 to 11
	S-525 High Moisture	85	7	5 to 11
Natural Living, Natural Personality LVT	S-288	80	5	5 to 9
Alterna	S-288	80	5	5 to 9
Linoleum	S-780	85	5	5 to 11

All tests must meet allowable moisture limits. Any area that exceeds the allowable moisture limit must be further dried to an acceptable level or treated with a moisture remediation system before flooring installation. Performance of any third-party moisture remediation system rests with the manufacturer of that system, not with Armstrong. As a reminder, these tests **cannot predict long-term moisture conditions of concrete slabs**. They are only indicators of moisture conditions at the time the tests are conducted.

NOTE: On installations for which both the Percent Internal Relative Humidity and Moisture Vapor Emission Rate tests are conducted, results for both tests shall comply with the allowable limits listed in the above tables.

11. Concrete pH

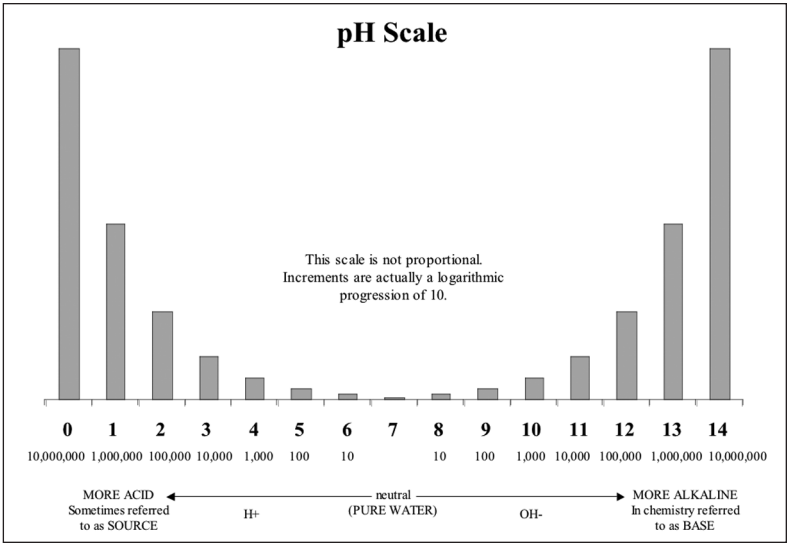
pH is a measure of the concentration of acid ions in a solution. The pH scale runs from 0 to 14; 7 is neutral. Below 7 is considered acidic and above 7 is basic. It is often incorrectly called “alkalinity” which actually refers to the concentration of ions of calcium, magnesium, sodium, and potassium.

The pH of new concrete will be approximately 12 to 13 mostly due to its calcium hydroxide, which is a normal by-product of cement hydration. As a concrete surface reacts with carbon dioxide in the air, the pH of the surface is reduced gradually to about 8.5 through a process called carbonation. A dry, normally carbonated concrete surface is ideal for flooring installation and adhesive performance. A high pH surface with excessive moisture can damage floor coverings and break down adhesives, leading to flooring failures.

In the presence of a continuing water source, dissolved alkalies and hydroxides can be carried to the surface of a concrete slab. Therefore, if testing shows a high pH value, it is important to determine the cause.

Alkaline salts in solutions with moisture, which exude from concrete or work their way up from the earth into on-grade or below-grade concrete slabs, have a tendency to destroy satisfactory bonding of adhesives by sheer physical displacement. They can leave unsightly salt deposits at the seams of sheet materials and joints of tiles. They can also have a deteriorating effect on the overall installation.

Concrete floors should be tested for pH following the procedures outlined in ASTM F710 before installing Armstrong resilient flooring. pH readings must be less than 9 to proceed with flooring installation. Distilled water is placed on the slab for 60 seconds and a pH indicator strip is placed into the water. A chart normally supplied with the strips allows you to determine the pH based on the color change of the test strip.



Rinsing and vacuuming with potable water is the best way to lower pH, but it cannot prevent the future deposit of salts on the surface of the slab. Do not use acid rinses to “neutralize” a high-pH concrete surface. The acid will deposit unwanted salts and can attack interior building finishes and be detrimental to the final installation.

Allowable pH limits can be found in section ten. The testing of concrete for pH can show the pH only at the time the test is run and cannot be used to predict long-term conditions.

12. Bond Test

It is recommended that this test be used to determine the compatibility of resilient flooring adhesives to concrete subfloors after the removal of old adhesives*, curing agents, parting compounds, dust inhibitors, oil, grease, paint, varnish and other special surface treatments or conditions. Using the flooring material and recommended adhesives, install 3' x 3' panels spaced approximately 50" apart throughout the subfloor area. Select areas next to walls, columns or other light traffic areas. Tape edges of panels to prevent edge drying of adhesive. When testing where a curing agent has been used, the curing agent must be removed in some areas for bond testing.

If the panels are securely bonded after a period of 72 hours, you may conclude that the subfloor surface is sufficiently clean of foreign material for satisfactory installation of the resilient flooring.

13. Residual Adhesives

Some previously manufactured asphaltic "cutback" adhesives contain asbestos (see **WARNING** statement on page x). For removal instructions, refer to the Resilient Floor Covering Institute's publication "Recommended Work Practices for Removal of Resilient Floor Coverings."

The following guidelines for adhesive removal pertain to resilient flooring adhesives only. All other adhesives are to be removed 100%.

Degree of Removal	Products
100% of the overall area of the original substrate must be exposed.	• Linoleum • MEDINTECH, MEDINTONE, MEDLEY, ROYAL, SOLID, TIMBERLINE, Ambigu, StoneRun and Residential Fiberglass Reinforced Flooring • POSSIBILITIES Petit Point and Connection CORLON • Luxury solid vinyl flooring • Abode
80% of the overall area of the original substrate must be exposed.	• Residential Felt-Backed Flooring • RUBBER TILE • STAIR TREADS • TRANSITION STRIPS • SAFETY ZONE • EXCELON Static Dissipative Tile (SDT) • Residential Tile **Subfloor must be porous when installing SDT**
Adhesives must be left so that no ridges or puddles are evident and what remains is a thin, smooth film.	• Bio-Based Tile and all vinyl composition tile except SAFETY ZONE and SDT

** Some previously manufactured asphaltic "cutback" adhesives contain asbestos (see warning statement on page x). For removal instructions, refer to the Resilient Floor Covering Institute's publication Recommended Work Practices for Removal of Resilient Floor Coverings.*

As an alternative to residual asphalt cutback adhesives, you can apply a cementitious underlayment, such as S-184 or S-194 as approved by the underlayment manufacturer. All warranties and/or performance guarantees concerning underlayment failure rest with the underlayment manufacturer and not with the manufacturer of the resilient flooring.

NOTE: Many adhesive removal products contain solvents that leave a residue within the subfloor. This residue can negatively affect the new adhesive and bleed through the new floor covering. The warranties provided by manufacturers of new floor covering materials will not cover instances where existing subfloor conditions damage their products or affect their installation.

The use of asbestos encapsulants or bridging materials over asphaltic adhesive is not recommended. These products may affect the bonding properties of the new adhesive.

14. Preparation of Concrete Subfloors

The surface of a concrete subfloor must be dry, clean, smooth, and structurally sound. It must also be free of depressions, scale, or foreign deposits of any kind. The surface shall be free of dust, solvents, varnish, paint, wax, oil, grease, residual adhesive, adhesive removers and other foreign materials that might affect the adhesion of resilient flooring to the concrete or cause a discoloration of the flooring from below. Spray paints, permanent markers and other indelible ink markers must not be used to write on the back of the flooring material or used to mark the concrete slab as they could bleed through, telegraphing up to the surface and permanently staining the flooring material. If these contaminants are present on the substrate they must be mechanically removed prior to the installation of the flooring material.

Many buildings built before 1978 contain lead-based paint, which can pose a health hazard if not handled properly. State and federal regulations govern activities that disturb lead-based painted surfaces and may also require notice to building occupants. **Do not remove or sand lead-based paint without consulting a qualified lead professional for guidance on lead-based paint testing and safety precautions.** For nonlead-based paint, a good paint remover for many concrete subfloors is a solution of trisodium phosphate and hot water, mixed and applied according to the manufacturer's instructions and recommended safety precautions. Paints with a chlorinated rubber or resin base that cannot be removed by trisodium phosphate may be removed by grinding with a concrete or terrazzo grinder. Armstrong does not recommend the use of solvents to remove paints or old adhesive residues because the solvents can remain in the concrete and negatively affect the new installation. Whenever sanding, be certain the work site is well ventilated and avoid breathing dust. If high dust levels are anticipated, use an appropriate NIOSH designated dust respirator. All power sanding tools must be equipped with dust collectors. Avoid contact with skin or eyes. Wear gloves, eye protection, and long-sleeve, loose fitting clothes.

After the concrete has cured and is dry, clean construction joints, saw cuts, score marks, and cracks, and fill with an underlayment such as S-184 or S-194 on any grade level. Repaired areas must be finished flush with the

surface of the concrete and allowed to fully dry before the installation of the floor covering.

Actual expansion joints or other moving joints with elastomeric fillers are designed to absorb movement in concrete slabs. Cementitious underlayments, patches, and resilient flooring installed across expansion joints often crack or buckle when the slabs move. Armstrong does not recommend flooring products be installed across expansion or isolation joints. Expansion joint covers are available for use with various floor coverings and should be specified by the architect.

Dusty concrete slabs may be primed with one coat of S-185 Primer. Sweep or vacuum the concrete and apply the S-185 with a 3/8" nap paint roller. You may also prime concrete subfloors with the recommended flooring adhesive for the material about to be installed. After sweeping/vacuuming, apply the adhesive using a smooth-edge trowel. When using adhesive as a primer, allow the adhesive to dry completely. After drying, install the flooring in accordance with the recommended installation system. **NOTE:** A dusty concrete floor on-grade or below-grade may be a sign of alkali salts.

A rough concrete floor can be ground smooth with a commercial diamond or carbide-equipped grinding machine. If the concrete subfloor is extremely rough or uneven, it may be too great a job to smooth this way. In this case, apply a cementitious underlayment such as S-184 or S-194. A smooth, flat, uniform surface is necessary as a good base for resilient flooring.

F. EXISTING RESILIENT FLOORS

Many Armstrong resilient floor products may be installed over a **single layer** of existing resilient flooring when the proper installation system is used for the new product and the existing resilient flooring meets the proper conditions. **Armstrong does not recommend installing new flooring over existing rubber or slip retardant floors**.

Existing Resilient Flooring Conditions:

- Not textured or embossed enough to show through the new installation.
- Only a single layer of flooring.
- Fully and firmly bonded on an approved subfloor and underlayment.
- Waxes, polishes, and other finishes must be properly removed with a recommended floor stripper. For existing linoleum, the stripper should not exceed a pH of 10.
- Indentations or damaged areas must be replaced or repaired.

NOTE: The responsibility for determining if the old resilient flooring is well-bonded to the subfloor and is not textured or embossed enough to show through the final installation rests with the retailer and the installer. Installation of rotovinyl over existing resilient flooring may be more susceptible to show-through than inlaid floors. Installations over existing resilient flooring may be more susceptible to indentations.