



# CONCRETE REPAIR GUIDE

tips, tricks, and suggestions for common problems / issues  
found in concrete construction and maintenance

*the polyurea people®*

# PERMANENT & DURABLE FLOOR REPAIRS IN 4 STEPS

## **DETERMINE CAUSES OF FLOOR DETERIORATION**

Before you begin repairing floor defects, it's important to identify their underlying causes in order to determine the best long-term repair strategy.

*Example:* Joint spalling may be the result of an improper joint filler installation (i.e. low filler profile or poor joint cleaning prior to filling), the wrong joint filler (i.e. urethane that is too soft to support traffic), or no joint filler at all. These are material problems. Joint spalling could also result from differing slab elevations (slab curl) or rocking slab conditions (subgrade deficiencies or voids). These are structural problems that need to be corrected prior to performing standard joint repair.

## **SELECT APPROPRIATE FLOOR REPAIR MATERIALS**

It's important to choose the repair material(s) best suited to meet the requirements of the facility's operations. Considerations may include frequency of traffic, vehicle loading and types, building temperature, time allowed to perform repairs, defect width, etc.

*Example:* The repair material best suited for repairing a spalled joint may be heavy-duty, semi-rigid polyurea or a structural repair polymer, depending on the width of the spalled joint (wider exposures require more rigid products), the access time required, structural condition of the floor (are the joints still opening? is the defect in a freezer/cooler? <-- Quick Mender X.O. is ideal for these conditions.)

Another point to consider is that any repair material should have very similar physical properties as the existing material it is supplementing/replacing -- hardness, elongation, etc. Otherwise, long term performance may be compromised.

## **PREPARE DEFECT FOR REPAIR MATERIAL**

The key to achieving long-lasting repairs is making sure the edges of the repair area are defined and it is cleaned properly prior to filling with repair material.

Failure to properly clean and prepare a floor defect is probably the #1 cause of ultimate failure. Even joint filler material will not function properly if it's placed into a poorly cleaned joint or crack, or if the material is "feather-edged" (thinned out at edges to much less than typical full depth) along the outside of the defect -- although Quick Mender® can reliably be feather-edged. Typically, the edges of joints, cracks, and surface spalls all should be at least 1/2" deep vertically, and clean and dry prior to filling, to ensure the long term durability and structural stability of any repair.

## **FINISHED REPAIR SHOULD BE FLUSH WITH FLOOR**

The goal in any floor defect repair is to restore a smooth, continuous transition across the floor surface. To achieve a flush profile, repair materials should be placed slightly higher than the floor, then shaved or ground flush with the surface.

The finished profile of any repair should be "flush" with the floor's surface. Simply filling a defect "even" with a material generally results in a finished profile that is concave or dished, as repair materials typically settle and shrink a bit during cure. Repair materials should always be placed slightly higher than the floor surface and be allowed to cure. Once cured, excess material can be shaved or ground flush with the surface.

# JOINT FILL SEPARATION



**VersaFlex**<sup>®</sup>  
INCORPORATED

## REPAIR MATERIAL

**SL/SERIES**

**SL75™ SL85™**

**SL88™ SL90™**

## TOOLS & EQUIPMENT

### Preferred:

Joint clean-out saw w/ dustless shroud, Nyalox abrasive wheel, Diamond blade, Vacuum system, Compressed air, Razor scraper

### Minimal:

Right angle grinder, Nyalox abrasive wheel, Shop vacuum, Compressed air, Razor scraper, Torch if moisture is present



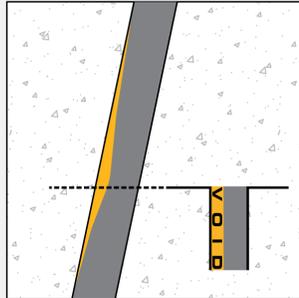
**DIFFICULTY**

### OPTION 1: Refilling Voids Without Removal of Existing Filler

Before choosing this option, ensure that existing filler is well bonded structurally to one or both sides of the joint, and exhibits signs of being properly installed originally (flush with floor, proper depth, etc). If filler is not well bonded or original installation appears deficient, remove filler and treat as you would a normal joint repair.

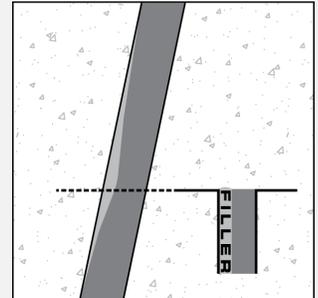
#### STEP 1

Use knife or narrow tool to loosen debris in voids. Nyalox abrasive wheel on a grinder may also be used. Blow out debris with compressed air and vacuum voids clean.



#### STEP 2

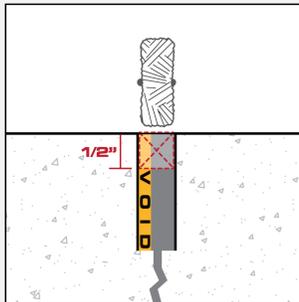
Overfill voids with appropriate semi-rigid filler. Monitor carefully as filler settles and releases trapped air. Allow to cure, then razor/scrape flush with the floor surface.



### OPTION 2: Partial Removal of Existing Filler

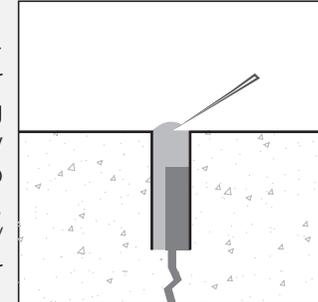
#### STEP 1

Use joint cleaning saw or right angle grinder with a Nyalox abrasive wheel to remove existing filler to a nominal depth of 1/2" below surface. All filler residue must be removed from joint walls. A diamond blade may be required to achieve this. Vacuum joint clean.



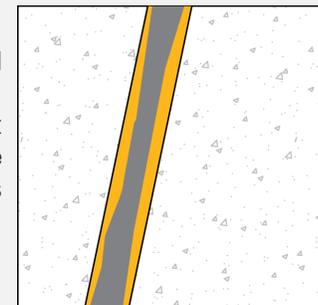
#### STEP 2

Overfill void with semi-rigid joint filler. Monitor filler profile carefully during material cure, as filler may settle unexpectedly into / through joint bottom. Allow to cure, then razor/scrape flush with the floor surface.



### OPTION 3: Complete Removal of Existing Filler

If existing joint filler has lost complete adhesive bond on both sides of joint, and by examining material there appears to be evidence of inadequate adhesion (i.e. dirt/debris bonded to sides of filler), or inadequate filler depth (shallower than joint depth), then the filler should be completely removed and replaced in order to provide maximum long-term durability. If this is the case, filler can be removed using methods described in Option 2, and joint should be treated as a standard joint repair.



# JOINT SPALLING 1" WIDE OR LESS



**VersaFlex**<sup>®</sup>  
INCORPORATED

## REPAIR MATERIAL



## TOOLS & EQUIPMENT

### Preferred:

Right angle grinder with dustless shroud, Joint clean out saw, Diamond blades, Vacuum system, Razor scraper

### Minimal:

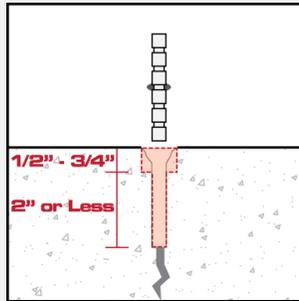
Right angle grinder, Diamond Blades, Shop vacuum, Razor scraper



**DIFFICULTY**

### STEP 1

Cleaning & re-sawing methods should be determined by the widest point of any spalled joint. If the spalled joint is narrow, it may be possible to use a single diamond blade to cut a "new" joint to the same depth as the original (or 2" min). If spalling joint is wider than a single cut can achieve, consider the use of a series of blades to reach the proper width. The center blade should always reach the depth of the original joint, and the outer blades should achieve a cut of 1/2" - 3/4", creating a "T" shape after cutting.

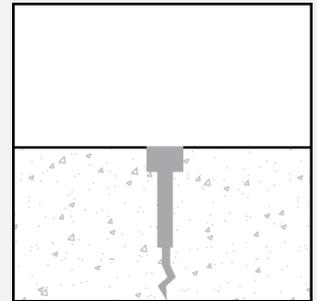


### STEP 2

Clean out any remaining debris.

Vacuum or blow clear with compressed air.

Slightly overfill cleaned joint with filler (multiple passes may be required), and allow to cure. After full cure, razor off excess or grind flush if razoring proves too difficult.



*Note:* If joint width exceeds 1/2", consider using Quick Mender® repair material in place of joint filler.

# CONCAVE / LOW JOINT FILLER PROFILE

## REPAIR MATERIAL



## TOOLS & EQUIPMENT

### Preferred:

Joint clean out saw with dustless shroud, Nyalox abrasive wheel, Diamond blades, Vacuum system, Razor scraper

### Minimal:

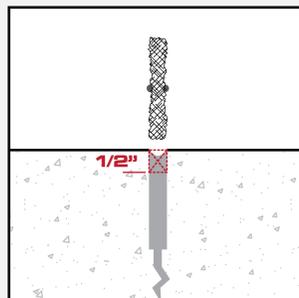
Right angle grinder, Nyalox abrasive wheel, Shop vacuum, Razor scraper



**DIFFICULTY**

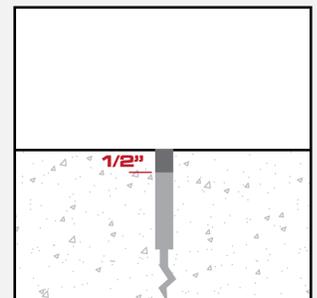
### STEP 1

Remove existing filler to a depth of 1/2" (min.) below floor surface using a saw or grinder with a Nyalox abrasive wheel / diamond blade. Ensure that joint walls are cleaned back to bare concrete, and that no filler residue remains. Completely vacuum out newly created channel.



### STEP 2

Overfill newly formed channel with chosen repair material. Allow to cure. Razor off excess flush with floor surface.



# MAJOR SPALLING WIDER THAN 1"



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## REPAIR MATERIAL



## TOOLS & EQUIPMENT

### Preferred:

Right angle grinder with dustless shroud, Joint clean out saw, Diamond blades, Vacuum system, Razor scraper, Pneumatic chipper

### Minimal:

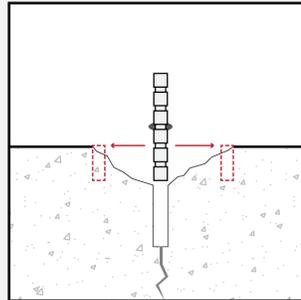
Right angle grinder, Diamond Blades, Shop vacuum, Razor scraper, Hammer / Chisel



**DIFFICULTY**

### STEP 1

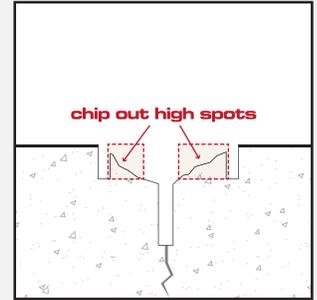
Create a vertical edge behind the spalled edges on both sides using a joint clean out saw or right angle grinder with diamond blade. The depth of these cuts should be 1/2" minimum (3/4" preferable).



### STEP 2

Chip out any concrete which remains above the elevation of the saw cuts using pneumatic chipper or hammer and chisel.

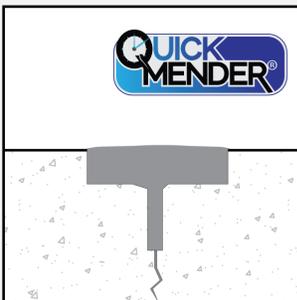
The new channel does not have to be completely flat, but should be as close as possible. Vacuum new joint channel clean.



### STEP 3

Pour / trowel Quick Mender® smooth and only slightly higher than the edges of the slab. Allow to cure fully, then grind off / feather edges until smooth with slab surface.

*Note:* If spall depth is greater than 6", VersaFlex recommends doing two 3" applications of Quick Mender®, allowing partial cure on initial pour before beginning the second.

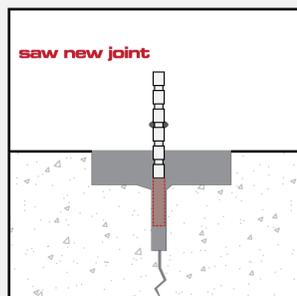


*Pro Tip:* Mix silica sand into Quick Mender® for greater tensile / compressive strength. This can effectively increase by 1000 psi. Follow Quick Mender® instructions for aggregate amounts.



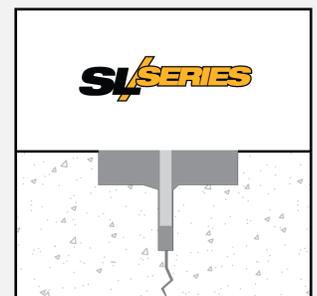
### STEP 4

Using joint cleaning saw with a diamond blade, cut a new joint through Quick Mender® in order to ensure depth of cut exceeds depth of repair.



### STEP 5

Overfill newly formed joint with SL/series polyurea joint filler. Allow to cure. Razor off excess filler flush with repair surface.



# RANDOM CRACKS LESS THAN 1/8"



## REPAIR MATERIAL



## TOOLS & EQUIPMENT

**Preferred:**  
Angle grinder w Nyalox abrasive wheel, Medium grit grinding pad, Vacuum / Compressed air

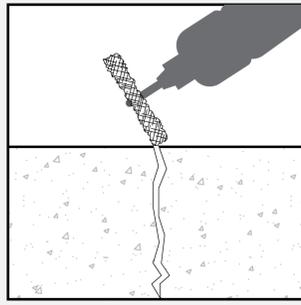
**Minimal:**  
Nyalox abrasive wheel, Vacuum / Compressed air



**DIFFICULTY**

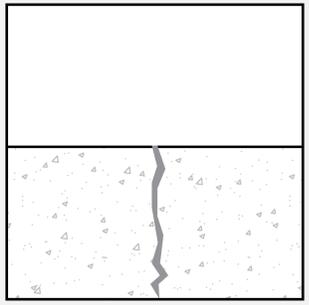
### STEP 1

If a crack is less than 1/8" wide, VersaFlex recommends that it **not** be saw cut open. Clean out crack using angle grinder with a Nyalox abrasive wheel, then vacuum / blow out with air.



### STEP 2

After crack is clean, apply Quick Mender® into crack, slightly overfilling. Monitor material and refill if seepage occurs. After cure, use medium grit grinding pad to remove excess Quick Mender®, and make flush with slab surface.



# RANDOM CRACKS GREATER THAN 1/8"

## REPAIR MATERIAL



## TOOLS & EQUIPMENT

**Preferred:**  
Angle grinder w/ dustless shroud, Crack chasing saw, Diamond blades "U" or "V" shaped, Vacuum system, Razor scraper

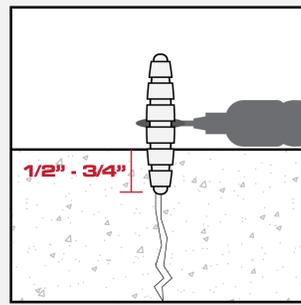
**Minimal:**  
Right angle grinder, Diamond blades "U" or "V" shaped, Shop vacuum, Razor scraper



**DIFFICULTY**

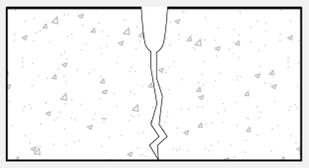
### STEP 1

Use angle grinder with a diamond "U" or "V" shaped blade to rout out crack to a depth of 1/2" minimum (3/4" preferred), creating a vertical edge. Be sure that remaining concrete along edge is structurally sound.



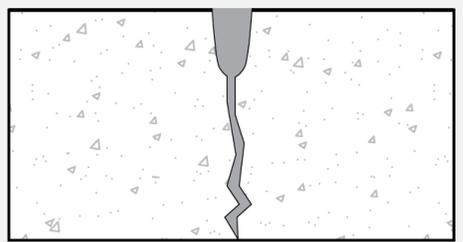
### STEP 2

Clean out any remaining debris or loose elements. Vacuum or blow clear with compressed air.



### STEP 3

Apply SL/Series joint filler or Quick Mender® and allow it to seep into the crack. Reapply until seepage stops, if necessary. Allow to cure. Razor / grind off excess material flush with floor surface.



# SURFACE SPALLS LARGER THAN 6"



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## REPAIR MATERIAL



## TOOLS & EQUIPMENT

### Preferred:

Right angle grinder with dustless shroud, Diamond blades, Grinding pads, Trowel, Vacuum system, Razor scraper

### Minimal:

3 lb. hammer, Cold chisel, Shop vacuum, Trowel, Razor scraper



**DIFFICULTY**

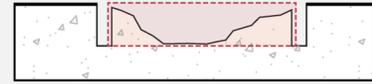
### STEP 1

Make cuts with blade or chip out section at outer edges of spalling, 1/2" deep (min.) to 3/4" deep (preferred), creating a vertical edge.



### STEP 2

Chip out any high spots above the level of the cuts. Vacuum/brush area clean. If oil / debris is present, solvent wipe with clean rag.



### STEP 3

Slightly overfill area with Quick Mender® and trowel smooth, slightly higher than slab surface.



### STEP 4

Remove overfill to create a smooth, flush surface with medium grit grinding pad.



# SURFACE SPALLS / DEFECTS LESS THAN 6"

## REPAIR MATERIAL



## TOOLS & EQUIPMENT

### Preferred:

Drill w/ Nyalox abrasive wheel, Medium grit grinding pad, Vacuum / Compressed air

### Minimal:

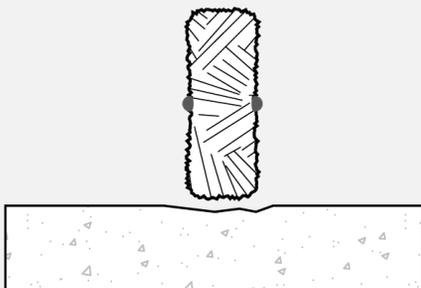
Abrasive wheel, Vacuum / Compressed air



**DIFFICULTY**

### STEP 1

Run drill with Nyalox abrasive wheel over defects twice, in opposite directions. Vacuum defect clean.



### STEP 2

Slightly overfill defect with Quick Mender® and allow to cure.

Grind off overfill flush with floor surface with medium grit grinding pad.



MATERIAL COVERAGE RATES



Joint Fill Linear Feet Per Gallon

INCHES	1/8	3/16	1/4	3/8	1/2	3/4	1
1/4	318	283	249	193	138	92	64
1/2	295	207	138	103	69	45	34
3/4	197	138	92	70	45	30	23
1	138	104	64	50	34	23	17
1 1/4	112	76	54	41	28	19	14
1 1/2	99	69	45	34	23	15	11
1 3/4	84	59	39	29	19	13	9
2	70	52	32	25	17	11	8
2 1/2	55	41	26	19	13	9	6

Joint Fill Linear Feet Per 600mL Cartridge Set

INCHES	1/8	3/16	1/4	3/8	1/2	3/4	1
1/4	58	44	32	28	24	16	11
1/2	48	32	24	17	11	8	6
3/4	32	21	16	12	8	5	3
1	24	14	11	8	6	3	2
1 1/4	18	12	9	7	5	2	1
1 1/2	16	10	8	6	4	2	1
1 3/4	13	9	7	5	3	2	1
2	12	7	5	3	2	1	0.9
2 1/2	10	5	3	2	1	0.9	0.4

Theoretical Quantity & Mixing Recommendations:

1 cubic foot = 1,728 inches or 7.48 gallons by volume.  
 There are 231 cubic inches in 1 gallon. 1,728 / 231 = 7.48 gallons

- 2 parts aggregate to 1 part Quick Mender® = preferred type mix
- 3 parts aggregate to 1 part Quick Mender® = soupy type mix
- 4 parts aggregate to 1 part Quick Mender® = scoop type mix
- Never mix more than 4 parts aggregate to 1 part Quick Mender®

TECHNICAL SUPPORT  
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