



TABLE OF CONTENTS- FREQUENTLY ASKED QUESTIONS

1. ENGINEERING	VI-2
2. PURCHASING.....	VI-3
3. PRODUCTION.....	VI-3
4. FIELD	VI-4
5. QUALITY CONTROL TESTING	VI-5

1. ENGINEERING

1. How many bar sizes differential can be accommodated?

Any given size sleeve can connect the bar designated or any combination of smaller bars. For example, the #11U-X sleeve can connect, #11, #10, #9, #8, #7, etc. The minimum embedment length for the bars in the sleeve must follow the requirements for the sleeve size, not the bar size. However, it is recommended to upsize 2 bar sizes. For example, #9U-X sleeves can be used for splicing #7, #8, and #9.

2. What is the difference between a Type 1 and Type 2 splice?

Type 1 mechanical connection splices outlines that, a full mechanical connection shall develop in tension or compression, as required at least **125 percent** of specified yield strength f_y of the reinforcing bar. The definition of **Type 2** depends on the code being referenced.

- For **Type 2** mechanical connection splices, Section 21.1.6.1 of ACI 318-11 outlines that a full mechanical splice connection shall develop in tension or compression, as required, at least **1.25 f_y** of the reinforcing bar and shall develop the specified tensile strength of the spliced bar which is the same as 150% of specified yield for ASTM A615.
- For **Type 2** mechanical connection splices, Section 1921.2.6.1.2 of UBC-97 outlines that, mechanical connections shall develop in tension lesser of **95 percent** of the ultimate tensile strength, f_u or **160 percent** of specified yield strength, f_y of the reinforcing bar and the ICBO Evaluation Service adds cyclic testing under Acceptance Criteria AC133. The NMB has been reviewed for Type 2 as noted in Evaluation Report ESR-3433.

3. Do I need to specify Type 2?

Type 2 splices are only needed if the coupler is deemed to be in a plastic hinge zone in the structural system and the building is located in a high seismic zone which requires confirming of provisions outlined in Chapter 21 of the ACI 318 Building Design Code.

4. Is the Type 2 NMB Splice-Sleeve different?

No, it is the same sleeve. However, the minimum grout strength changes from 6,500-psi for Type 1 (125%) to 9,500-psi for Type 2 (150%) connections as per ACI 318-11.

5. Do I need to specify different grout for Type 2?

No, the only grout approved for use in the NMB Splice-Sleeves is SS Mortar[®]. We have designed SS Mortar to achieve well over 11,000-psi at 28-days when mixed as directed. Typical 28 days strength ranges above 12,500-psi.

6. Can I use the NMB upside down?

Yes, this is called Pre-Grout position. The sleeve is filled (pre-grouted) just before the precast element is erected above. This is especially good to create blind architectural connections. However, if you want the option of pumping grout after erecting, you can detail so as to pump grout through the 14 mm PVC grout tube and seal off the 22 mm port that allows grout to spill over at the wide end.

7. Do I need to stagger sleeves?

No, sleeves are not usually staggered. It is highly impractical to stagger sleeves on either side of a joint. Many tests have been done over 33 years that show staggering is not necessary. Further, you can refer to the ACI Committee 349 "Code Requirements for Nuclear Safety Related Concrete" that gives design criteria for eliminating staggering that normally is required in Chapter 21 of the ACI 318 code.

8. How close can I space NMB's?

The NMB is treated like it is a rebar. You must be able to get concrete around it. Based on the maximum size of aggregate a minimum distance of 1" between sleeves is to be maintained.

9. How much concrete cover is required for the NMB's?

The NMB is treated like it is the main reinforcing bar. Depending on the exposure conditions, one need to maintain the minimum cover that would have been required over the main bars.

10. What is the embedment length of a bar and sleeve assembly?

The NMB is considered to be part of the bar and its length is part of the embedment length for the situation in question.

11. Can the NMB connect Epoxy Coated Rebar?

Yes. NMB Splice Sleeves are available with Epoxy Coating on the outside.

12. Can the NMB be hot-dip galvanized?

No. However, zinc coating can be applied on the outer surface. SSNA provides zinc coated sleeves

2. PURCHASING

1. Where can I get help to figure out what to order?

Call Splice Sleeve North America at (877) 880-3230 or email to info@splicesleeve.com.

2. Where do I place an order?

Call Splice Sleeve North America at (877) 880-3230 or FAX (734) 838-0422 or email to: order@splicesleeve.com.

3. What is the difference between a Rubber Plug (RP) and a Setter Rubber (SR)?

The Rubber Plug (RP) is a standard accessory that fits over the narrow end of the sleeve and seals the factory bar coming into the sleeve. The Setter Rubber (SR) is part of the Cam-Type Sleeve Setter (STR-CT). It fits in the wide end of the sleeve and holds it to the form. If production calls for more rubbers, you need to ask which ones, for the sleeve or the setter?

4. What else do I need to order besides sleeves?

That depends on the application. You will probably need PVC tubing if the sleeves are located in Post-Grout position (bottom of piece, above the joint). You will need Cam-Type Setters (STR-CT) or PIN Type- (PS) for each sleeve in each form. The field crew will need SS Mortar, a hand grout pump and mixer blade among other common items. Call us for help with your specific situation. Please refer to **NMB Order Guide** page.

5. When can I expect delivery?

We have warehouses in California and Pennsylvania. Most orders are shipped by truck to arrive within one week. We can air freight overnight for stocked items as per your instruction.

3. PRODUCTION

1. Can we use flexible grout tubing?

Flexible tubing is not recommended because the grouting crew may have to clear a plugged port in the field. It is much easier to clear a straight tube with a rod or drill bit. If you must use a flexible tube, make sure the interior is smooth and the tubing as stiff as possible to minimize the risk of collapse. Check all tubing in the plant before shipping precast to the field. Field crews should check tubing on the truck before erecting.

2. How do you attach PVC tubing to the sleeve?

The preferred method is to use thick PVC cement. You can also use electrical tape wrapped around the end to wedge and seal the tube in the sleeve's port for short lengths (less than 6").

3. How much do you tighten the sleeve setter (STR-CT)?

The setter should be just tight enough that the sleeve cannot be rotated by hand. Over-tightening is not a problem however, the Setter Rubber (SR) wears out faster. It is recommended that you release the cams overnight during curing to prolong rubber life.

4. How do I know the factory rebar is properly embedded?

The NMB has Bar-Stops in the middle of the sleeve to set the embedment length. It is also recommended to mark the bar using a jig tube such that the mark appears just outside the Rubber Plug (RP) as a visual pre-pour check.

5. We are using #11U-X sleeves to connect #9 rebar. Any precautions?

Check the Rubber Plug (RP) to make sure it is sealing around the bar as it enters the sleeve. Add duct tape or wrap the RP with a tie wire to make sure the seal is tight. Make sure the bar is fully embedded in the sleeve (see answer above).

6. Do I have to saw cut rebar going into NMB Splice-Sleeve?

Rebar going into the NMB Splice-Sleeve can be cut by saw, shear, or torch.

7. What do we do if we lose some accessories?

Those accessories can be re-ordered separately. For emergency measure; if you lose the Rubber Plug (RP), cut tubular foam pipe insulation into donuts and duct tape them to the end of the sleeve and bar. See the procedure in the User's Manual for the #18U sleeve. Duct tape can also be used to cap the grout tubes. You can substitute ASTM Schedule 40 PVC tubing for our standard metric tubing, but you will have to bevel grind the ends to fit the port. The Grout Washer is used in the field and can be re-ordered and shipped overnight.

4. FIELD

1. The rebar anchor dowel coming out of the foundation is too short. What can I do?

Weld a short length of rebar or a small nut on the short bar to bring it into tolerance.

2. The rebar anchor dowels are out of tolerance in plan. What can I do?

If the bar is within a bar diameter of correct position, drill a hole similar to the diameter of the bar on the side you need to move it. Bend the bar over such that it is in proper location at the base and insert a steel wedge to hold the position. Then, bend the bar back to vertical pivoting at the wedge. Epoxy or grout the hole around the wedge.

If the bar is more than a bar diameter away, cut it off and drill and epoxy anchor a new bar in the correct location. Choose an epoxy anchoring system that develops the ultimate strength of the rebar.

3. Can I use any grout besides SS Mortar®?

No.

4. How fast does SS Mortar cure?

It depends on temperature. In warm weather (70°F+ daytime), it should cure overnight to achieve more than 4,000-psi compressive strength, which should be sufficient to allow removal of bracing. Freezing weather requires the use of radiant heaters to first get the sleeves over 50°F and then to maintain heat overnight.

5. Do I need a high pressure power pump?

No, a hand-operated grout pump is quite sufficient. We recommend the Kenrich Model GP-2HD/SS. It works well for SS Mortar and can be used all around the job site for other grouting applications. SSNA also

provides a Handy Pump for small jobs. It is a simple, robust, plunger style pump that has been designed for small or hard to reach jobs to allow the user to inject SS Mortar grout into Splice Sleeves up to 9U-X.

5. QUALITY CONTROL TESTING

1. What kind of inspection is needed on site?

Our ICC ESR-3433 report states that “special inspection” is required. This means that a quality assurance technician should check the rebar anchor dowel lengths to make sure they meet the minimum embedments specified in the User's Manual. The technician should monitor the grouting operation to verify that all sleeves have been filled and the grout mixed properly. Finally, they should take 2” cube specimens of the grout to test before the removal of bracing and at 28-days.

2. Can the testing lab use plastic cube molds?

No, they must use heavy brass molds with cover plates as per ASTM requirements.

3. Can the lab use the same testing apparatus as they use for concrete cylinders?

No, the test machine must be fitted with the proper supports for 2” cubes. The test values are very high (reaching 14,000-psi) and ASTM procedures must be strictly followed.

4. How do we know if the sleeve is filled?

The proper grouting procedure is to pump into the lower inlet port and catch the grout in a cup. The sleeve should be over-pumped by a few strokes to show that all the air has been pushed out and only a smooth flow of grout is coming from the upper outlet port. Then, stop pumping, wait for the flow to subside and immediately put a stopper in the upper port. This insures that the grout cannot backflow. Remove the nozzle and put a stopper in the lower inlet port.

If you are doing Pre-Grout sleeves, you can look down inside and see that the sleeve is filled with grout. If the grout is somewhat stiff, use a wire to stir it to remove any entrapped air at the very bottom. Shooting the grout down in the sleeve with the grout pump nozzle is a good alternative to pouring it by hand. It's faster, too.

5. How do we know the strength of the splice?

The performance of the NMB is related to the embedment length of the bars and the compressive strength of the grout. Charts and data are available to show the effect of bar embedment and grout strength. As long as the bars meet minimum embedment lengths and the grout meets minimum compressive strengths, the splice will perform as specified.