

MANUFACTURER'S NAME—Splice Sleeve North America, Incorporated, owner.

SUBJECT—To approve models NMB Splice Sleeve and model OS Splice Clip for reinforced concrete steel bars.

APPEARANCES—

For Manufacturer: Alvin C. Ericson.

ACTION OF BOARD—Appliance Material approved in accordance with the report and recommendation of Committee on Text.

THE VOTE TO GRANT—

Affirmative: Chairman Bennett, Commissioner Tamm, Commissioner Lawrie and Commissioner O'Keefe..... 4
Negative:..... 0

THE RESOLUTION—

WHEREAS, the report of a Committee on Test reads:

WHEREAS, Administrative Code ("Code") §27-131 provides that no material of any manufacturer or producer shall be acceptable for the use intended unless and until the material shall have been tested for compliance with Code requirements under a test method prescribed by the Code, or shall have been tested and approved by the Board of Standards and Appeals ("Board"); and

WHEREAS, Code §27-131(a)(2) authorizes the Board to approve the use of a material regulated by the Code in the absence of a test method specified by the Code; and

WHEREAS, Subchapter 10 and Reference Standard RS 10-1 regulates the use of reinforcing bar splices, but prescribes no test method; and

WHEREAS, the report of a Committee on Test reads:

Splice Sleeve North America Inc. filed for approval for their Model NMB Splice Sleeve and Model OS Splice Clip for reinforced concrete steel bars.

PROPOSED USE: Reinforcing bar splices

DESCRIPTION: Both the NMB Splice Sleeve and Model OS Splice Clip are manufactured by Splice Sleeve Japan Ltd.

The NMB Splice Sleeve is half straight and half tapered steel cylinder with four to seven, internal annular ridges spaced between 0.591" and 1.181". The mid-section of the interior of the Sleeve may be provided with a rebar stop, which establishes the proper distance of embedment of the reinforcing bars. The material complies with ASTM A536 Grade 85-60-06 for all Sleeve sizes. Grade 64-41-10 may be used for Sleeve sizes #6 and below. The NMB Splice Sleeve may be used as a tension or compression splice for ASTM A615 Grade 60 reinforcing bars as specified in Section 12.15.3 or 12.16.5 of the Building Code Requirements for Reinforced Concrete (ACI-318-83, Revision 1986). The NMB Splice Sleeve meets the requirements of AASHTO Bridge Specification, Section 8.32.2.3. The Sleeve may be epoxy coated and can be used with epoxy coated reinforcing bars with little reduction in strength and without rupture of the epoxy coating. The Sleeve is used in precast and cast-in-place concrete construction. Specific sizes are available from #4 through #18 bars. Sleeves can accommodate bars up to 2 sizes smaller than the designated Sleeve size.

The connection is made by pumping high strength cementitious grout into the Sleeve. Only grout approved by the manufacturer such as Master Builders EMBECO 602 or SS Mortar, shall be allowed. The grout shall be proportioned so that it will achieve a minimum strength of not less than 9300 PSI in 28 days, as determined by testing specimens made according to standards ASTM methods (cubes and or cylinders). Sleeves may be put into service in less than 28 days, if grout tests indicate sufficient strength to carry loads.

The OS Splice Clip is a deformed metal Sleeve, conforming to ASTM A519, 1020, or 1025 from 1.38' to 3.15' long to accommodate reinforcing bars sizes #3 through #6. Bars, which lap each other inside the Sleeve and extend a minimum of 1 bar diameter beyond each outside edge, are mechanically connected by driving a steel wedge meeting AISI 1045 specification through the hole in the Sleeve. The wedge must be driven until the round head extends not higher than 3/32 of an inch above the body of the Sleeve. Plain reinforcing bars are completely spliced with one Clip. A plain bar and an epoxy coated bar can also be spliced with one Clip. However, two epoxy coated

reinforcing bars require two Clips spaced ten bar diameters apart, according to manufacturer's literature. The Clips are used in cast-in-place and precast construction to join reinforcing bars monolithically and structurally. They offer and advantage in repair of existing work, in that concrete is demolished to a minimal extent to expose a short length of rebar to which the new reinforcing steel is connected. The splice is allowed only for tension, meeting all the requirements of ACI 318 Code.

INSPECTION AND TEST: The NMB splices are produced by Victaulic Company of America, which has its own extensive laboratory tests and certifies every production lot per ASTM A536, Grade 85-60-06. In turn Victaulic's laboratory is regularly audited by UL and FM. The OS splice clip is tested by OKABE and Co., Tokyo, per ASTM A519 and AISI 1045. OKABE is regularly audited by the Japan Maritime Institute. The grout used with the NMB splices are field sampled and tested in accordance with the Building Code.

The NMB Splice Sleeves were strength tested by Yokohama National University (File No. SS4927 dated April 15, 1975). The OS Splice Clips were tested by Meiji University (File OSSC005 dated January 13, 1982). The results were summarized by C.E. Warnes, P.E., Civil Engineer State of California Lic. No. 16173 as follows:

SUMMARY OF TESTS
OS SPlice CLIP

Grade 60 Bar Size	Required Minimum (1.25 x 60 ksi)	Actual Test Capacity	Double Clip (Epoxy Bar)
#3	6,600lbs	-	Not made
#4	14,400	15,400lbs.	19,600lbs.
#5	23,250	29,200	30,700
#6	33,000	43,000	42,300

NMB SPlice SLEEVE

Grade 60 Bar Size	Required Minimum (1.25 x 60 ksi)	Actual Test Capacity (ksi x As)
#4	(Not used in U.S.A.)	
#5	23,250lbs.	32,135lbs.
#6	33,000	44,048
#7	45,000	63,480
#8	59,250	86,610
#9	75,000	92,430
#10	95,250	117,560
#11	117,000	157,498
#14	168,750	229,090
#18	300,000	361,558

RECOMMENDATION: The Committee on Test recommends approval of NMB Splice Sleeve for tension and compression and OS Splice Clip for tension only to be used for steel bar connections in reinforced concrete construction and repair as described above on condition that all uses locations and installations comply with the N.Y.C. Building Code.

The descriptive information about this item, including brochures, catalogues, bulletins, etc., as well as all product labels, packaging, and where possible, the item itself shall be labeled with the wording: "Approved by the New York City Board of Standards and Appeals under Calendar Number 529-89-SM".

A sworn affidavit by a responsible officer of the manufacturer familiar with the materials, processes and controls of the product manufactured, shall be filed annual with this Board, certifying that materials, processes, controls and labeling of materials, literature, catalogues, bulletins, and packaging are being maintained as were in effect at the time of this approval under this Calendar Number. Failure to notify the Board of change of ownership, change of corporate name, change of address or to submit the annual affidavit will be cause for revocation of approval.

(Sgd.)
FOR THE COMMITTEE ON TEST:
MARK JACHNIEWICZ, P.E.
RAYMOND W. LAWRIE, P.E.
Commissioner
KATHLEEN A. CARNEY
Executive Director

Resolved, that the Board of Standards and Appeals does hereby approve this material in accordance with the above report.

Adopted by the Board of Standards and Appeals, June 5, 1990.

A true copy of resolution adopted by the Board of Standards and Appeals, June 5, 1990.

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To Applicant |
Fire Com'r. |
Borough Supt. |

Chairman.