SECTION 03 24 00

FIBER-REINFORCEMENT FOR CONCRETE

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\*\* NOTE TO SPECIFIER \*\* MAPEI; fiber-reinforcement for concrete, concrete additives.
This section is based on the products of MAPEI, which is located at:
1144 E. Newport Ctr. Dr.
Deerfield Beach, FL 33442
Toll Free Tel: 800-992-6273 -Floor Installation
Email: [request info (jwhitfield@mapei.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=MAPEI&coid=33991&rep=&fax=&message=RE:%20Spec%20Question%20(03240mag):%20%20&mf=)
Web: <https://www.mapei.com/us/en-us/home-page> | <https://www.mapei.com/ca/en-ca/home>
 [ [Click Here](https://www.arcat.com/arcatcos/cos33/arc33991.html) ] for additional information.
MAPEI markets concrete admixtures and auxiliary products for the concrete industry in the central United States. The company's products are routinely used to produce high-performance concrete mixes that are called upon to perform in all weather conditions. MAPEI continually incorporates the latest product technology available in its efforts to meet customer needs and is focused on continuing the development of next-generation chemical admixture products.
Throughout all MAPEI's manufacturing processes for adhesives, sealants and other chemical products for the building industry, we have maintained a strong commitment to the environment and to sustainability. We work continuously to have all of our locations ISO 9001-certified for Quality Management and ISO 14001-certified for Environmental Management. We regularly review our product formulations against emerging technology and reformulate when appropriate to produce ever more environmentally friendly products.
MAPEI is ready to meet its customers' needs with the best products, customer service and technical support in our market today and in the future.

1. GENERAL
	1. SECTION INCLUDES
		1. Fiber reinforcement for concrete.
	2. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 03 30 00 - Cast-in-Place Concrete.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASTM C 1116 - Standard Specification for Fiber-Reinforced Concrete.
		2. ASTM C 1609 - Standard Test Method for Flexural Performance of Fiber-Reinforced Concrete (Using Beam with Third-Point Loading).
		3. ACI 544.1R - State-of-the-Art Report on Fiber Reinforced Concrete (Reported by ACI Committee 544).
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. Product Data: Manufacturer's data sheets on each product to be used, including:
			1. Preparation instructions and recommendations.
			2. Storage and handling requirements and recommendations.
			3. Installation methods.
	2. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
	3. PRE-INSTALLATION MEETINGS
		1. Convene minimum two weeks prior to starting work of this section.
	4. DELIVERY, STORAGE, AND HANDLING
		1. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
		2. Handling: Handle materials to avoid damage.
	5. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
	6. SEQUENCING
		1. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: MAPEI, which is located at: 1144 E. Newport Ctr. Dr.; Deerfield Beach, FL 33442; Toll Free Tel: 800-992-6273 -Floor Installation; Email: [request info (jwhitfield@mapei.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=MAPEI&coid=33991&rep=&fax=&message=RE:%20Spec%20Question%20(03240mag):%20%20&mf=); Web: <https://www.mapei.com/us/en-us/home-page> | <https://www.mapei.com/ca/en-ca/home>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
	1. FIBER REINFORCEMENT PRODUCTS

\*\* NOTE TO SPECIFIER \*\* Advantage Macrosynthetic Fiber provides post-first-crack toughness and enhanced fatigue strength, impact resistance and surface abrasion resistance, which leads to a more durable concrete with a longer service life. Delete if not required.

* + 1. Synthetic Macro Fiber Reinforcement - Advantage Macrosynthetic Fiber:
			1. Product shall meet the requirements of ASTM C1116, Section 4.1.3 and Note 2 for Synthetic Fiber Reinforced Concrete.

\*\* NOTE TO SPECIFIER \*\* Delete length not required.

* + - * 1. Length: 1.5 inches (38 mm).
				2. Length: 2.0 inches (51 mm).

\*\* NOTE TO SPECIFIER \*\* Minimum recommended dosage rate of 3.0 pcy, with a typical working range of 3.0 pcy to 6 pcy and an upper limit of 16 pcy.

* + - * 1. Dosage Rate: \_\_\_\_\_\_\_\_ pcy.
			1. Physical properties:
				1. Material: Polypropylene-Polyethylene Blend.
				2. Specific Gravity: 0.91.
				3. Tensile Strength (Avg.): 70 ksi (0.48 KPa).
				4. Absorption: NIL
				5. Melting Point: 330 degree F (166 degree C).
				6. UV Resistance: Excellent.
				7. Alkali Resistance: Excellent.
			2. Flexural Strength and Toughness (Compressive Strength 4,000 psi) Results:
				1. Test Standard: ASTM C1609-05.
				2. Dosage: 4 lbs per cubic yard (2.4 Kg/cubic meter).
				3. Specimen Width: 6.00 inches (152 mm).
				4. Specimen Depth: 6.01 inches (152 mm).
				5. Peak: Load: 6,487 lbf (2942 Kgf).
				6. Peak: Strength: 541 psi (3730 kPa).
				7. Residual Load P (150): 1,910 lbf (866 Kgf).
				8. Residual Strength f(150): 159 psi (1096 kPa).

\*\* NOTE TO SPECIFIER \*\* Polymesh is manufactured to optimum graduations from 100% pure virgin polypropylene, which increases the homogenization of concrete to produce a more favorable consistency at equal slump. Although concrete with Polymesh fibers may appear stiffer than non-fibrous concrete, it still maintains the same level of workability without the addition of extra water. Delete if not required.

* + 1. Fibrillated Fiber Reinforcement System for Concrete - Polymesh F:
			1. Type: Fibrillated Fiber Reinforcement.
			2. Material: 100% pure virgin polypropylene.
			3. Product shall meet the material specifications described in ASTM C-1116, Type III, Section 4.1.3, "Synthetic Fiber Reinforced Concrete or Shotcrete".
			4. Product shall meet the properties for polypropylene established in ACI 544.1 R-82, Table 1.1.

\*\* NOTE TO SPECIFIER \*\* When used at an addition rate of 1 pound per cubic yard of concrete Polymesh™ will meet or exceed the specified value for Performance Level 1 of ASTM C-1116 I5 Toughness Index. Polymesh™ Micro-Fiber reinforcement may be used at 1 pound per cubic yard of concrete due to the increased number of micro-fibers per pound. Dosage Rates may vary according to application. (Minimum 1.0 lb/cubic yard). Custom packaging and lengths are available according to project requirements (1/4 inch (6 mm), 1/2 inch (13 mm), 3/4 inch (19 mm), 1 inch (25 mm)). Delete lengths not required.

* + - 1. Length: 1/4 inch (6 mm).
			2. Length: 1/2 inch (13 mm).
			3. Length: 3/4 inch (19 mm).
			4. Length: 1 inch (25 mm).
			5. Addition Rate: 1 lb/cubic yard (0.6 Kg/cubic meter) of concrete providing Performance Level 1 of ASTM C-1116 I5 Toughness Index.

\*\* NOTE TO SPECIFIER \*\* Polymesh is manufactured to optimum graduations from 100% pure virgin polypropylene, which increases the homogenization of concrete to produce a more favorable consistency at equal slump. Although concrete with Polymesh fibers may appear stiffer than non-fibrous concrete, it still maintains the same level of workability without the addition of extra water. Delete if not required.

* + 1. Monofilament Fiber Reinforcement System for Concrete - Polymesh M:
			1. Type: Monofilament Fiber Reinforcement.
			2. Material: 100% pure virgin polypropylene.
			3. Product shall meet the material specifications described in ASTM C-1116, Type III, Section 4.1.3, "Synthetic Fiber Reinforced Concrete or Shotcrete".
			4. Product shall meet the properties for polypropylene established in ACI 544.1 R-82, Table 1.1.

\*\* NOTE TO SPECIFIER \*\* When used at an addition rate of 1 pound per cubic yard of concrete Polymesh™ will meet or exceed the specified value for Performance Level 1 of ASTM C-1116 I5 Toughness Index. Polymesh™ Micro-Fiber reinforcement may be used at 1 pound per cubic yard of concrete due to the increased number of micro-fibers per pound. Dosage Rates may vary according to application. (Minimum 1.0 lb/cubic yard). Custom packaging and lengths are available according to project requirements (1/4 inch (6 mm), 1/2 inch (13 mm), 3/4 inch (19 mm), 1 inch (25 mm)). Delete lengths not required.

* + - 1. Length: 1/4 inch (6 mm).
			2. Length: 1/2 inch (13 mm).
			3. Length: 3/4 inch (19 mm).
			4. Length: 1 inch (25 mm).
			5. Addition Rate: 1 lb/cubic yard (0.6 Kg/cubic meter) of concrete providing Performance Level 1 of ASTM C-1116 I5 Toughness Index.
1. EXECUTION
	1. INSTALLATION
		1. Add fiber reinforcement to concrete mix in accordance with manufacturer's instructions and approved submittals.
		2. Test periodically as recommended by manufacturer to ensure proper addition rate.

END OF SECTION