

# A Guide to GRACE SDS™ STRUX® Slab-On-Grade Design Software

GRACE SDS™ STRUX® Slab-On-Grade Design Software enables the Engineer to design slab-on-grade using the latest in synthetic macro fiber technology. STRUX 90/40 Synthetic Macro Fibers are a unique form of high strength, high modulus synthetic macro reinforcement that is distributed uniformly throughout the concrete matrix. STRUX 90/40 fibers adds toughness, impact and fatigue resistance to concrete and can replace welded wire mesh, steel fibers, or rebar for crack control secondary reinforcement.

The use of synthetic macro fibers as a replacement for crack control in flooring applications is becoming more accepted due to various

advantages such as tight crack control, ease of use, safe handling, construction placing techniques, faster slab construction, and the elimination of corrosion potential.

Grace's SDS software is a user-friendly, flexible software tool for designing slab-on-grade and can be used to design a variety of light to heavily loaded commercial, industrial, and educational facilities.

The software program was developed to aid in determining which design is the most cost-effective for long-term performance under given conditions. Engineers enter slab parameters, such as slab thickness, concrete strength, sub-surface soil conditions, and load factors.

SDS provides the most advantageous dosage rates of STRUX 90/40 fibers dependent on the input parameters.

The software is primarily based on the Yield Line Theory (1960, 1962, 1983), Technical Report 34 from the British Concrete Society (2003), Eurocode 2, and ACI-318 and 360.

Consultation and availability of the GRACE SDS is accessible through the local Grace Representative.

This information is provided as a guide. Final design decisions of the concrete slab are the responsibility of the engineer of record.


Examples of projects where SDS software was used to designate the most efficient and cost effective dosage of STRUX 90/40 fibers to meet design specifications, based on a Modulus of Subgrade Reaction of 100 lbs/in.<sup>3</sup> (28 Mpa/m<sup>2</sup>):

Vehicle Parking Garage	
Loading	10,000 lbs
Load conditions	4 wheels on two axles, 35 psi tire pressure
Fork lift load	None
Rack load	None
Proposed design thickness	5 in.
SDS Software design recommendations	3.5 lbs/yd <sup>3</sup> dosage @ 4,000 psi concrete

School Office	
Office loading	500 lbs/ft <sup>2</sup>
Load conditions	Uniform – file cabinets, desks, foot traffic
Fork lift load	None
Rack load	None
Proposed design thickness	4 in.
SDS Software design recommendations	3.5 lbs/yd <sup>3</sup> dosage @ 3,000 psi concrete

Industrial Floor	
Joint conditions	Doweled joints; 15 ft x 15 ft
Load conditions	Forklift (pneumatic – 125 psi), foot traffic
Fork lift load	10,000 capacity fork lift, single axle load = 22,200 lbs
Rack load	None
Proposed design thickness	6 in.
SDS Software design recommendations	4.7 lbs/yd <sup>3</sup> dosage @ 4,000 psi concrete

**North American Customer Service: 1-877-4AD-MIX1 (1-877-423-6491)**

 Visit our web site at: [www.graceconstruction.com](http://www.graceconstruction.com)

W. R. Grace & Co.-Conn. 62 Whittemore Avenue Cambridge, MA 02140

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This product is covered by U.S. Patent Nos. 6,569,525; 6,569,526; 6,758,897 and 6,863,969.  
STRUX-42 Printed in U.S.A. 1/06 FA/UNI/500

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