



SHOE TECHNOLOGY: BENEFITS AND PITFALLS

*A PRACTICAL GUIDE FOR TRACK
AND FIELD COACHES*

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INTRODUCTION

SHOE TECHNOLOGY HAS EVOLVED
DRAMATICALLY.

FROM BASIC SPIKES AND FLATS TO
"SUPERSHOES."

WHAT'S THE HYPE AND WHAT MATTERS FOR
COACHING?

THE EVOLUTION OF SHOE TECHNOLOGY

TRADITIONAL SHOES: FOCUSED ON
PROTECTION & STABILITY.

SUPERSHOE REVOLUTION: HIGH-STACK,
CARBON-PLATED, ULTRA-FOAM.

KEY MATERIAL: PEBAX FOAM—LIGHTWEIGHT,
SPRINGY, SUPER RESPONSIVE.

N HEADER



Weight: ~96g



Weight: ~220g

Track Events (including hurdle events) up to but <u>not</u> including 800m	20mm	For relays the rule applies to the distance of the leg being run by each athlete.
Track Events from 800m and above (including steeplechase events)	25mm	For relays the rule applies to the distance of the leg being run by each athlete. For Race Walking Events the maximum thickness of the sole is the same as that for Road Events.
Cross Country	25mm	
Road Events (Running and Race Walking Events)	40mm	

5.13 Until further notice, unless specifically agreed by World Athletics in writing, any shoe used in competition:

5.13.1 (**except** where Rule 5.13.2 applies) must not contain more than one rigid plate or blade made from carbon fibre or another material with similar properties or producing similar effects, whether that plate runs the full length of the shoe or only part of the length of the shoe; and

5.13.2 may contain one additional rigid plate or other mechanism only where used solely to attach spikes to the outer underside of the shoe; and

HOW DO SUPERSHOES WORK?

PEBAX FOAM: TRAMPOLINE EFFECT—HIGH ENERGY RETURN.

CARBON PLATE: ACTS AS A LEVER FOR PROPULSION.

ROCKER SHAPE: ROLLS RUNNER SMOOTHLY THROUGH EACH STEP.

PEBAX polyether block amide foam

high-performance thermoplastic elastomer
incredibly light and bouncy.

Lightweight: PEBAX is lighter than EVA or TPU foams

use more for cushioning without making the shoe heavy.

Energy Return: can compress and rebound very efficiently, that “springy” feeling.

makes supershoes so effective at improving running economy

PEBAX foam lives cushioned fast.

THE BENEFITS

PERFORMANCE:

2.6-4.2% BETTER RUNNING ECONOMY
([FRONTIERS](#))

LESS MUSCLE FATIGUE IN LONG RACES.

PSYCHOLOGICAL:

PLACEBO EFFECT—RUNNERS FEEL FASTER,
MORE CONFIDENT.

RECORDS:

MOST DISTANCE RECORDS NOW SET IN
SUPERSHOES.

THE PITFALLS

INJURY RISK:
HIGHER RISK FOR KNEE/HIP INJURIES
([SPORTRXIV](#))

NOT FOR EVERYONE:
BEST FOR FASTER, MID/FOREFOOT
STRIKERS.

COST & DURABILITY:
EXPENSIVE, WITH PERFORMANCE FADING
OVER TIME

NOT ALWAYS AFFORDABLE OR AVAILABLE
TO ALL.

INJURIES

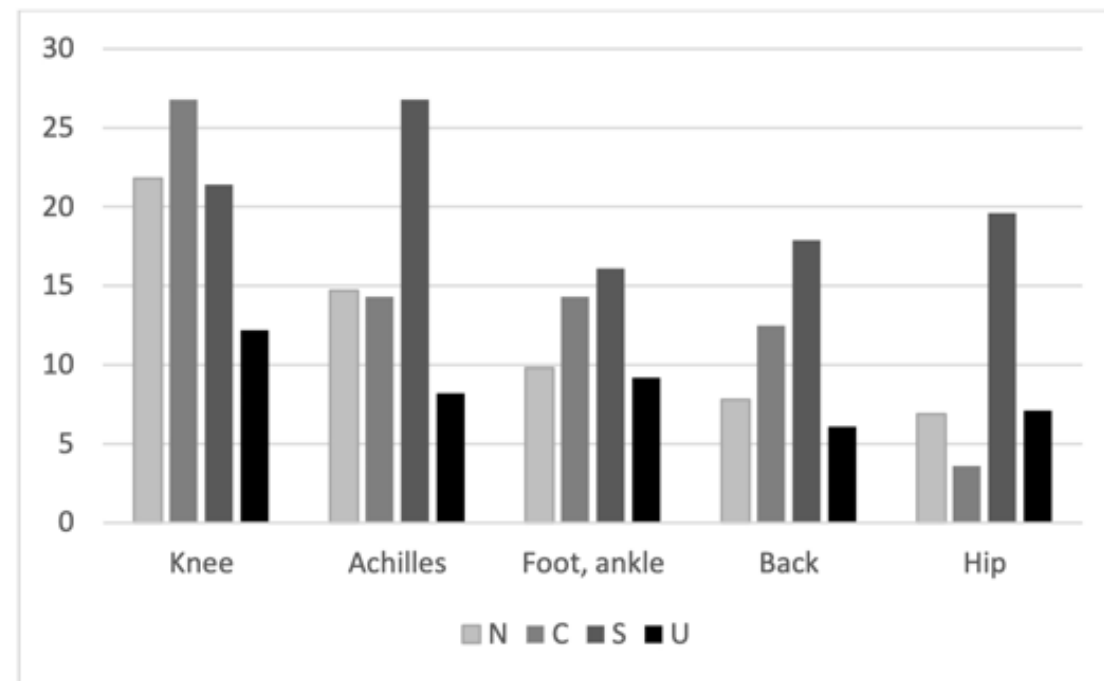


Figure 2: Injury frequency (%) within the 25-weeks survey of most prominent locations in the four footwear cohorts (N: neutral shoes, C: motion control shoes, S: super-shoes, U: U-TECH™-shoes).

PRACTICAL IMPLICATIONS FOR COACHES

KNOW YOUR ATHLETE: MECHANICS,
EXPERIENCE, EVENT.

INTRODUCE GRADUALLY: TRAIN BEFORE
RACING

EDUCATE: SHOES WON'T FIX POOR TRAINING
OR FORM.

STAY INFORMED: RESEARCH IS STILL
EMERGING.

KEY TAKEAWAYS

SUPERSHOES HAVE CHANGED THE SPORT—
BUT NOT A MAGIC FIX.

MONITOR FOR INJURIES, ESPECIALLY KNEES
& HIPS.

USE TECH THOUGHTFULLY FOR EACH
ATHLETE.

**METABOLIC EFFECTS OF CARBON-PLATED
SHOES (PDF)**

WWW.FRONTIERSIN.ORG/JOURNALS/SPORTS
-AND-ACTIVE-
LIVING/ARTICLES/10.3389/FSPOR.2025.171
0224/PDF

BIOMECHANICAL RISK STUDY (PDF)

HTTPS://SPORTRXIV.ORG/INDEX.PHP/SERVE
R/PREPRINT/DOWNLOAD/570/1230

RUNNING ECONOMY REVIEW

HTTPS://LINK.SPRINGER.COM/CONTENT/PDF
/10.1186/S13102-026-01721-W.PDF

WOMEN'S INJURY RISK STUDY

HTTPS://COMMONS.NMU.EDU/CGI/VIEWCON
TENT.CGI?ARTICLE=2827&CONTEXT=ISBS

FUNDAMENTALS!

TRAINING

CONSISTENCY
VOLUME
INTENSITY

TECHNIQUE

HANDS AND ARMS
POSTURAL CONTROL



SHOE TECH, PERFORMANCE, AND INJURY PREVENTION

SPECIFIC SHOE OR TECHNOLOGY?

INJURY RISKS OR BEST PRACTICES FOR
INTRODUCING NEW TECH TO ATHLETES?

ANY REAL-WORLD COACHING SCENARIOS?

THANK YOU!