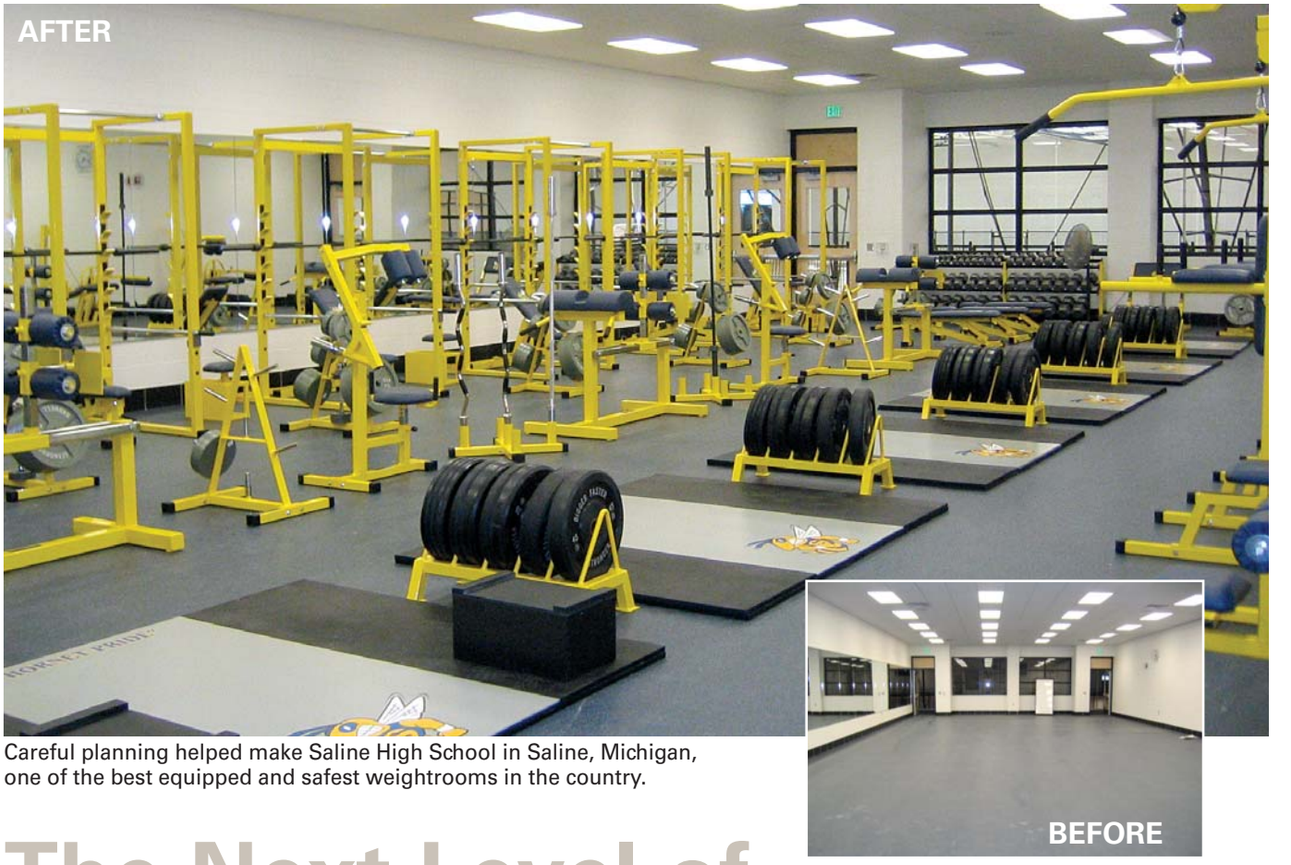


Careful planning helped make Saline High School in Saline, Michigan, one of the best equipped and safest weightrooms in the country.

The Next Level of Weightroom *Safety*

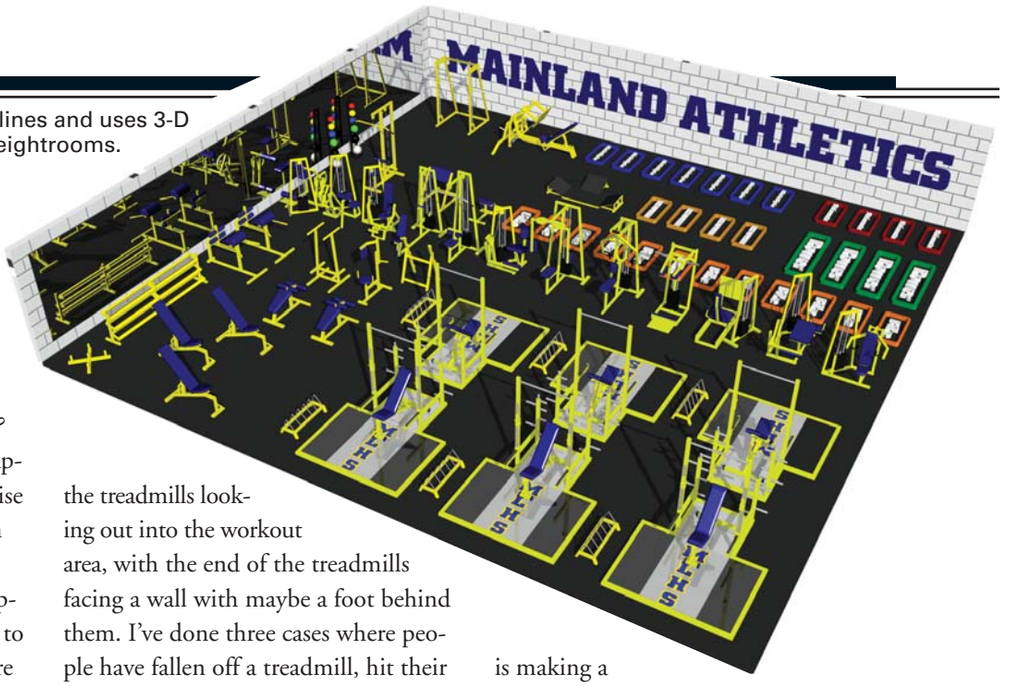
Practical advice on reducing injuries, and the risk of lawsuits, in your weightroom

"Every day, in every way, I'm getting better." Although this inspirational mantra might be much overused by self-help gurus, the idea is actually a useful philosophy when addressing the issue of safety in the weightroom. Just ask Dr. Marc Rabinoff.

For the past three decades, Dr. Rabinoff has been on a mission to promote safety in the weightroom. A full professor at Metro State College in Denver, Colorado, Dr. Rabinoff teaches weight training classes with an emphasis on safety. For the past 30 years he has conducted lectures and seminars, written articles, served on committees and sat through hundreds of interviews to get his message across that making your weightroom safe requires common sense and a lot of work.

One aspect of Dr. Rabinoff's work involves serving as an expert witness in lawsuits. Having served on over 200 legal cases, he understands the causes and devastating effects of injuries. Each severe injury or death is a tragedy – especially when you consider that virtually every case Dr. Rabinoff has seen could have been prevented by following a few simple measures.

In this exclusive interview, Dr. Rabinoff shares his insights into weightroom design and offers practical advice on



BFS follows safety guidelines and uses 3-D models to design safe weightrooms.

how to make your weightroom safer.

BFS: *With the popularity of weight training in this country, is it a problem in high schools with there being too much equipment in weightrooms?*
Rabinoff: Absolutely! What often happens is that companies that sell exercise equipment will do a free weightroom analysis. Using a computer program, they will show how to put their equipment into your facility and lay it out to maximize available space. But if you're going to have weight equipment, you have to make certain there is adequate space, and that may mean checking with the manufacturers, rather than the marketers, to determine what the actual spacing needs are.


Dr. Marc Rabinoff

BFS: *Are there standards in weightroom design that should be referenced when designing weightrooms?*
Rabinoff: There are some standards, some by BFS in articles published in your magazine, but the basic minimum standard is at least two feet to three feet of space around a piece of equipment. But that's just for most exercise equipment; it's different with a treadmill. I believe you have to have at least six feet behind the end of a treadmill, and at least three feet on each side.

BFS: *Why is more space needed for treadmills?*
Rabinoff: What I've seen in cases that I've testified in is the gym owner lines up the treadmills looking out into the workout area, with the end of the treadmills facing a wall with maybe a foot behind them. I've done three cases where people have fallen off a treadmill, hit their head on a wall and died of trauma. Also, if you don't have enough space between the treadmills, there is the risk that when someone gets on the treadmill and another gets off, they could hit each other.

BFS: *Many equipment distributors do not have warehouses and simply ship their equipment from their manufacturers. What is the distributor's responsibility in regard to providing equipment that is safe?*
Rabinoff: My feeling is if you're putting your name on something, then you should be responsible for what it is. If you're distributing equipment made in Taiwan and they used the wrong kind of bolt so if you get up to a certain poundage the bolt breaks and causes injury, then the distributor is partly responsible. It's just not a matter of who is making a piece of equipment but also who is selling and marketing it. If you're misrepresenting the equipment you sell, that's fraud, and I've seen a lot of cases where distributors were sued because they misrepresented what their products can and cannot do.

BFS: *Some weight training machines have a counterbalance system with levers that extend behind them. Are there any special precautions that need to be taken for these machines?*
Rabinoff: There certainly should be warning labels on the machine from the manufacturers, such as "Steer clear of moving parts" or "Stand back while in use," but that's not enough. The coach, gym owner and other people in the gym all need to understand how these machines work. At our gym every instructor explains every piece of equip-

"I've done three cases where people have fallen off a treadmill, hit their head on the wall and died of trauma."

— DR. MARC RABINOFF

ment to each student who uses that facility, and we supervise them 100 percent of the time. That's one way we minimize the chance of injury.

BFS: *Are warning signs important?*
Rabinoff: Definitely! At our gym at school we have warning signs posted all over the place, not just on the equipment. We also have general weightroom rules posted on our walls.


Weight training equipment must be properly maintained to prevent accidents.

BFS: *If someone does not want to go through an orientation on how to use your equipment, can they simply sign a waiver to release them of liability?*
Rabinoff: No. If an individual can't understand how to use your equipment safely, effectively and efficiently, then you can't have them use it. What it comes down to is if you're going to present yourself as a professional and invite people into your venue, then you have to teach them how to use the equipment.

BFS: *Are waivers for weight training classes important at the high school level?*
Rabinoff: I think you certainly have to have waivers in high school. Parents have to understand what their children are doing and what the risks are so they can determine if they want to allow their children to do those activities.

BFS: *Do waivers hold up in count?*
Rabinoff: A waiver is a process for edu-

BFS Weightroom Safety Guidelines

BY ROGER FREEBORN AND JEFF SELLERS, BFS CLINICIANS

To ensure a high level of performance and maximum safety in your weightroom, follow these commonsense guidelines.

- **Do not use homemade equipment.** The money saved in using homemade equipment not designed by reputable manufacturers is not worth the risk of injury.
- **Bolt equipment to the floor when possible.** Bolt to the floor all equipment that must be secured to the floor by design.
- **Position weight trees near appropriate racks,** benches and platforms. Reduce traffic flow and risk of injury from walking with plates by keeping weight trees close to the racks and benches they support.
- **Provide adequate space between equipment.** To ensure that spotters can move freely and do their job, allow at least 24 inches between racks and benches.
- **Ensure all equipment is in good repair.** Replace, repair or remove all worn/damaged equipment immediately – pay special attention to cables. Post signs on equipment being repaired so that it will not be used.
- **Provide lifting belts.** Keep enough belts on hand for athletes who need them, and supply a variety of belt designs appropriate to the various lifts.
- **Place weights on the bars properly.** The lettering should be on the inside so you can be certain the correct weight is on the bar. Also, placing the weights this way allows for a more secure grip on the plate.
- **Use collars whenever possible.** If there is weight on the bar, use collars on the bar. Keep an adequate supply, plus four extra in case of breakage, so that no athlete is forced to lift without them.
- **Return equipment to appropriate areas.** A place for everything and everything in its place! There should be nothing on the floor, such as weight plates or belts, that could cause someone to trip.
- **Maintain proper heating and air conditioning.** Supply appropriate heating, cooling, ventilation and air conditioning.
- **Have water available.** Provide water coolers or drinking faucets.
- **Have a safety orientation.** Have all students complete a safety curriculum at the beginning of each cycle: Watch videos, read posters, demonstrate safety-spotting techniques. Provide written materials about your safety practices to parents and administrators.
- **Have a first-aid plan.** Keep a first-aid kit and appropriate emergency procedures on hand, as well as forms to document injuries.
- **Use posters.** Prominently display posters listing gym rules and safety guidelines.
- **Establish and enforce a dress code.** Do not allow athletes to lift while wearing inappropriate clothing and footwear. Prohibit any jewelry that has the potential to cause injury.
- **Clean vinyl upholstery daily.** Use soapy water or a disinfectant to maintain maximum sanitation.
- **Vacuum and mop at least once a week.** Vacuum to improve sanitation and appearance.
- **Keep a maintenance log.** Monitor your maintenance to ensure compliance.

cating everyone about the risks of an activity. As long as everyone appreciates it and understands it, then a waiver could be an affirmative defense on the part of the entity.

BFS: *Should all heavy equipment be bolted to the floor?*
Rabinoff: I would consult the manufacturer's guidelines, as there is some equipment that must be bolted down to be used safely.

BFS: *Are there some exercises that probably should never be taught in a high school setting? For example, standing or performing bench presses on a Swiss ball?*
Rabinoff: Absolutely – there are exercises that are just plain stupid. First of all, using a Swiss ball under a piece of weight equipment, as opposed to a weight bench, is stupid because there are absolutely no standards for such an exercise.


Proper spotting is key to gym safety.

BFS: *Do you see many injuries caused by poor spotting?*
Rabinoff: I've heard about injuries caused by no spotting – that happens all the time – but I don't see a lot of injuries caused when an individual lifting was being spotted.

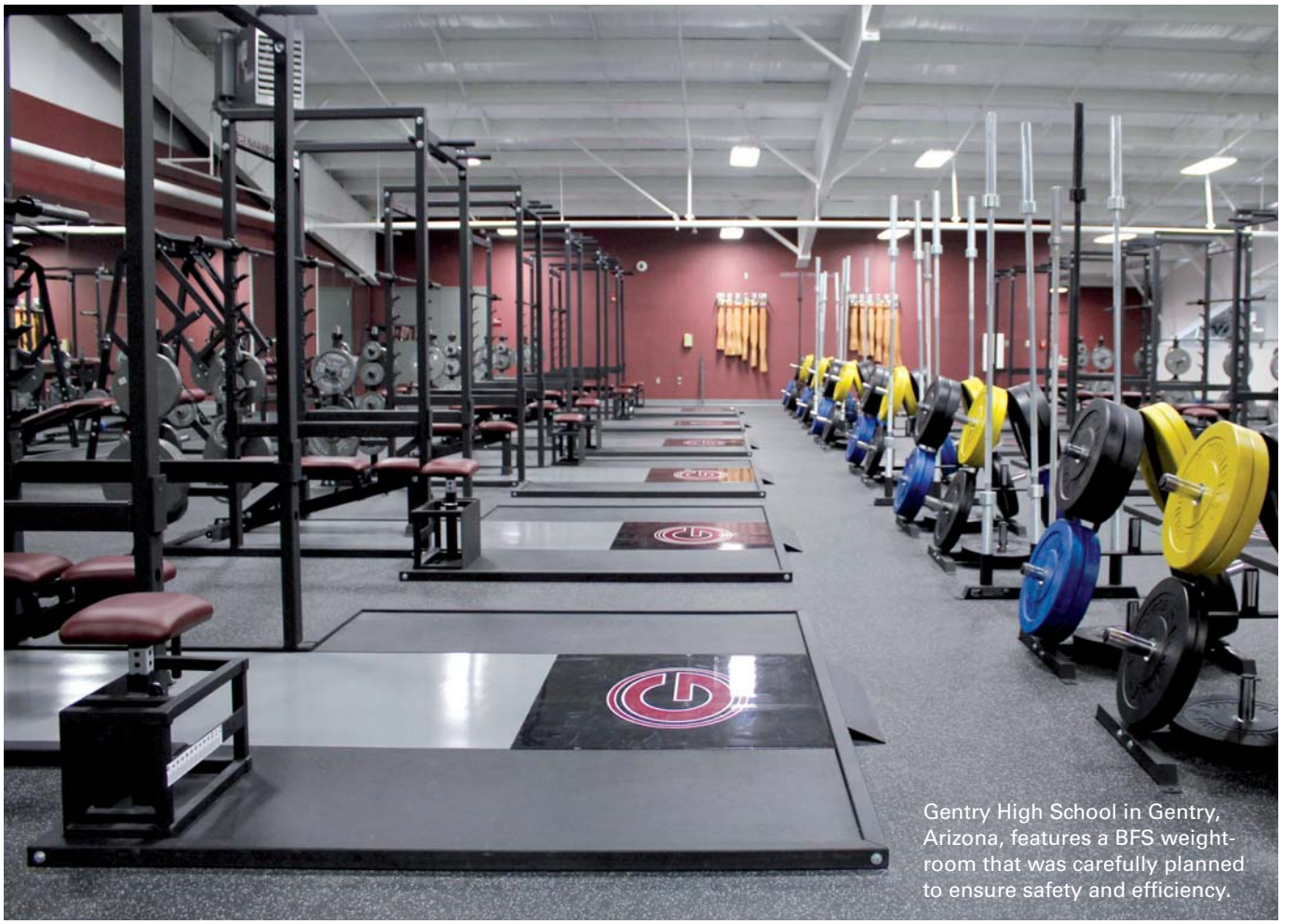
BFS: *What is your opinion about using bands on lifts such as squats and bench presses, especially in the high school environment?*
Rabinoff: Over the past 40 years I've seen a lot of new exercise gadgets, but I'm always hesitant about using them because they are usually marketed as the best way for everyone to do it. Not every exercise, or every method of exercising, is good for everyone. But to answer your question, when you get something like a band that's going to react to torque and stress and pressure, then you have to understand how that band works mechanically along with the muscle group that you're working. It's a whole new variable. That being said, I certainly wouldn't recommend bands at the high school level unless the coach was very knowledgeable about using this type of equipment. Also, I don't recommend them because I haven't seen any research that says that bands will make athletes stronger than conventional training, and I read the literature all the time.

BFS: *Many athletes will not use the spotter rods in a power rack or a Smith machine. Do you see this as a problem?*
Rabinoff: A coach should not allow their athletes to do that because those are optimal safety operation procedures. Let's talk about Smith machines because I just did two cases where the users became quadriplegics. Some people think the process of disengaging the bar and then rotating your hand forward or back to reengage the hook over the pin is the safety mechanism. That's not the safety mechanism! It's the operating mechanism of the apparatus, because you can't do a Smith machine exercise without disengaging and then reengaging the hooks. The safety mechanism is the adjustable stop at the bottom. If you have a Smith machine that doesn't have an adjustable stop, you've got a defective Smith machine because there's no safety mechanism on it.

BFS: *So, providing the equipment is complete and functioning properly, who or what is responsible for any injuries that happen?*
Rabinoff: You can't blame an inanimate object for an injury. If the person who gets hurt never knew how to use a piece of equipment, you can blame whoever was responsible for letting them on that piece of equipment in the first place. Or you can blame the person performing the exercise because they knew how to do it and didn't do it. And if the equipment was poorly designed, you can blame the manufacturer. But to ban Smith machines simply because of one injury is ridiculous.

BFS: *At the high school level, have supervision and weightroom design generally improved?*
Rabinoff: Unfortunately, I think they're getting worse. There are more students in weight training classes and fewer PE teachers, so you have bigger classes and more stress on the teachers. Many schools don't have a lot of money to update equipment, so there is a lot of older equipment that may not have been maintained appropriately. And I'm dumbfounded because so many coaches simply don't do anything about safety until a kid gets hurt and files a lawsuit. Then they say, "Well, we didn't know." Well, yeah, you did.

BFS: *What general advice would you give our readers about weightroom safety?*
Rabinoff: What we can do is minimize risk greatly by doing our jobs as coaches, teachers, administrators and club owners by making sure that each day we open that gym door is a new day with a higher standard of care. BFS



Gentry High School in Gentry, Arizona, features a BFS weightroom that was carefully planned to ensure safety and efficiency.

The Weightroom *Checklist*

Practical advice to keep your gym safe and organized

I just love it when a plan comes together!" is a famous line by John 'Hannibal' Smith, a lead character in the 1980s action television series *The A-Team*. Although Smith was fictional, his outlook is useful in real life. Start by ensuring your strength and conditioning program runs smoothly by using a maintenance checklist.

Of course, the first step before writing such a checklist is to properly design your facility. Dr. Marc Rabinoff, a sports/liability expert who has been a consultant in over 600 litigations, says that approximately half the cases he has worked on were a result of poor facility design. "One of the major problems is having too much equipment for the space available. Often this is a result of school administrators or gym owners listening to the advice of equipment manufacturers who ignore safety considerations so they can sell as much equipment as possible to increase their bottom line."

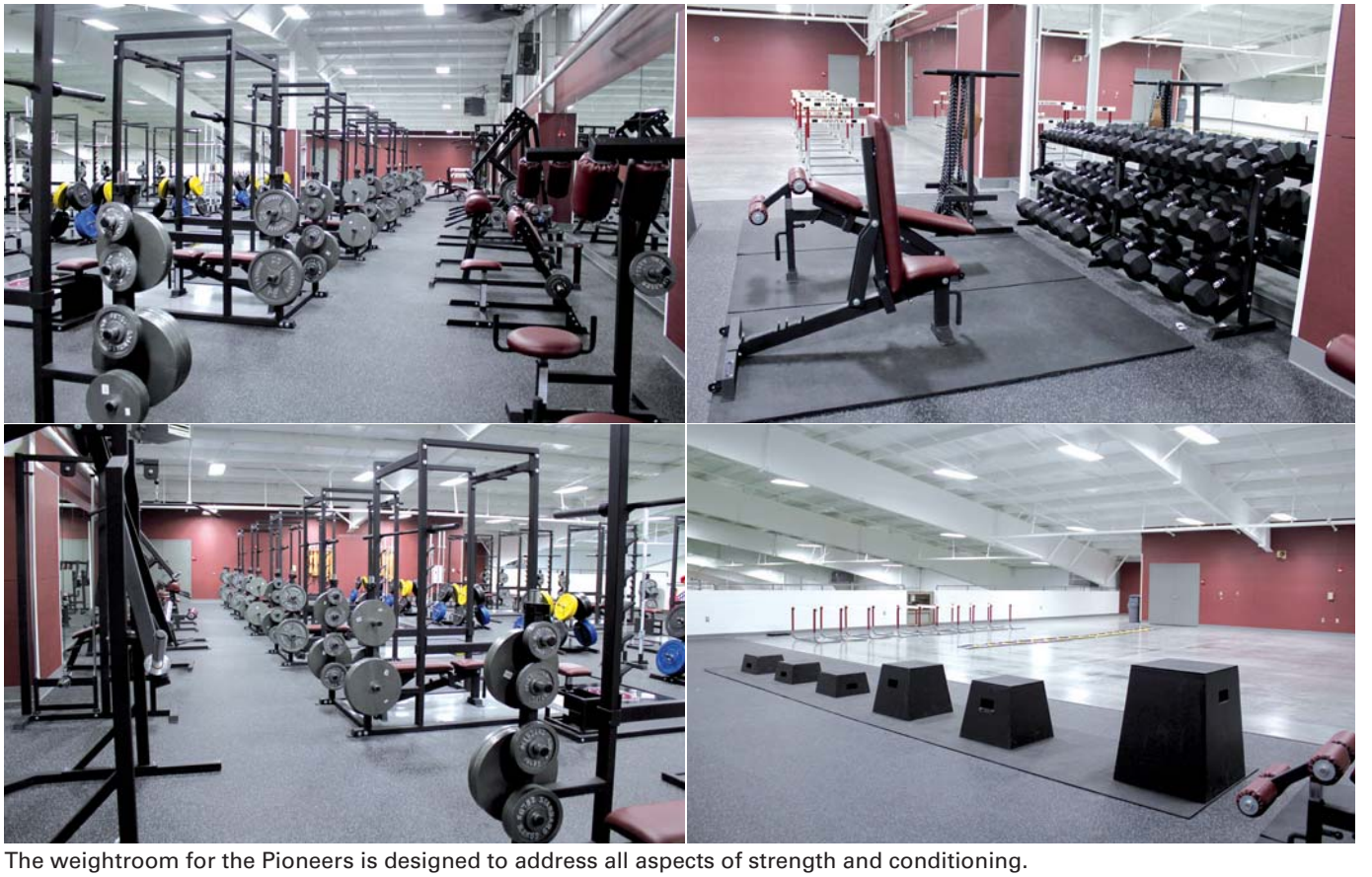
A particularly useful service BFS offers is weightroom planning through the use of 3D illustrations. These illustrations are drawn to scale to show you exactly how your weightroom can look at various angles, thereby ensuring proper use of available space and the best design for safe traffic flow. For example, whereas three feet of space between equipment might be adequate, treadmills might require twice that

One of the services BFS offers is weightroom planning through the use of 3D illustrations.

space. Having a 3D illustration is also a great way to help generate funding for a new facility so that potential sponsors can see what they can expect from their investment.

For detailed design standards and recommendations for equipment and facilities, the standard reference is the *Annual Book of ASTM Standards.* Founded in 1898, ASTM International is a nonprofit organization that provides standards for materials, products, systems and services. In many of the cases Rabinoff has participated in, the recommendations in ASTM's annual publication provide much of the primary authoritative reference material.

To ensure that your plan comes together, Dr. Rabinoff has tailored the following checklist specifically for strength and conditioning facilities. It's invaluable to use in the initial stages of planning or upgrading your facility; then, after everything is in place, use the checklist on a regular basis to keep your weightroom safe and efficient. BFS



The weightroom for the Pioneers is designed to address all aspects of strength and conditioning.

Weightroom Design Checklist

YES NO

1. Weight Training Area

- ☐ ☐ Space allows for easy access to equipment
- ☐ ☐ Walls free of protruding objects

2. Signage (BFS Safety Package)

- ☐ ☐ Instructional signs visible and undamaged
- ☐ ☐ Signs posted emphasizing safety
- ☐ ☐ Signs posted stating spotting requirements, warnings and acknowledgment of assumption of risk
- ☐ ☐ Entry/exits visible, marked and unobstructed

3. Environment

- ☐ ☐ Air exchanges and ventilation adequate
- ☐ ☐ Lights functioning properly
- ☐ ☐ Ceiling space sufficient for overhead lifts

4. Flooring

- ☐ ☐ Nonslip
- ☐ ☐ Shock absorbing
- ☐ ☐ Easily cleaned, repaired and replaced
- ☐ ☐ Free of debris
- ☐ ☐ Platforms available for Olympic lifting exercises

5. Mirrors

- ☐ ☐ Positioned higher than largest weight plates
- ☐ ☐ Secured and unbroken
- ☐ ☐ Positioned away from activity
- ☐ ☐ Above and away from dumbbell racks
- ☐ ☐ Easily cleaned and replaced
- ☐ ☐ Cracked and distorted mirrors replaced quickly

6. Equipment maintenance and service

- ☐ ☐ Receipts and all paperwork available associated with purchase
- ☐ ☐ Manufacturers' contact information available (phone, E-mail, fax)

7. New member/student orientation (BFS Safety Package)

- ☐ ☐ Acknowledgment form signed (assumption of risk)

YES NO

8. Weight training equipment

- ☐ ☐ Collars and clips
- ☐ ☐ Weight storage, dumbbell racks adequately positioned, easily accessible

Benches:

- ☐ ☐ Braced firmly
- ☐ ☐ Surfaces cleaned/disinfected regularly

- ☐ ☐ Warning signs visible and undamaged on equipment
- ☐ ☐ Weight machines, weight racks and anchor points securely anchored to wall/floor, where required
- ☐ ☐ Weight machines, squat racks have properly functioning safety stops

Weight machines, weight racks and pulley mechanisms:

- ☐ ☐ Cables not broken or frayed
- ☐ ☐ Mechanisms lubricated
- ☐ ☐ No nude-metal stress
- ☐ ☐ Corrosion free
- ☐ ☐ Nonslip material on pedals
- ☐ ☐ Nonslip rubber grips on machines

9. Cardiovascular/Circuit Training Area

- ☐ ☐ Warning signs visible and undamaged
- ☐ ☐ Climate controlled
- ☐ ☐ Nonslip flooring and drip mats
- ☐ ☐ Restrictions enforced for using area (regarding age or disability, etc.)
- ☐ ☐ Housekeeping: potential sites of infection controlled/disinfected
- ☐ ☐ Machine and equipment maintenance done regularly and documented
- ☐ ☐ Area supervised

10. Supervision by qualified staff

- ☐ ☐ Certified with practical and theory courses (BFS certification)

A great way to make over a weightroom is with new bars, bumpers, platforms, vertical bar holders and horizontal bumper plate racks.

The BFS *Weightroom Makeover*

How to make big improvements in your weightroom on a small budget

One of the popular themes in reality television is the makeover. First there were the shows that focused on giving women and men new haircuts, makeup and stylish clothes. Then it expanded with teams of architects and contractors who would come into homes and businesses and transform them into models of style and efficiency. In the case of *BFS* magazine, we would feature articles about schools that replaced all their old equipment with new purchases. That was then – this is now.

In the current economic environment where budgets are tight, and except for the rare event where a new school is built, you seldom find schools that can afford completely new weight training equipment. What these schools can do, however, is best described as a *weightroom makeover*.

The first step in a weightroom makeover is to increase the safety of the facility. Start by downloading a copy of the free *BFS Safety and Liability Manual*, which includes a weightroom design checklist. Go through the checklist, and then look at the traffic patterns and positioning of your current equipment to ensure they comply with safety standards and manufacturer recommendations. Often, you'll find that simple changes not only make a weightroom safer and more efficient but also will enable more athletes to use the facility. And don't hesitate to call BFS and ask our staff of highly trained coaches about your facility or to arrange a safety inspection by a certified BFS clinician.

The next step is to look at equipment that needs to be replaced. Often trying to fix weight training equipment yourself is expensive, violates equipment warranties and compromises the safety of the equipment. The most common example is barbells, which due to high use often need to be replaced after several years. After that you should consider bumper plates, platforms, vertical weight holders, bumper plate holders, medicine ball racks and flooring. Let's look at each of these in turn.

Barbells

There are basically three types of barbells: powerlifting bars, Olympic lifting bars and general-purpose bars. Powerlifting bars are designed for the basic power lifts: the squat, bench press and deadlift – these bars are generally stiffer. Olympic lifting bars should be more flexible and should rotate more easily; they also tend to be more expensive, with top-of-the-line bars costing as much as $1,000. In high schools, the best choice is usually a general-purpose bar, which is a hybrid of the powerlifting bar and the Olympic bar and is reasonably priced. The majority of our bar sales to high schools are for multipurpose bars.

Key qualities to look for in a barbell are yield strength, sleeve construction, knurling and finish.

Yield Strength. Yield strength refers to the number of pounds per square inch (PSI) it takes for steel to bend and stay bent. The higher the number, the better; and you should not consider a bar of less than 125,000 PSI.

Sleeve Construction. The revolution of the sleeve is commonly accomplished in two ways: needle bearings or bushings. What you need to know on this subject is that for the best rotation, needle bearings are the best; bushings are not as good as needle bearings, but they are less expensive and tend to last longer. A slightly more expensive bushing, the oil-impregnated bronze bushing, creates better rotation but not to the level of the needle bearing.

Knurling. Knurling refers to the jagged marks that help you grip the

bar. Powerlifters tend to like a thicker knurling than do Olympic lifters. Also, for the squat, having an area of center knurling helps secure the weight on the shoulders.

Finish. Regarding finish, there are several ways of finishing a bar surface, including zinc oxide/silver, zinc oxide/black, chrome, and nickel. The best possible finish is made of polished stainless steel, which provides the best protection against rust; the cost of upgrading to this type of material is a good investment.

Regardless of the type of bar you decide to purchase, you need to take care of it, and one way is to use bumper plates for the Olympic lifts, lifting platforms and vertical bar racks.

Bumper Plates

In the early part of the century, a platform was a must because weight plates were primarily solid steel. If a lifter dropped a loaded barbell on a cement floor, that floor would be damaged along with the barbell. In the sport of Olympic lifting, spotters were used to prevent such accidents; but as the weights lifted became heavier, trying to catch heavy snatches and clean and jerks became too risky for the spotters. Then along came rubber bumper plates.

The first bumper plates were primarily smaller-diameter weight plates with a rubber strip attached to the rims. They were certainly an improvement, but as with retreaded tires for your car, those early bumper plates were not as durable as the solid bumper plates that came along later. Now, with steel prices being what they are, solid rubber bumper plates have become much more economical. Although steel plates that are rubber lined are generally less expensive, they place more stress on the bar.

Platforms

Do not make the mistake of

thinking that a platform is not necessary, as dropping heavy weights can easily damage a bare floor. In fact, BFS heard recently of one school that decided that rubber bumper plates would be enough protection – the result was extensive damage to the floor that was extremely expensive to repair.

The early platforms were primarily wood, and in weightlifting competitions this is a preferred surface. The major problem with wood is that it can warp, which creates an unstable surface for the athlete to lift on. Wood can also chip easily (especially around the corners if a frame is not used), and as such often needs to be replaced, as the divots create a safety issue. Because wood is often not very attractive and is difficult to keep clean, some manufacturers will use coatings that give the wood a shine and make it more durable, but the drawback is that these coatings often become very slick when chalk or water gets on them.

Many platform manufacturers use a polyurethane surface, which is sticky (like a basketball court) and does not allow the feet to slide easily for lifts such as power cleans and jerks. The two best coatings are rubber and an upgrade to a special vinyl surface we call Protect-All®, which is placed on top of two layers of heavy rubber for shock absorption. Protect-All is an attractive gray surface that is easy to clean and is extremely durable (it has 3-4 times the life span of wood or polyurethane – it is rare that a Protect-All surface ever has to be replaced). Also, the surface allows for the placement of durable logos; and having a school logo provides personality that creates team unity and school pride.

Vertical Bar Holders

If a gym has a large variety of barbells, including Hex bars, it's not a good idea from a safety standpoint to let them rest on the floor or the corner of the wall. Vertical racks, as opposed to horizontal racks, have a much smaller footprint. The BFS vertical rack holds five bars and is available in custom colors.

Hunter High School basketball player Alise Larson shows how upgrading to color bumpers and a custom platform with a personalized logo can make a big difference in the appearance of a weightroom. Just visible at far right is a vertical medicine ball rack to efficiently store medicine balls.

Bumper Plate Racks

Because bumper plates tend to be thicker than steel plates and are used primarily for deadlifts and Olympic lifting exercises, they should be stored with horizontal or vertical bumper plate holders. For ease of use, horizontal plate racks have become the most popular.

Medicine Ball Racks

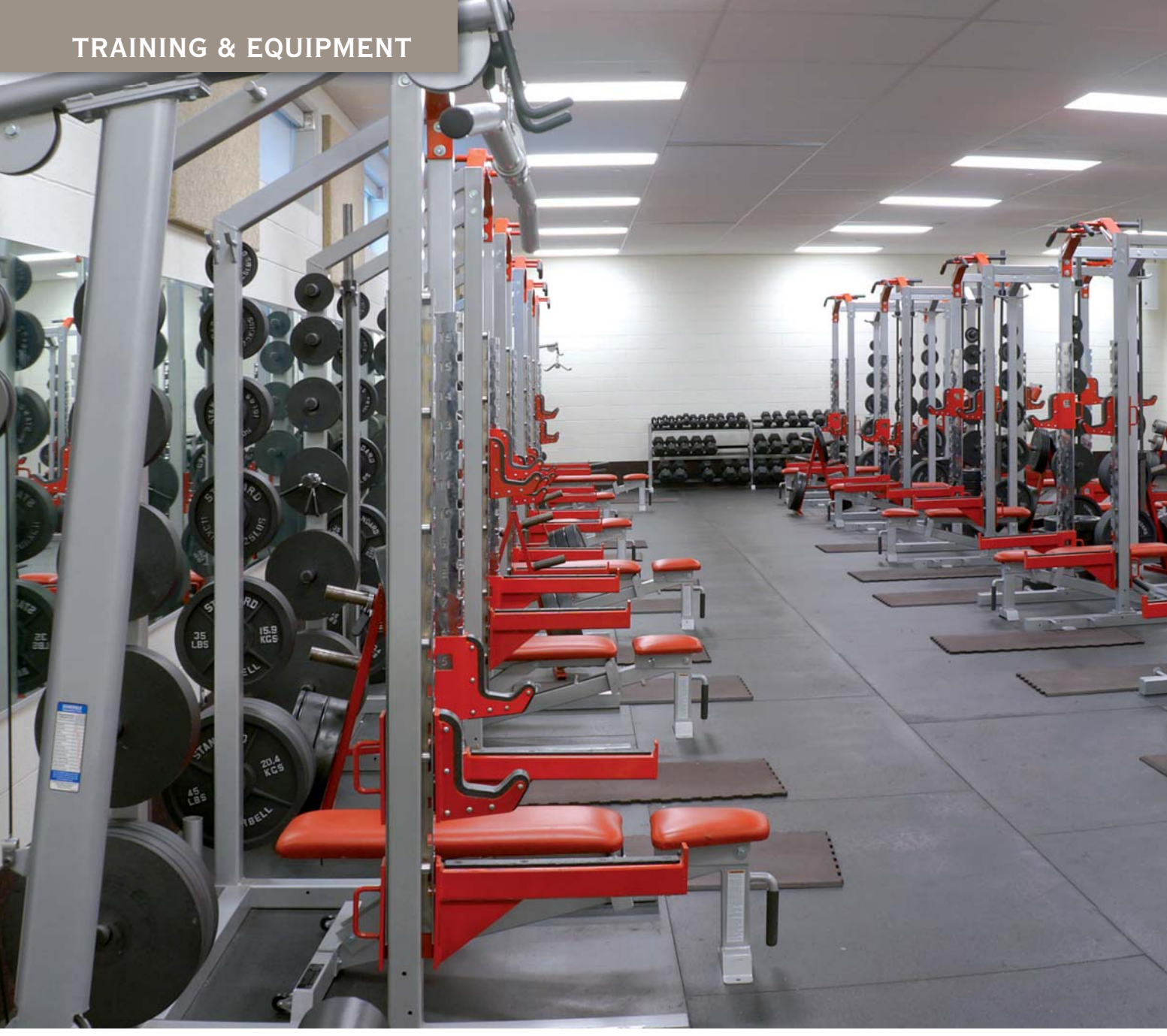
Medicine balls can be a safety hazard if they are not stored properly, and the way to store them with the smallest footprint is with a medicine ball tree. BFS offers several types, with our newest version holding up to six balls.

Flooring

Having a quality floor does wonders for improving the appearance of a weightroom. Carpeting is definitely out, as it will quickly be torn up with high use, and the best surface is rubber.

There are many types of rubber flooring, such as interlocking mats, loose mats and rolled flooring. The major issue with the first two types is that they require more effort to clean, as dirt can seep in between the cracks. Rolled flooring costs a bit more but has a neater appearance and cleans quickly.

Hopefully the economy will continue to rebound and school budgets will rebound along with them. Until then, a weightroom makeover with new bars, bumpers, lifting platforms, vertical racks, and rolled flooring is the next-best option. BFS



Build a Better *Weightroom*

How to design weightrooms that look good and do good

"You only pay for quality once!" is an essential motto for anyone who is designing a weightroom. After all, if you purchase poor-quality equipment, it will require more maintenance and will need to be replaced sooner. A bonus of having nice equipment is it creates a sense of pride that inspires athletes to take their training seriously and train with greater intensity. Above all, there is the issue of safety.

"I would estimate that 50 percent of all the litigations I have been involved with were the result of poor

The new weightroom at Granger High School in West Valley City, Utah, is equipped with high-quality BFS D1 racks and benches.

facility design," says sports liability expert Dr. Marc Rabinoff. "One of the major problems is having too much equipment for the space available. Often this is the result of school administrators or gym owners listening to the advice of equipment manufacturers that ignore safety considerations so they can sell as much equipment as possible to increase their bottom line."

One of the services BFS offers is weightroom planning through the use of 3D illustrations such as the one provided in this article. These illustrations are drawn to scale to show you exactly how your weightroom can look, thereby ensuring proper use of available space and the best design for safe traffic flow. Having a 3D illustration is also a great way to help generate funding for a new facility.

For detailed design standards and recommendations for equipment and facilities, the bible in this area is the *Annual Book of ASTM Standards*. Founded in 1898, ASTM International is a nonprofit organization that consists of committees working to provide standards for materials, products, systems and services.

The Do-It-All Solution

One practical solution to the challenge of working with a large number of athletes safely is to use do-it-all stations, so you have everything you need to perform all your core exercises in one area. This approach is more efficient because athletes don't have to roam around the weightroom to use different pieces of equipment, and you save space. Let's expand on this point.

If you have a weightroom with 10 do-it-all stations, you can have three athletes per unit, one to lift and two to spot and help with loading the weights. This means 30 athletes can train the core lifts at the same time. It follows that in a weightroom with 15 racks, 45 athletes can train; and with 20 racks, 60 athletes can train. Such efficiency is why do-it-all stations have been, year after year, our best-selling racks by far.

To see a great example of a school that uses do-it-all-stations and other high-quality BFS equipment, check out the photos in this issue of the weightroom at Granger High School in West Valley City, Utah. This summer the Lancers equipped their weightroom with six D1 Half Racks and six D1 Double Sided Half Racks, along with many other high-quality pieces of BFS equipment. It's the type of weightroom that boosts pride and encourages athletes to stay focused and train hard. It's what a weightroom should look like. BFS

With the addition of key auxiliary equipment such as glute-ham developers and adjustable benches, coaches can train any type of athlete.

To help you decide what type of do-it-all station is best for you, BFS offers a computer-aided weight-room design service that produces 3D illustrations of your future weightroom.

The D1 Double Sided Half Rack with Platform enables six athletes to train at once in all the core lifts, including squats, bench presses, power cleans and deadlifts.

Want the heaviest-duty squat cage sold anywhere? The BFS Heavy-Duty Super Cage is 8 ½ feet tall and has massive, 3 x 3 11-gauge steel construction.

CONSUMER'S GUIDE

to Power Racks

Practical advice on selecting equipment that is perfect for your weightroom

At what point did weightrooms start to look like the stage of a Cirque du Soleil performance? Colorful Swiss balls, suspension ropes, bungee cord contraptions – what the heck is so wrong about getting strong with basic free weight equipment?

Not that Swiss balls and such have no place in strength and conditioning, or for that matter circuit training machines. But for athletes, often this type of equipment detracts from the types of heavy-duty equipment that will help get you strong – equipment such as the power rack.

A Brief History of the Power Rack

A power rack, also known as a squat cage, was first patented in 1989 by Karl I. Mullen of Portland, Oregon. The basic power rack consists of four vertical posts linked together to increase its strength (thus the term "cage") and

has bar catches that can be adjusted vertically. It's the bar catches that are the unique aspect of power racks.

With exercises such as squats, more weight can be squatted than can be lifted from the floor. Portable squat racks will elevate the bar, but they do not have safety catches; so, if a lifter misses the weight, the bar will drop on the floor unless the lifter has spotters. Olympic lifters will often perform squats on portable squat racks and use bumper plates, so when they miss a weight, they simply drop the weight behind them on the platform. However, this technique takes considerable skill, and from a safety and liability standpoint it is not recommended, especially in the high school environment.

We must stress that even when lifters are using a power rack, BFS always recommends spotters when performing squats and bench presses. Dropping a weight on the safety catches may save the lifter from serious injury, but it tends to ruin barbells. Also, spotters can help coach their teammates to perfect technique and encourage them to try their best.

Other basic exercises that can be

The BFS Ultimate Multi-Use Rack is a versatile power rack that offers 46 inches of work space – you can even perform power cleans inside the unit!

Champion weightlifter Maegan Snodgrass is shown preparing to squat on the BFS Squat Cage, an extremely affordable, heavy-duty unit for the high school environment. Are you on an extremely tight budget? Do you already have plate holders? Then the stock version of the BFS Squat Cage (see inset) is the power rack for you. The unit has 36 inches of workspace and 11-gauge steel for reliability.

performed in power racks are bench presses, which are usually not low enough when done with portable squat racks. The bench press is unquestionably the most dangerous exercise that is performed in the weightroom because the barbell can drop across the throat; but the bar catches of the power rack enable lifters to perform this exercise with maximum safety.

One unique feature of the power racks is that the safety catches allow the performance of heavy partial movements. Powerlifters use partial movements to work on a specific range of motion in a lift, such as the finish of a deadlift, or to overload the strongest positions of a lift. Partial movements are often used in the later stages of rehab; for example, an athlete who is overcoming a pectoral injury may be able to perform the end range of the bench press. As the injury heals, the range of motion can be increased. Carl Miller, a former coach of the World Championship Team who now runs a successful gym in Santa Fe, New Mexico, often has his clients use partial ranges of motion to rehab their injuries.

The vertical catches also allow the performance of isometrics, a training method that works specific ranges of motion and is used on a limited scale by advanced athletes. Although isometrics are not as popular as they were in the '60s, many strength coaches who work with elite athletes find that isometrics can help them achieve greater strength gains. To perform isometrics in the bench press, for example, the safety catches will be placed at a specific height, with the barbell supports set below them. The lifter removes the barbell from the supports and then presses the bar upward against the bar catches. A typical protocol is to hold the contraction for six seconds for several sets.

Power Rack Shopping

BFS has featured USA-made power racks for over 30 years, and our experience has led us to settle on two basic types of racks: the 8-Foot Power Rack and the Ultimate Multi-Use Rack. However, there are several variations, such as having attached plate holders and having the rack attached to a lifting platform. There are also custom features, such as paint selection, and a chin- up bar and a dip attachment for the Ultimate Multi-Use Rack Often. All BFS power racks come standard with a chin-up bar that is linked to the top of two vertical supports. Let's take a closer look at each of these products.

One feature you see in all our racks is that there is plenty of workspace inside the rack. We offer three racks

that have 40 inches of work space, and our Ultimate Multi-Use Rack has 46 inches. Many power racks have much less workspace, which increases the risk of hitting the vertical supports when lifting. Often those who purchase these types of racks find that their athletes will only squat outside the racks, thereby negating the safety feature of the safety catches.

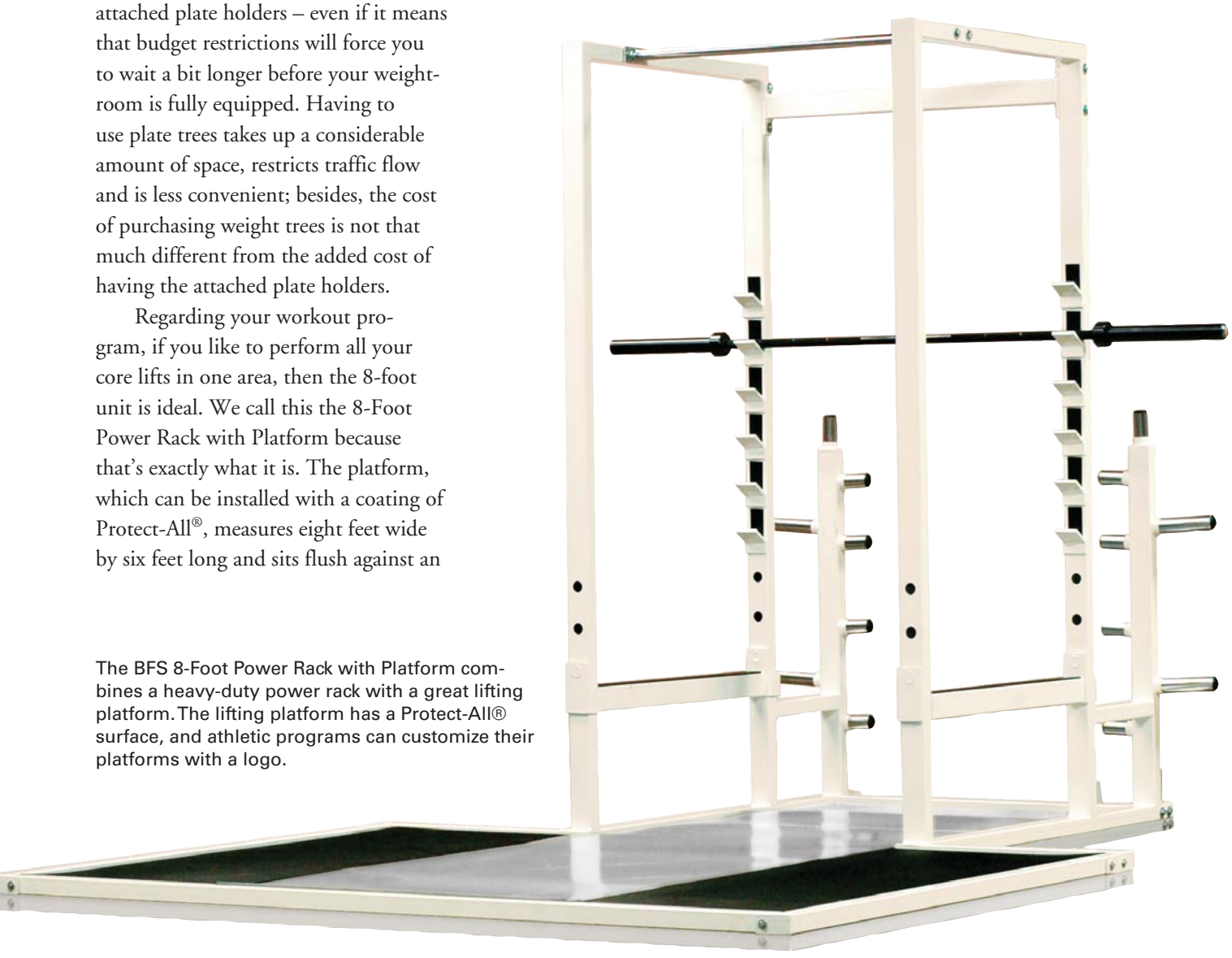
Two keys to selecting the ideal power rack(s) for your facility are to look at the amount of space you have available and how your workout programs are designed. For example, if your space is limited, then it would be best to purchase power racks with attached plate holders – even if it means that budget restrictions will force you to wait a bit longer before your weightroom is fully equipped. Having to use plate trees takes up a considerable amount of space, restricts traffic flow and is less convenient; besides, the cost of purchasing weight trees is not that much different from the added cost of having the attached plate holders.

Regarding your workout program, if you like to perform all your core lifts in one area, then the 8-foot unit is ideal. We call this the 8-Foot Power Rack with Platform because that's exactly what it is. The platform, which can be installed with a coating of Protect-All®, measures eight feet wide by six feet long and sits flush against an 8-Foot Power Rack. The crossbar in the front of the power rack can be used for chin-ups and pull-ups.

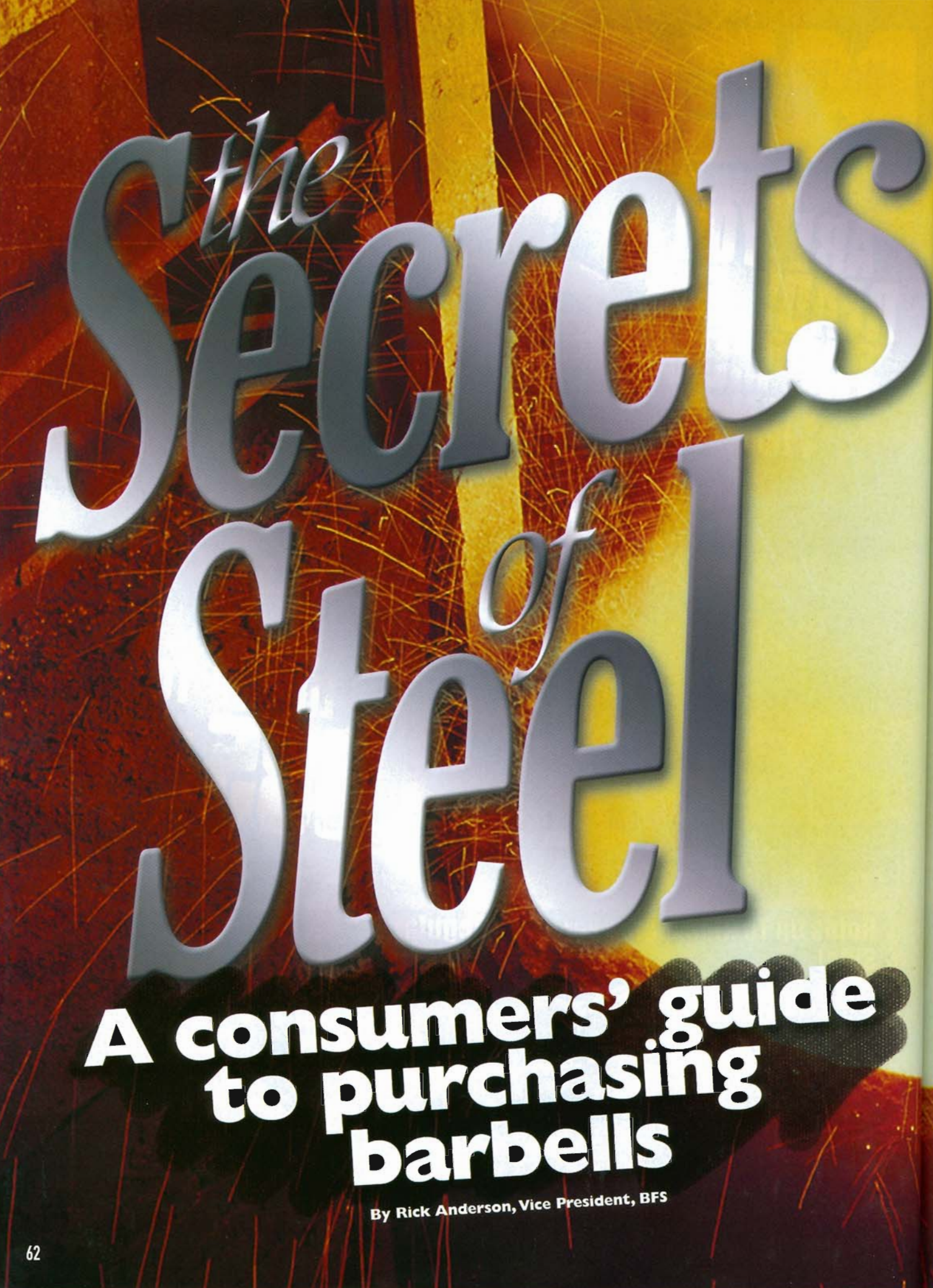
However, if space is an issue but you still like the idea of "do-it-all stations," you should consider the Elite Half Rack with Platform. Although these stations are not made for heavy partials and isometrics, they will enable you to perform the vast majority of lifts used in most strength training programs. Utah State University made the switch to our Elite Half Rack with Platform, and it enabled them to add another station to their weightroom in the same amount of space.

Finally, rather than having removable pins, it's better to have bar catches attached to the vertical supports, rather than steel rods, as this reduces the amount of time between sets. In the high school environment these rods often end up on the floor, whereas this is less likely to happen when the bar catches are attached to the vertical supports.

These pages show our selection of power racks to help you determine the best equipment for your needs and budget. Swiss balls may have some value outside the circus, but in the weightroom let's focus on using the right tools to get your athletes strong! BFS



The BFS 8-Foot Power Rack with Platform combines a heavy-duty power rack with a great lifting platform. The lifting platform has a Protect-All® surface, and athletic programs can customize their platforms with a logo.

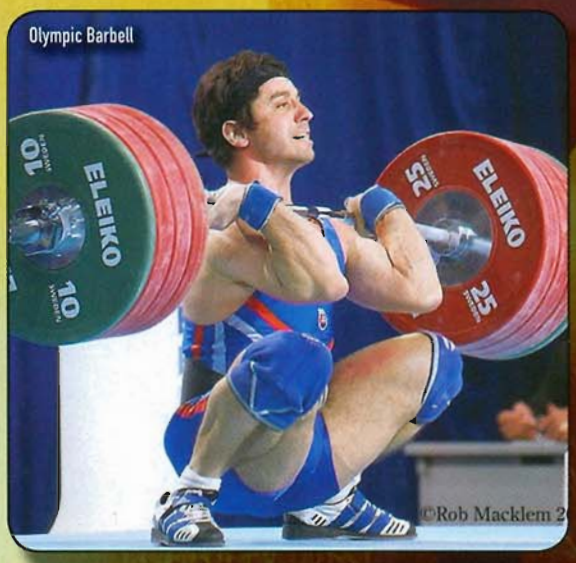


the Secrets of Steel

A consumers' guide to purchasing barbells

By Rick Anderson, Vice President, BFS


General Purpose Barbell



Olympic Barbell


Lightweight Training Barbell

Powerlifting Barbell

When it comes to exercise equipment I'm always looking for a bargain, especially when that means I can pass those savings on to our customers. So if we can save 5 percent by buying 1,000 bumper plates instead of 100, we'll buy 1,000. However, there are times when you shouldn't try to cut corners, especially when it comes to buying barbells.

Because BFS has been a leader in free-weight equipment for the past three decades, we are often contacted by manufacturers who want us to carry their products. This past year I've examined and tested at least two dozen new Olympic and powerlifting barbells, and there are only two I'm considering. The others simply did not meet our standards or were unreasonably priced.

For any barbell we might consider offering in our BFS catalog, I look closely at any scientific testing that has been performed on it and then go a step further: at BFS we take our testing outside the laboratory. First, we try it ourselves to see how it performs; then we load it with plates and drop it from various heights onto power rack spotter rods to evaluate its durability. Ultimately we send out several bars to our clinicians and have their athletes try them. Only after passing these "bar exams" do we consider adding the product to our catalog.

Because we take the time for extensive testing and listening to feedback from our customers, we've learned what it takes to make a great barbell. And this is essential, because the barbell is the key piece of equipment in the gym.

Although BFS sells a variety of barbells, including specialty lightweight training bars for young athletes – there are basically only three types of full-sized barbells: Power bars, Olympic bars and general-purpose bars. Here's an introduction to each type, followed by a list of features you'll want to look for when selecting a barbell:

Power Bar

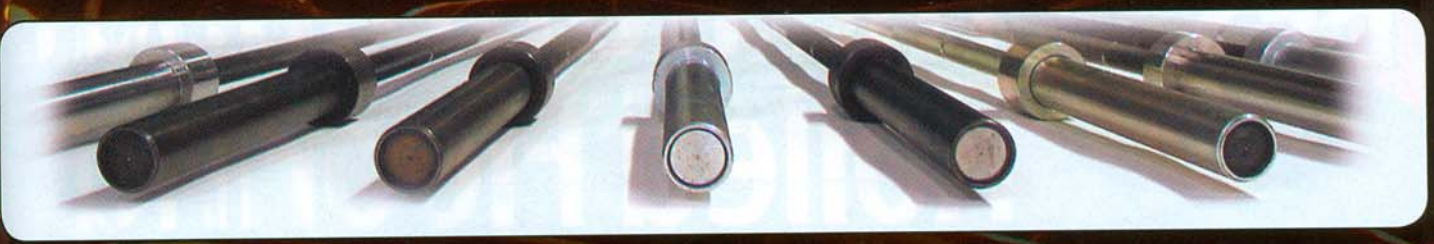
A power bar is a barbell designed for the basic power lifts: the squat, bench press and deadlift. Because power lifts are performed with a considerable amount of weight and are performed relatively slowly, this bar needs to be very strong but not very flexible. In fact, a more expensive springy-type bar is not desirable when performing these lifts, as the vibration makes it more difficult to control the lift. The sleeve needs to revolve smoothly, but it does not need to be silky smooth.

Olympic Barbell

So-called because it is used in the Olympic lifting movements of the snatch and clean and jerk, an Olympic bar is used for explosive exercises such as the power clean. These bars need to be very flexible to minimize the stress on the wrists and other joints, and because lifters can use the spring to lift more weight. It also needs to have smoothly revolving sleeves to facilitate the snapping of the wrists at the top of such exercises as power cleans and snatches.

General Purpose Bar

The general-purpose bar is a hybrid of the power bar and the Olympic barbell. For the competitive sport of powerlifting, bars can be expensive – the top Olympic bars cost as much as $780, and the top powerlifting bar is not far behind. A multipurpose bar is perfect for those who are on a tight budget and can't afford several bars, especially bars of the highest quality. The majority of our bar sales to high schools are for multipurpose bars.



What to Look for in a Barbell

Key qualities to look for in a good barbell are yield strength, sleeve construction, knurling and finish.

Yield Strength. This is a number that refers to the number of pounds per square inch (PSI) it takes for the steel to bend and stay bent. The higher the number, the better (and you should not consider a bar of less than 125,000 PSI, or 150,000 PSI for a heavy lifting environment), but this is reflected in a higher price. Yield strength is not to be confused with the expression "stress level." This is a bogus number, as there is no standardized way of determining an accurate number. For example, a manufacturer could place a barbell on a bench, add 1500 pounds to it, and if the barbell doesn't break after a few minutes, call it a 1500-pound-stress bar. What's worse, some manufacturers won't even go this far and they simply pull out a number from thin air and hope that their distributors don't ask for proof, which unfortunately many don't.

Sleeve construction. The sleeve should be anchored on the bar with strong snap rings, as this type of construction will never come loose and cause potential injury to the athlete. Avoid barbells that have sleeves that use exposed hex bolts, as these bolts almost always come loose after time and it is almost impossible to re-tighten them to factory standards.

The revolution of the sleeve is accomplished either of two ways: needle bearings or bushings. What you need to know on this subject is that for the best rotation, needle bearings are the best; bushings are not as good as needle bearings, but they are less expensive and tend to last longer. A slightly more expensive bushing, the oil-impregnated bronze bushing, creates better rotation but not to the level of the needle bearing.

Knurling. Knurling is the jagged marks that help you grip the bar. Powerlifters tend to like a thicker knurling than Olympic lifters. Also, for the squat, having an area of center knurling helps secure the weight on the shoulders.

Finish. There are several ways of finishing a bar surface, including zinc oxide/silver, zinc oxide/black, chrome, and nickel – all these finishes are designed to retard rust and corrosion. The best possible finish is made of polished stainless steel, which provides the best protection against rust; the cost of upgrading to this type of material is a good investment.

Regardless of the type of bar you decide to purchase, you need to take care of it. It's good practice to use bumper plates for Olympic lifts and use spotters to prevent the bar from slamming on safety supports that can bend bars. Shop for the bar that is right for you and lift smart – your program will flourish. And hey, maybe on the way you might find a bargain!

BFS

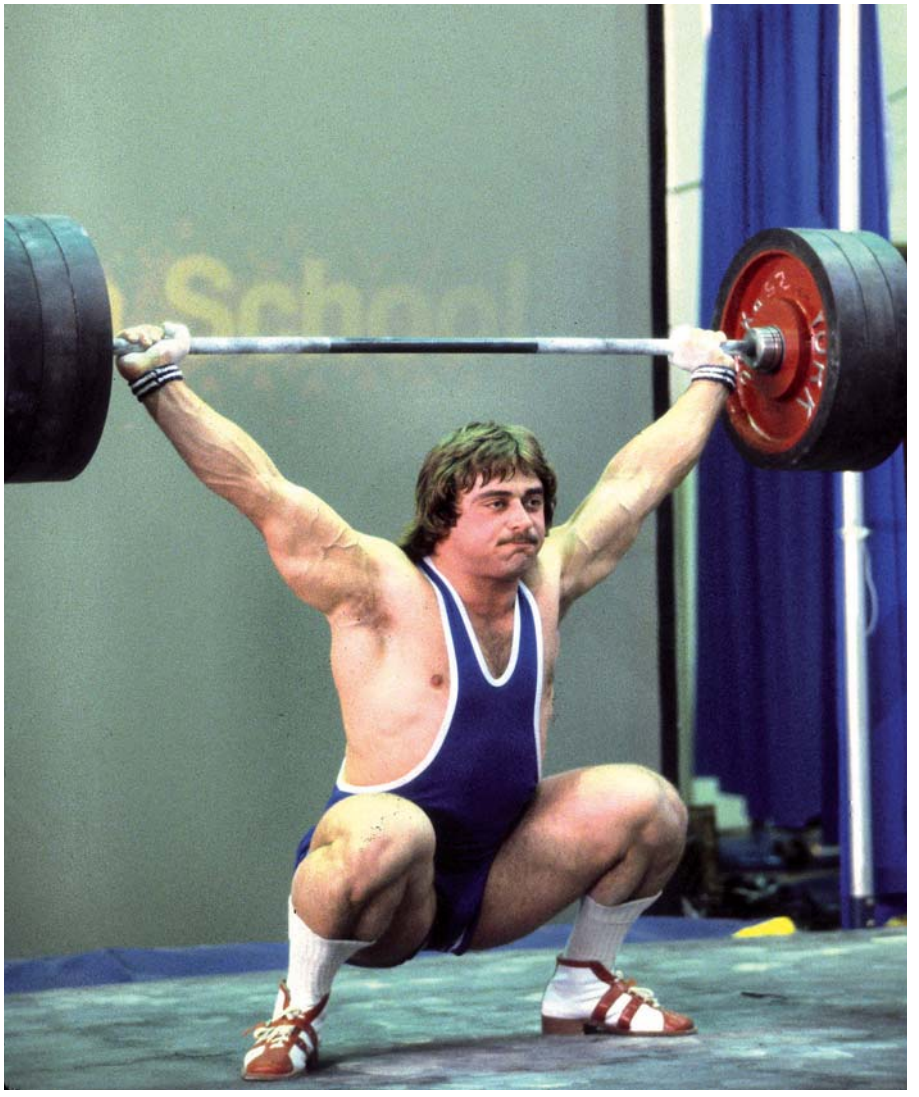
BFS warehouse worker Chris Collum prepares barbells for shipping

Weightroom 101: Olympic Plates

What you need to know to start building a great gym

When it comes to sports equipment and training, good coaches always emphasize the importance of the basics. For a weightroom those basics include bars, plates and platforms. Beyond those, if your department budget permits, there is a place for machines; they are especially valuable for working around injuries, and from a liability standpoint they are well suited for large commercial gyms that have minimal supervision. However, before looking into what is the best leg curl or lat pulldown machine to buy, a strength coach needs to start with the basics, two of which are bumper plates and platforms.

Bruce Klemens Photo



In the early days of competitive weightlifting, thick platforms were needed because weight plates were primarily solid steel. The platform protected the floor and reduced the stress on the barbell, although lifters needed to be careful about lowering the barbell because it could easily damage the floor and bend the bar. In lifting competitions, dropping a weight was considered a rule infraction; at one time, spotters were recruited to catch missed lifts, that is, until the weights became too heavy to catch safely. For example, in 1956 Paul Anderson won the super heavyweight weightlifting gold medal in the Olympic Games with results that included a 319-pound snatch and a 413-pound clean and jerk. Today, both these results have been exceeded by women weightlifters and a 132-pound teenager.

Among the first bumper plates were small-diameter steel plates with a rubber rim. Shown using such plates is Russia's Sergey Arakelov, a two-time world champion (1981-82) who broke five world records.

The Bumper Plate Revolution

Most of the early Olympic weight plates had a wide flange. These were easy to grip and, when dropped, distributed the force over a wider area. Also, they created a vacuum effect with other equal-size plates that made them less likely to slide off the sleeve (nevertheless, BFS still recommends using collars for safety and liability reasons). The problem with the wide-flange plates was that their size limited the total weight that could be put on the bar; today these plates would be especially impractical because so many powerlifters are performing 1,000-pound squats, deadlifts and even bench presses!

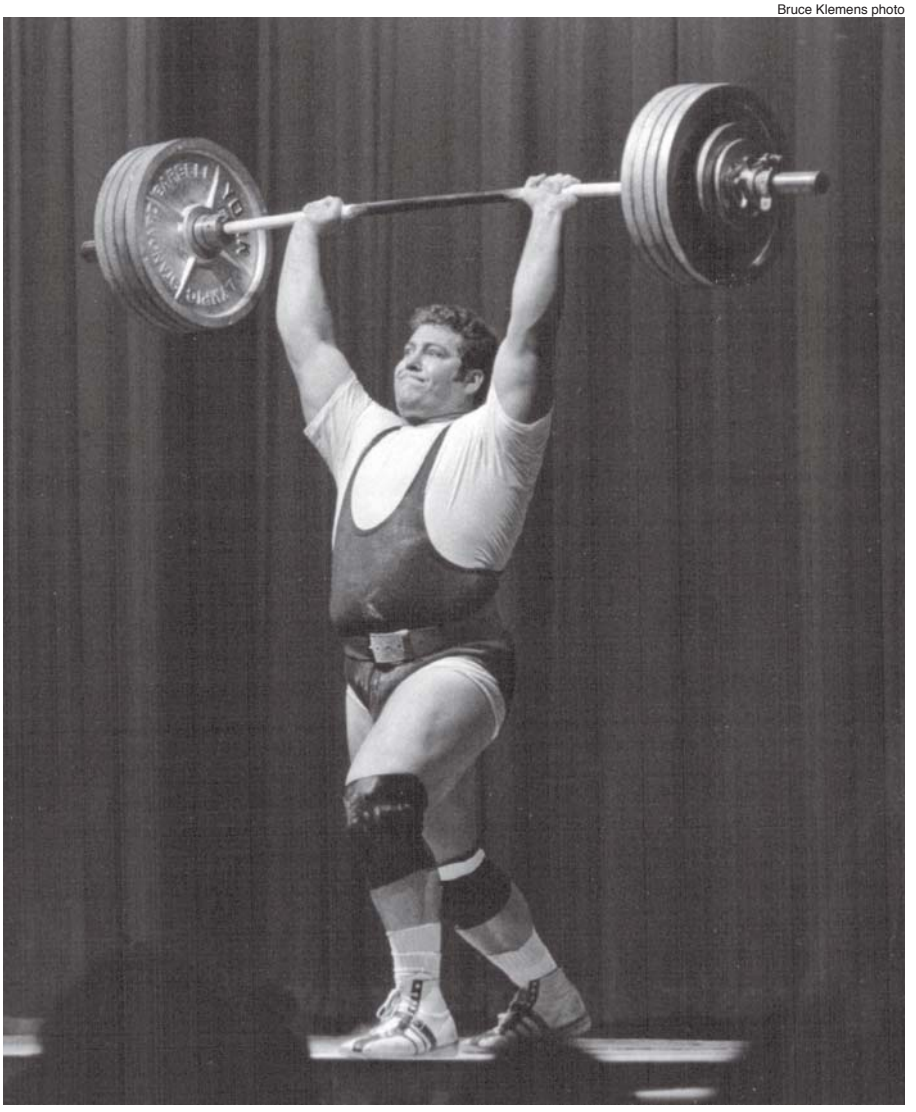
The invention of the bumper plate came from a desire to prolong the life of barbells and platforms, but because the first ones produced were extremely expensive, few gym managers rushed out to buy them. Among the first bumper plates were smaller-diameter weight plates with a rubber strip attached to the rims.

Rubber-rimmed plates were certainly an improvement, but as with retreaded tires for your car, those early bumper plates cracked easily. Many strength coaches also complain that they tend to cause more damage to the bar sleeves, and that barbells don't seem to last as long with these types of bumpers. (At one Olympic Games, reportedly, during the weightlifting competition quite a few cracked plates were piled up in a corner of the weightroom for disposal.) Further, with steel prices so high, solid-rubber bumper plates have become much more economical. BFS still sells these old-style bumper plates because many gyms already have them and don't want to mix plates, but they are not in big demand.

The best solution turned out to be a solid bumper with either a brass ring in the middle or a larger steel hub, both having a tight tolerance. The designs that have a solid piece of rubber with a hole in it do not last long, but in any case these haven't been marketed for some time. For international competitions, bumpers with steel hubs are preferred. However, consider that a competition bumper plate can cost up to four times as much as a solid bumper plate with a brass ring.

Another factor to consider with bumpers is the quality of the rubber. One type BFS sampled was made from the rubber used in recycled tires – unfortunately, the steel shavings could cut the athletes who were using the bumpers (and there was an additional risk that the shavings could get on the platform and bounce up into an athlete's eye when the plates were dropped. One Division I college strength coach told BFS that three players had to be sent to the doctor in one week to have shavings removed from their eyes due to this problem). Those bumpers would have cost us slightly less to purchase, but there was too much of a liability issue for us to sell them.

Bruce Klemens photo



In the early days of weightlifting, steel plates were used. Although many know Ken Patera from his days as a pro wrestler, he was also a great weightlifter, the first American to lift over 500 pounds in the Olympic press and clean and jerk.

Bruce Klemens photo

Photo courtesy Paul Anderson Youth Home

Wide-flange steel plates distribute the force of a dropped weight over a larger surface area, but their size limits the amount of weight that can be used on the barbell. Shown using such plates are 1974 World Powerlifting Champion Paul Woods and 1956 Olympic Games weightlifting champion Paul Anderson.

Another company we tried had very wide bumpers that bounced high when dropped. The problem was that these plates tended to bounce back and hit athletes in the shin or the knee. Also, these plates were so wide that only a few could fit on the end of a barbell – they looked impressive, but when the weights got over 300 pounds you'd have to combine them with steel weights, as they simply wouldn't fit on the sleeve.

We went through several manufacturers over the years; that's a common challenge for most companies – you never know what you are getting. For example, we had to stop doing business with one company that had manufactured our dumbbells because their quality decreased significantly when they started using lower-grade steel. Likewise, in shopping around we found bumpers that smelled terrible and left black smears when touched – fixing these problems required a citrus-based degreaser (along with a lot of elbow grease), and it's important that BFS products are ready to use from the get-go. For nearly a decade we have used the same bumper manufacturer because they have an exceptional level of quality control.

Although it might appear we have two separate solid-rubber bumpers (black and colors), the only difference is appearance – they are all the same product. It simply costs more to dye a bumper, and this cost is absorbed by the customer. The advantages of colored bumpers are they are attractive and easier to organize.

Lightweight training plates usually weigh about 5 pounds and are made of composite materials. Although the plates shown here are very durable, most training plates will crack or bend if dropped.

Solid-rubber bumper plates are the most economical and practical for training. Colored bumpers cost a bit more but look great and are easier to organize.

Although the weights used in international weightlifting competitions must be in kilos, in the US there is a greater demand for pound increments. In pounds, bumper plates are usually available in increments of 10, 15, 25, 35, 45 and 55 pounds. Five- and 10-pound Olympic plates should be called training plates, as they are usually made of a composite material and most will crack or bend if dropped. Avoid mixing pound plates and kilo plates because it's too easy to load the bar incorrectly.

Finally, it's not a good idea to try to save money by purchasing only one set of bumper plates for a platform and then using a lot of cheaper, steel plates for additional weight. This practice places excesses stress on the bar and the bumper plates. In competition, you'll see that the loaders will use the largest bumper plates as early as possible because they are the most durable, and then they'll use smaller bumper plates for additional weight. This practice provides maximum protection for the barbell, which is especially important when you consider that the price of some of these bars is now over $1,200!

Some coaches will try to cut corners by buying poor-quality equipment, but ultimately they will be disappointed when the equipment doesn't perform as well or last as long as they expected. It's smarter to buy the good stuff. As the weightlifting community has taught us, you only pay for quality once! BFS