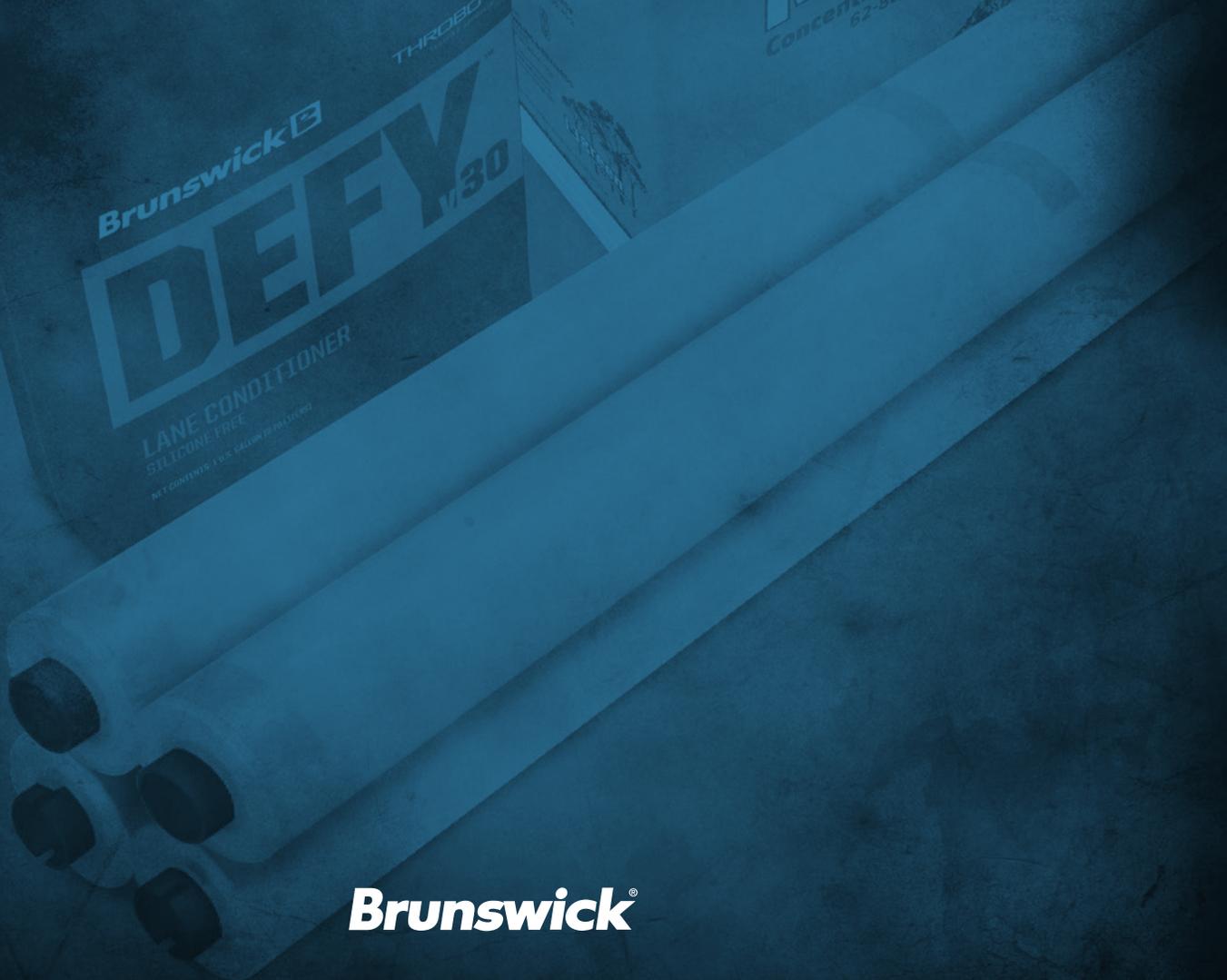




KNOW YOUR 3Cs



Brunswick®

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THE BRUNSWICK ADVANTAGE

Brunswick has been a pioneer in lane maintenance products. Brunswick began manufacturing the B90 lane machine for bowling centers in the 1960s. Over the last fifty-plus years, Brunswick has continuously invested in the development of 3Cs products. The knowledge and products of Perry-Austen and DBA, early leaders in lane maintenance, have been incorporated into Brunswick's lane maintenance offering. Today, no one rivals Brunswick with the quality or breadth of line of lane maintenance products. Knowing more about our commitment can help you better manage your center lane maintenance needs.

Dedicated R&D Team

In support of Brunswick's commitment to lane maintenance research and development, Brunswick has a committed 3Cs R&D team. This multi-faceted group consists of project managers, chemists, researchers, purchasing agents and marketing professionals focused on developing innovative new products that advance the science of lane maintenance.

A Focus on Science and Technology – ThroBot™ and C.A.T.S.

ThroBot, Brunswick's state-of-the-art ball-throwing robot, was designed and fabricated in the late 1990s for bowling ball development. Computer controlled, it combines hydraulics, air pressure and electronics to power a mechanical arm that delivers bowling balls predictably down the lane. ThroBot can simulate nearly any bowler's style including speed, rev rate, axis tilt, and rotation.

In the early 2000s, Brunswick engineers began exploring different ways to objectively measure lane conditioner performance. Through these studies, ThroBot data was used to develop a set of equations which correlate ball position to lane oil pattern transition, providing an objective measure of conditioner performance. This early work eventually led to the introduction of Command® and shortly thereafter Control® lane conditioner. In the late 2000s, the equations were updated to separate performance within and beyond the oil pattern.

The recently updated 24-sensor C.A.T.S. system measures ThroBot's ball path consistency within the pattern as well as launch angle, ball speed, breakpoint and entry angle. These measurements provide important information on how the ball path is affected by carry down. Using this information as well as data gathered on the effects of lubricity and speed loss within the pattern, Brunswick recently developed its two newest, highly successful conditioners: DEFY™ and DEFYv30™.

Brunswick continues to use ThroBot to analyze and develop state-of-the-art lane conditioners and even cleaners. After multiple ThroBot tests, engineers are able to measure how different product formulations perform relative to the same ball, conditioner pattern, and lane surface. With this data in hand, Brunswick chemists can create new additive packages with specific characteristics.

Continuing Commitment

The combination of ThroBot and C.A.T.S. is an example of Brunswick's commitment to use scientific research to measure and enhance performance bowling products. Brunswick is the only supplies manufacturer with this technology and research methodology. Brunswick's R&D in 3Cs is unrivaled, and a competitive advantage for your bowling center.



KNOW YOUR 3Cs

WHY IT'S IMPORTANT TO KNOW YOUR 3Cs

The more you know about the 3Cs (Conditioners, Cleaners, and Cloth), the better you can analyze your lane maintenance needs and choose the best products for your center. Knowing your 3Cs enhances the trust and confidence that bowlers have in you – and can lead them to better enjoy their bowling experience and bowl more often.

While they might seem simple at first, the conditioners, cleaner and cloth that go into lane machines are actually quite sophisticated, technical products. Different brands – even different varieties of the Brunswick 3Cs – are made to do slightly different things and sometimes perform very differently in a center. Owners and managers can look to Brunswick for help in selecting the best 3Cs products for them.

Once a center begins using a certain brand of lane maintenance products, they typically stay with those products until there is a compelling reason to change. That situation is especially true with conditioners because it (and the pattern applied) has a direct impact on the shot and the bowler's success. A center will usually only change a conditioner when there's an issue, and almost never during league season. Sometimes a center may be more willing to change cleaner, and many will change cloth based on the desire of their bowlers, price, or a combination of both.

Centers with new lane machines tend to use the supplies from the lane machine manufacturer. Some believe they should only use supplies from the same manufacturer. Centers should be aware that all Brunswick supplies will work in all brands of lane machines.

Rest assured, Brunswick is ready and able to assist you with any conditioner, cleaner, or cloth changes that may be appropriate for your center, based upon the needs of your bowlers or yourself.

KNOW YOUR 3Cs

WHAT TO USE AT YOUR CENTER

Brunswick has a broad line of conditioners and cleaners to meet different bowling center needs.

Which conditioners and cleaners should you use?

1 Keep it simple:

- For conditioners, Authority22® W22™, Connect®, DEFY™, DEFYv30™, and Logic™ are all very versatile. For a low cost option, consider Command®.
- For cleaners, Judge® or Invincible® would be a good choice. If you like concentrates, consider MAX10 or BLITZ.
- For cloth, 8460 XL and 8460 QC are direct replacements for Kegel K2 and K2 Select.

— or —

2 Analyze your center – Consider these key factors to understand what options are best for your center:

- Popular products – Look at the charts provided to determine the Brunswick recommended replacements for the most popular competitive products in your market.
- Type of play – Is sport bowling a major factor, or is it mostly recreational play? In centers where sport lane conditions are the focus, DEFY, DEFYv30, Logic, Connect, and Authority22 W22 are good choices.
- Lane surfaces – If your center has wood lanes, look at DEFY, Command, Absolute Control®, and Authority22 W22.
- Lane machine technologies – If wick machines are in use, consider lower viscosity conditioners such as DEFY, Absolute Control or Authority22 W22.
- Price – This is always a factor, and sometimes a key driver for customers. Price is important, but so is performance. Brunswick offers a variety of conditioners, cleaners, and cloth so you can balance price and performance for best results

As above, consider Judge or Invincible cleaner and MAX10 (or MAX20), or BLITZ for a center wanting a concentrate.

The rest of this guide will help you understand the characteristics of 3Cs and Brunswick's product line so you can select those that are most appropriate for you.

BOWLING CENTER BENEFITS OF USING HIGH QUALITY PRODUCTS

Every bowling center cleans and conditions their lanes on a regular basis, which means they go through lots of supplies. A typical center spends \$150-\$200 per lane per year on conditioners, cleaners, and cloth. So choosing the right supplies for your center is very important.

This guide provides the information and some tips you need to better understand and utilize Brunswick supplies. We'll look at Brunswick's 3Cs products in detail, pointing out their advantages. We'll go over the 3Cs basics – what these products are, how to apply them, and what they do.

BOWLING CENTERS BENEFIT BY USING HIGH-QUALITY 3Cs

- 1 Improves scoring conditions > Higher bowler satisfaction/loyalty > Higher revenues.
- 2 Protects bowling lanes against excess wear and tear from ball impact and rolling friction.
- 3 Less oil carry-down into pinsetters and ball return equipment > Fewer equipment problems.

THE BASICS

BRUNSWICK LANE MACHINE CLOTH

Lane cloth is the least costly of the 3Cs, and the easiest of the 3Cs to change over. There are different types of lane cloth for different types of lane machines.

What Lane Cloth Does

- 1 Dusts the lane by contacting the surface.
- 2 Mounted at the very front of lane machine, the cloth scrubbing and dusting the lane is the first action performed by the machine.

How It Works

- 1 Cloth is stretched around rollers built into the lane machine that are the same width as the lane.
- 2 Rollers position the cloth on the lane surface, dusting the entire lane on the machine's forward operation.
- 3 Rollers retract upwards off the lane during the machine's return pass toward the foul line.
- 4 The cloth winds one increment between lanes so each lane starts with clean cloth.

Lane Cloth Differences

- Different brands made of different materials and thicknesses.
- Different core designs.

Lane Cloth In Direct Application Vs. Transfer-System Lane Machines

- In Kegel machines, cleaner is applied onto the lane surface in front of the cloth, so the cloth spreads the cleaner.
- The Authority22/Envoy cloth is used dry, dusting the lane before the cleaner is applied.
- Different styles of lane cloth are used in different machines and in some cases are not interchangeable.

THE BASICS

BRUNSWICK LANE CLEANERS

Lane cleaner is the second-biggest 3Cs bowling center expense. It is easier to change cleaner during the league season than to change conditioner.

What Lane Cleaner Does

- 1 Removes dust, dirt and residual oil from lane surface.
- 2 Prepares the lane surface for new application of conditioner.

How It's Applied

- Most centers use combination lane cleaning and conditioning machines.
- Some centers use separate machines for lane cleaning and conditioning.
- Only a few centers still clean by hand.

Lane Machine Operation

- 1 As lane machine moves down-lane, lane-cleaning solution is sprayed onto lane in periodic bursts (older Kegel machines), in a moving stream (current Kegel), or continuously (Authority22®/Envoy®).
- 2 In Kegel machines, overspray dampens the cloth to wet-scrub the lane surface.
- 3 Machine squeegee assembly wipes cleaner and lifts it off of the lane surface. The vacuum removes cleaner and oil leaving the lane dry.
- 4 Machine programming functions control amount of cleaner used and where it's dispensed.

Environmental Consideration

- All Brunswick lane cleaners are formulated to be readily biodegradable and non hazardous.
- Brunswick is the only major supplies manufacturer marketing a complete line of environmentally friendly cleaners - BGreen.

Dilution

- All lane cleaners are technically concentrates, since all are diluted with water before use.
- Available lane cleaners range from as little as 4:1 to as high as 50:1 dilution rates.
- Many centers water-down lane cleaners at a higher dilution rate than recommended to save money. This can be an acceptable approach, depending on conditions at the center that impact the effectiveness of the solution – including frequency of lane maintenance, temperature, and lane machine used.
- Centers can find the ideal dilution level by progressively adding more water to the solution until lane cleaning becomes ineffective, then backing up to an acceptable (less diluted) solution for daily maintenance.

THE BASICS

BRUNSWICK LANE CONDITIONERS

Lane conditioner is the most important of the 3Cs. Which lane conditioner a center uses greatly affects how their lanes perform (higher vs. lower average scores), how long the lanes last, and can have pinsetter maintenance implications. Conditioner is also the most costly of the 3Cs. Bowling centers are often reluctant to change from one brand of conditioner to another, especially during league season. This is due to the centers wanting to keep their bowlers content. Typically, if the bowlers are not complaining, there is little argument to change conditioners.

What Lane Conditioner Does

- 1 Creates ball reaction conditions that result in higher or lower scores.
- 2 Protects against lane wear-and-tear by reducing the force of bowling balls when first impacting the lane and reducing the friction as balls travel down the lane.

How It's Applied

- Most centers use automatic lane machines that both clean and condition in one pass.
- Some centers use older, separate machines for cleaning and conditioning.
- Only a few centers still clean lanes manually and apply conditioner with spray guns.

Lane Machine Types

- 1 Wick machines – conditioner is drawn up from a reservoir by wicking-action then applied to the lane through a transfer system of brushes/rollers (e.g., Phoenix Lite).
- 2 Pump machines – conditioner is released onto a transfer system which ultimately spreads it over the lane (e.g., Kegel Sanction technology machines).
- 3 Direct-to-lane injector machines – conditioner is sprayed directly onto the lane (e.g., Authority22® or Envoy®).

Key Physical Characteristics of Brunswick Lane Conditioners

Lane Conditioner	Viscosity in cPs @ 70° F	Surface Tension	Predictability Oil	Backend	Lubricity	Viscosity Index (VI)
Authority22® W22™	22.0	24.5	8.40	4.50	High	234
Absolute Control®	22.0	24.0	9.15	2.38	Med-High	303
Command®	22.5	25.5	7.90	5.13	High	255
Connect®	33.0	24.5	5.54	5.50	Med-Low	277
Control®	37.0	24.5	6.03	5.89	Med	270
DEFY™	23.0	26	11.35	6.73	High	308
DEFYv30™	30.0	26.5	11.19	8.92	Med-Low	282
Logic™	43.0	25.0	6.84	6.50	Low	180

THE BASICS

BRUNSWICK LANE CONDITIONERS CONTINUED

- 1 Viscosity** – thickness: “the resistance to flow of a liquid or semi-liquid”
 - The greater the viscosity, the thicker the conditioner
 - Viscosity closely reflects a conditioner’s ability to reduce friction, but it is not specifically a measure of this (see “Lubricity” below)
 - Conditioners of different viscosity work better (or worse) for different centers with different types of lanes using different lane machines
 - The USBC requires all manufacturers to measure their conditioners’ viscosity using the same method and in the same units, called centipoise. 1 centipoise (cPs) = 1 centimeter-gram-second unit of dynamic viscosity equal to one hundredth (10⁻²) of a poise. (The viscosity of water at 59° F is 1.139 CPs.)

- 2 Surface Tension** – smoothness: uniform consistency of a solution that keeps it from clumping
 - Conditioners with lower levels of surface tension tend to lay better on the lanes, resist carry down and create better ball reaction
 - Conditioners with higher levels of surface tension tend to “bead up,” attaching themselves to balls more easily and increasing oil carry-down

- 3 Oil Predictability** – an exclusive Brunswick measurement of the stability within the oil pattern: how long an oil pattern holds up before it begins to deplete and change the lane’s performance
 - Measured by testing with ThroBot™ and the Computer Aided Tracking System (C.A.T.S.)
 - More durable/lasting conditioners get higher oil predictability ratings while poorer performing conditioners will have lower ratings

- 4 Back-end Predictability** – an exclusive Brunswick measurement of the stability of the entry angle on the back-end, as a result of carry-down beyond the oil pattern
 - Also measured by testing with the ThroBot and C.A.T.S.
 - Essentially measures carry-down of conditioner onto the back-end of a lane, where the conditioner is not initially applied
 - Oil carry-down reduces a ball’s ability to see friction and hook over the final section of the lane
 - Conditioners with higher back-end predictability values have less carry down, improving back-end ball action

- 5 Lubricity** – slipperiness: “the capacity of a solution to reduce friction”
 - Affects how the ball loses speed in the conditioner pattern, which in turn determines how the ball responds to friction
 - Manufacturers make conditioners with different lubricities to provide different performance characteristics and work well with different types of lane surfaces and lane machines
 - Higher lubricity conditioners (more slick) are better for use on fast-response (“hooking” or “worn”) lane surfaces since they provide a slower response time. Balls can be more affected by carry down with this type of conditioner and may require the pattern volume to be lower.
 - Lower lubricity (less slippery) conditioners are excellent for use on slow-response (harder, less “hooking”) lane surfaces since they provide a faster response time. Low lubricity conditioners may require the pattern volume to be higher.

THE BASICS

- 6 Viscosity Index** – how conditioner viscosity varies with temperature
- Raising the temperature of a fluid typically lowers its viscosity. Generally, conditioners with a lower viscosity will have a higher VI since they are already “thin”.
 - The temperature at most centers does not vary greatly during a given day (generally kept between 65° - 80° F at all times), making a conditioner’s change in viscosity insignificant in terms of performance.
 - Brunswick offers conditioners across a range of VIs, but we do not recommend this as a determining factor in choosing a conditioner.

Key Performance Attributes of Best Formulations:

- 1 Minimal transition – conditioner stays in place where it is applied.
- 2 Durability – conditioner lasts longer before breaking down.
- 3 Consistency – composition of ingredients and consistency is the same from batch to batch.
- 4 Stability – does not separate, no need to “shake well before using.”
- 5 Ease – easy to pour, work with and cleaned in a single pass.

THE 3Cs CONVERSION

GOING THROUGH A 3CS CONVERSION

In most cases, changing your 3Cs supplies is a fairly logical process that follows certain steps.

STEP 1 Observe / Listen – Observe your bowlers, both open play and league bowlers. Talk with them about their bowling experiences. Consult with other knowledgeable people in your center or sister centers. Listed below are some issues that may drive you to look for a change.

Scoring issues:

- Overall low scores
- An inconsistent shot

Oil pattern concerns:

- Excessive carry down
- Premature pattern breakdown
- Poor ball reaction/motion noticed by better players

Specific 3Cs supplies issues

- Poor product quality (e.g. inconsistent batches of conditioner)
- Perceived over-pricing
- Poor service from distributor (e.g. low inventory, out-of-stock)

Equipment problems:

- Pinsetter stops due to out-of-range pins
- Ball return malfunctions
- Pin distributor / conveyor problems

STEP 2 Confirm / Analyze – Don't be too hasty to make a change. Confirm what you have observed, analyze all of the factors and make sure you have a plan, and backup plan, before you start the change-over.

Always start by inspecting the center's lane machine. Often, a poorly performing or malfunctioning lane machine is to blame for a center's poor lane maintenance, or at least some of the issues. Changing the supplies with a poorly working lane machine will probably not solve a center's lane maintenance problems.

TIP: Ensure your lane machine is in proper working order for two reasons. 1) The lane machine could be causing your "lane" issues and changing supplies will not solve a problem caused by a poorly working lane machine. 2) During and after the change-over you will want consistency. Fixing or changing the lane machine performance after changing supplies will affect your lanes and you will not have the performance you were targeting.

Evaluate your current lane conditions. Note the type of lanes, their general condition, age, and how often they are cleaned and conditioned. Also, assess how much use the lanes get and whether the center caters to more league or recreational play. If possible, pull tapes to understand your current oil pattern.

THE 3Cs **CONVERSION**

STEP 3 **Trouble-shoot / Advise** – By applying your knowledge of the different characteristics of Brunswick 3Cs products to a center’s specific lane concerns, you’ll be able to determine solutions that will effectively solve these problems.

- Know Brunswick’s 3Cs products, paying close attention to each one’s benefits and the problems it remedies. Focus on the conditioners and cleaners you’ve decided to consider using.
- Recognize opportunities to start small and work your way up the 3Cs ladder. Centers will often experiment by changing over their lane machine cloth or cleaner, which only have a minimal impact on their shot, before changing over their lane conditioner.
- If the lane conditioner or pattern is the root cause of the center’s lane maintenance difficulties, you will need to be more persistent as you try to change your center’s conditioner to a more appropriate, better performing selection.

TIP: Once you commit to make a change, you need to get the old product out of the center. This prevents possible mix-ups in the future and makes for a more organized lane maintenance process.

SPECIFYING AND CONVERTING

BRUNSWICK LANE MACHINE CLOTH

Lane cloth is the least expensive and, frankly, least consequential of the 3Cs since cloth selection has the least impact on the shot.

Brunswick Cloth Varieties:

For Lane Machines Using Standard Duster Cloth (cleaner not over-sprayed on cloth):

Authority22/Envoy Duster Cloth

- Water-resistant core.
- Special fiber maximizes scrubbing action.
- Absorbs dust and dirt.

Red Edge® Lino-Duster Cloth

- Strong, long fibers trap and hold dirt.
- Removes dirt while leaving conditioner pattern unchanged.
- Available in sizes to fit any lane maintenance machine or duster.

For Lane Machines Using Combination Scrubber/Duster Cloth (cleaner is over-sprayed on cloth):

8460QC

- Latest upgrade in Brunswick Red Edge lane cloth.
- Same material as in 8460XL.
- Now features quick-change disposable plastic core.
- Easier to use, saves time and hassle.
- Direct replacement for Kegel K2 Select cloth.

Gold Edge Lane Cleaning/Dusting Cloth

- Specially designed mixture of fibers to maximize scrubbing strength.
- MAX absorb design for faster, more complete cleaner pickup.

Suitable For Most Lane Machines:

8460XL

- Designed for use wet or dry, in any lane machine.
- Extra heavyweight duster cloth.
- Direct replacement for Kegel K2 cloth.

SPECIFYING AND CONVERTING

BRUNSWICK LANE CLEANERS

Lane cleaners and lane conditioners work in tandem – in fact, lane conditioners will provide an inconsistent shot unless the lanes are effectively cleaned first.

Benefits of Brunswick Lane Cleaners

- 1 Strip/clean lane more thoroughly, removing even the toughest conditioners.
- 2 Improve the consistency of ball motion from lane pair to lane pair, day to day.
- 3 Reduce undesired “pattern transition” – smearing of oil pattern beyond intended zones.
- 4 Often effective at higher dilution rates for additional savings to the center.

Matching Lane Cleaner to Lane Conditioner

While all Brunswick lane cleaners will effectively clean Brunswick conditioners, some lane cleaners match up better to clean other brand lane conditioners. There are two simple ways to recommend which Brunswick cleaner you should use with your lane conditioner.

Using the charts on page 14, you can either:

- 1 Select the Brunswick cleaner that is most equivalent to the cleaner you are currently using. (However, please note that this method assumes you are using a suitable cleaner now. If in fact you are not, replacing that cleaner with an equivalent Brunswick brand will not likely improve the results.)

— or —

- 2 Select the Brunswick Cleaner that is most compatible with the brand/variety of lane conditioner that you are using. (Preferred approach.)

Remember that some cleaners will work better with different brands of conditioners. So whenever you change lane conditioners, you should consider if you need to change cleaners as well. Use the previous chart to determine the most appropriate Brunswick cleaner to use with competitive brand conditioners.

All Brunswick lane cleaners work well with Brunswick conditioners.

SPECIFYING AND CONVERTING

BRUNSWICK REPLACEMENTS FOR OTHER BRAND LANE CLEANERS



If you are interested in trying a similar product to your current cleaner, consider the Brunswick cleaner listed in the second column.

Competitive Lane Cleaner	Brunswick Recommended Lane Cleaner	Competitive Lane Cleaner	Brunswick Recommended Lane Cleaner
Kegel Fizzion	MAX10, MAX20, or BLITZ	Polychem ST-21/ST-21 Plus	MAX10, MAX20, or BLITZ
Kegel Pure	Authority22® or Invincible®	Polychem 407	Authority22 or Invincible
Kegel Defense C	Judge®	Legends Signature Concentrate	Judge
QAMF Formula C	Judge	Legends Professional Concentrate	MAX10, MAX20, or BLITZ
QAMF Formula ACC	Authority22 or Invincible	Legends Legacy Lane Cleaner 4:1	Authority22 or Invincible
QAMF VisClean	MAX10, MAX20, or BLITZ	NeoTac 8 to 1 Lane Cleaner	Judge
Lane Concepts pH MAX	Judge	NeoTac 40 to 1 Lane Cleaner	MAX10, MAX20, or BLITZ
Lane Concepts Extreme 12 to 1	MAX10, MAX20, or BLITZ	DBA White Glove	Judge

When two cleaners are recommended, both are recommended equally.

BRUNSWICK CLEANERS FOR USE WITH OTHER BRAND CONDITIONERS



If you are interested in trying a good cleaner to compliment your current conditioner, consider the Brunswick cleaner listed in the second column.

Competitive Lane Conditioner	Brunswick Recommended Lane Cleaner	Competitive Lane Conditioner	Brunswick Recommended Lane Cleaner
Kegel Offense HV	Judge	Shotmaker 9557	Authority22 or Invincible
Kegel Offense LV	Judge	Shotmaker 9584S	Authority22 or Invincible
Kegel Navigate	Judge	Polychem 509	Authority22 or Invincible
Kegel Infinity	MAX10, MAX20, or BLITZ	Polychem 9512	Authority22 or Invincible
Kegel Prodigy	MAX10, MAX20, or BLITZ	Polychem 9526 ULTIMIT	Authority22 or Invincible
Kegel Crossfire	Judge	Legends Signature Series 25	Judge
Kegel Defense S	MAX10, MAX20, or BLITZ	Legends Signature Series 60	MAX10, MAX20, or BLITZ
Kegel Defense HF	Judge	Legends High Lineage TE 62	MAX10, MAX20, or BLITZ
QAMF Utopia	MAX10, MAX20, or BLITZ	Legends Original 19	Judge
QAMF Reactor LL	Judge	Legends Original 25	Judge
QAMF Reactor ML	Judge	Legends Original 47	Judge
QAMF Reactor HL	Judge	Legends Plus 17	Judge
QAMF Visflo 12.7	Authority22 or Invincible	Legends Plus 23	Judge
QAMF Visflo 19.5	Authority22 or Invincible	Legends Plus 45	MAX10, MAX20, or BLITZ
QAMF Visflo 32.5	Authority22 or Invincible	Black Gold Hi-Tec LV	MAX10, MAX20, or BLITZ
QAMF Visflo 39	Authority22 or Invincible	Black Gold Hi-Tec HV	MAX10, MAX20, or BLITZ
QAMF Visflo 48.5	Authority22 or Invincible	Black Gold HV Original Formula	Judge
Lane Concepts SynPro 40	MAX10, MAX20, or BLITZ	Black Gold 50/50	Judge
Lane Concepts Lubricity S	Judge	Black Gold Texas Tea	Judge
Lane Concepts Lubricity W	Judge	Lane Dynamx Elite 20	Authority22 or Invincible
Polychem Signature Edition 28	Authority22 or Invincible	Lane Dynamx Exacta 28	Authority22 or Invincible
Polychem CEO 33	Authority22 or Invincible	DBA 801	Authority22 or Invincible
Polychem CEO 42	Authority22 or Invincible	DBA 811	Authority22 or Invincible
Polychem CEO 65	Authority22 or Invincible	DBA 850	Authority22 or Invincible
Shotmaker 9544	Authority22 or Invincible		

When two cleaners are recommended, both are recommended equally.

SPECIFYING AND CONVERTING

STEPS TO CONVERTING TO BRUNSWICK LANE CLEANERS

To assure optimum performance of Brunswick cleaner, first verify the lane machine's cleaning system is functioning properly. Correct any issues before proceeding.

1 Drain the existing cleaner from the cleaner supply tank.

2 Mix the Brunswick cleaner to the recommended ratio.

TIP: For optimal cleaner performance, use filtered water. Using filtered water may also reduce the residue build-up on the cleaner spray nozzles. This is especially important in centers where the water quality is known to be poor. Filtering water can be a quick and cost effective solution to lane cleaning issues.

TIP: In some cases, cleaners can be effective at a higher dilution ratio than what is recommended. To determine the ratio that is correct for that center's conditions, start at the recommended ratio and make the dilution ratio weaker on subsequent cleanings until the cleaner is no longer effective, then make it a little stronger. If a higher dilution ratio is effective, it allows the center to use less cleaner concentrate and save money over the recommended ratio. Using this approach, a "more expensive" Brunswick cleaner may be more cost effective than a "cheaper" cleaner.

3 Prime the cleaning system, with the machine on the lane, to ensure air is removed from the system.

4 Verify that the squeegee assembly is in good condition and in proper adjustment. Adjust or replace if necessary, referring to the lane machines operator manual.

5 Replace any other bad components that may have a negative affect on cleaning, including spray nozzles, filters, wipers and pads.

6 Clean four lanes to properly saturate the cleaning system.

7 Closely inspect the cleaning and make sure that no conditioner film or cleaner residue is left behind.

- If conditioner film is left behind, make adjustments to the cleaner by either slowing the machine, increasing the cleaner output, or increasing the strength of the cleaner (if diluted more than the manufacturer's recommended ratio). Repeat steps 4-6.
- If a cleaner residue is left behind it may be necessary to weaken the cleaner mixture ratio. Repeat steps 2-6.
- If the Brunswick cleaner is unable to remove a competitive conditioner, notify Brunswick for assistance. Drain and replace cleaner with previous product.

SPECIFYING AND CONVERTING

BRUNSWICK LANE CONDITIONERS

While conditioners are the most costly of the 3Cs, they are also the products that can produce the most dramatic and positive results when a center changes brands.

Many centers have older lane machines manufactured by Kegel but sold by Brunswick during our marketing partnership in the early 2000s.

Benefits of Brunswick Performance Conditioners

- 1 **Performance** – products produce desired ball motion and more consistent scoring.
- 2 **Durability** – products retain their original performance for longer between applications.
- 3 **Value** – products deliver high performance per dollar.
- 4 **Support** – products are from Brunswick, renowned for customer care and follow-up service.

Information You Need to Choose the Right Brunswick Conditioner

- 1 Lane machine type and condition.
- 2 Conditioner currently in use.
- 3 Lane surface and condition.
- 4 Lineage, and # of leagues vs. open play?

Since the shot is a combination of the right conditioner and pattern, you will also need to know the patterns currently being used, how they perform, and what you consider an improvement to the shot.

How to Choose the Right Brunswick Replacement Conditioner

There are two basic ways to do this. You can either:

- 1 Identify the Brunswick conditioner that is most comparable to the brand now being used. Use the chart on the next page – Suggested Brunswick Replacements for Other Brand Lane Conditioners - to find the nearest Brunswick equivalent.

— or —

- 2 Find the Brunswick conditioner that is best suited to the center's lane machine, lane surface and determine if your center caters more to leagues or recreational play. The Conditioner charts for different lane machine types that follow take these factors into account and identify which Brunswick conditioners will work best.

SPECIFYING AND CONVERTING

Brunswick has spent much time in Research and Development to design products to better fit the customers needs. Lane surfaces, machine types, and environmental factors have been taken into consideration when developing the most complete line of conditioners in the market today.



Brunswick has a full line of lane conditioners to match up with your new or current lane surface. Keep in mind, not all lane conditioners are recommended for all lane machines, and environmental variables can affect the performance of any lane conditioner. Brunswick Aftermarket Product Specialists and International Distributors have the expertise to help you when evaluating a new conditioner for the first time.

BRUNSWICK REPLACEMENTS FOR OTHER BRAND LANE CONDITIONERS



If you are interested in trying a similar product to your current conditioner, consider the Brunswick conditioner listed in the second column.

Competitive Lane Conditioner	Brunswick Recommended Lane Conditioner	Competitive Lane Conditioner	Brunswick Recommended Lane Conditioner
Kegel Offense HV	DEFYv30	Lane Concepts Lubricity S	DEFY
Kegel Navigate	Control	Lane Concepts Lubricity W	DEFY
Kegel Infinity	Logic	Lane Concepts C1-Pro (19)	Command
Kegel Prodigy	Authority22 W22/DEFY	Lane Concepts C1-Pro (26)	Connect
Kegel Crossfire	Absolute Control	Lane Concepts Break-Point	Connect
Kegel Defense S	Logic	Polychem Signature Edition 28	DEFYv30
Kegel Ice	Authority22 W22/DEFY	Polychem CEO 33	Connect
Kegel Fire	Connect/DEFYv30	Polychem CEO 42	Logic
Kegel Curve	Logic/DEFYv30	Polychem CEO 65	Logic
QAMF Utopia	DEFYv30	Polychem Shotmaker 9544	Authority22 W22
QAMF Reactor LL	Absolute Control	Polychem Shotmaker 9557	Authority22 W22
QAMF Reactor ML	Authority22 W22	Polychem Shotmaker 9584S	Absolute Control
QAMF Reactor HL	Connect	Polychem 509	Authority22 W22
QAMF Visflo 12.7	Absolute Control	Polychem 9512	Authority22 W22
QAMF Visflo 19.5	Absolute Control	Polychem 9526 ULTIMIT	DEFY
QAMF Visflo 32.5	DEFYv30	NeoTac Neo 1	DEFY
QAMF Visflo 39	Control	NeoTac Black Gold Texas Tea	Authority22 W22/Absolute Control
QAMF Visflo 48.5	Logic	NeoTac Black Gold 50/50	Absolute Control
Lane Concepts SynPro 40	Logic		

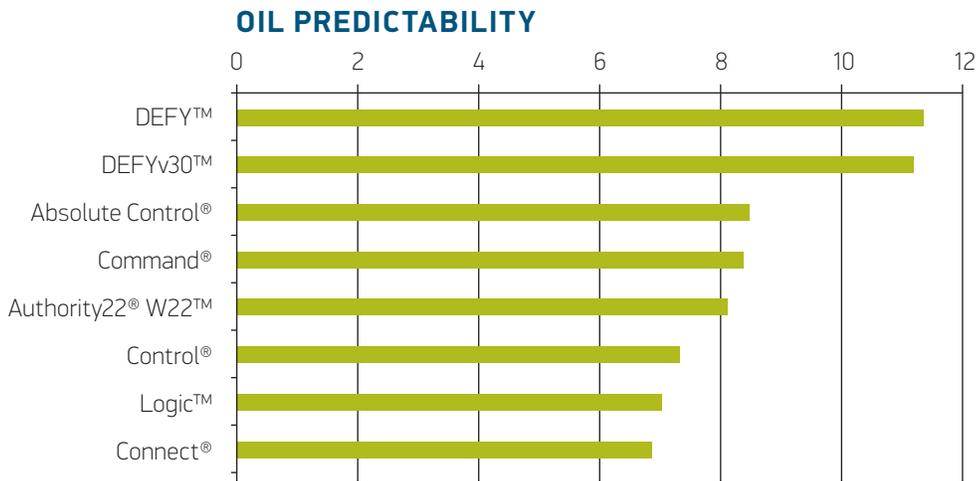
When two conditioners are recommended, both are recommended equally.

SPECIFYING AND CONVERTING

BRUNSWICK LANE CONDITIONERS

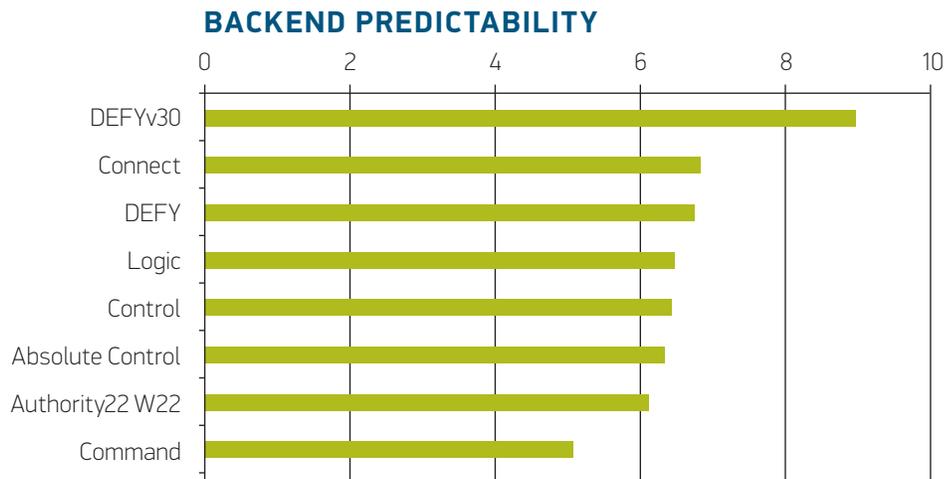
Oil Predictability – an exclusive Brunswick measurement of the stability within the oil pattern—how long an oil pattern holds up before it begins to deplete and change the lane’s performance:

- Measured by testing with ThroBot™ and the Computer Aided Tracking System (C.A.T.S.)
- More durable/lasting conditioners get higher oil predictability ratings while poorer performing conditioners will have lower ratings



Backend Predictability – an exclusive Brunswick measurement of the stability of the entry angle on the back-end, as a result of carry-down beyond the oil pattern:

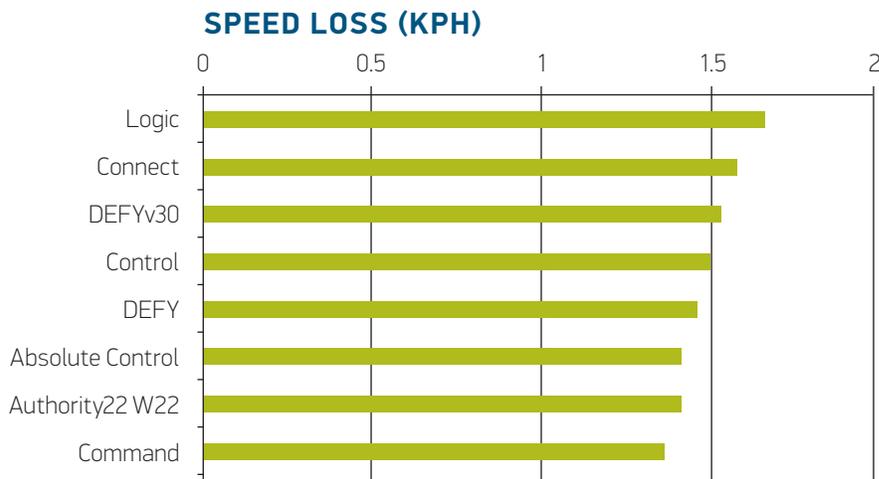
- Also measured by testing with the ThroBot and C.A.T.S.
- Essentially measures carry-down of conditioner onto the back-end of a lane, where the conditioner is not initially applied
- Oil carry-down reduces a ball’s ability to see friction and hook over the final section of the lane
- Conditioners with higher back-end predictability values have less carry down, improving back-end ball action



SPECIFYING AND CONVERTING

Lubricity – Slipperiness - “the capacity of a solution to reduce friction”

- Affects how the ball loses speed in the conditioner pattern, which in turn determines how the ball responds to friction. Speed loss is measured using C.A.T.S. from the first sensor to the last sensor within the oil pattern (MPH – miles per hour; KPH – kilometers per hour).
- Manufacturers make conditioners with different lubricities to provide different performance characteristics and work well with different types of lane surfaces and lane machines.
- Higher lubricity conditioners (more slick) are better for use on fast-response (“hooking” or “worn”) lane surfaces since they provide a slower response time. Balls can be more affected by carry down with this type of conditioner and may require the pattern volume to be lower.
- Lower lubricity (less slippery) conditioners are excellent for use on slow-response (harder, less “hooking”) lane surfaces since they provide a faster response time. Low lubricity conditioners may require the pattern volume to be higher.



SPECIFYING AND CONVERTING

CONDITIONERS FOR USE IN PUMP AND INJECTOR-TYPE MACHINES

Lane Type	Condition of Lanes	Recreation Center	League Center
Wood with Barricade/Guardian	All	Absolute Control®, Command® Authority22® W22™	Authority22 W22, Absolute Control, DEFY™
Wood with Water-base Finish	All	Absolute Control, Command	Authority22 W22, DEFY, Absolute Control, Control®
Wood with Moisture Cure Urethane Finish or 100% Solids Epoxy Finish	All	Absolute Control, Authority22 W22	Authority22 W22, Command, Control, DEFY
Wood with Lane Shield	All	Authority22 W22, Control	Authority22 W22, Control, DEFYv30™
AMF HPL 9000, 1/2" DBA IQ, 7/16" Anvilane™	All	Connect®, Control	Authority22 W22, Connect, Control, DEFY, DEFYv30
Brunswick Pro Lane™ (textured approach), 3/8" Anvilane, AMF SPL, Murrey Pathfinder II, System 300, Mendes	All	Authority22 W22, Connect	Connect, Logic™, Control, DEFYv30
Brunswick Pro Lane (non-textured approach)	Good - Excellent	Logic, Control	Logic, Connect, Control, DEFYv30
Brunswick Pro Lane (non-textured approach)	Fair - Poor	Connect, Control	Logic, Connect, Control, DEFYv30

SPECIFYING AND CONVERTING

CONDITIONERS FOR USE IN WICK-TYPE MACHINES

Lane Type	Condition of Lanes	Recreation Center	League Center
Wood with Barricade/Guardian	All	Authority22® W22™, Absolute Control®, Command®	Authority22 W22, Absolute Control, DEFY™
Wood with Water-base Finish	All	Authority22 W22, Absolute Control, Command	Authority22 W22, Absolute Control, DEFY
Wood with Moisture Cure Urethane Finish or 100% Solids Epoxy Finish	All	Authority22 W22, Absolute Control, Command	Authority22 W22, Absolute Control, DEFY
Wood with Lane Shield	All	Authority22 W22, Absolute Control, Command	Authority22 W22, Absolute Control, DEFY
AMF HPL 9000, 1/2" DBA IQ, 7/16" Anvilane™	All	Authority22 W22, Absolute Control, Command	Authority22 W22, Absolute Control, DEFY
Brunswick Pro Lane™ (textured approach), 3/8" Anvilane, AMF SPL, Murrey Pathfinder II, System 300, Mendes	All	Authority22 W22, Absolute Control, Command	Authority22 W22, Absolute Control, DEFY
Brunswick Pro Lane (non-textured approach)	Good-Excellent	Authority22 W22, Absolute Control, Command	Authority22 W22, Absolute Control, DEFY
Brunswick Pro Lane (non-textured approach)	Fair-Poor	Authority22 W22, Absolute Control, Command	Authority22 W22, Absolute Control, DEFY

NOTE: DEFY can be used as a longer lasting solution for recreation centers.

SPECIFYING AND CONVERTING

STEPS TO CONVERTING TO BRUNSWICK LANE CONDITIONER

As previously noted, it is critical that the lane machine is functioning properly before a change, especially a change to a new conditioner. If it isn't, the new products will not eliminate performance issues. Therefore, it is important that you confirm the lane machine's conditioning and cleaning systems are operating properly, and repair (or have repaired) any operational or maintenance related issues as part of our process to change over your conditioner (or cleaner).

Reminder: Before making any adjustments or repairs to the lane machine, or starting a conditioner or cleaner conversion, pull tapes of their pattern so you fully understand their current situation.

NOTE: Always refer to the Lane Machine's owner's manual for specific instructions.

1 Clean the center's lane machine's conditioning system

Make sure the smoother pads and transfer system (if equipped) are clean and functioning properly.

2 Drain the conditioner tank per the manufacturer's instructions

If the old conditioner is a competitive product that separates, it will be necessary to remove the conditioner tank and flush thoroughly.

3 Replace all filters in the conditioning system

It may be necessary to put an additional fine mesh filter before a fluid metering pump to prevent the release of separated oil that can affect the pump in these types of machines. NOTE: Remove the added filter that was installed in front of the fluid metering pump.

4 Fill the conditioner tank with the new Brunswick conditioner

After filling the tank, turn on the conditioner pump to flush the old oil from the conditioning system allowing it to drain in a disposable container.

5 Set the Pattern

- A. Apply the current pattern settings to approximately 10 lanes.
- B. Take tape samples of the pattern and read through the Computer Lane Monitor.
- C. Compare the most recent graph with a graph of the previous lane conditioner. If pattern volumes are considerably different then skip to step F.
- D. Allow players to test the pattern, compiling enough games to match typical amount of lineage seen with the previous conditioner.
- E. Watch ball reaction/motion and pay attention to the pattern transition across the total number of games. Watch how the oil carries down the lane and if it has a negative affect on ball reaction. Watch how the pattern breaks down and focus on the areas that are critical to ball reaction (heads, mid-lane, end of pattern). Watch how the ball drives through the pins and if the type of pin movement is positive.
- F. Take tape samples of the pattern after the desired number of games has been played, at the same distance as before the players started.
- G. Listen to players' feedback in comparison to how they played the pattern with the previous conditioner.

SPECIFYING AND CONVERTING

6 Adjust the Pattern

- A. Based on the feedback, pattern transition, and lane graphs decide on the necessary parts of the pattern to be adjusted.
- B. Do not make large adjustments to the pattern unless the transition is very bad.
- C. Run five lanes taking sample tapes after the fifth run. Read the pattern through the computer lane monitor.
- D. Allow players to play on the pattern and watch ball reaction and pattern transition closely.

If the transition is not desirable then repeat steps A through D.

ADJUSTING THE PATTERN FAQs—WHAT SHOULD I DO IF...

Too much carry-down?

Decrease the distance of the applied oil in the center of the lane leaving the pattern distance the same. This adjustment increases the buff distance and reduces the oil thickness at the end of the pattern.

Back ends are too strong?

Lengthen the pattern to “tone” down the ball reaction. Make sure that the conditioner application distance does not change, only the total pattern distance.

Not enough hold?

Hold is created by the length and amount of oil in the “mid-lane” (20-32 ft.). This is done by applying oil in the mid-lane on the reverse pass of most lane machines. Lengthening the reverse application distance creates hold oil which allows the ball to more consistently guide to the breakpoint. Brunswick’s Envoy® and Authority22® easily accomplish this by adding oil to the required boards in the Zones (20-32 ft.) during the forward run.

No swing area?

A lack of swing area can be caused by three things: 1) too much oil applied to the outside boards, 2) too lubricious a lane oil, or 3) “crowned” lane topography. 1) Reduce the amount of oil on the outside boards if there is too much. 2) Try Connect® or Logic™ conditioner. 3) If topography is the problem, contact your professional lane resurfer.

Heads hook?

Two things cause the heads to hook. 1) Not enough oil applied to the head area. 2) The physical condition of the heads. To increase the volume of oil in the heads, slow the machine down on the reverse pass. With Brunswick’s Envoy and Authority22 direct oil system, during the forward run you can increase the units of oil by board in the head Zone(s) to resolve this problem.

Mid-lane ball track hooks too much?

The mid-lane ball track can hook if there is not enough oil or if there is too much oil. This can be determined by looking at the pattern settings along with Computer Lane Monitor graphs.

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