

Discus Throw

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About the tutorial

Discus Throw is a game of projection and distance, just like javelin and hammer throw. Here an athlete needs to throw a circular object called **discus** into the air to land it inside a prescribed area. The discus is thrown within a circle with a single hand.

This tutorial will help you to understand the basics of Discus Throw.

Audience

This tutorial provides is aimed at giving an overall knowledge to any reader who wants to learn the art of Discus Throw. It contains step-by-step illustrations and guidance to help beginners learn the fundamentals of Discus Throw.

Prerequisites

We assume the reader has passion and eagerness to learn Discus Throw game and is interested in knowing more about the game.

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Table of Contents

About the tutorial	i
Audience.....	i
Prerequisites.....	i
Disclaimer & Copyright	i
Table of Contents.....	ii
1. DISCUS THROW – OVERVIEW	1
2. DISCUS THROW – PLAYING ENVIRONMENT	4
Discus Throw – Field Design	4
Discus Throw – Throwing Circle	5
Discus Throw – Cage	5
Discus Throw – Landing Zone	6
3. DISCUS THROW – EQUIPMENT.....	7
The Discus.....	7
Supporting Equipment	9
4. DISCUS THROW – IMPORTANT TERMS	10
5. DISCUS THROW: HOW TO PLAY?.....	12
Discus Throw – Foul Throw	12
Gripping the Discus	12
Discus Throwing Step-by-Step.....	13
Discus Weight Specifications.....	16
6. DISCUS THROW – TECHNIQUES	17

7. DISCUS THROW – PERFORMANCE TECHNIQUES.....	19
Arm Swinging.....	19
Discus Bowling.....	19
Throws Related to Height	20
Skip Throws	21
Heel Turns with Partner	21
Reverse 180's.....	22
Safety Measures in Discus Throw.....	22
8. DISCUS THROW – THE RULES	24
Rules Regarding	24
Discus	24
Rules Regarding Cage	25
Rules Regarding Throw	26
9. DISCUS THROW – CHAMPIONS.....	27

1. Discus Throw – Overview

There are many games under the umbrella of track and field event. Discus Throw is one of those games played solo in competition with other players.

Discus Throw – A Brief History

Discus Throw can be traced back into the ancient Greece, where in the Olympiad games this sport was used to be organized to judge the physical strength of the athletes. This game was also popular because it requires high precision and coordination. During that time it was believed to be one of the easiest sport events.



Some eminent historic proofs shows that the trace of this game was found during the period of 708 B.C. soon after its addition into 18th Olympiad games it was also introduced into pentathlon games that included wrestling, running, javelin throw, and jumping. According to the facts of Perseus digital library, earlier times the discus used to be made up from stones, bronze, or iron.

Discus Throw – Objective

The athlete needs to throw a discus of 1 to 2Kg into the air as far as possible within the prescribed zone by remaining inside a circular area of 2.5m diameter. If the discus lands beyond the boundaries of the zone then the throw is counted as invalid.

In this game the athlete needs to hold the discus in his hand with proper placement of fingers. By standing in a circular zone and facing towards the discus-throwing area, the athlete spins around oneself to gain the momentum and finally throws the discus in the air.

Discus Throw – A Game of Projection

Discus throw demands high physical strength and more importantly, one's balance upon one's body since weight of the discus, the grip on the discus and precise circular movement around oneself involved matters the most.



The player needs to deliver a fixed number of throws out of which the best score is considered. The player who throws the discus farthest among all competitors is declared as a winner. This projection game is played in both men's and women's category.

Discus Throw – Participating Countries

Since its introduction to Olympiad games, the popularity and demand of this game by different nations grew exponentially. Many Asian and non-Asian countries have their active participation in this category of game. List of some of the major dominating Asian countries follows China, Iran, India, Qatar, and Saudi Arabia.

The IAAF championships shows participation of men and women from US, Germany, Cuba, Hungary, Estonia, and Lithuania in Discus Throw sport.

Discus Throw – Regulating Body

International Association of Athletics Federation (IAAF) is the body of people who governs athletic sports and organizes various world championship since 1983. It sets rules for the athletic games and holds various world championships annually, biennially, and every four years.

Discus Throw – Throwing Circle

Also called Discus Circle, it is the area within which the player needs to take a start and complete the throw. It is made of iron, steel or other suitable material such as hard rubber sheet. The top of this circle is aligned horizontally with the ground outside the circle.

The measurements of throwing circle are as follows:

- Inside diameter = 2.5m (± 5 mm)
- The throwing circle rim = at least 6mm thick, and 70mm to 80mm deep.

The rim is always painted white for the purpose of demarcation. The interior of the throwing circle is made of concrete or some non-slippery material. The surface of the throwing circle is even and 1.4cm–2.6cm lower than the rim of the circle.

Discus Throw – Cage

The U shaped cage offers protection for the viewers. It is designed and manufactured such that it can take the load of mishrow of the discus of 2Kg flying at the speed up to 25m per second. Any strong material that offers protection for the player from rebounding the discus can be used for the cage.



Generally, the netting of cage is constructed from synthetic fibers or steel wire of moderately high tensile strength.

The cage measurements are:

- Width of the mouth is 6m
- Height = 4m

Mouth of the cage is positioned 7m in front of the center of the throwing circle.

Discus Throw – Landing Zone

The landing zone (also called landing sector) is where the discus arrives after the player throws it. The landing zone's surface must be capable of taking the impression of the discus upon its landing. It is made of natural grass or other suitable material without any bumps.

The landing zone is laid at an angle of 34.92° with respect to the middle of the throwing circle. It is marked by 50mm wide white lines. The landing zone is 80m long.

3. Discus Throw – Equipment

Discus throw game is not equipment-heavy. You just need a couple of things to play the game. The discus throw equipment are available for amateur as well as for professionals. The main equipment in the game is the discus that comes in various materials and weights. The equipment in the playing environment such as the cage is also equally important for safe playing.



The Discus

It is the primary object in the Discus Throw game. The discus can be made of various materials such as rubber, wood, and metals. It weighs in the range of 1 Kg to 2.5Kg. The beginners prefer discus with less weight for practicing the throw.

The discus is often paired with a case that protects the discus from damage and makes it easy for the player to carry.








Discus Dimensions and Weights

These are typical dimensions and weights of the discus used by men and women:

Gender	Diameter	Weight
Men	22cm	2Kg
Women	18cm	1Kg

Types of Discus

There are various discus available in the market for the use by different genders and age groups. Here are the typical types of discus:

Discus Style	Look	Purpose
Club		Made of solid wood, meant for all throwers.
Training		Adjustable weights, meant for beginners to start learning the throws.
Top Fly		Made of polycarbonate fibers, meant for professionals.
Swift		IAAF certified discus designed for workout session. Comes with galvanized steel rim of 80% of the total weight and side plates made from Polycarbonate material.
Ultimate		Meant for seasoned and professional throwers.
Target		IAAF certified discus designed for all throwers. Comes with galvanized steel rim of 70% of the total weight.
Rubber		Made of highly durable solid rubber that gives good grip. Meant for training sessions.

Supporting Equipment

There are a few more equipment required to conduct Discus Throw game:

- **Measuring tape** – It is used for measuring length of the throw of the discus.
- **Marking Flags** – They are used to mark several throws made by a single player.
- **Recording Sheets** – They are required by the trainers or officials to record the scores and other details of the players.



Measuring Tape

Marking Flags



Recording Sheets

4. Discus Throw – Important Terms

Here is a list of a few common terms used in discus throw:

- **Cage** – A U shaped mesh installed around the discus circle for the protection of viewers, officials, and competitors.
- **Discus Circle** – A circle marked with 2.5m diameter from which the player launches the discus.
- **Throw** – Propelling the discus in the proper direction with appropriate body movements.



- **Foul** – If the player has thrown the discus without adhering to the rules, the throw is counted as a foul.
- **Swing** – It is the movement of the player around itself.
- **Stance** – A deliberately taken posture of the body for being ready for the activity.
- **Release Angle** – It is the angle between the right arm and the horizontal ground made at the time of releasing the discus. Release angle and speed of throw are inversely proportional to each other.

- **Release** – Propagating the discus into the air at the time of throw.
- **Lift** – It is the force that opposes the force of gravity. It depends on the speed of discus relative to the speed of wind, the density of air, shape of the object, orientation, and the angle of orientation with respect to the direction of motion.
- **Drag** – It is the force that tends to oppose the motion. It depends on all the factors as listed above.

5. Discus Throw – How to play?

Every game has some bottom lines for playing than contribute to playing it accurately. Let us know more about how to play Discus Throw:

The game starts when a player enters into the cage with discus and takes position in the discus circle. Till the throw is complete, you need to remain inside the discus circle.

Discus Throw – Foul Throw

Fouls can occur in the following cases:

- You step outside the discus circle.
- You drop the discus outside the discus circle during your first swing.
- You throw with both hands.

Gripping the Discus

To hold the discus with a firm grip, follow the given steps:

- Place your non-throwing hand under the discus for support.
- On the top of the Discus, place your throwing hand.
- Without stretching, spread the fingers of throwing hand evenly over the discus.
- Avoid putting excess pressure on the discus.



- Position the Discus properly at the first joint of the fingers and place the finger tips firmly over the rim.

Discus Throwing Step-by-Step

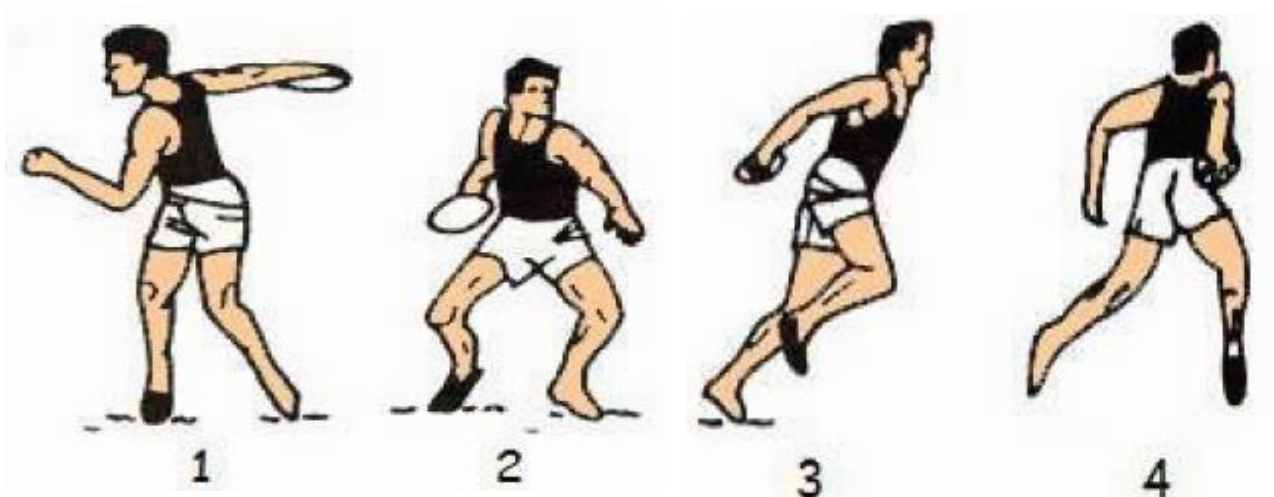
Before going into the main event, you need good practice of some preliminary swings and with that adopt your shoulder well with the stance. Let us see the throwing techniques step by step:

Step 1

- Position of the discus high, in a relaxed manner.
- Instead of speed it is the radius that matters the most. So keep your hand long enough from the body so that it will give a huge radius on the discus.
- Position your body weight in the middle of the stance.
- Aim on chin over the knee over toe of your left leg.

Step 2

- As soon as you take off the right foot from the ground, shift your body weight on the left foot.
- Trail the discus behind your hips.



- Bring right foot towards the center of the circle by swinging it wide of the left foot.

Step 3

This step is important in the view of positioning of the foot.

- Pivot your right foot on the ground with its ball.
- Position the left foot low.

Step 4

- Hold the discus in the high position behind your back.



- Balance and maintain the level of both your shoulders.



- As soon as the right foot lands on the ground, aim for the chin over knee over toe over right leg.
- Maintain the position of the left foot still low and fast.

Step 5

- You can achieve real power when you touch the ground with the left foot.
- During this time position, your left arm in the direction of the throw.

- Complete the pivoting of the right foot.



- Brace the left side of your body now.
- Drive your right hip in forward direction to aid the motion.

Step 6

- As you drive forward the right hip, note the "bow" position.
- Make your right arm relaxed and comfortable as it is the time to strike.

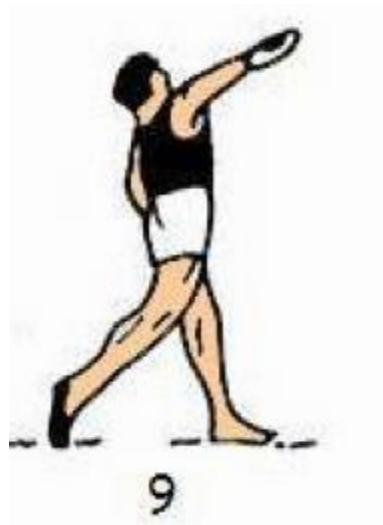


- Keep the left side braced and firm all over this step.

Step 7

- Let your right arm come through fast and last.

- Do the aerodynamic lift and drag of the release angle.



- Even after the release of the discus, keep your left foot well-grounded as before.
- Soon after the throw, keep the position of your right arm and the corresponding thumb in line with each other.

Discus Weight Specifications

Weight specification of the discus varies depending upon the age group and gender. The below given chart clearly shows the details:

Age group (Years)	For Male (in Kg)	For Female(inKg)
11-12	1	0.75
13-14	1.25	1
15-16	1.5	1
17-19	1.75	1
20-34	2	1
35-49	2	1
50-59	1.5	1
60-69	1	1
70-75	1	1
75+	1	0.75

6. Discus Throw – Techniques

The rules or the bottom lines of the game also make performance assessment of the participants easy.

Throwing the Discus to Optimum Distance

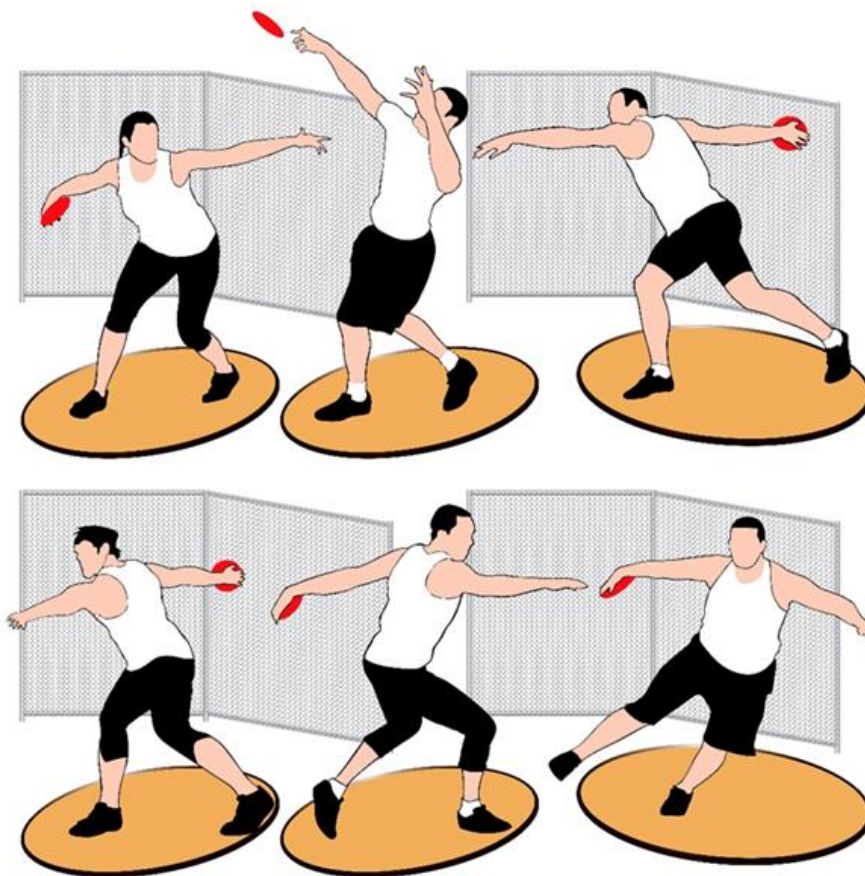
As of now, you must have already known that Discus Throw is the game of distance. You have to throw the discus so that it will reach up to targeted area. The distance covered by the discus depends upon many factors but the following factors are most important:

- The speed with which the discus is thrown.
- The height from which it is released.
- The projected angle.

Among the above three, it is the speed that dominates the other two factors while deciding the actual distance covered by the discus.

Keeping Optimum Release Angle

The ultimate angle with which an athlete releases the discus in the air is known as **Optimum Release angle**.



With the case of ballistics, the initial speed applied to all the projectiles is more or less same irrespective of their angle of projection. The optimum releasing angle range used by most of the successful athletes varies in the range of $38^\circ \pm 8^\circ$.

But it is also a fact that the releasing angle and speed of throw are inversely proportional to each other. That means, if the angle of release is increased, the speed of projection decreases and vice versa. However; the speed decreases due to the following two main factors:

- With the increase angle of projection, you require more energy to overcome the weight of the discus and hence less energy will be available with you to generate more speed.
- With increase in the release angle, the speed decreases.

By making a unique combination of releasing angle and the velocity with which the discus is released, every player comes up with a different throwing style. It depends upon again various factors such as:

- Size of the player's body
- Strength of the player's body
- Stamina of the player
- Techniques of discus throwing

7. Discus Throw – Performance Techniques

As of now, you have understood clearly that discus throw demands extreme physical strength and core stability. Hence it is better for you to know some basic exercises and drills which can prepare you with stamina and increase your endurance. These exercises also will help you in getting a good grip over this game.

We will discuss some of the important exercises in this chapter.

Arm Swinging

Discus throw is all about the proper use of centrifugal force. This drill will make you understand about this force in a better way. Below are the step by step instructions.

- Stand on the ground with your feet wide apart.
- Hold the discus in your right hand.
- Now by doing back and forth motion of your shoulders, swing the discus from your left hand and try to catch it in your right hand.
- The feeling of pushing out on the hand should come while doing so.



Discus Bowling

Proper release of the discus is very important. Hence you need to learn a small drill that will help you tackling this more quickly. Go through the step by step instructions given below.

- Align the discus properly in your palm.
- Ask one of your partners to stand at a distance of 15 meters from you.
- Bowl the discus towards him.
- Make sure the discus will not wobble while releasing.
- Squeeze the discus such that it will roll out of your index finger.

- Once you get the proficiency over a width of 15 meters, increase the distance between you and your partner.
- Practice more.



Throws Related to Height

Practice this drill to have a good release of discus with a sufficient height. Go through the step by step procedure given below.

- Stand with distance in legs.
- Relax your shoulders wide.
- Hold the discus in the throwing hand.



- Swing the discus twice in a forward-back manner next to your body.
- Remember to squeeze it out properly.
- Position your throwing arm straight.
- After one and a half or two swings, throw the discus up in the air.

Skip Throws

This is also another drill to enhance the discus release techniques. Follow the simple steps described below.

- Stand with your legs and shoulders wide apart.
- Position yourself vertical to the throwing direction.
- Place the discus in your throwing hand.
- Swing the discus in a forward-back manner next to your body.
- Squeeze the discus properly.
- Position the throwing palm flat.
- Throw the discus up in the air.



Heel Turns with Partner

Throwing action is accompanied by the turning action of hips. So, a little bit exercise of this type will ensure good motion of hips. Below are the step by step instructions.

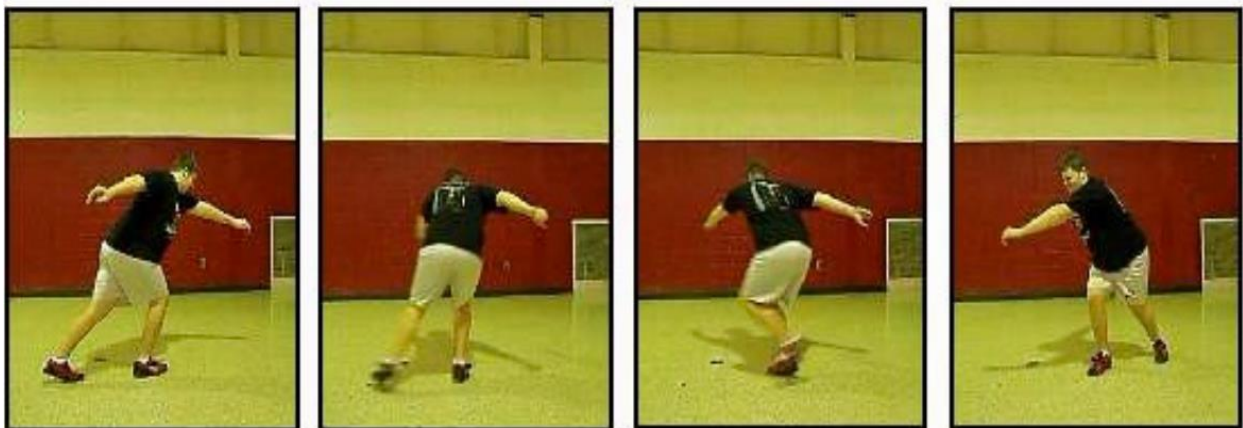
- Get into the power position without holding a discus.
- Tell one of your partners to hold the right heel of yours.
- Ask your partner to make artificial movement of your heel with his hand.
- Try to smack and drive in the direction of movement of your partner's hand.
- You can add a surgical tube to add more resistance.



Reverse 180's

The player should also be trained for the throwing from the middle of the center. This drill has been designed to practice pivoting yourself at the center of the ring. Follow the below steps.

- Start your throw with the help of your right foot in the middle of the ring.
- Try to bring both your knees together by picking up your left foot and by making a 180 degree rotation.
- During this process, make sure that the turning of your right foot continues.



Safety Measures in Discus Throw

Although the game looks simple, it needs many safety measures on the field. This is because any slight carelessness can hamper a great injury to both player and the spectators. For this reason it is often played in a semi closed encasement.

Some important safety measures that should be followed during the play are;

- During performance all the retrievers and officials should not turn their back to the area of playing.

Discus Throw

- Soon after bringing the discus to the athletics field, the retrievers should walk backward or on the side of their head.
- Officials and judges should always stand at the back side of the net.
- The ground should be clear from any foreign objects or bumps.
- Landing sector must be clear.
- The ground should be inspected for wet and slippery patches.

8. Discus Throw – The Rules

It is needless to say that discus throw is a game that needs a lot of strength and endurance. So after a lot of hard work if you will lose your points on the field for some foul throw then it is very demotivating. Hence knowing the necessary rules and practicing in accordance to them well in advance is going to help you a lot.

The rules for Discus Throw game are laid and governed by IAAF for the discus, the playing environment, and for the player itself.

Rules Regarding Discus

Here are some of the important rules regarding discus:

- The discus can be made of any material such as wood but it must have a circular edge with a metallic rim.
- Inner construction can be both solid and hollow.
- The cross section of the edge should be made in circular manner and it should have a radius of 6mm.
- All sides of the discus should be identical. They must be free from any type of sharp edges or irregularities.
- Finishing of the discus should be smooth.



Rules Regarding Cage

Here are some important rules regarding cage:

- The construction and the strength of the cage should be such that it can arrest a disc of around 2Kg coming at a speed of 25m/sec.
- There should be no threat of rebounding of the disc from the cage.
- The cage should have at least one side open. Therefore it is often recommended to construct it in a "U" shape.
- At the lowest point the height of the netting point should be 4m.
- Synthetic and natural fiber is the ideal material for the construction of the net. However, high tensile strength steel wire can also be used.

Rules Regarding Throw

Here are some important rules regarding throw:

- The discus can only be thrown by an athlete when he or she will stand inside a circle which has a diameter of 2.5m.
- During the course of throw, the athletes are prohibited from touching the top of the rim. However, they can touch the inner part of the rim.
- An athlete cannot touch the ground beyond the circle.
- If the athlete leaves the circle before the landing of the disc on the ground, then it will be considered as a foul throw.
- In the Olympic matches, each athlete is given 8 chances to showcase their talents.
- There is particular boundary of landing of the disc. If the disc lands outside that zone then that throw is considered invalid.

9. Discus Throw – Champions

Discus Throw has shaped a number of proud men and women winners in this athletics sport category around the world. Some of the popular discus throw champions are listed below:

Jürgen Schult

He is a German discus thrower and world record holder till date since 1986, who set a record for the farthest discus throw of 74.08m.

He was ranked 1st in second IAAF World Championship in Athletics held in 1987 and in Olympic games conducted at Seoul in 1988.

In 2002, Schult became the trainer of the German track and field association's men's discus team.



Robert Harting

Yet another German discus thrower popularly called "Shaggy" in the domain of athletics. He is an esteemed owner of a number of Gold, Silver, and Bronze medals in numerous championships and represents SSC Club, Berlin.

His personal best throw record is 70.31m. Harting is also famous for demonstrating victory by ripping own's shirt, running with a German flag, and placing mascot tattoos on the shoulders.



Franka Dietzsch

She is a German discus thrower best known for winning gold medals at three World Championships in Athletics. She has a record of her personal best throw at 69.51 meters.

She has won gold medals a number of times in her career as a professional discus thrower. IAAF World Cup held in 1998 at Johannesburg in South Africa and 11th World Championship in Athletics held in 2007 at Osaka in Japan are to name a few.



Yarelys Barrios Castañeda

Yarelys Barrios Castañeda is a discus thrower from Cuba. She won the Diamond Race in the women's discus throw of the IAAF Diamond League subsequently in year 2010 and 2011.

She has won Cuban National Championships held in 2012 with a personal best throw of 68.03 meters.



Virgilijus Alekna

He is a Lithuanian athlete. Alekna has won two gold medals in the Summer Olympics in the discus throw on his name with the first in 2000 and the second in 2004.

He won bronze medal at Beijing Summer Olympics held in 2008. In 2007, he was appointed as UNESCO Champion for Sport. His personal record of farthest discus throw is 73.88 meters.

Alekna stands tall at 6 ft 7 in, which gives him an incredibly long armspan, measured 2.22m (7 ft 3.5 in), which is helpful in discus throwing.



Frantz Kruger

He is a South African-born-Finnish discus thrower who won the Olympic bronze medal in 2000 and gold medal in 2004 African Championships in Athletics held in Congo. He is also a double African champion.

His personal best throw of 70.32 meters. He is permitted to represent both South Africa and Finland both under special permissions from IAAF since 2007.



Gerd Kanter

He is a popular Estonian discus thrower. He was the World Champion of 2007. He has won gold medal at the 2008 Summer Olympics, and bronze medal in London 2012 Summer Olympics.

Kanter has recorded a personal best throw of 73.38 meters, which is the Estonian record and the third best mark of all-time.

