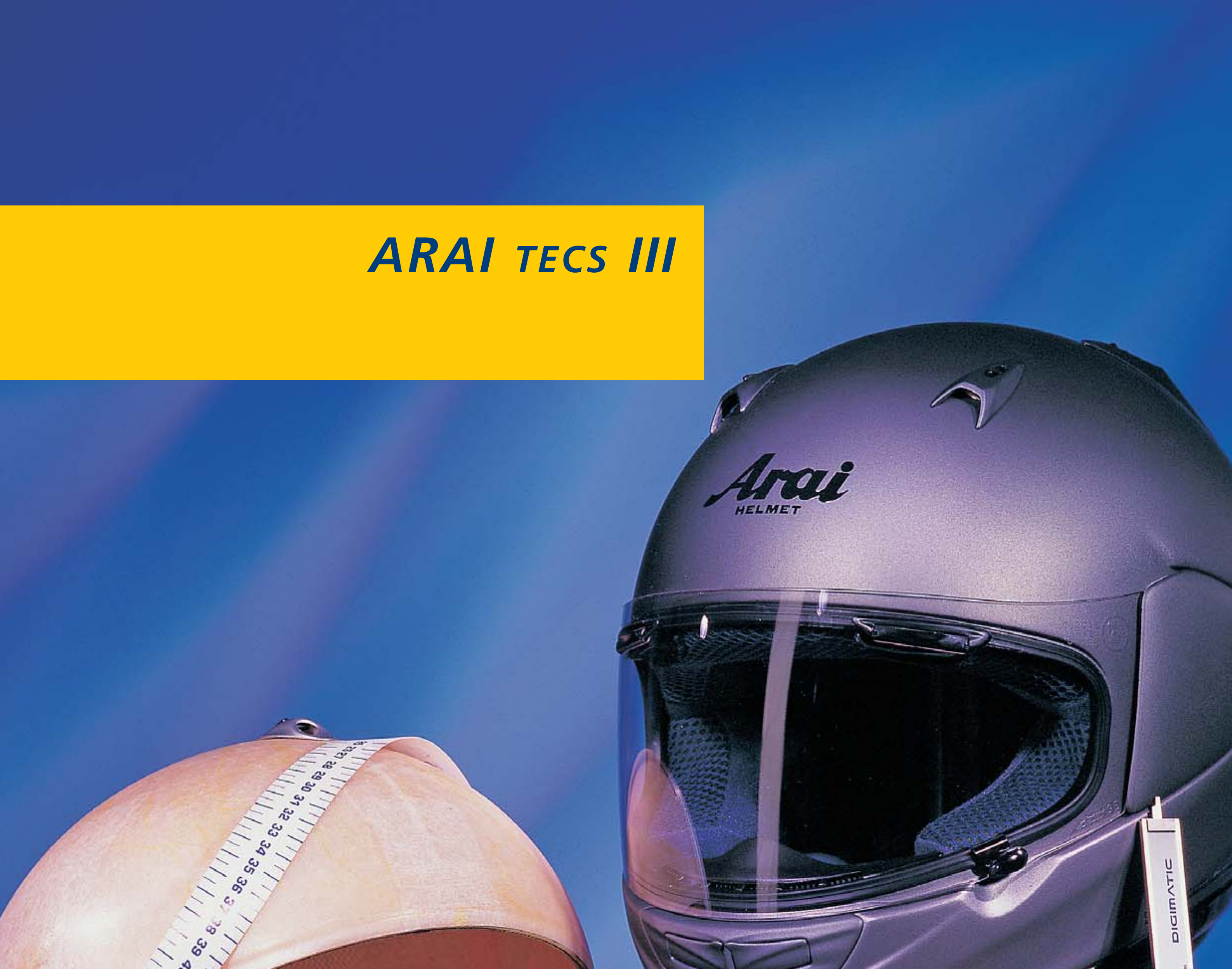
ARAI TECS III



TECHNICAL INFORMATION ABOUT ARAI HELMETS CONSTRUCTION

THE OUTER SHELL

The backbone of a helmet is the outer shell. Arai shells are made out of several types of resins blended together with ‘superfibre’ in different combinations, it has been developed through Arai know-how.

The semitransparent, inorganic shell is distinctive for Arai. On its surface several markings, numbers, words, etc. can be seen, although most Arai helmets wearers will never see them.
However, these are special identification marks with great importance, both for the owner and maker of the helmet, and are to be found on all Arai products.

Don’t doubt that they are there. You can check for yourself, but you’ll have to tear the helmet apart to find them! Every sign and code has of course a special meaning, which we will explain:

WHEN YOU LOOK AT THE INSIDE OF THE OUTER SHELL, YOU FIRST NOTICE:

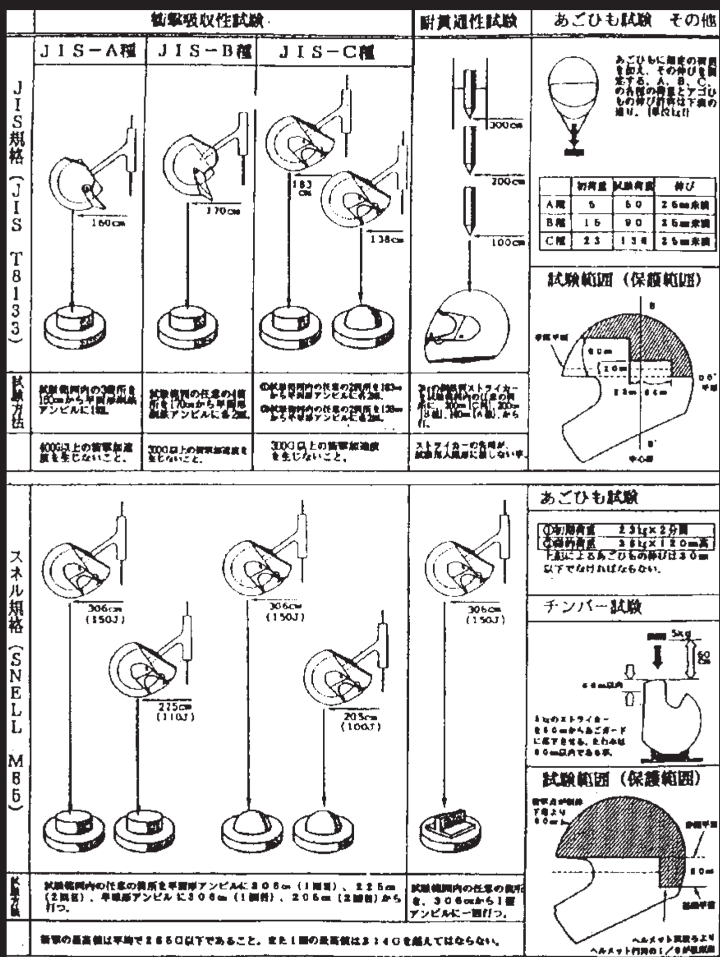
‘800 OK 6’
This code has the following meaning: 800 is the weight of the shell in grams, OK 6 is the certified number written only at the final shell inspection.

‘69397’
The first digit ‘6’ is the shell inspectors personal identification number, ‘9397’ is the daily serial number which increments by one digit every day since Arai started double shell inspections (one in the shell moulding department and one at the final inspection stage by the quality control Division).

‘UE 86 X 7A’
This code represents the factory name for this type of shell.

NEED TO KNOW MORE ABOUT TESTING OR HOMOLOGATIONS?

Arai Helmet has prepared a special booklet ‘Helmet Testing and Homologations’ in which you will find all procedures and tests of international homologation standards. (Snell M90, ECE 22-3 to 22-05, AFNOR, BS 6658 and the Arai Standard. Arai's own standard test meets but more often exceeds all homologation tests with multiple impact tests at higher velocities.



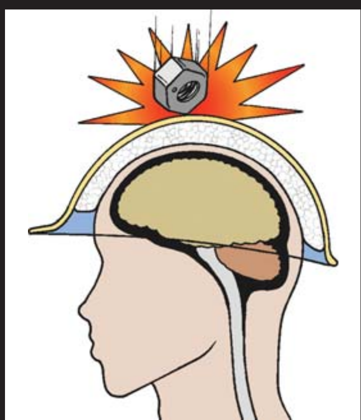
'SAWADA'

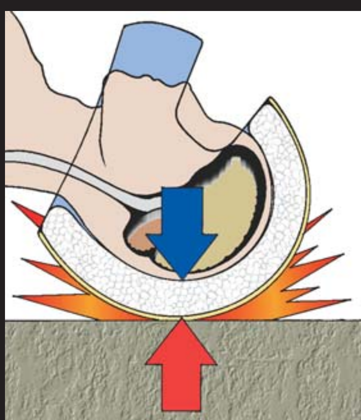
If you could read them, you would see the name of the man who mould the shell here, written in Japanese characters, in this case Sawada-san. From such identity marks, placed in an inconspicuous spot, it is possible to determine the following information:

1. *That this shell has passed two stringent quality control inspections*

2. *The personal commitment, responsibility and pride that follows from writing your own name on the product*

As the shell will later be painted, fitted with a shock-absorbing liner and completed with a comfortable interior padded lining, it is very unlikely that anyone will ever see these identity marks. Nevertheless the Arai craftsmen are proud to mark their work, that's the difference between an Arai and other helmets. But they are also important for the new owner, because what matters is the philosophy behind them, a philosophy that applies to all Arai products which is best explained by the following example. It's easy to dress in fashionable clothes, with nice and colourful accents for style. But the most important thing is what is in the clothes, body and spirit. So, even though Arai helmets are fashionably colourful and good looking, always remember that what's inside is really important. The backbone of the helmet, is the shell. The backbone of a sound construction is the spirit with which it is made and Arai always starts from 'The Spirit'.





INDUSTRIAL VERSUS MOTORCYCLE HELMET

Typical impact under industrial conditions. The industrial helmets offers protection from a dropping object around the crown area of the human skull.

Typical impact under motorcycling conditions. The mass of the body increases the impact energy to the body.

The helmet itself stops quickly at impact, but inertia makes the head keep moving on.

The head can bottom through the liner and hit the inside of the shell. The impact energy can then be transferred to the brain.

WHY A MOTORCYCLE HELMET PROTECTS UNLIKE AN INDUSTRIAL HELMET.

The purpose of helmets is to protect the human head. Their function is to decrease the amount of impact energy reaching the scalp, skull and brain. Impact energy reaching the brain may cause serious injury and helmets are meant to prevent that. However, there are many differences between helmets intended to protect against injuries because of motorcycle accidents and industrial helmets.

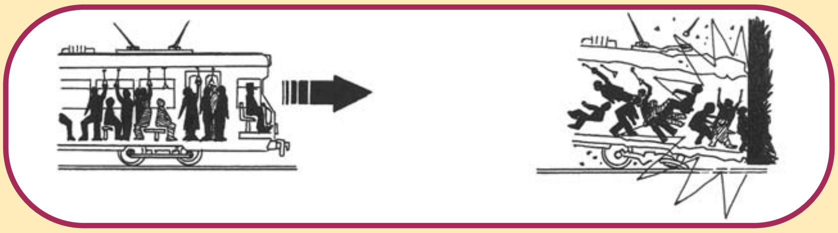
They must be different because the impact energy that causes injury comes from opposite directions!

Motorcyclists are subject to various speeds and impacts from different directions, while industrial helmets are primarily designed to protect from dropping objects. Therefore industrial helmets can be designed to protect against impacts from just one direction, while a helmet designed to protect a motorcyclist must be able to handle impacts from almost any direction and with rising energy levels with increasing speeds.

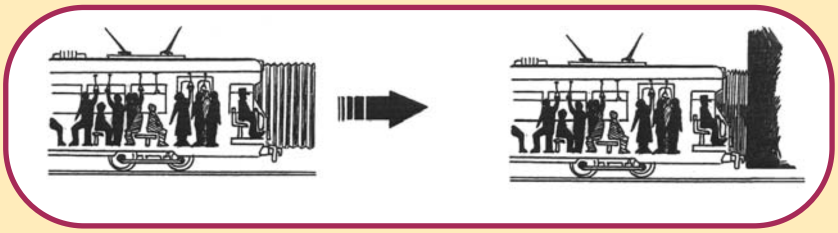
It is often thought that the helmet protects the head from impacting objects from outside. But the motorcycle helmet must handle much more than just that (relatively simple) task: first it must protect the soft (brain)tissue inside the head. Hitting the inside of the skull itself can injure this tissue.

Perhaps these illustrations may help to explain this phenomenon. Picture the train as being the skull and its passengers representing the brain:

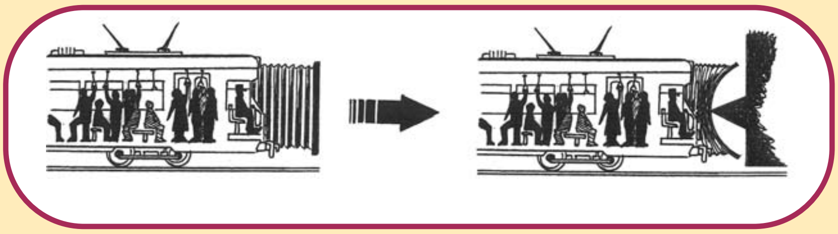
WHAT HAPPENS WHEN THE HEAD HITS THE INSIDE OF THE HELMET?



The train (skull) hits the wall and stops with little external damage. The passengers (brain) however, keep on moving due to inertia and are flung to the inside front of the train with considerable potential for damage.



Should the train (skull) be protected by a cushioning device at the front, impact energy will be absorbed and velocity reduced - the passengers (brain) will suffer less damage. In a motorcycle helmet the interior shock absorbing liner performs the function of this cushioning device.



What if the train hits a protruding object instead of a flat one? If the train's structure is not rigid enough under impact, the object may penetrate it and damage the passengers directly. However, if the body is strong and stiff enough, the force of the impact will be spread across a wider area and the passengers are better protected. The rigid body of the train represents the helmet shell.

Anatomy of the Arai helmet

Under the smooth surface of the helmet outer shell, a complex combination of materials and constructions can be found. Basically a helmet consists of:

(1) The (outer) shell
(2) The inner shell
(3) Comfort material
(4) The retention system

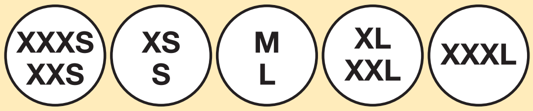
The outer shell

The Arai one piece superfibre laminate constructed shell, combines styling with protection. The anatomical designed shell protects the shock absorbing inner shell (and thus your head) against:

a) Penetration
b) Abrasion
c) First and repeating impacts
d) Weather conditions

The shells, in which aperture and rim are cut by laser with 0.01 mm precision, go through a process of minimum three quality inspections before they are released for final production. This can be seen by the different confirmation stamps and marks the inspectors have written on the inside of every shell (see page 25). In case a shell does not pass quality control, it will be destroyed.

Unlike many other manufacturers Arai provides one shell for each two helmet sizes. For example, on a helmet with a 'G' type shell you can recognise this by the approval numbers:



The advantage of using different shell sizes (instead of just one inner shell and the use of additional more or less foam padding to stretch the size range) is that of all helmets the inner shell and comfort material can always maintain the correct thickness for every size. This guarantees that all Arai helmets provide the same high graded protection. Also it is not by the likes of Arai to see a very small person with a rather big, 'oversized' looking helmet. Besides the cosmetic disadvantage, it is also possible that wearing a extremely large and/or heavy helmet may cause possible injury to the neck.

The inner shell

The polystyrene Arai inner shell, which fits exactly in the outer shell, protects the head against impact by functioning as a safety cell. It smoothly reduces the impact energy. But if the density (indicated in ‘gram/litre’) of the expanded polystyrene inner shell is too high, it will be too hard and will therefore not absorb the impact force.

In order to provide maximum safety, the inner shell should not be too large, causing the helmet to ‘dance’ around your head nor too small so that it constricts and causes pain. If the size of a persons head is required place a measuring tape around the head, just above the eyes and ears and over the small bump on the back of the head and read the size where the tape joins (see also page 40).
As is the nature of quality helmets, an Arai helmet is constructed in such way that the energy of a severe impact is absorbed through partial destruction of the shell and/or inner shell. Such damage may not be directly visible however from the outside. If the helmet has suffered a heavy impact, and any doubt exists about further ability to protect, we strongly advice either to return the helmet to the manufacturer for inspection or discard the helmet and replace it by a new Arai helmet. To provide effective ventilation, the inner shell is equipped with ventilation groves on the front and neck support side.

The retention system (chin strap)

The cloth covered chin strap is made of tight woven nylon webbing with the Arai patented double “D” ring buckle and mounted to the outer shell by means of stainless steel rivets.
Although conventional, the D-ring buckle is generally acknowledged as the safest retention system at the moment. The chin strap has a small push button to attach the red strap end, which can only be fastened if the chin strap has been tightened in the proper way. If the button is closed without looping through both double “D” rings, it can easily be noticed, because the chin strap will feel sloppy as a warning. You can find the ECE 22 orange approval label sewed on the chin strap. The date of production is stamped into the chin strap’s leather part.

In case of an accident, you may be subjected to impacts that occur coming from any direction. Some may tend to lift the helmet from your head. Therefore it is absolutely necessary that the chin strap is securely fastened, keeping your helmet firmly in place whenever you ride.

Comfort material

The comfort material is made of urethane foam, covered with (cloth) nylon webbing. In combination with the inner shell it provides a snug and comfortable fit, which is of course important for the safety. To prevent corrosion, the luxurious absorbent liner breathes and disperses moisture. The entire interior is washable in place! There is no need to remove bits and pieces, just swish in lukewarm soapy water, rinse well and let it dry for a day, never in direct sunlight or near a stove. Some Arai models feature complete or partly removable inner linings. These may also be cleaned and washed.

Construction and Material of the Shells

In general two kinds of materials are used for the outer shell of helmets: one is thermo-injected plastic (for instance ABS or Polycarbonate) the other is reinforced resin material better known among the public as 'fibreglass'. At Arai we only use 'Super Glassfibre' for our shell material, an exclusively by Arai developed reinforced resin material.

Any good raw material is just simply "raw material" unless technology is provided to make it to suitable for the specific needs of helmet shells. Arai's technical research is not only for resin, but also for other materials needed for complex shell construction, using several raw materials, which are light yet tough. Arai's advanced technical research has developed a new material called 'Super Fibre' and is one of the first manufacturers in the industry to make such an advance. Super Fibre is one of the best glassfibres for strength, and is developed for space and army defence technology. Its specific gravity is 2.4 and Super Fibre is 40% stronger for extension and bending resistance than normal fibreglass. Please note that even the basic Arai outer shell is made out of one layer of Super Fibre, but is often specified within Arai brochures and technical information as 'Standard Glassfibre' although it is actually Super Fibre.

Resin is an important factor to the strong yet light shell. Not only raw materials but also resins are the keys to produce stronger, tougher yet light-weight shells. Generally speaking, there are two types of resin: first those cured by thermo-setting (common for FRP shell helmets) and second is the resin cured at ambient temperature (for helmets with PC or ABS shells). The resin Arai use for manufacturing is not a standard resin commonly available in the market. It is made by mixing several different brands and types of resin to provide superior strength (by 10-15%) with selected raw materials.

Although different helmets can pass the same standards, this is no guarantee that they will be both

CHARACTERISTICS OF SHELL MATERIALS

Fibreglass Good for extension, compression, good balance for overall strength and reliability, but heavy. Its density is about 2.4 specific gravity.

Kevlar Good strength in extension, very light, specific gravity is 1.4. Strength for extension is more than steel, but not good enough against compression (as compared with fibreglass), and cannot be used solely as shell material.

Carbon Fibre Specific gravity is 1.8, good strength after moulding, but not tough and becomes fragile when impact exceeds its maximum strength level. This material absorbs less energy.

Super Fibre Developed for space technology and army defence purposes. Specific gravity is 2.4, about the same as fibreglass, but much better than fibreglass in extension and compression. Arai employs this material for the shell and has succeeded providing better performance as fibreglass with less weight.

equally effective in protecting against injury. Unfortunately these characteristics cannot be determined by standard tests.

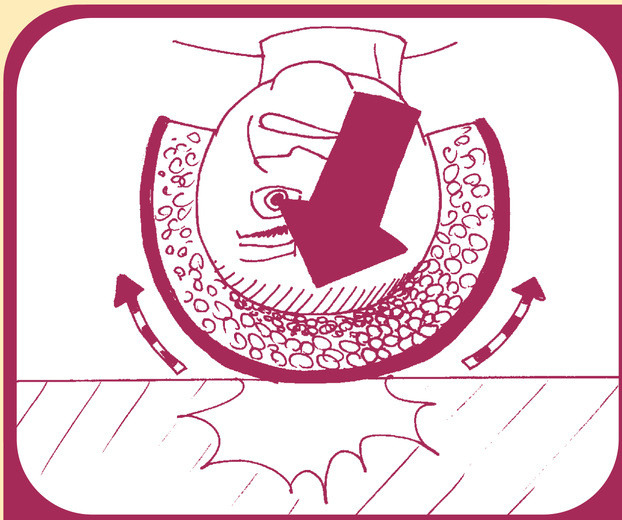
There are many helmets available with various standards such as SNELL 95, ECE 22-05, BSI 6658 A etc. All these helmets may look the same because they all wear the same approval label or sticker. However, there is a significant quality difference among these helmets. Some of them are made in such a way, that the standard requirements are also the maximum requirements. Others are on the contrary made with the standard demands as the minimum requirements!

For example, let's look at two types of helmets to make a comparison for a shock absorbing test. In this test the helmet is dropped from a certain height with a magnesium alloy headform to determine impact energy (G) occurring at impact. Also the important 'HIC' value (the Head Injury Coefficient) can be determined.

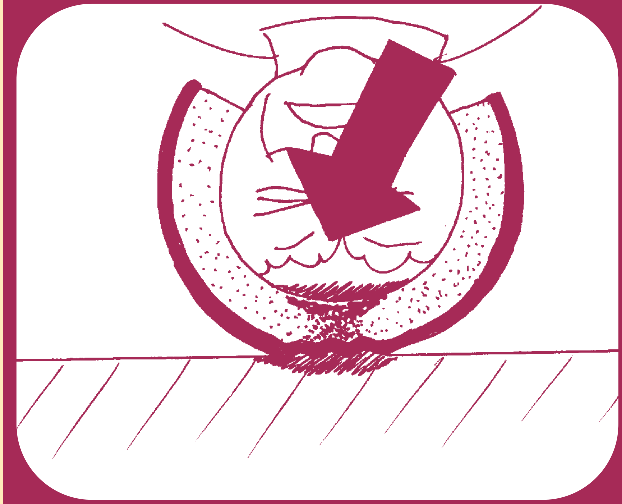
The test will be done with two completely different helmets:

Type A: *Rigid outer shell with soft density liner*
Type B: *Non-rigid outer shell with hard density liner*

Either helmet A or B may pass the same standard. But the reason why B may pass, is that a non-rigid shell breaks itself and absorbs impact energy in doing so. The remaining energy, which the shell cannot absorb, is then absorbed by the hard density liner, which can also work as part of shell function. Note that the absorption of the non-rigid shell may not be enough to absorb sufficient impact energy if multiple impacts hit the same point, and the harder density liner is not sufficient to absorb the total energy that is passed through.



Helmets designed as Type B can save much weight in the shell. However, when we talk about safety helmet shells, there should be another requirement in addition to "light weight" and that is "strong enough".

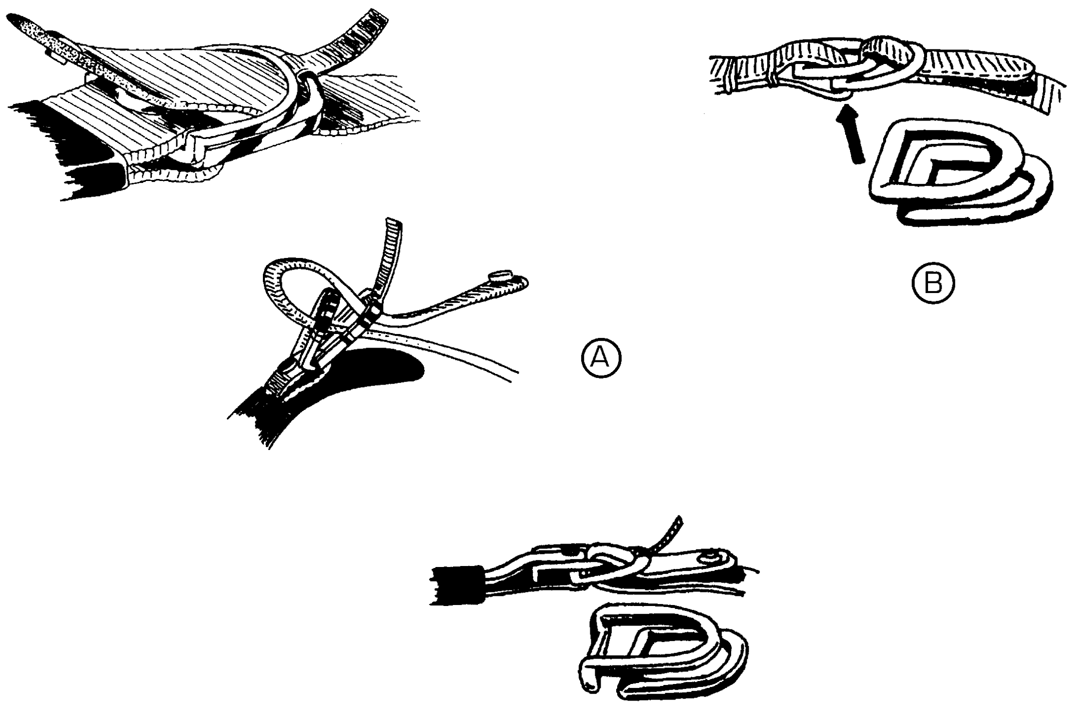


Although even Type B helmets satisfies penetration tests for shell strength required in some standards, some helmets are constructed in such a way that the outer shell is made partially strong only in those places where the tests impact will occur, in order to pass those tests.
As said, there will be many quality levels beyond what is required by the official standards. It is therefore important to know how to identify the better quality helmets.

The 'Double-D' *chin strap fastener*

The function of the fastening device is to hold the helmet on the head in case of an accident. The famous Arai 'Double-D' ring is well known and generally accepted as the best and most efficient fastening device within the helmet industry for a long time.

One touch quick release fastening devices are common on the market, but may malfunction if dust, sweat, oil or corrosion affects such a fastening device. The user might think that the chinstrap is fastened securely while actually the fastening device may not be not secured properly. Another disadvantage of the quick-release fastener is that it might press uncomfortably against wearer's jaw when the chinstrap is secured tight.
Therefore Arai has designed a D-ring fastener, known as 'L-type' which fits smooth to the wearers jaw, eliminating pressure caused by ordinary fasteners, yet providing absolute secure fastening. (Drawing A). A strap snap button is provided to prevent strap-end flapping during riding at high speeds. A red release tab allows easy loosening of the chinstrap even when wearing gloves. Another advantage of the D-ring fastener is the fact that everybody understands how its functions, and can therefore easily be released in case of an emergency.



ARAI SHELL CONSTRUCTION METHODS

Arai outer shells are constructed in several different methods:

(A) ScLc (Super Complex Laminate Construction)
2 layers of Super Fibre, one middle layer of special fibre. The middle layer consists of a very special material, a chemical fibre exclusive to Arai, which is very strong and light. The very advanced ScLc construction is used for the top of the range RX-7 and GP-5 models.

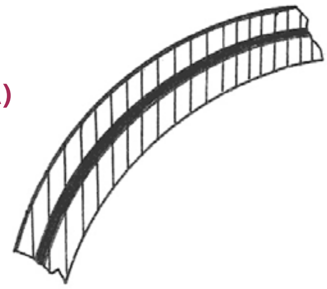
(B) cLc (Complex Laminate Construction)
2 layers of Super Fibre, one middle layer of composite fibre. This middle fibre is light and strong and better suited for production in lager numbers. This construction method is used for among others the Signet/GT, Maverick, Quantum/f. MX/VX and SZ Ram models. The cLc system replaces the old 'SCL' (Super Complex Laminate) method.

(C) FCL (Fibre Complex Laminate)
2 layers of Super Fibre with a layer of composite material in the middle. This is a new construction and is the successor of the SFL construction (Super Fibre Laminate, used for some SZ and MX models).

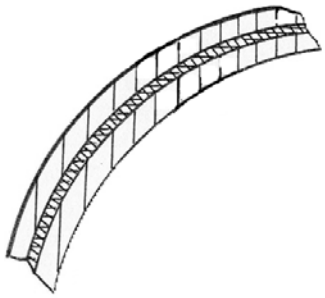
(D) Standard Glassfibre
One layer of Super Fibre, this is the basic Arai outer shell and is therefore called 'Standard Glassfibre' although the material actually is Super Fibre.

(E) New patented SNC® Construction
SNC "Structural Net Composite" is Arai's newest and most advanced shell construction. It incorporates a structural net reinforcing material embedded between Arai's exclusive Super Complex Laminate Construction layers. The specially-developed strands bond the layers more rigidly to further improve shell integrity and impact-force management. SNC also allows for more weight to be removed from the top of the shell, reducing overall helmet weight by almost three ounces (RX-7 Corsair vs. previous RX-7 models) while it lowers the center of gravity, resulting in better balance and reduced fatigue for more comfort.

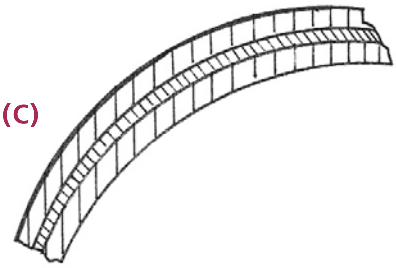
(A)



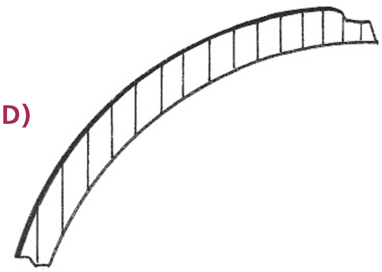
(B)



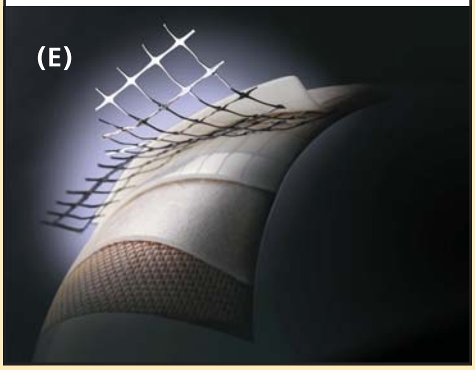
(C)



(D)



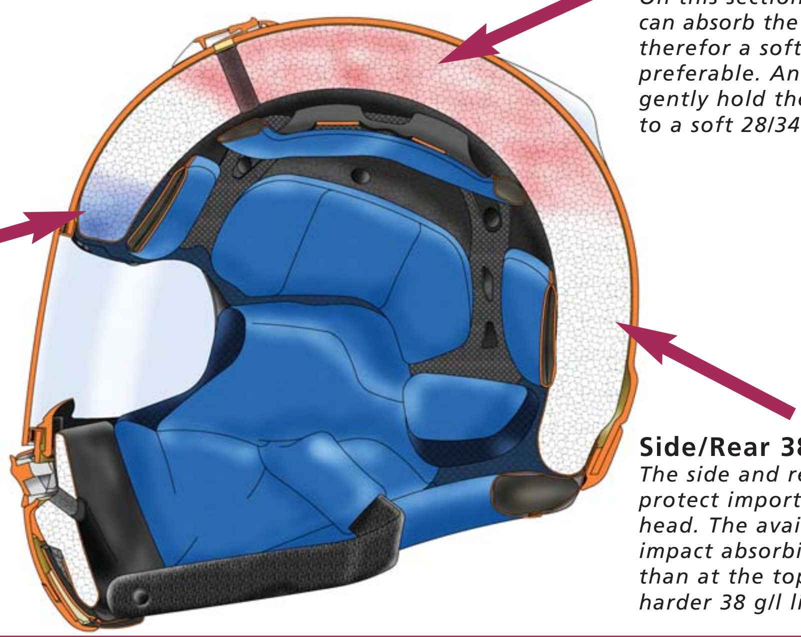
(E)



How the Arai 'Multiple-Density' inner shell functions

The inner shell (also named 'shock absorbing liner' or 'inner liner') absorbs impact energy as follows: beads in the liner are compressed and destroyed piece by piece extending the time of impact. This is similar to the crushing of bodypanels to absorb energy in automobile crashes.

Therefore, it is important to know if the helmet is furnished with harder density liner or one with a softer density liner, because the density of the inner shell has a strong relationship with the hardness (softness) and construction of the outer shell.
The role of the liner is to absorb an impact from the shell. Since helmets in general do not have a perfect round shape, the area of impact shell surface will be different in accordance with the shell shape. Also the direction of the impact energy will change during its travel through the outer shell and liner. Thanks to great strength of the Arai Super Fibre shell, the Arai shock absorbing liner density may vary from 24 up to 50 grams/litre, which is softer than other makers liners.
We must note that the surface of shock absorption (surface where beads of the liner are compressed and destroyed) is different in some cases, even when the same amount of impact energy is met. It depends on which direction the energy meets the shell: frontal impact is absorbed with a relatively small and narrow surface, while side impact will be absorbed with a much larger surface. When the density of the liner at the front would be the same as at the side, it might be not enough to absorb impact energy if the density at the side is soft. But a hard liner at the side would not be as comfortable as a soft liner would be.
The solution is the unique Arai 'Triple-density' liner. For over 20 years Arai has provided shock absorbing with different densities. With this system, the density of the forehead area is slightly harder than that of the side, rear and crown area.

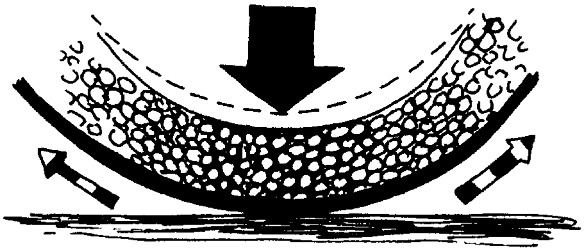


Top 28/34 grams/litre
On this section, a large area can absorb the impact energy, therefor a soft liner is preferable. An Arai helm will gently hold the head thanks to a soft 28/34 g/l liner.

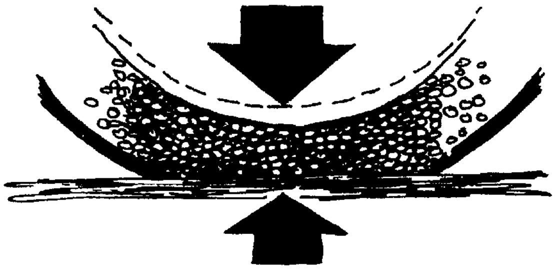
Front 50 grams/litre
A small area must absorb impact energy here, therefore harder 50 g/l liner is used to prevent total destruction of the liner under impact.

Side/Rear 38 grams/litre
The side and rear section protect important parts of the head. The available area for impact absorbing is smaller than at the top, therefore a harder 38 g/l liner is used.

SAME LINER, DIFFERENT SHELL

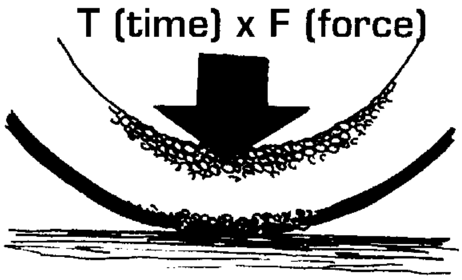


Strong, stiff shell will transfer impact energy to a larger surface, resulting in impact energy to be absorbed over a large area.

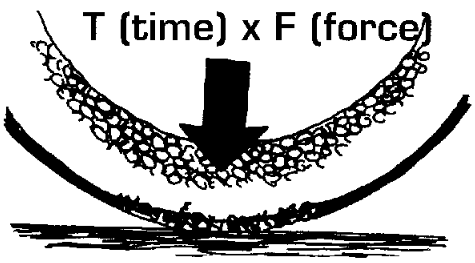


Less stronger and stiffer shell will absorb impact with partial destruction, but if the impact energy is more than it can handle, shock absorbing liner may not be able to absorb all remaining impact energy.

SAME SHELL, DIFFERENT LINER



T (time) x F (force)
Thinner liner with harder liner density has smaller surface to absorb energy, final transmitted energy is higher as time period of destruction is shorter.



T (time) x F (force)
Larger, softer liner beads can provide large surface to absorb impact energy, destruction time is longer, and as a result transmitted force is smaller.

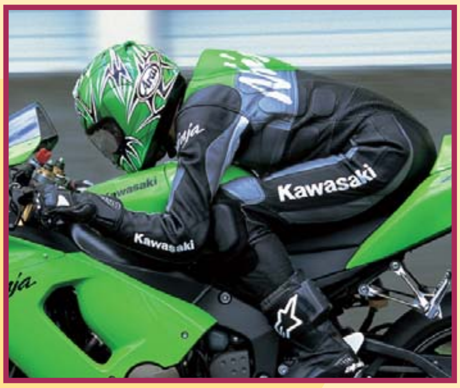
Superior Ventilation

An effective ventilation is of very important for several reasons: it will reduce fogging of inside of the shield, provide fresh air for the rider and will remove, transpiration and damp and warm air. Comfort and therefore safety will therefore increase with the superior Arai ventilation systems

Cool, fresh air enters the helmet through these vents. The vents can easily closed or opened with one hand.Damp and warm air leaves the helmet through these Double Delta Duct exhaust vents.

Typical for Arai helmets are these very efficient vents in the visor, fresh air can enter directly tot the forehead area.Essential for defogging of the visor and fresh air for the respiration is the chin vent.

Ram-air entering the diffuser causes a vacuum between the diffuser and the helmet's outer-shell. Due to this vacuum, warm air is sucked out of the helmet through the (seven) air-vent holes and leaves the diffuser through the two outlet channels that may be closed if needed.



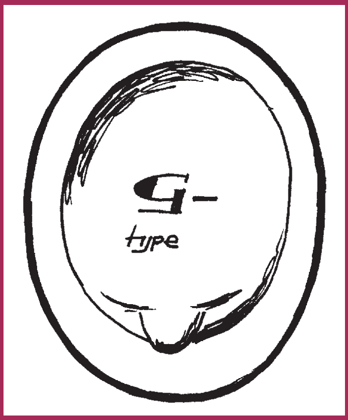
A fortunate side-effect of the vents and scoops on an Arai helmet is the fact that they lower very efficiently the noiselevel in the helmet, because the turbulence they cause lowers the vacuum behind the helmet which is the main source for helmet noise.

THE BEST SHAPE OF A HELMET

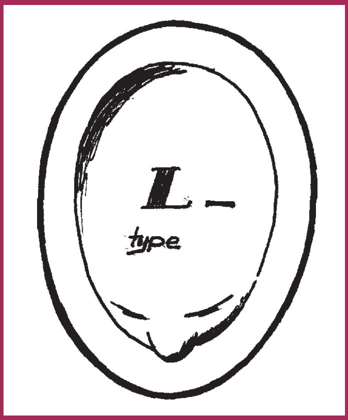
Nobody knows from which direction impact energy forces may come. Therefore, a shell must be good enough to transfer impact force across its surface, wherever the impact comes from. In this regard, not only shell materials, but the shape of the shell is also an important factor. The shell shape must be as close as possible to the one of the human head. One of the characteristics of Arai is the use of different shell shapes. There is for instance the G-shell for a more rounded human head and the L-shell for longer, narrower faces. Arai even produces different shaped shells and liners for different continents: rounded for Asian countries, longer and narrower for North American customers and wider at the front for the European market.

It should also be as small as possible to minimise the centrifugal force effects. Both inner and outer shell surfaces should be smooth, and there should not be external or internal projections which might cause secondary impacts or the destruction of the shock absorbing liner. The shell should have a certain radius which is stronger than a flat surface. A flat surface is good for parts assembly, but not strong enough against severe impacts (as compared with a round surface of the same thickness).

Top View
View of the human head seen from the top, showing widely rounded shape at the rear and narrower rounded shape at the forehead. A helmet shell should be as close as possible to the same shape as the human head.



Top View G-Type



Top View L-Type

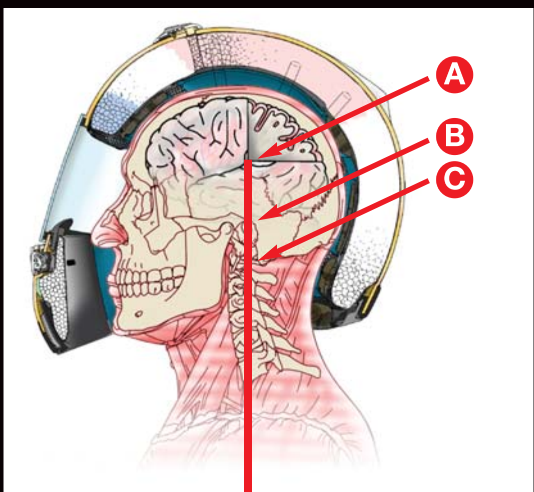
Front View
Cheek and chin area should be narrower to fit the shape of the human face - however it is difficult to mould shells this way.

HELMET WEIGHT AND CENTRE OF GRAVITY

It is not logical to simply state that lightweight helmets are 'better' than heavier ones. Instead we should define 'better helmets' by the stress transferred to the neck and helmet weight is just one of the many factors that may cause stress to the neck.

The average weight of a full-face fibreglass helmet is about 1400 grams. In general, the mass of a human head differs between 5 tot 7 kilos. Even if the helmet weight is measured on a scale, you still cannot tell whether the helmet will give much stress on the neck or not. Why? Because we hardly feel the weight of the helmet if its positioned straight above the head in a totally upright seating position, as both the human head centre of gravity and the helmets centre of gravity are close together when wearing a helmet.

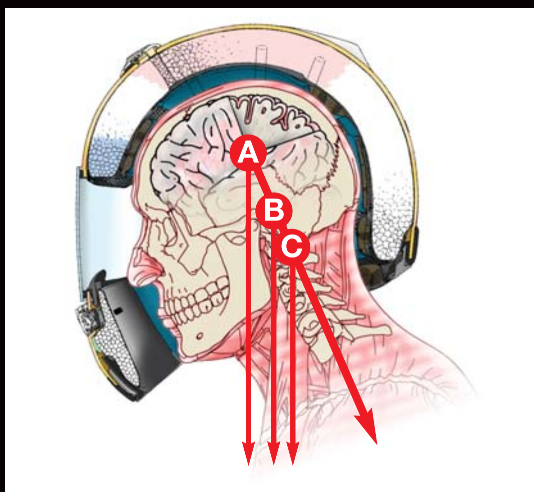
But we will experience stress on the neck by helmets weight in a crouching position, which points at the fact that weight balance between the helmet and the



(A) Centre of gravity of helmet (far from C)

(B) Centre of gravity of helmet (close to C)

(C) Centre of gravity of the human head



When the helmet is straight (vertically) on the head, the centres of gravity of A, B and C are in line and we do not feel much difference. In a crouching position, as shown in this sketch, a difference in load or pressure between A and B will be noticed. When the centre of gravity is positioned at point A, the downforce on the head will be much higher compared with force caused by the centre of gravity at point C.

human head is not close, or may also be caused by a poor fit. This allows slack between the helmet and the wearer's head, causing the helmet to move just after the head moves when looking back. Wind lift and long distance riding can also provide stress.

Therefore, to find out whether a helmet stresses the neck or not, we should test the helmet by wearing it in a crouching position and shake the head left and right. If the centre of gravity of the helmet is far above the head, you will feel much stress. If the helmets centre of gravity is positioned high, it could indicate that shell thickness is not entirely uniform. It might be thicker above test line (the line indicated fort shell tests, see also page 12) to meet required shock absorbing tests, but not around the edge which lies out of test area. If the shell thickness is constantly uniform and a certain thickness is provided down to the bottom edge of the helmet, such a helmet might be a little heavier, yet its centre of gravity will be lower which causes less stress on the neck.

If a helmet fits too loose, it will give additional load when you turn the head to look backwards. It will give secondary stress on the neck, as the helmet still tries to move by inertia even if the head already has stopped moving. But of course, a loose fit is never good and the same is true when the helmet fits too tight. A correct fit of the helmet is a crucial factor in reducing stress on the neck.

HELMET STRENGTH: A QUICK TEST

Helmet strength depends on design, materials and construction, but each individual part should be strong enough to provide sufficient stiffness and strength in the helmet.

The regulations of most official helmet standards (or homologations) examine only the upper half of the helmet for shock absorption, but the lower edge of the helmet should be examine also to find out about the strength of the helmet. Experts check helmet strength by pressing both edges as shown here. Then compare several different helmet makes. You will immediately feel if the helmet shell is string and stiff, which indicates that the whole shell and not just a certain part offers sufficient thickness.

How to determine the right size

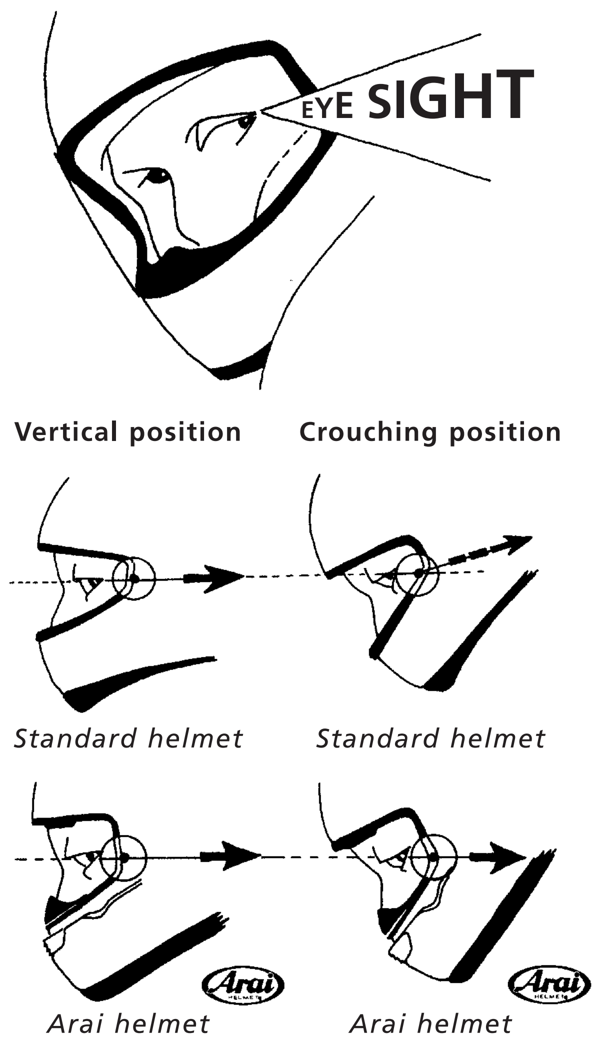
Shown here is the correct way to measure the circumference of the head, in order to determine the best size of an Arai helmet for customers who are buying a helmet.

Check the circumference across the forehead, above the ear and at the back of the head as illustrated. Allow some tolerance in case of very long or thick hair, try on both smaller and larger size. If you prefer a tight fit, choose tighter size, looser size if not. If uncertain, take the tighter size. In special cases, Arai helmets can be made to measure by the official Arai dealer or national importer. But thanks to the interchangeable cheek- and chinpieces in different thickness', Arai helmets can almost always be modified for a perfect fit. Cheekpieces are for instance available form 15 up to 35 mm thickness.

Table of Arai sizes:

Size	Circumference in centimetres
XXXS	49-50
XXS	51-52
XS	53-54
S	55-56
M	57-58
L	59-60
XL	61-62
XXL	63-64
XXXL	65-66

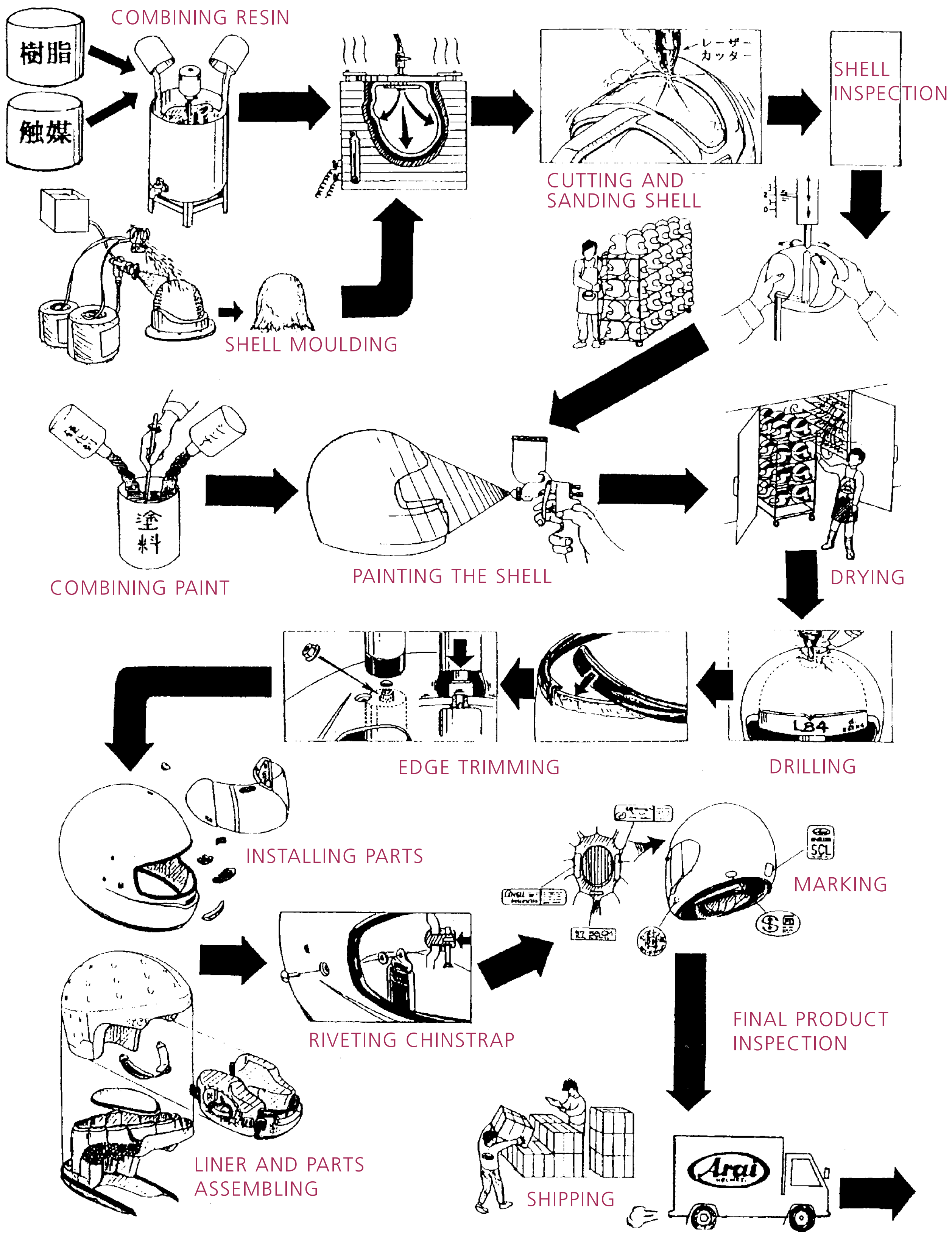
LARGE HELMET APERTURE



HELMET APERTURE (VISOR OPENING)

For safety in traffic, the aperture in the shell should provide enough peripheral vision for sufficient sight to the side and, when looking over the shoulder, backwards as well. As illustrated, an enlarged aperture on both side provides a wide view to the back while riding.

ARAI, WHAT'S IN A HELMET.....



PROCESS OF MANUFACTURING HELMETS