

# Sword steel

## Sharpness of a Japanese sword

The sharpness of any blade is expressed by its ability to cut. This effect is typically produced with a very acute angle on the blade giving it the ability to slice through material that is softer than the blade itself with comparative ease. This is the simplest way we can look at sharpness, but this definition, this explanation has its flaws. The reason we want a blade to be sharp in the first place is because we want to put it to a purpose and because of that, the blades purpose is more important than how hair poppingly sharp it is.

If you have an edge with a very acute angle and flat or even concave sides then it will slice very easily, but because of these properties it will be more delicate. This makes this sort of edge very good for soft targets that offer little resistance or are dense but not hard. However the blade would not fare as well if it were used to cut bamboo or if it were used in battle, clashing off of other swords or armour. In fact it would not last very well at all.

A blade for such a purpose would have to be more substantial. Historically this was achieved by forging a blade with more niku, or 'meat' to it. Rather than having flat planes on the sides of the blade, it would be forged with a convex or 'appleseed' type cross section. This meant it came to a much less acute edge angle and had extra supporting metal behind it allowing it to take more of a beating. None of this means that a blade with no niku is really more functionally sharp than a blade with plenty, simply that the sharpness has been forged into the blade with its intended purpose in mind.

On an edge of any angle, there are other factors that come into play in determining whether or not it will cut well. The angle of the edge has to be consistent, the steel has to be resilient and the edge itself has to be straight and free of damage. Any sword will sustain damage to some degree when it is used and this damage adds up over time like a well used razor, until it doesn't cut as well as it should.

The most common type of damage is scuffing which is the scratching of the blade by the target as it is cut through. This is mainly cosmetic however and can be touched up by using a very mild abrasive or in some cases, even by using uchiko powder. Other forms of damage include rusting caused by neglect and poor maintenance or even rolled edges, which are more common on through hardened blades and are caused by incorrect edge alignment and hard targets. All of these things negatively impact on the sharpness of your sword.

Fortunately, a well made sword is maintainable and most edge damage can be fixed by a professional. Attempting to rehone your own blades is possible but unless you're confident I wouldn't recommend it as too many swords are ruined by well intended amateurs. Chips, flattened edges or even pitting and mild rust can be worked out of the blade by someone who knows what they're doing. Having said this, if the sword in question is not expensive or a valuable antique and you do feel confident then with some research, materials and patience you can normally return the edge to its original functionality.

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