

## Product Information DSC carbon



# Datasheet DSC carbon

## DSC - Damascus Steel SuperClean ferritic-martensitic compound

Steel	Etch Color	C	Si	Mn	Cr	Mo	V	Ni
1.2842	dark	0.85-0.95	0.1-0.4	1.8-2.2	0.2-0.5	-	0.05-0.2	-
1.2767	bright	0.45	-	-	1.40	0.25	-	4.0

Chemical compositions (%)

### Hot Working

The forging temperature for our carbon Damascus steel is 950-1080°C.

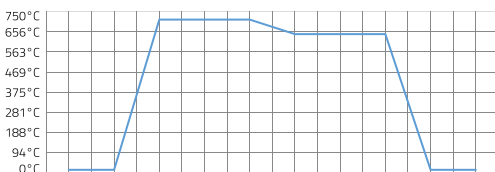
### Cold Working

Cold working of our Damascus steel is usually not possible.

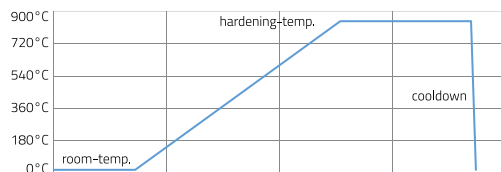
### Machining

All our products are delivered soft annealed. The hardness of the steel in this state is about 22-27 HRC.

### Annealing Information



### Hardening Information



Deep freezing after hardening is not required, but recommended.

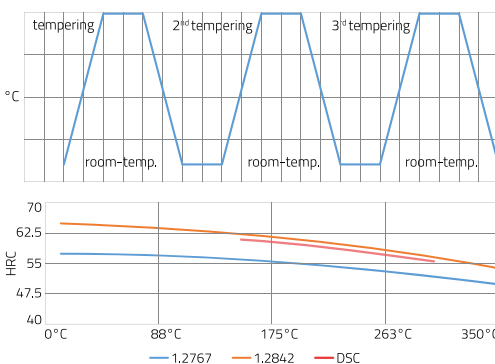
To process our DSC carbon after hot working, you need to perform a soft annealing process as follows. This will avoid cracks or breaks in the material.

- Heat it in the oven up to 720°C
- Holding time of 2 hours at 720°C
- Holding time of 2 hours at 650°C
- Slow furnace cooling
- Remove at temperatures of < 300°C

We recommend the hardening process according to the following instructions:

- Heat it in the oven up to 840°C
- Holding time for 4 minutes at 840°C
- Rapidly quench in oil

### Tempering Information



Please note that a new material with its own hardness profile is created through the composition of Damascus steel.

Tempering after the hardening process is needed to convert the steel structure into tempered martensite and to adjust its hardness. We recommend a tempering of at least 2 x 1 hour.

#### We recommend for knife blades:

2 x 1 hour at 180°C (62 HRC)

#### We recommend for decorative items:

2 x 1 hour at 200°C (61 HRC)

## DSC – Damascus Steel SuperClean ferritic-martensitic compound

DSC stands for “Damascus Steel SuperClean”, entered as a trademark at the German Trademark and Patent Office. In the steel industry, the term “super clean” designates extremely fine and pure steels. This carbon steel is super clean as it is produced and specially treated by a weld bonding process which prevents the build-up of contaminants in the steel or the welding seams. This pure weld-bonded composite steel is produced powder-free using traditional methods on the basis of solid material and reacts with very low distortion when heat-treated. The connections of the welded layers of steel do not separate during further hot working or machining. A high degree of hardness of up to 62 HRC and good ductility produces the best cutting properties for blades. DSC carbon consists of up to 320 layers of steel.

### Applications

Our DSC carbon provides use in multiple applications including excellent razor production, with problem free heat-treating. The welds remain completely intact under production stamping. Your unique requirements and ideas come first and are our guideline and we are ready to produce according to your special wishes. Feel free to contact us and discuss your specially produced DSC carbon.

### Quality

We have been producing custom Damascus steel since 1991 and you will profit from our experience. DSC carbon combines the know-how and experience of over 25 years. Our patented DSC SuperClean process gives us 160 layers, with other layer and component combinations possible per request. Our unique process is exemplified by the extreme cleanness and fine grain without weld faults.

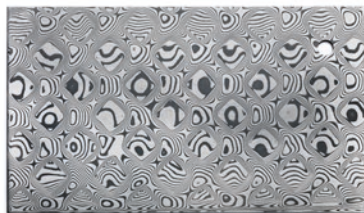


## Variety – Our Patterns

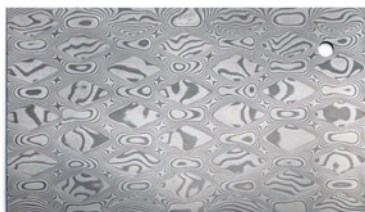
Discover the wide variety of our Damascus steel. Our patterns are created traditionally with blows from a hammer or by mechanical displacement of the single layers deep into the core. Special or exclusive patterns can be produced for bulk purchase customers upon request.



leopard skin



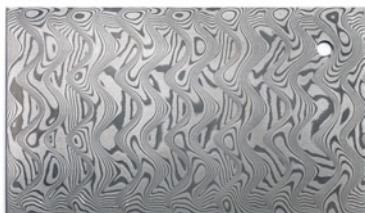
large pyramids



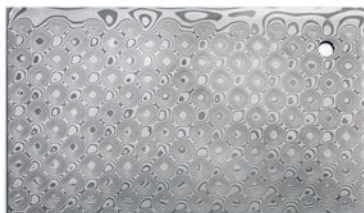
large rhombi



roll damascus



herringbone



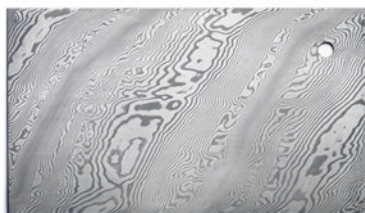
small roses



wild damascus



ferus



torsion damascus



special & customized patterns

## DSC – Damascus Steel SuperClean ferritic-martensitic compound

Only highly alloyed and modern steels are used for our carbon Damascus steel – to guarantee that our consumers receive steel with the best properties. The steel industry advertises the material as having very good cutting properties, as being corrosion-resistant and particularly suitable for industrial applications. These unique properties can once again be found in our finished Damascus and make our steel compound interesting for steel experts, jewelry manufacturers, the knife industry and for the production of exclusive unique pieces all over the world.

Steel	Etch Color	C	Si	Mn	Cr	Mo	V	Ni
1.2842	dark	0.85-0.95	0.1-0.4	1.8-2.2	0.2-0.5	-	0.05-0.2	-
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Chemical compositions (%)

### Characteristics

- SuperClean-layer welds
- Easy working
- Very fine grain
- Reliable production process
- Multiple options, patterns and dimensions
- High edge holding
- High hardening possible (up to 63 HRC)
- Uncritical misforming after heat treatment



## Hot Working

The forging temperature for our carbon Damascus steel is 950-1080°C. Please note that the steel is very tough during processing, even during hot working – a manual processing is therefore only recommended for smaller dimensions.

- Be sure to comply with the forging temperature
- Cool the steel down slowly after deformation
- Before further machining can take place, soft annealing is required

## Cold Working

Cold working of our Damascus steel is usually not possible.

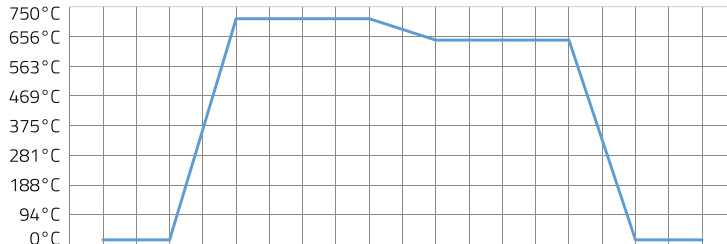
## Machining

All our products are delivered soft annealed. The hardness of the steel in this state is about 22-27 HRC. Metal-cutting operations are possible in this state – the connections of the welded steel layers will not separate during further machining.



## Annealing Information

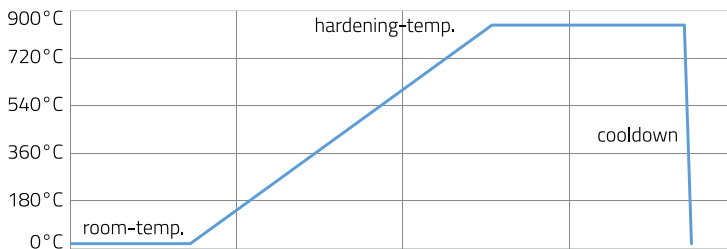
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- Heat it in the oven up to 720°C
- Holding time of 2 hours at 720°C
- Holding time of 2 hours at 650°C
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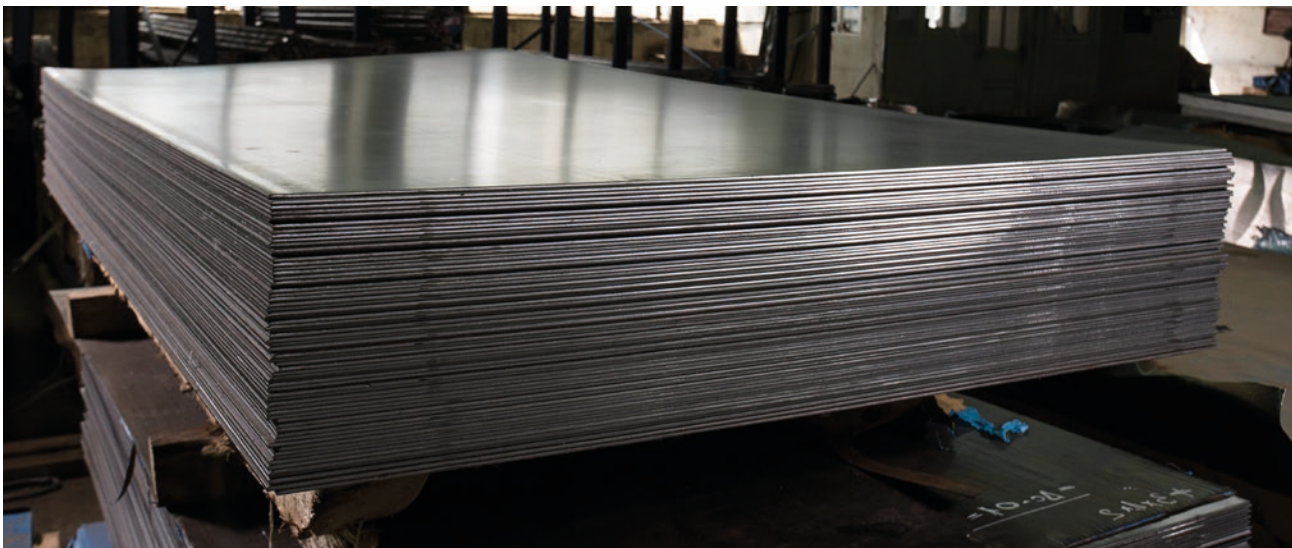
## Hardening Information

We recommend the hardening process according to the following instructions:



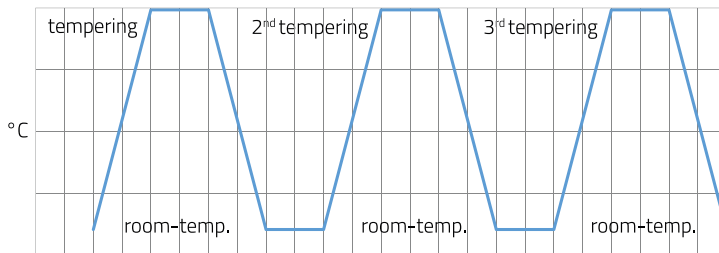
Deep freezing after hardening is not required, but recommended.

- Heat it in the oven up to 840°C
- Holding time for 4 minutes at 840°C
- Rapidly quench in oil



# Tempering Information

Tempering after the hardening process is needed to convert the steel structure into tempered martensite and to adjust its hardness. We recommend a tempering of at least 2 x 1 hour.

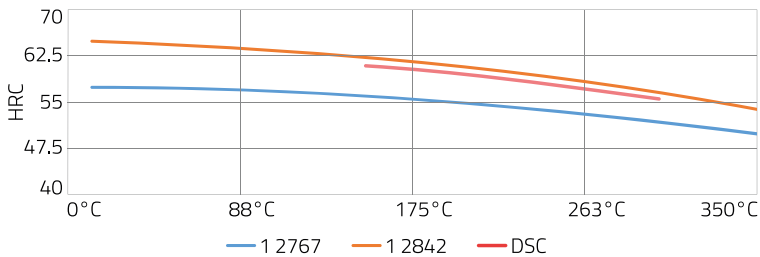


**We recommend for knife blades:**

2 x 1 hour at 180°C (62 HRC)

**We recommend for decorative items:**

2 x 1 hour at 200°C (61 HRC)



Please note that a new material with its own hardness profile is created through the composition of Damascus steel.



## Etching Information

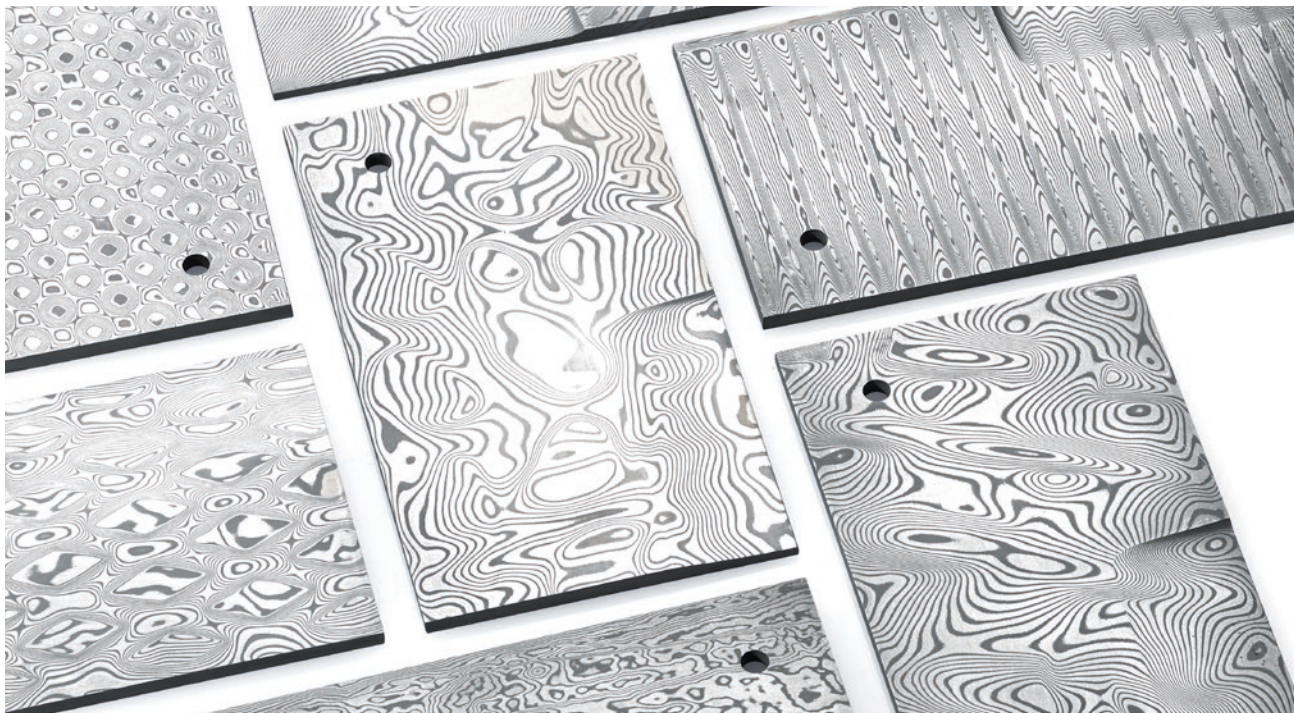
In order to achieve a perfect etching result, the following steps should be followed:

- Fine polish and mirror polish after hardening
- Remove contaminations and possible fats with e.g. dishwashing liquid / acetone
- Etching process (see next page)
- Neutralize
- Second fine polish or fine grinding (grade > 2000) until desired contrast is achieved.

You can etch our steel with various acids. In order to achieve a good result, the acid should be heated in a water bath to 50°C. We recommend a deep etching until the change in layers is quite noticeable.

	acid	chemical name
1	Sulfuric acid (15-30 %)	H <sub>2</sub> SO <sub>4</sub>
2	Iridium (III) chloride (15-35 %)	FeCl <sub>3</sub>

Please note the safety instructions and warnings for handling acid. Neutralize the Damascus steel thoroughly after etching.



Samples, fine polished after deep etching.

## Shapes / Sizes

Our products are available in various shapes and sizes. The following dimensions are the maximum possible dimensions. The standard length of embossed Damascus steel is from 1.0 to 1.15 meters.



Standard material cross-sections, other shapes are possible by arrangement.

### Round

Manufactured by hand in the patterns torsion Damascus and layered Damascus, scaled surface, raw.

- Torsion Damascus: diameter < 35 mm, length < 1150 mm
- Layered Damascus: diameter < 60 mm, length < 1150 mm

### Square/Rectangle

Available in the patterns torsion Damascus and layered, scaled surface, raw.

- Torsion Damascus: side length < 32 mm, length < 1150 mm
- Layered Damascus: side length < 450 mm, length < 5000 mm

### Flat

- Embossed patterns: width < 60 mm, thickness 1-20 mm, length < 1150 mm
- Torsion Damascus: width < 60 mm, thickness 1-15 mm, length < 1150 mm
- Layered Damascus: width < 480 mm, thickness 8-450 mm, length < 5000 mm

### Sheet

- Layered Damascus sheet „hot strip“: width < 700 mm, thickness 1.5-8.0 mm, length < 2000 mm

## How to Order

### Consumers

As an end consumer or when purchasing a small quantity, you can easily order in our online shop. All items are in stock and immediately available.

[www.balbachdamast.com/en/material-store](http://www.balbachdamast.com/en/material-store)

### Bulk buyers

We will gladly prepare an attractive offer and will support you in the implementation of projects – please contact us.

[info@balbachdamast.com](mailto:info@balbachdamast.com)

### Seller / Knife maker

For small dimensions and orders, please use our online shop. For larger orders or custom orders please contact us by email.

[info@balbachdamast.com](mailto:info@balbachdamast.com)

### Distribution partners

You want to offer your customers our Damascus steel and actively market it? Terms and conditions are available upon request – please contact us.

[info@balbachdamast.com](mailto:info@balbachdamast.com)

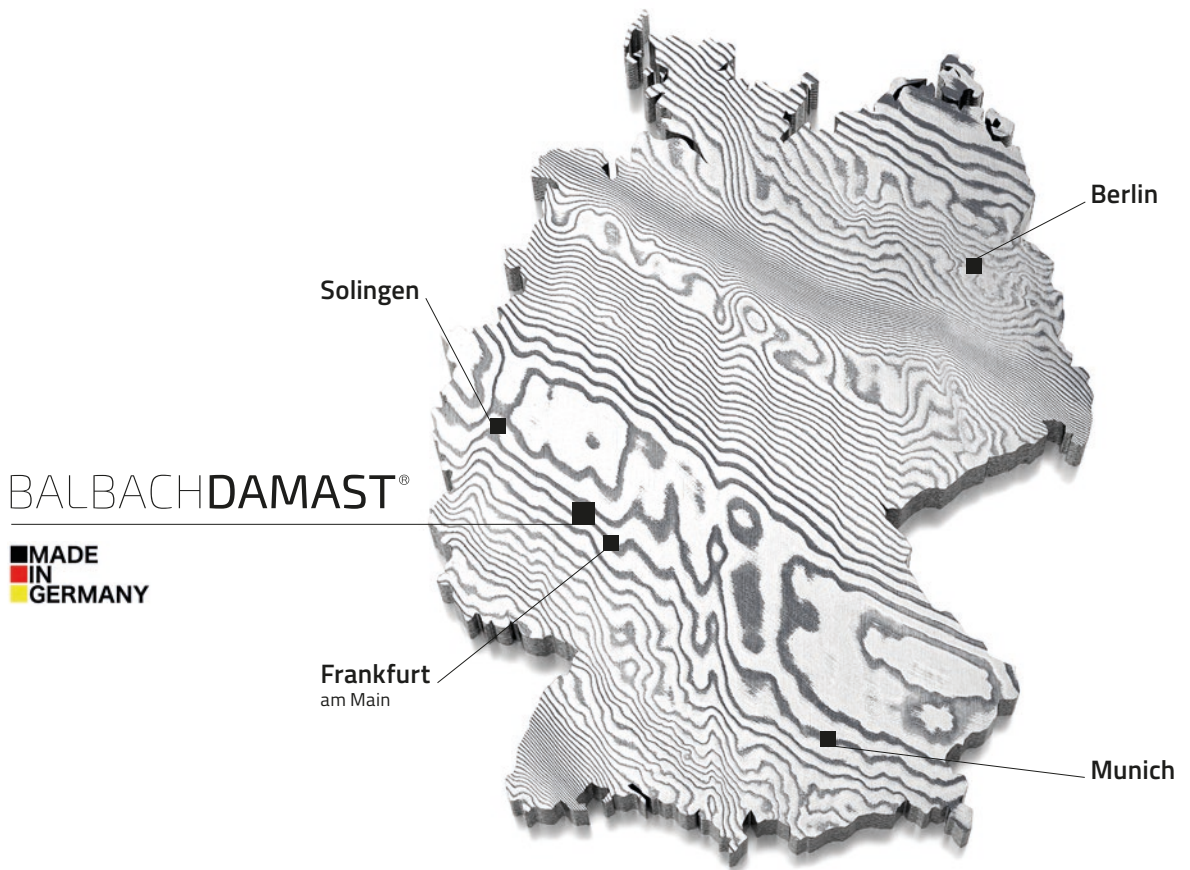
### Please always specify:

- Full name and mailing address, Tax ID Number
- Type of Damascus steel
- Dimensions, quantity & pattern



## Location

On more than 3,200 square meter production area, we've been manufacturing our unique Damascus steel since 1991 centrally and exclusively in the heart of Germany.



The information in this document is based on experience, there is no legal claim. All data is not guaranteed, no liability is accepted for damage.