

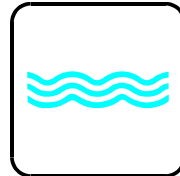


## Refinishing Instructions

Accessory Tools for Pneumatic and Electric Hammers

**pneumatiline**

**electroline**

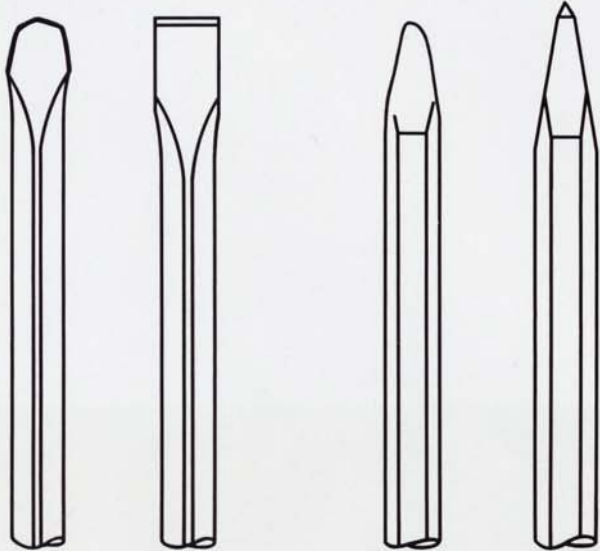


(Water Hardening)



# Refinishing Instructions

## Regrinding



### Regrinding

Tools which show slightly worn working ends (points, cutting edges) can be **carefully** reground. It is important to prevent any heat build-up, to avoid any loss in hardness or create grinding cracks. Water-cooling is a must in this case! If the working end area is badly worn, fractured, or otherwise damaged, refinishing in the form of reforging with subsequent heat treatment will be the only way of reconditioning.

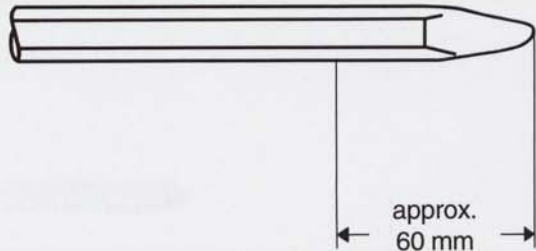
## Reforging

Temperature Color Chart		
	Temperature in °C approx.	Color Designation
	550°	dark - brown
	630°	brown - red
	680°	dark - red
	740°	dark cherry red
	780°	cherry - red
	810°	light cherry red
	850°	light - red
	900°	quite light red
	950°	yellow - red
	1000°	light yellow red
	1100°	yellow
	1200°	light - yellow
	1300°	yellowish white

### Reforging

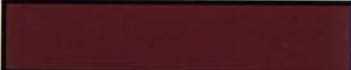

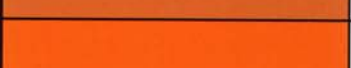
Tools with excessively worn working edges should be reformed as follows: Heat the working end over a length of approx. 60 mm to a temperature of 900° - 1000°C equal to the heat color of "quite light red" to "light yellow red".

Length of tool area to be heated:



# WATER HARDENING

## Rehardening

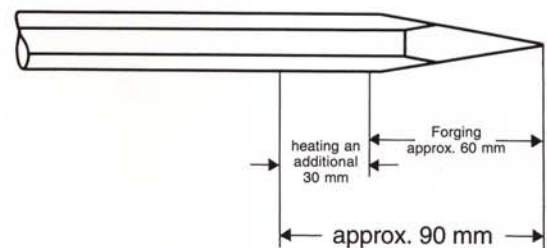
Temperature Color Chart		
	Temperature in °C approx.	Color Designation
	550°	dark - brown
	630°	brown - red
	680°	dark - red
	740°	dark cherry red
	780°	cherry - red
	810°	light cherry red
	850°	light - red
	900°	quite light red
	950°	yellow - red
	1000°	light yellow red
	1100°	yellow
	1200°	light - yellow
	1300°	yellowish white

### Rehardening

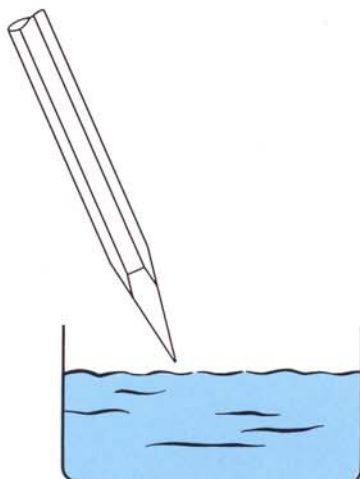
After forging, the tool must be rehardened as follows:

Reheat tool only over the area of reforging (i.e. 60 mm) and add 30 mm to it for an approx. total length of 90 mm to a temperature of 780° - 810°C equal to the heat color of "cherry - red" to "light cherry red".

Length of tool area to be heated for rehardening process:



## Quenching


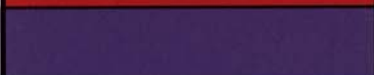



### Quenching

The above "Rehardening" process is NOT complete until the reheated parts are quenched **immediately** after reheating. Use a water bath (not oil) with a temperature of 20°C minimum to 40°C maximum. The addition of salt is recommended - ideal a 10 to 12% solution.

It is **important** that the parts are kept moving during the quenching process. This prevents the formation of air- or steam bubbles which can lead to "soft spots".

# Tempering

Tempering Color Chart		
	Temperature in °C approx.	Color Designation
	200°	pale yellow
	220°	straw - colored
	230°	golden - yellow
	240°	yellowish - brown
	250°	brown - red
	260°	red
	270°	purple - red
	280°	violet
	290°	dark - blue
	300°	cornflower - blue
	320°	light - blue
	340°	bluish - grey
	360°	grey

## Tempering

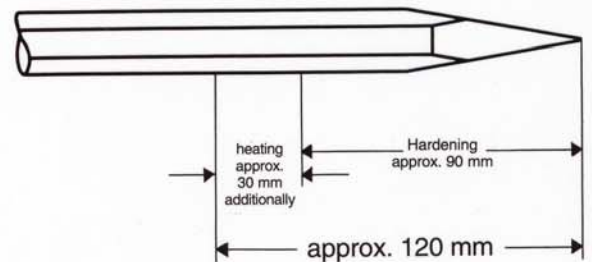
Tempering is an essential part of the whole reconditioning process which insures that the forging or hardening area receives the same hardness distribution as the untreated part of the tool!

Omission of the tempering process will inevitably lead to cracking and breakage within the transition area.

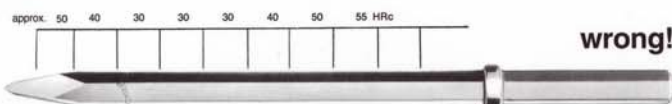
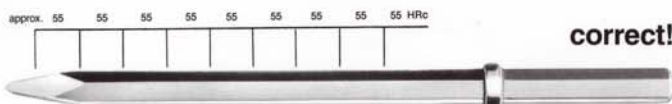
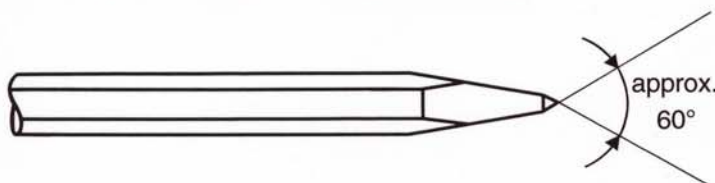
Tempering a tool means reheating the tool once again over the rehardened area (length of 90 mm) plus an additional 30 mm for an overall length of 120 mm to a temperature of 260° - 280°C equal to the heat color of "red to violet" over a tempering time period of approx. one (1) to two (2) hours.

The temper-color is best checked over a bright ground surface.

Heated Tempering Area:



## Sharpening / Regrinding



## Sharpening / Regrinding

The last step - after the tool has cooled down properly - is to regrind the working point or edge. (also see "Regrinding")

If the tool is properly reground, hardness distribution will be constant over its whole length.

If, however, the tool is **improperly** reground, the hardness distribution will vary considerably with the untreated part of the tool, leading to fracturing under stress!