

# WM D-7

**WM D-7** is a high carbon-high chromium die steel with added carbon and vanadium for unexcelled abrasion resisting qualities. It was developed especially for applications involving extreme abrasive wear. It approaches the powder metal 10V wear properties at less than half the cost.

## Chemical Composition

<b>Carbon</b>	<b>2.30</b>
<b>Silicon</b>	<b>0.40</b>
<b>Manganese</b>	<b>0.40</b>
<b>Chromium</b>	<b>12.50</b>
<b>Vanadium</b>	<b>4.00</b>
<b>Molybdenum</b>	<b>1.10</b>



## Typical Applications

Brick Mold Liners, Brick Mold Die Plates, Wear Resisting Parts, Ceramic Tools & Dies, Briquetting Dies, Deep Drawing Dies, Flattening Rolls, Lamination Dies, Forming Rolls

## Hardening

Harden **WM D-7** in properly rectified salt baths or in controlled atmosphere furnaces. If an open furnace is used, pack harden, wrapping the pieces to be hardened in heavy brown paper and pack in clean, gray cast iron chips or one of the commercial packing compounds. Austenitic stainless steel foil has also been found to be an effective method of surface protection when a limited number of tools are being produced. Preheat at 1400-1500°F, then heat to 1950-2000°F for maximum hardness and abrasion resisting qualities or to 1875-1925°F for dies and tools which require a better balance of toughness and abrasion resistance.

To hold size change to an absolute minimum, hold as close to 1900°F hardening temperature as possible. When pack hardened, hold the container at temperature for minimum time of one hour per inch of thickness to allow for proper carbide solution. With atmosphere furnace or salt bath hardening, soak at temperature for a minimum section should be soaked for an additional period of 15 minutes per inch.

Quench the pieces in still air. Extremely heavy sections may require an oil quench to develop maximum hardness. If an oil quench is used, flash quench into oil until the piece loses color, then complete the quench in air. Temper as soon as the pieces have cooled to room temperature.

## Tempering

When the pieces have cooled to room temperature, transfer to the tempering furnace. If the 1950-2000°F hardening range was used, select a low temperature temper from 250°F to 300°F so that maximum hardness and abrasion resistance will be maintained.

If the 1875-1925°F range was used for hardening, temper in the 350-400°F range for most applications or in the 950-975°F secondary hardness range for semi-hot work applications. Double tempering of large section sizes is recommended.

This information is intended to provide general data on our products and their uses and is based on our knowledge at the time of publication. No information should be construed as a guarantee of specific properties of the products described or suitability for a particular application. Walter Metals reserves the right to make changes in practices which may render some information outdated or obsolete. Walter Metals should be consulted for current information & capabilities.

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