

# LKM2083 ESR

## 高纯度高镜面防锈塑胶模具钢

Stainless Plastic Mould Steel with High Purity and Mirror Finish

▶▶ 高抛光性 High Polishability

▶▶ 良好耐腐蚀性 Good Corrosion Resistance

▶▶ 细型非复杂模具 Plastic Injection Mould with Small Size and Non-Complicated Structure

## LKM2083 ESR 简介 Introduction

LKM2083 ESR是属于龙记特殊钢系列中之防锈塑胶模具钢，其特点是高抛光、耐腐蚀及高耐磨性。与常规的德国W.Nr 1.2083标准相比，经过了ESR（电渣重熔）处理，材质更纯洁、夹杂物含量更低，具有更高的耐腐蚀性、更佳的抛光性、更小的热处理变形等优点。

LKM2083 ESR is a stainless plastic mould steel from the LKM Special Steel series, providing the characteristics of high polishability, good corrosion resistance and wear resistance. Thanks to the Electro-Slag Remelting (ESR) process, LKM2083 ESR has higher purity and lower inclusion level than the ordinary W.Nr 1.2083, thus offering higher corrosion resistance, better polishability and less deformation during the heat treatment process and so on.

### 供货状态 (原材表面硬度) Delivered Hardness From Steel Mill (Measured at Surface)

LKM2083 ESR

软性退火 ≤ HB250 Soft annealed to HB250 (max.)

### 参照标准

- Q AISI 420改良型ESR
- Q W.Nr 1.2083改良型ESR

### Comparable Standard

- Q AISI 420 Modified ESR
- Q W.Nr 1.2083 Modified ESR

### 化学成分(%) Chemical Composition (Percentage by Mass)

碳 C	硅 Si	锰 Mn	铬 Cr	钒 V
0.38	0.9	0.5	13.0	适量

### 应用

- ✓ 适合制作需要耐腐蚀性塑胶模具
- ✓ 添加玻纤塑胶模具
- ✓ 需要长期生产之塑胶模具
- ✓ 制作透明产品部件模具
- ✓ 制作医疗器械模具

### Application

- ✓ Plastic injection mould with good corrosion resistance
- ✓ Moulding abrasive/filled materials
- ✓ Plastic injection mould for PC, PMMA with long production run
- ✓ Production of optical parts
- ✓ Moulding of medical components

## 物理性能 Physical Properties

温度(°C) Temperature	20-100	20-200	20-300
热膨胀系数 [10 <sup>-6</sup> m/(m x K)] Coefficient of Thermal Expansion	11	11.3	11.6

温度(°C) Temperature	20	200	300
热传导率 [W/(m x K)] Thermal Conductivity	21.0	23.0	25

## 高纯洁度

LKM2083 ESR经过电渣重熔处理，使钢材杂质含量降低、偏析少、组织更致密。

## High Purity

Through the Electro-Slag Remelting (ESR) process, LKM2083 ESR has lower inclusion level, less segregation and more homogeneous microstructure.

## 超声波检测

SEP 1921-Test Group

## Ultrasonic Testing

SEP 1921- Test Group 3, Class E/e

## 焊接处理

- 焊前预热温度：200-250°C
- 采用专用焊枝（LKM牌号Z04-A08-XX）
- 焊后热处理工序：
  - 如在退火态焊接，焊后在780°C去应力退火
  - 如在淬硬态焊接，焊后以低于先前回火温度20-30°C作去应力处理

## Welding

- Preheating temperature: 200-250°C
- Welding rod: LKM Z04-A08-XX
- Heat Treatment after Welding:
  - Annealed condition: Soft-anneal at 780°C
  - Hardened condition: Temper at 20-30°C below the last tempering temperature

## 表面处理

可以通过离子氮化、镀铬或PVD等表面处理提高模具表面的硬度，延长模具的使用寿命

## Surface Treatment

Suitable for plasma/ion nitriding processes, hard chromium plating and PVD coating to increase surface hardness and improve mould life



## 良好抛光性

以LKM2083 ESR拥有高纯洁度，可以抛光至镜面级SPIA1

## Good Polishability

With high purity, LKM2083 ESR could attain the mould finish to SPIA1

建议抛光工艺次序 Recommended Polishing Process

1	机械加工/放电加工 CNC Machining/EDMing	--
2	油石研磨 Rough Grinding by Oil Stone	120#-180#-240#-280#-320#
3	砂纸研磨 Fine Grinding by Sand Paper	320#-400#-500#-600#-800#-1000#-1200#-1500#-2000#-2500#-3000#
4	金刚石研磨膏研磨 Polishing by diamond Paste	7#-5#-3#-1#

## 良好耐磨性

LKM2083 ESR可通过热处理提高硬度及耐磨性，建议使用硬度为HRC46-52（如模具尺寸增加或形状复杂，建议进一步降低硬度）

## Good Wear Resistance

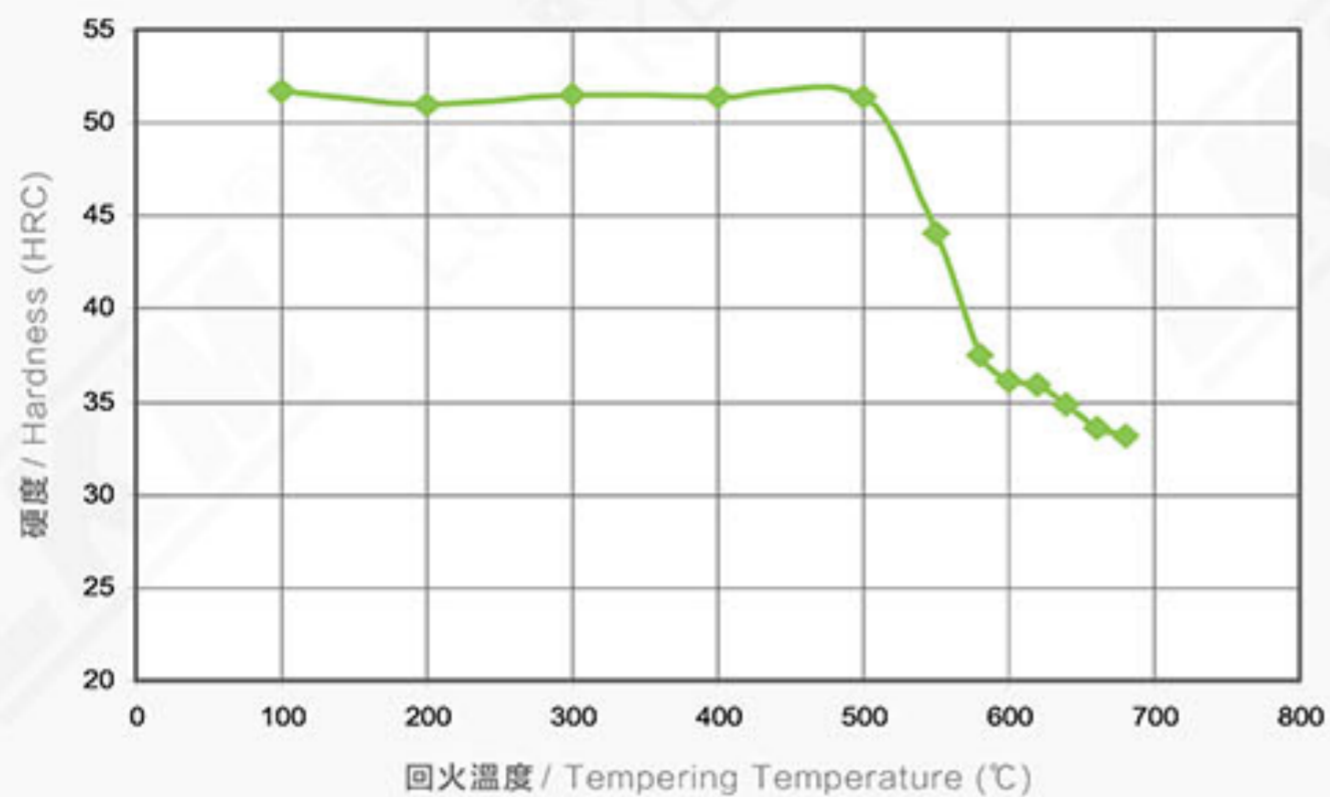
The recommended working hardness of LKM2083 ESR is HRC46-52 through heat treatment, it is suggested to reduce the hardness of the mould with bigger size and/or complicated structure.

## 热处理工艺 Heat Treatment

锻造 Forging	软性退火 Annealing	淬硬 Quenching	回火 Tempering
1050-1050℃	760-800℃	1000-1040℃	250-570℃

回火图 (试样尺寸 :  $\varnothing 25 \times 50\text{mm}$ ; 油淬温度 :  $1020^{\circ}\text{C}$ )

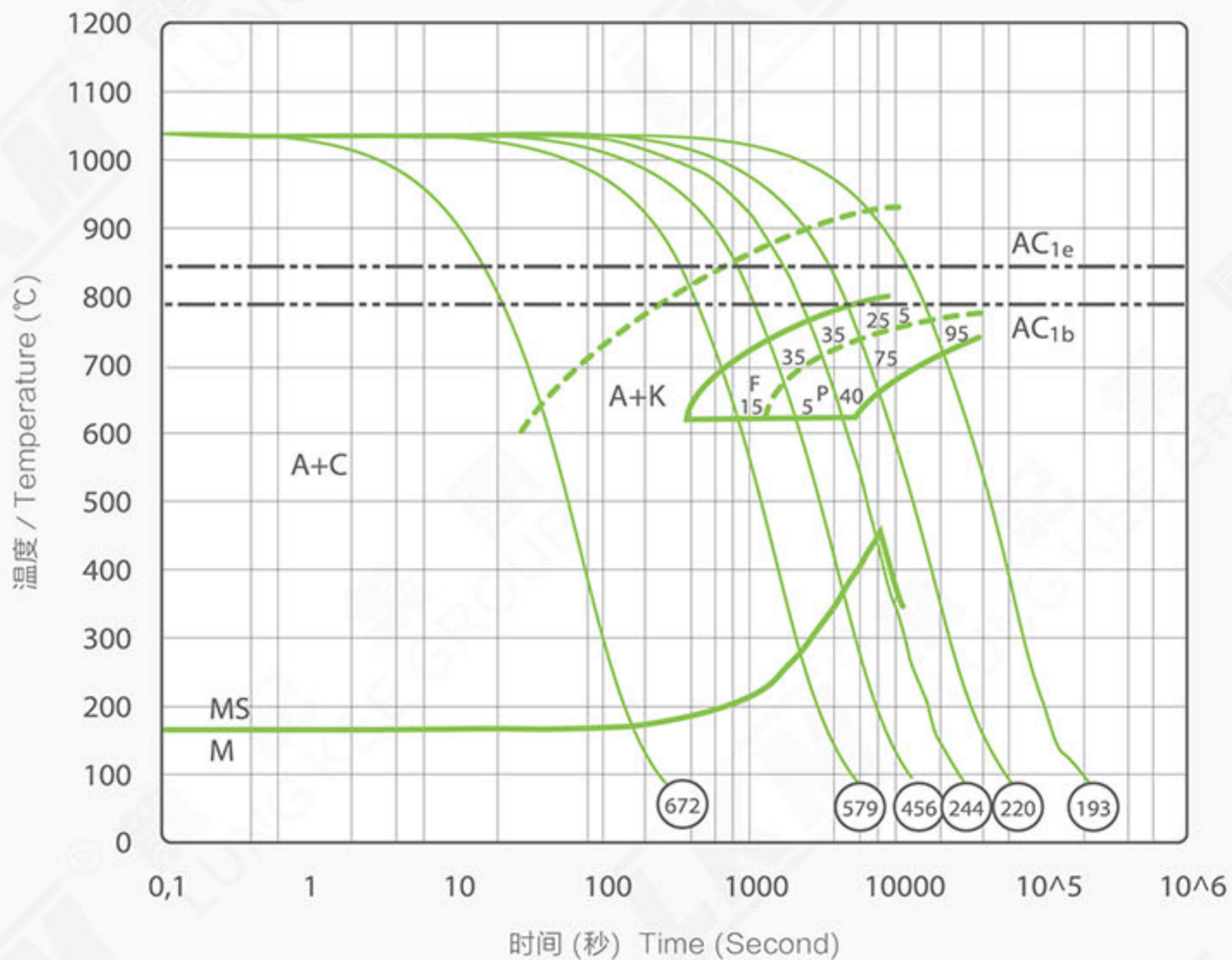
Tempering Curve (Sample dimension:  $\varnothing 25 \times 50\text{mm}$ ; Quenched at  $1020^{\circ}\text{C}$  by Oil)



CCT图(连续冷却转变曲线图)

CCT Diagram (Continuous Cooling Transformation Diagram)

奥氏体化温度 :  $1040^{\circ}\text{C}$  Austenitizing Temperature:  $1040^{\circ}\text{C}$



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