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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 29534-2013

**General specifications for combined warm and cold forged
parts**

温锻冷锻联合成形锻件 通用技术条件

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Foreword

This standard was drafted in accordance with GB/T 1.1-2009 given rules. This standard by the National Standardization Technical Committee Forging (SAC/TC74) and focal points. This standard was drafted. Shanghai Jiaotong University, Jiangsu Pacific Precision Forging Technology Co., Ltd., Jiangsu Sunway Precision Forging Co., Ltd., Beijing Inst. The main drafters of this standard. Zhao Zhen, Zhuang Village, Dong Yi, Huang Zepei, Xu Xianglong, Gong Aijun, red and gold, Wei Wei. Warm forging forging forging forming joint general technical conditions

1 Scope

China's national general specification for parts made by combined warm and cold forging. It specifies the technical requirements, the inspection rules and the delivery conditions for such forgings, and it applies to steel parts formed by the combined warm forging and cold forging process. Combining the two operations is a way of getting the accuracy of cold forging on a part that is too difficult to form cold. Cold forging - forming at room temperature - produces excellent dimensional accuracy and surface finish and work-hardens the material, but the forces required rise steeply with the amount of deformation, so a complex shape either exceeds what the press and the tooling can take or requires so many stages that the economics fail. Warm forging, at a temperature below the scaling range but well above ambient, reduces the flow stress substantially while producing far less scale and far less distortion than hot forging. The combination does the heavy deformation warm, where the material is compliant, and finishes cold, where the accuracy is. The result is a part with near-net geometry on the critical features, a good surface, and the strength benefit of the cold work in the finished surfaces - which is why the process is used for driveline components in volume. What the standard has to specify is the outcome rather than the route: the material and its condition, the dimensional and geometric tolerances achievable on the cold-finished features as against the warm-formed ones, the surface condition and permitted defects, the mechanical properties and hardness, the internal quality, and the

delivery condition including the surface protection. Issued on 9 June 2013 and in force since 1 March 2014.

This standard specifies the warm forging forging joint forming (hereinafter referred to as "forging") technical requirements, inspection rules and delivery conditions. This standard applies to steel forgings warm forging cold forging joint forming.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 699 high-quality carbon structural steel

GB/T 700 carbon structural steel

GB/T 1220 stainless steel rods

GB/T 1591 high strength low alloy structural steel

GB/T 2828.1 Sampling procedures for inspection - Part 1. by acceptance quality limit (AQL) retrieval batch inspection sampling plan GB/T 3077 alloy steel

GB/T 5216 guaranteed hardenability structural steel

GB/T 6478 steel for cold heading and cold extrusion

JB/T 9180.1 steel cold extrusion tolerances

3.1 Raw materials

3.1.1 Forgings selected raw materials shall comply with GB/T 699, GB/T 700, GB/T 1220, GB/T 1591, GB/T 3077, GB/T 5216, the provisions of GB/T 6478, and we can use the raw materials supplier and customer agreed material.

3.1.2 Quality of raw materials should be forging a pledge to comply with the technical requirements of the material. Forging into the needs of customers, the company shall Line reinspection.

3.1.3 According to the forging surface quality requirements, the raw materials needed to decide whether the peeling process.

3.2 After forging temperature before forging heat treatment requirements

3.2.1 After forging temperature before forging generally respond workpiece heat treatment, heat treatment process generally includes annealing, normalizing, isothermal normalizing, cooling temperature And quenched.

3.2.2 After forging temperature before forging should normally be small, non-oxidizing atmosphere in the annealing heat treatment of the workpiece.

3.3 forging shape and size Forgings shall conform to the shape and size forging drawing and technical documents. Forging cold forming Tolerances shall comply with JB/T 9180.1 Provisions; if there are special requirements, by a forging supplier and customer consultation.

3.4 forging quality requirements

3.4.1 surface quality forgings shall comply with forging graph, no cracks, folds and other defects.