

ICS 77.140.01
CCS J 31



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

GB/T 45681-2025

**General technical specification for repair welding of steel
castings**

铸钢件补焊通用技术规范

Issued on: May 30, 2025

Implemented on: December 1, 2025

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

Preface	III
1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
4 Classification of casting defects	2
5 Defect repair welding range	2
6 Preparation before repair welding	2
7 Repair welding	4
8 Post-weld heat treatment	5
9 Inspection and record after repair welding	5
Appendix A (Informative) Welding rod selection, welding rod drying and welding parameters	6
Appendix B (Informative) Preheating temperature before welding and welding interlayer temperature	9
Appendix C (Informative) Post-heat treatment and post-weld heat treatment temperature	12
Appendix D (Informative) Casting Repair Welding Operation Record	15
References	16
Table A.1 Welding rod selection, welding rod drying and welding parameters.....	6
Table B.1 Preheating temperature before welding and welding interlayer temperature.....	9
Table C.1 Post-heat treatment and post-weld heat treatment temperatures.....	12
Table D.1 Casting repair welding operation record.....	15

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

This document is proposed and coordinated by the National Casting Standardization Technical Committee (SAC/TC54).

This document was drafted by: Wuzhong Instrument Co., Ltd., Anhui Yangtian Jinsu New

Energy Equipment Co., Ltd., Jiangsu Xingyuan Power Plant Metallurgy Equipment Manufacturing Co., Ltd., Jiangsu Wanheng New Material Technology Co., Ltd., Sanming Yijun Machinery Casting Co., Ltd., Wenzhou Haige Valve Co., Ltd.

Co., Ltd., CGN Engineering Co., Ltd., China Machinery Engineering Institute Group Shenyang Foundry Research Institute Co., Ltd., Harbin Large Electric Motor Research Institute Co., Ltd.

Company, Shandong Tianli Machinery Casting Co., Ltd., Xiangyang Jinnaite Machinery Co., Ltd., Chengde Rongmao Steel Casting Co., Ltd., Shanghai Steam Turbine Co., Ltd., Erzong (Deyang) Heavy Equipment Co., Ltd., Tongyu Heavy Industry Co., Ltd., Baosteel Group Machinery Equipment Manufacturing Co., Ltd., Shandong Heavy Equipment Testing Technology Co., Ltd., Yantai Hengbang Pump Industry Co., Ltd., Yantai Standard Metrology Inspection and Testing Center, Tsinghua University, Hebei University of Technology, Shenyang University of Technology, Anhui University of Science and Technology, Qingdao Kehua Steel Structure Co., Ltd., Zhuzhou Riwan Precision Co., Ltd., Hubei Gucheng County Donghua Machinery Co., Ltd., Ganzhou Zhiyue Machinery Co., Ltd., Liyang Feiyue Electromechanical Co., Ltd., Qingdao Degut Energy Saving Equipment Co., Ltd.

Co., Ltd., Chongqing Xingda Shipbuilding Co., Ltd., Huaxia High-speed Railway Operation and Maintenance Co., Ltd., Tangshan Caofeidian Industrial Zone Changbai Electromechanical Equipment Co., Ltd.

Beixiu Repair Co., Ltd., Zhejiang Suijin Special Casting Co., Ltd., Hunan Tianzhuo Pipe Industry Co., Ltd., Zhongjun Technology (Shenzhen) Co., Ltd., Changchun Sanyou Auto Parts Manufacturing Co., Ltd., Jiangmen Guangjin Casting and Forging Co., Ltd., Qinfeng Technology (Anhui) Co., Ltd., Zhejiang Deka Control Valve Instrument Co., Ltd., Shandong Guanxian Zhongli Traffic Facilities Co., Ltd., Jiangsu Dongye Roller Co., Ltd., Taigang Alloy (Zhongshan) Co., Ltd., CSSC Shuangrui (Luoyang) Special Equipment Co., Ltd., CRRC Qishuyan Locomotive and Rolling Stock Technology Research Institute Co., Ltd., China Railway Baoqiao Group Co., Ltd. company.

The main drafters of this document are: Wang Xuepeng, Wang Yong, Wang Yuanyuan, Zhang Jian, Wu Tieming, Cao Qiao, Zhu Guowei, Shao Tian, Yu Bo, Qiu Keqiang, Wang Qingyu, Zhang Huandong, Chen Yatao, Liu Yuanyi, Guo Chun, Ma Zhengqiang, Wang Lianghui, Qiao Mu, Ma Kai, Chen Xiang, Wang Jinghui, Shuai Dejun, Jiang Yanfei, Zhu Zhengfeng, Lin Shaobin, Sun Zhibiao, Wang Hanchao, Xu Xilong, Yang Zhisen, Li Shuli, Zhang Jianxiong, Wu Haibin, Cui Lanfang, Su Zhidong, Chang Siwei, Zhang Haoran, Li Pengrui, Sun Wenqin, Song Xianjie, Xu Zulun, Wang Xiaodong, He Jianquan, Huang Xin, Wei Zhixiang, Li Jie, Song Chao, Kang Kang, Yang Jingfang, Yuan Changhua, Dai Wenbo, Xu Haiyong, Gao Peng, Wang Guishen, Bai Dacheng, Luo Yaoping, Xu Wenhao.

General technical specification for repair welding of steel castings

1 Scope

This document specifies the defect classification of steel castings, the scope of defect repair welding, preparation before repair welding, repair welding, post-weld heat treatment, and post-repair welding inspection. and records.

This document is applicable to the repair welding of pressure-bearing castings (hereinafter referred to as castings) made of carbon steel, alloy steel and stainless steel.

2 Normative references

GB/T 983

GB/T 3375

GB/T 5117

GB/T 5118

GB/T 5611

GB/T 8110

GB/T 10045

GB/T 15169

GB/T 17493

GB/T 37400.7

GB/T 40800

3 Terms and definitions

The terms and definitions defined in GB/T 3375 and GB/T 5611 and the following apply to this document.

3.1 interpasstemperature

In multi-layer and multi-pass welding, the temperature of the adjacent welds should be maintained before the subsequent welds are welded (usually within 25mm from the weld).

Note. Commonly known as inter-channel temperature.

3.2

The test process and result evaluation carried out to verify the correctness of the proposed welding process for weldments.

Note. In this document, welding procedure qualification refers to the mechanical properties, bending properties, etc. of welded joints welded according to PWPS or the chemical composition, corrosion resistance, etc. of corrosion-resistant cladding layers.

The process of conducting verification tests and result evaluation on PWPS to determine whether the corrosion performance and bending performance of cladding parts meet the requirements.

3.3

Welding procedure documents prepared for welding procedure assessment.