



TECHNICAL GUIDE  
**STUD WELDING**



## INTRODUCING OUR NEW PRODUCT NOMENCLATURE

BISALLOY® has recently introduced a new product nomenclature. The following table details the grade equivalents.

Note: Only the designation has changed – not the product

Previous Name	New Name
BISPLATE® 60	BISALLOY® Structural 60 steel
BISPLATE® 70	BISALLOY® Structural 70 steel
BISPLATE® 80	BISALLOY® Structural 80 steel
BISPLATE® 100	BISALLOY® Structural 100 steel
BISPLATE® 80PV	BISALLOY® Structural 80 Pressure Vessel steel
BISPLATE® 320	BISALLOY® Wear 320 steel
BISPLATE® 400	BISALLOY® Wear 400 steel
BISPLATE® 450	BISALLOY® Wear 450 steel
BISPLATE® 500	BISALLOY® Wear 500 steel
BISPLATE® 600	BISALLOY® Wear 600 steel
BISPLATE® HIA - Class 2	BISALLOY® Armour RHA300 steel
BISPLATE® HIA - Class 1	BISALLOY® Armour RHA360 steel
BISPLATE® HTA	BISALLOY® Armour HTA400 steel
BISPLATE® UHT	BISALLOY® Armour UHT440 steel
BISPLATE® HHA	BISALLOY® Armour HHA500 steel
BISPLATE® UHH	BISALLOY® Armour UHH600 steel



# STUD WELDING

Recommendations for stud welding of BISALLOY® steel plate

## STUD WELD

Bisalloy® high strength and high hardness steel plates can be arc stud welded readily with the studs in various sizes provided the following recommendations are observed:

1. The stud must be manufactured from low carbon mild steel, complying with the requirements of AS/NZS 1554.2. The standard, however, limits the maximum yield strength of parent materials that can be stud welded to 800MPa. The stud welding of abrasion resistant steels is currently not addressed by AS/NZS 1554.2 so the welding procedure should be qualified before welding.
2. It is important that the surface area where the stud is going to be welded is clean and free from grease, dirt, heavy rust and moisture. Preheating per below recommendations would assist in removing moisture that may potentially cause delayed HAZ cracking.
3. Pre heating is required for stud welding on high hardness wear grades. Preheating can reduce the risk of hydrogen delayed cracking and it is a must when the ambient and plate temperature is below 20°C. See Table 1 for the recommended preheating temperatures.
4. Post heating can keep the welding area to cool slowly and it will help to reduce the risk of hydrogen cracking in HAZ. Slow cooling can also be achieved by covering the stud welded plate with blanket.

## PREHEATING TEMPERATURE RECOMMENDATIONS

Table 1:

GRADE	PRE HEATING TEMPERATURE (°C)
BISALLOY® Structural 60, 70, 80 and 100 steel	20
BISALLOY® Wear 320 and 400 steel	50
BISALLOY® Wear 450 steel	50
BISALLOY® Wear 500 steel	75
BISALLOY® Wear 550 steel	75
BISALLOY® Wear 600 steel	100

5. As the amount of total weld heat input is critical in relation to the amount of cracking in the HAZ, it is important that weld time and current are accurately controlled.
6. Longer weld times should be used to create a pre-heat condition during the weld process. Weld times generally 10% longer than optimum stud welding settings used for mild steel have been shown to produce the best results.
7. To check if the delayed cracking has occurred in HAZ, tension test by applying torque should be done at least 72 hours after welding.

The recommendations for stud weld on high hardness wear resistance plate mentioned above can help to achieve optimum results of the weld but they cannot guarantee the weld stud to be failure free.

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