

INDULAY[®]

abrasion resistant

*chromium carbide welded overlay
for piping products*



INDUTECH
INDUSTRIAL TECHNOLOGY

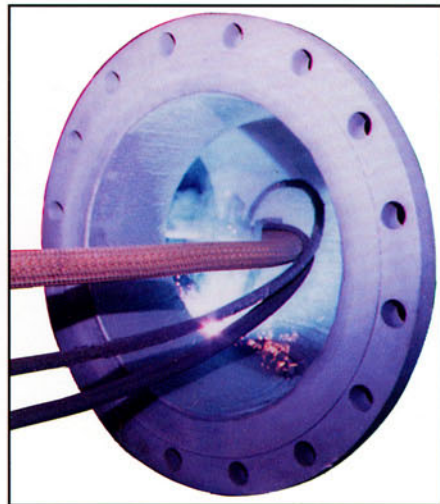
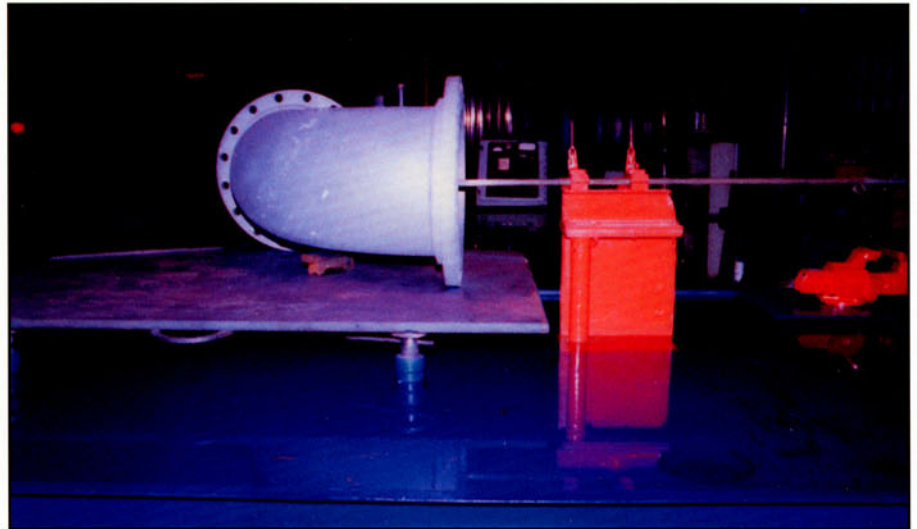


INDULAY – ABRASION RESISTANT CHROMIUM CARBIDE WELD OVERLAY

INDULAY is an internal chromium carbide weld overlay process designed to combat abrasion in piping systems used for the conveyancing of bulk materials.

INDULAY is cost effective where there is severe pipe abrasion. Actual performance is dependent on the overlay thickness and the system's operating conditions. Field results have shown Indulay to have a wearlife of 8 to 20 times that obtained from regular carbon steel.

INDULAY is a unique process which gives a smooth continuous overlay on a one piece pipe bend. It eliminates the need for bends of segmented construction. Integral tangents can be overlaid in the same continuous manner.



INDULAY can overlay pipe bends of any radius from 1 diameter to 20 diameters and to any angle up to 90 degrees provided that the arc length does not exceed 16 ft (4.9 metres). Minimum pipe diameter is 3" (76.2 mm), maximum 48" (1219 mm).

INDULAY can be applied to straight pipe, tees and reducers. Minimum diameter 3" (76.2 mm), maximum length 20 ft (6 metres).

INDULAY pipe bends and fabrications can be fitted with standard ASTM flanges and coupling rings (*See End Preparation*).

INDULAY welding process is open arc flux core. Overlay thickness is from 3/16" (5 mm) to 9/16" (14 mm). The overlay can be placed in areas of high wear to maximize life (*See Overlay Options Figure 1*).

INDULAY has been developed to give maximum abrasion resistance through the chrome carbide layer. This has been achieved by the development of specialized welding techniques which gives an even dispersion of carbides across the chrome carbide layer and the minimum of dilution between the steel pipe and the chrome carbide overlay. (See Figure 2/3 Microphotograph). Hardness across the undiluted carbide overlay is in the range of: 575 BHN (56 HRc) to 720 BHN (64 HRc).

INDULAY spools, if specified, can conform to A.S.M.E. B31.3 and B31.11.

INDULAY Alloys

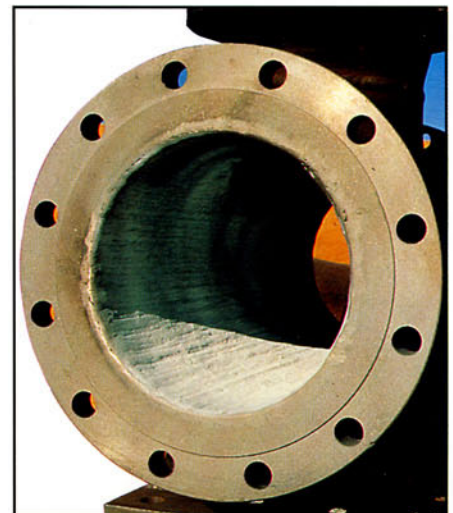
Type G – For severe abrasion, moderate impact and temperatures up to 900°F (482°C) (See alloy table).

Type H – For temperatures up to 1700°F (925°C) which is used in conjunction with a stainless steel backing pipe.

Alloys for extreme service conditions can be applied to suit customer's requirements.

INDULAY Bend Repair

Worn bends or fittings of weldable alloy can be patched when worn through and overlaid to bring them back to their original condition.



INDULAY[®] TECHNICAL INFORMATION

Figure 1
Overlay Options

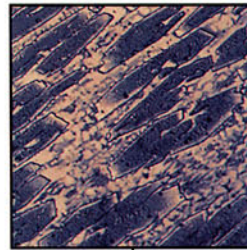
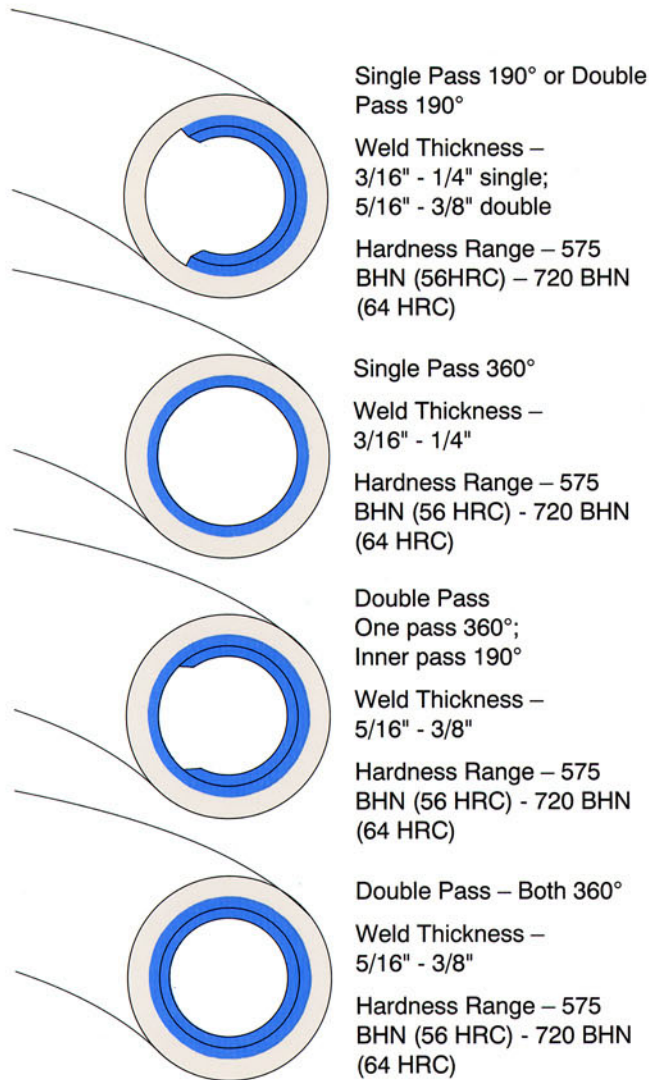


Fig. 2
Enlargement of chrome carbide matrix showing even dispersion of carbides.
Mag x 200

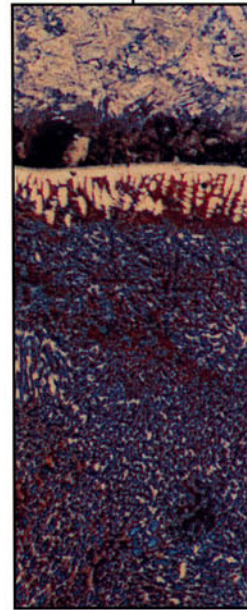


Fig. 3
Photograph of chrome carbide overlay and steel pipe showing minimal weld dilution at the interface.
Mag x 50

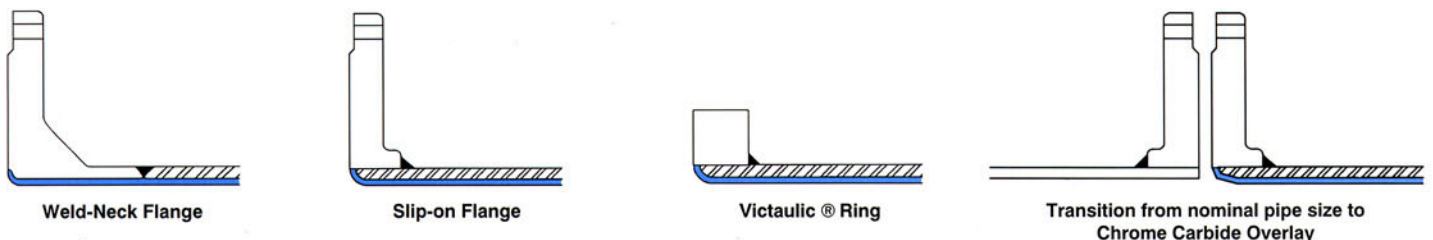
INDULAY WELD CHEMICAL COMPOSITION

	TYPE G		TYPE H
Carbon	6.0% - 7.0%	C	1.5% - 2.5%
Manganese	0.75% - 1.1%	MN	1.2% - 1.7%
Silicon	0.1% - 0.35%	SI	0.75% - 1.1%
Chrome	24.0% - 27.0%	CR	26.0% - 29.0%
Iron	Balance	FE	3.0% - 5.0%
		Co	Balance

APPEARANCE:

During the overlay welding process, the residual stresses from thermal expansion and contraction are relieved by checking of the overlay deposit. This checking is confined to the hard surface deposit and does not extend into the pipe base metal. The check frequency is 2 to 4 per lineal inch.

TYPICAL END PREPARATION FOR WELDED OVERLAY PIPE



THE INDULAY[®] SYSTEM OFFERS UNIQUE ADVANTAGES:

- continuous overlay of one piece bends eliminating the need for segmented construction
- we have the ability to repair and rebuild many of your present elbows and fittings

OTHER INDUTECH PRODUCTS



The induction bending process in operation at Indutech.

INDUCTION PIPE BENDING

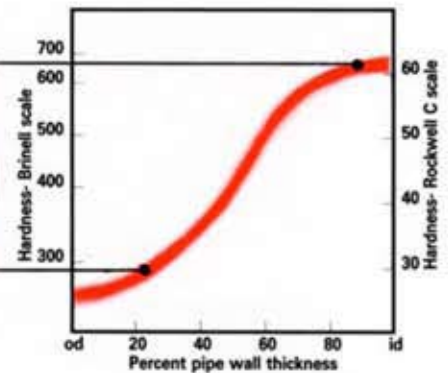
INDUTECH offers to customers the induction bending of carbon, stainless and alloy steel pipes up to 36" (914 mm) diameter, wall thickness to 4" (102 mm), angles to 180°.

COLD BENDING

Up to 6" (168 mm) diameter.



Single and compound bends in stainless, carbon and alloy steels.



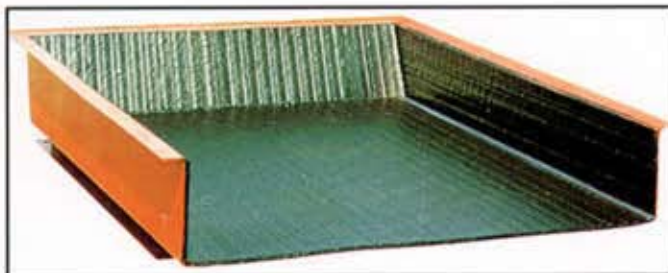
NASPipe's monolithic structure facilitates in service ultrasonic measurement of wall thickness.

NASPipe

Abrasion resistant induction hardened steel piping in straight lengths, bends, tees and laterals

Diameter – 2-1/2" (64 mm) - 40" (1016 mm)

Lengths – 40' (12.2 m) stock; 50' (15.2 m) special order



INDUPLATE

Abrasion resistant plate overlaid with chrome carbide

Overlay Thickness – 3/16" (4.8 mm) - 1/2" (12.7 mm)

Plate Size – Width 48" (1219 mm) - 72" (1829 mm);
Length 96" (2438 mm) - 144" (3658 mm)

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