



**tube forgings**  
OF AMERICA, INC.

5200 NW Front Avenue  
Portland, OR 97210



Certificate #: 30248

TFA Heat:	S734	Mill:	USS
TFA Grade:	WPB	Mill Heat:	A23165
Product:	18" STD 45 LR ELBOW		

*Chemical Properties*

C: 0.16	CU: 0.03
MN: 0.97	V: 0.002
P: 0.009	CB: 0.001
S: 0.005	B:
SI: 0.22	TI:
MO: 0.03	AL:
CR: 0.08	CE: 0.3474
NI: 0.02	

*Physical Properties*

Yield PSI:	51000
Tensile PSI:	72500
Test Bar Type:	STRIP
Tensile Orientation:	LONG
% Elongation in 2":	45
Brinnell Hardness:	174

Coupon Size:  
Charpy V Notch Text @:  
Charpy Orientation:

% Shear			
1:	2:	3:	Avg:
Joules			
1:	2:	3:	Avg:
Lateral Expansion (Mils)			
1:	2:	3:	

1. THESE FITTINGS WERE HOT FORMED BETWEEN 1150F AND 1800F AND AIR COOLED. 2. THE HARDNESS DOES NOT EXCEED 197 BHN PART TO PART. 3. STARTING MATERIAL IS ASTM A 106 GRB SEAMLESS PIPE. 4. THIS PRODUCT IS SEAMLESS.

THE MATERIAL IS MANUFACTURED TO ASTM A 234 GR WPB REV: 06A. ALSO PER ASME SEC II SA 234 GR WPB, 2004 EDITION THRU ALL ADDENDAS AT TIME OF ORDER. 2. DESIGN AND DIMENSIONS TO ASME B16.9-2003 OR MSS-SP-75-04 AS APPLICABLE BY DESIGN. 3. PER NACE MR0175/ISO15156-2. OUR QUALITY SYSTEM HAS BEEN REGISTERED BY (ABS) TO (ISO-9001, REV: 2000), CERTIFICATE #: 30248. OUR ORGANIZATIONAL STRUCTURE AND CERTIFICATION COMPLIES WITH (EN 10204-3.1.B). OUR FITTINGS SATISFY THE MATERIAL REQUIREMENT OF (PED 97/23-EC ANNEX 1-4.3). RESULTS OF TESTS AND INSPECTIONS REQUIRED BY THE ABOVE STANDARDS MEET THE REQUIREMENTS OF THE STANDARDS.

*This information is electronically generated using the Tube Forgings of America Internet web site. This is provided to it's customers for informational purposes only. Originally signed and certified mill test reports are available by calling TFA at (800) 426-3274 or e-mail sales@tubeforgings.com.*