

SAMPLE OF 3.1 CERTIFICATE



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 R.E.A. Cremona n. 183314

Fittings, forgings, flanges, valves & pipes

CERTIFICATO D'ISPEZIONE

CERT. N° 00.....
 Pag.1

Inspection certificate - Abnahmeprüfungs - Certificat de réception - EN 10204 : 2005 3.2 - ASME B 16.9 - 2007

RC commessa interna / internal job WRC	Ordine del Cliente - Customer's order / Bestellung - Commande du Client	Norma di collaudo - Test specification Abnahmetheorie - Specification ASTM A 860 WPHY65; ANSI B16.9 ; PO REQUIREMENTS (DOC. No 2013-3200-1M-0018)	KV Resilienza- Impact test Erschlagzähigkeit - Resilience / (3025 J)		
Dimensione dei raccordi / Acciaio Dimensions of fittings / Steel Fittingsabmessungen / Stahl Dimensions des raccords / Acier		Durezza/ Hardness Härte - Dureté			
Posizione PO Item Stellung Poste	Quantità Quantity Menge Quantités Pc	Direction L / T	Resultato Result Obtenut/Ermitit	Temp. °C	
PS-035	1		164	-46	
PS-039	1		164	-46	
PS-052	1		166	-46	
PS-063	1		166	-46	
PS-027	1		164	-46	

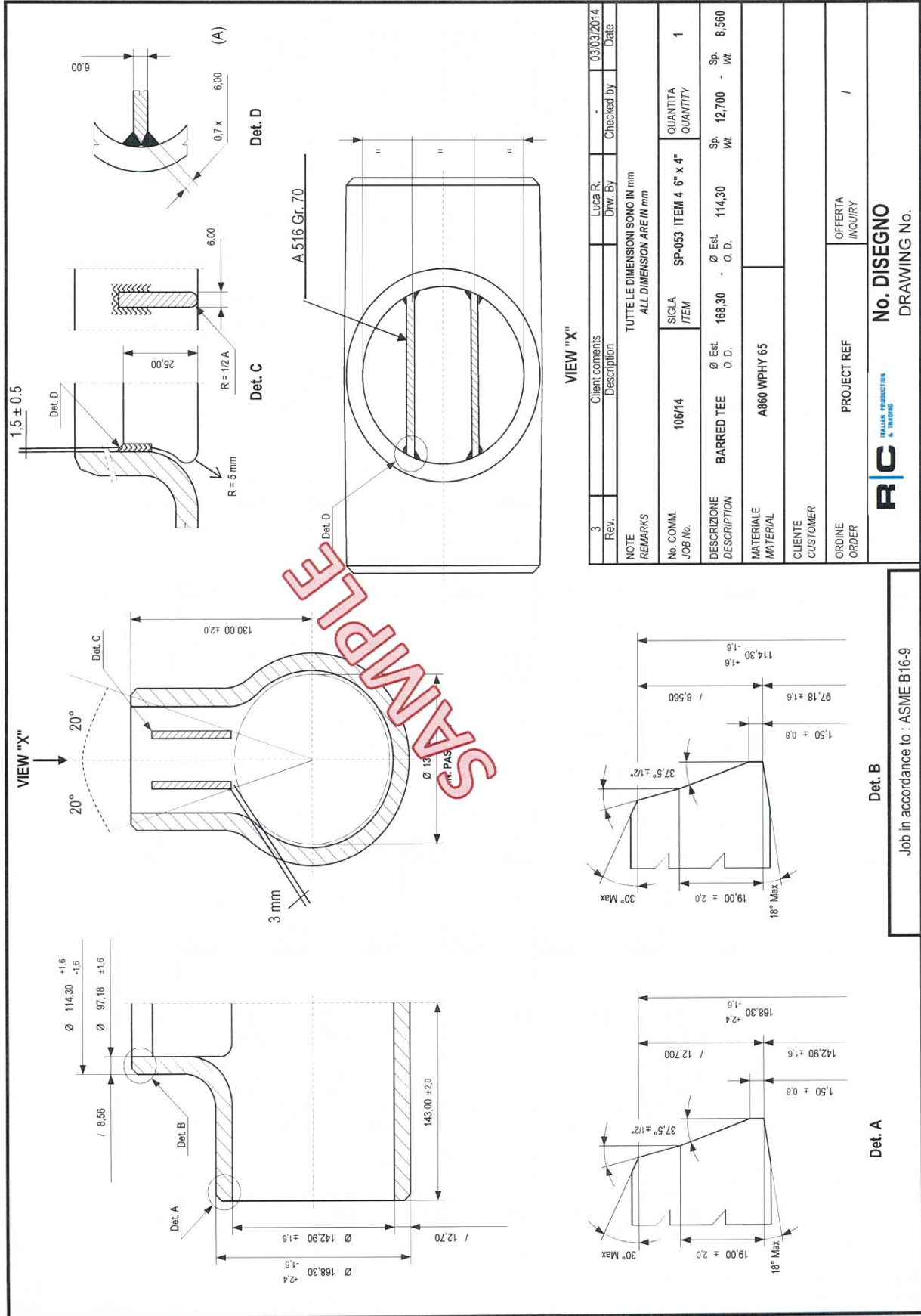
IMPORTANT NOTE : - HYDROSTATIC TEST ON TOTAL ITEMS - PERFORMED WITH SATISFACTORY RESULT (REPORT HYT N° 0018) - 100%
 - UT EXAMINATION ON BW MACHINED AFTER HYDRAULIC TEST : PERFORMED (CRC RPT 2324 / 0245)

Analisi chimica di colata - Ladle analysis - Schmelzanalyse - Analyse chimique de coulée - Check analysis

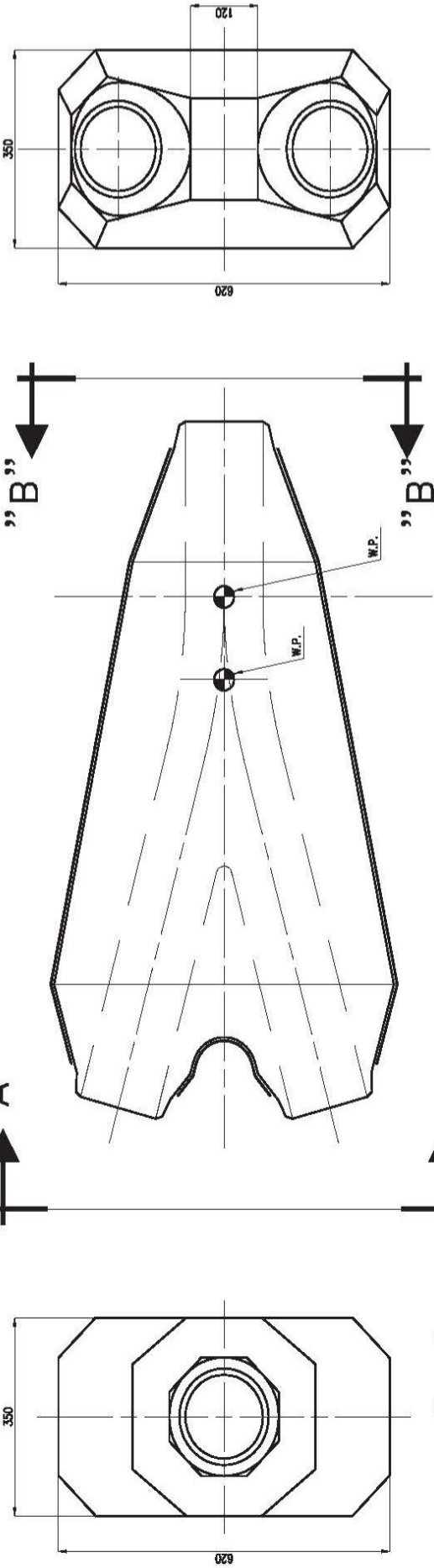
Fabbricazione (Trattamento - Manufacture / Heat treatment) HOT FORMED BUTT WELD 780° - 980°C, COOLED IN STILL AIR QUENCHING AT 920°C & TEMPERING AT 679°C	Note - Remarks - Anmerkung - Notes: - Quality Management System supports the requirements of Annex 1, Section 4.3 of Pressure Equipment Directive (PED) 97/23/EC 1 VISUAL/DIMENSIONAL CHECKING PERFORMED WITH SATISFACTORY RESULT ACCORDING TO: ANSI B16.9 - ANSI B16.25; PO Docs. No.2013-3200-1M-0018 & relevant approved DWG 106-14-01;106-14-02; 106-14-03 2 GAUGING TEST AT 97% OF NOMINAL ID - PERFORMED WITH SATISFACTORY RESULT 3 THE PRODUCTS ARE IN COMPLIANCE WITH PO ORDER REQUIREMENTS & ALL RELEVANT DOCUMENTS. 4 MATERIAL ACCORDING TO NACE MR0175/ISO 15948	Mnfr Quality Assistant	Data - Date	Nb	N	TI	C	AI	V	Cu	Mo	Cr	NI	S	P	SI	Mn	C	Colata - Heat Schmelze	Req. Min	Req. Max
				%	%	%	%	%	%	%	%	%	%	%	%	%	%	%			
				0.014	0.006	0.003	0.409	0.030	0.160	0.70	0.100	0.090	0.040	0.160	0.100	0.100	0.090	0.002	0.012	0.220	1.260

LEGENDA / TRANSLATION : RC=CONCENTRIC REDUCER RE= ECCENTRIC REDUCER TEE=TEE CURVA=ELBOW FONDELLO=CAP GROCE=CROSS TUBO=PIPE

SAMPLE OF BARRED TEE DWG



SAMPLE OF WYE PIECE DWG

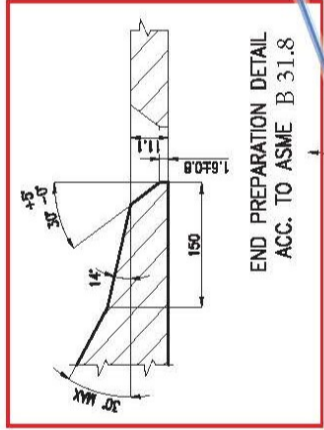


View "A-A"

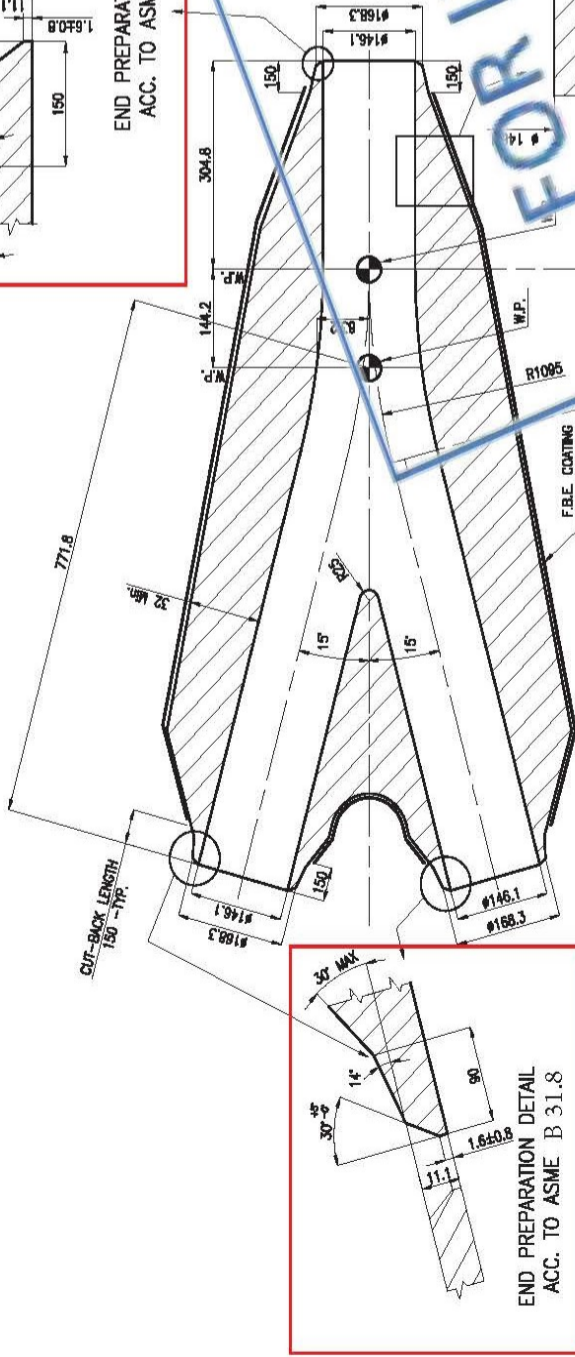
View "B-B"

PLAN ON WYE PIECE

SCALE 1:15



END PREPARATION DETAIL
ACC. TO ASME B 31.8



SECTION ALONG CL. OF WYE PIECE

SCALE 1:15

FBE Coating graphic based on the requirement as stated on Inner Pipe Fusion Bonded Epoxy (FBE)

NOTE:

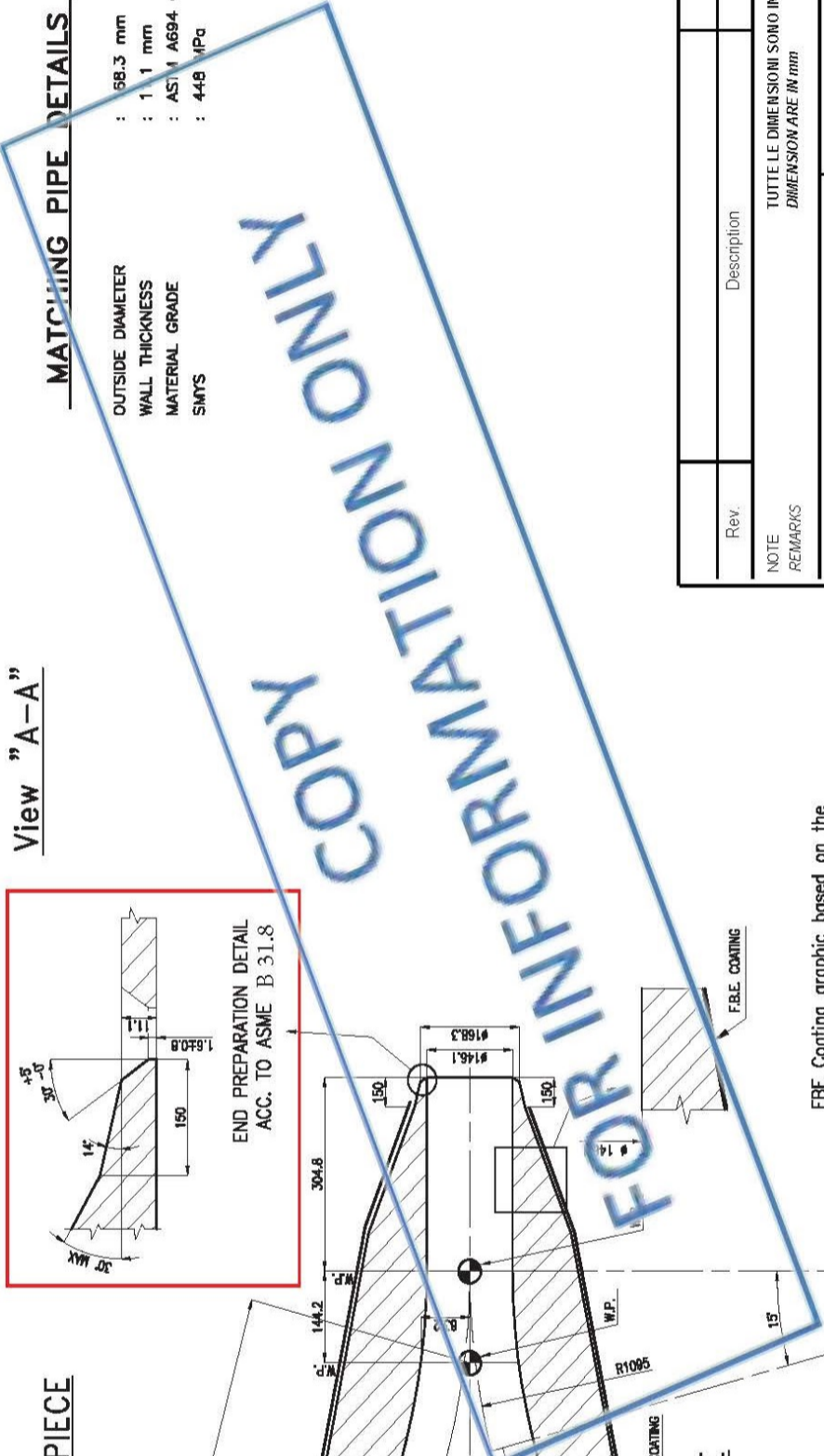
1) ALL DIMENSION ARE IN MILLIMETERS UNLESS NOTED OTHERWISE

SUBSEA WYE PIECE PARAMETERS

- SERVICE FLUID : CRUDE OIL
- APPROX. WATER DEPTH : 75 m
- SOUR SERVICE : NO
- MAX. DESIGN TEMPERATURE : 110°C
- MIN DESIGN TEMPERATURE : 0°C
- DESIGN PRESSURE : 46 BAR
- DESIGN LIFE : 15 YEARS
- SEAWATER TEMPERATURE : 20.6 - 27 °C
- WYE PIECE SIZE / TYPE : 6" x 6" x 6" x 30° SYMMETRICAL
- DESIGN STANDARD : ASME VIII DIV.1
- CLASS RATING : 300#

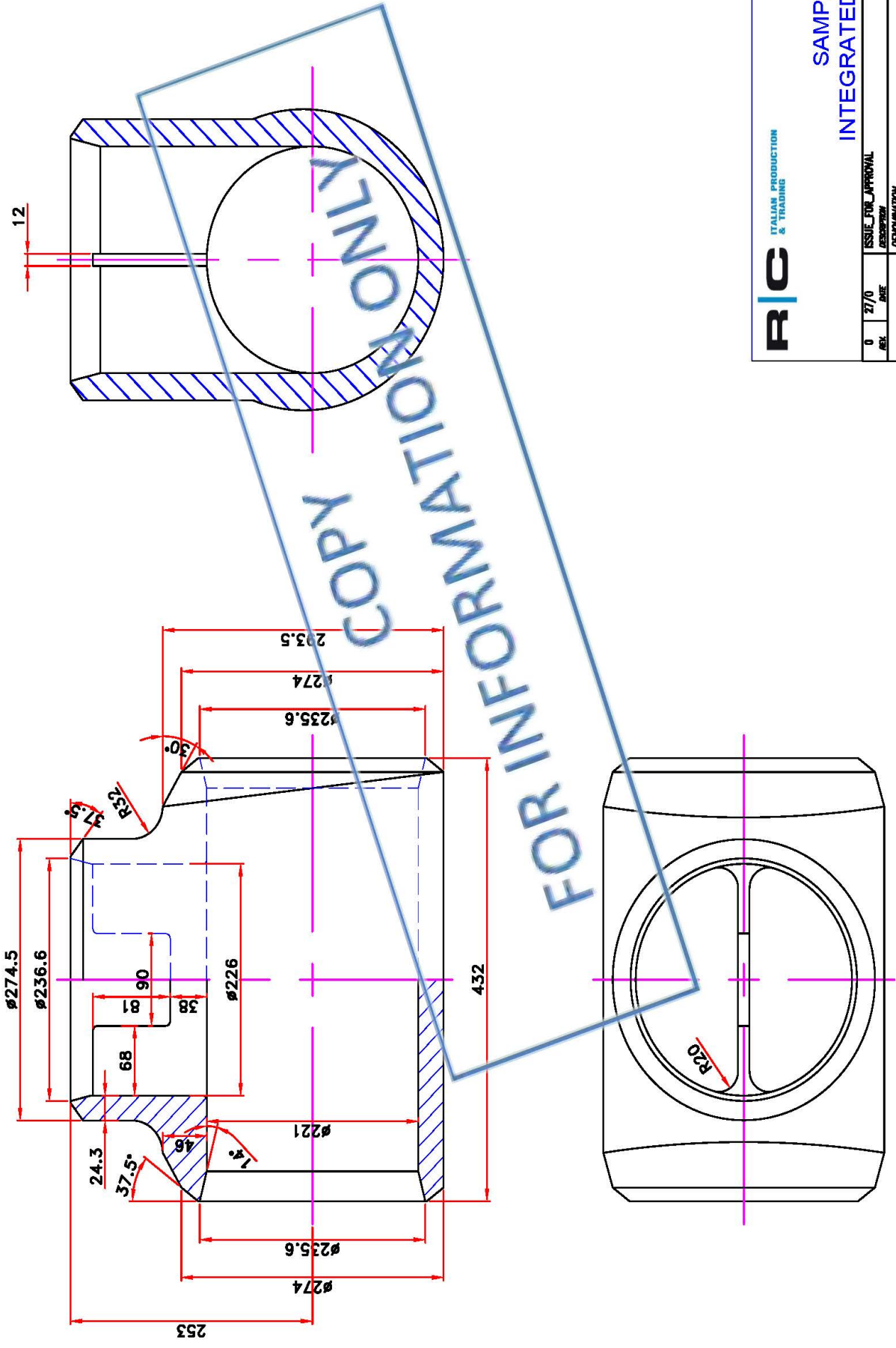
MATCHING PIPE DETAILS

- OUTSIDE DIAMETER : 58.3 mm
- WALL THICKNESS : 1.1 mm
- MATERIAL GRADE : ASTM A694 Gr. E65
- SMYS : 448 MPa



Rev.	Description	Checked by	Date
NOTE REMARKS TUTTE LE DIMENSIONI SONO IN mm ALL DIMENSION ARE IN mm			
No. COMM. JOB No.	SIGLA ITEM	QUANTITÀ QUANTITY	
DESCRIZIONE DESCRIPTION	Ø Est. Ø. D.	Ø Est. Ø. D.	Sp. Wt.
SUBSEA PIGGABLE WYE PC	168.30	168.30	11.10 11.10
MATERIALE MATERIAL	A694 F65	PESO TEORICO TEORICAL WEIGHT	850 kg
CLIENTE CUSTOMER			
ORDINE ORDER		OFFERTA INQUIRY	
RIC ITALIAN PRODUCTION & TRADING		No. DISEGNO DRAWING No.	

SAMPLE OF INTEGRATED BARRED TEE



RIC ITALIAN PRODUCTION & TRADING		SAMPLE DWG		DESIGN	CHECKED	DATE
ISSUE FOR APPROVAL		INTEGRATED BARRED TEE		DATE		
REV.	DATE	DESCRIPTION		REV. No		
0	27/0	BARRED_TEE				
		10" WITH 18.26				
DRAWING No		C.O. No				
A						

SAMPLE OF DESIGN CALCULATION



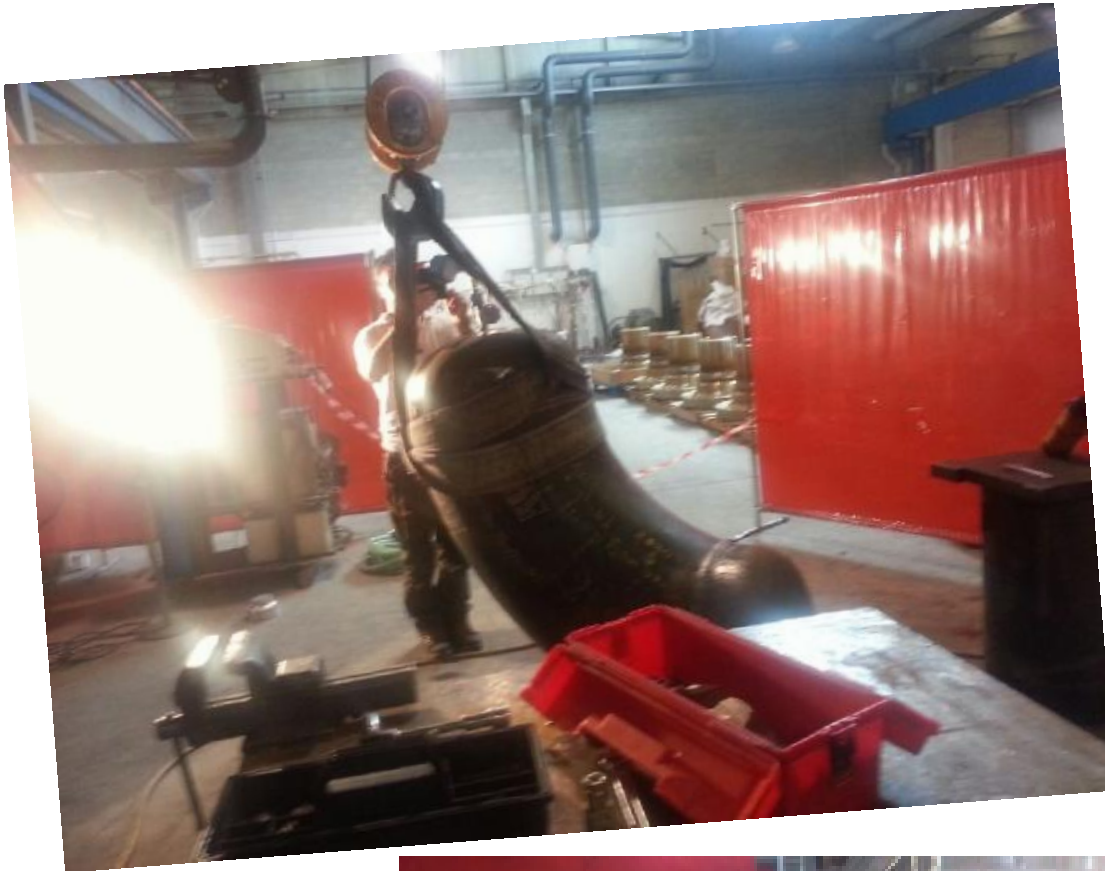
DESIGN CALCULATION OF REINFORCEMENT
 OF "PIGGABLE SUBSEA WYE " PIECE TO TRD 301 SECT 5.6
 CYLINDRICAL SHELL WITH Y SHAPED BRANCH

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Description	Unit	Value	Customer:	
P. = DES. PRESSURE	BAR	46	Customer: P.O. Item: Description: PIGGABLE SUBSEA WYE PIECE OD 168,3 X 11,1mm WT. A694 F65 Quantity: Our Job Project:	
DT. = DES. TEMPERATURE	°C	110		
σall = MAX ALLOVABLE STRESS, FROM TABLE A-2 OF ASME B 31.1 ⁽¹⁾	BAR	1.183,0		
MAT. = MATERIAL		694F65		
CA. = CORROSION ALLOWANCE	mm	0		
di = INSIDE DIAMETER OF CYLINDRICAL SHELL	mm	146,1		
Sv = WALL THICKNESS OF MAIN BODY WITH OPENINGS AND WITHOUT ALLOWANCES	mm	20		
Dal = DIAMETER OF OPENINGS, OR INSIDE DIAMETER OF BRANCH; FOR ELLIPTIC OPENINGS THE AXIS IN THE DIRECTION OF THE LONGITUDINAL AXIS OF THE SHELL	mm	146,1		
Sao = WALL THICKNESS OF BRANCHES, WITHOUT ALLOWANCE	mm	20		
β = ANGLE OF INCLINATION OF BRANCH, RELATIVE TO GENERATRIX OF MAIN BODY	°	15		
Calculation reinforcement lengths			TRD 301 SECT 5.6	
Maximum lenght of main body wich is effective a compensation $eG = \sqrt{(di + Sv) \times Sv} = $ 57,64 mm			DWG:	
Maximum lenght of branch wich is effective a compensation $eA = (1 + 0,25 \times \beta / 90) \sqrt{dAi + Sao} \times Sao = $ 60,04 mm				
W.Th. Calculation			Area calculation	
Required wall thickness for run, with allowances $So = di \times P / 2 \times (\sigma_{all} - P) = $ 2,96 mm			Cross sectional area effective as compensation without allowances $A_{a1} = (eA \times Sao) + [(Sao^2 \times tg B/2) / 2] = $ 2.720,6 mm ²	
Required wall thickness for branches, with allowances $SA = dAi \times P / 2 \times (\sigma_{all} - P) = $ 2,96 mm			Pressure loaded area, without allowances, ZONE I $A_{p1} = (eA \times dAi/2) + [(dAi^2/4) / (tg B/2)] / 2 = $ 24.661,1 mm ²	
			Cross sectional area effective as compensation without allowances $A_{o11} = (SA \times Sao) + (eG \times Sv) + [(Sv \times (Sao \times sen B/2)) / 2] = $ 2.379,6 mm ²	
			Pressure loaded area, without allowances, ZONE II $A_{p11} = (eA \times dAi/2) + (eG \times Di/2) + [(Di/2 \times (dAi/2 \times sen B/2)) / 2] = $ 8.944,3 mm ²	
Stress verification				
ZONE I				
$\sigma = P(A_{p1}/A_{o11} + 0,5) = $ 195,9 BAR efficiency factor $a = \sigma / \sigma_{all} = $ 2,59	$\leq \sigma_{all} = $	1.183,0 BAR	PASSED	
ZONE II				
$\sigma = P(A_{p11}/A_{o11} + 0,5) = $ 195,9 BAR efficiency factor $fb = \sigma / \sigma_{all} = $ 6,04	$\leq \sigma_{all} = $	1.183,0 BAR	PASSED	
⁽¹⁾ FROM TABLE A-2 APPENDIX A OF ASME B 31.1 AT THE DESIGN TEMPERATURE BY INTERPOLATION				
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> INPUT VALUE CALC VALUE </div>				
Rev	0	1	2	3
Date	02/09/2014			
Designed	L.RIVAROLI			
Checked	G.RIVAROLI			
Approved				

BURST TEST

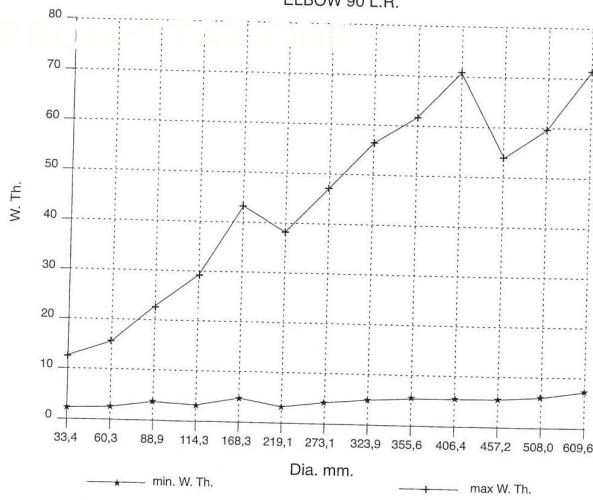


BW FITTINGS

Example of Qualification Range

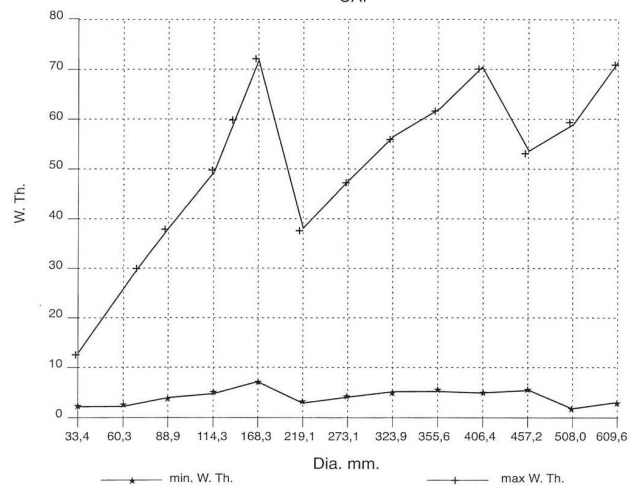
BURST TEST

ELBOW 90 L.R.



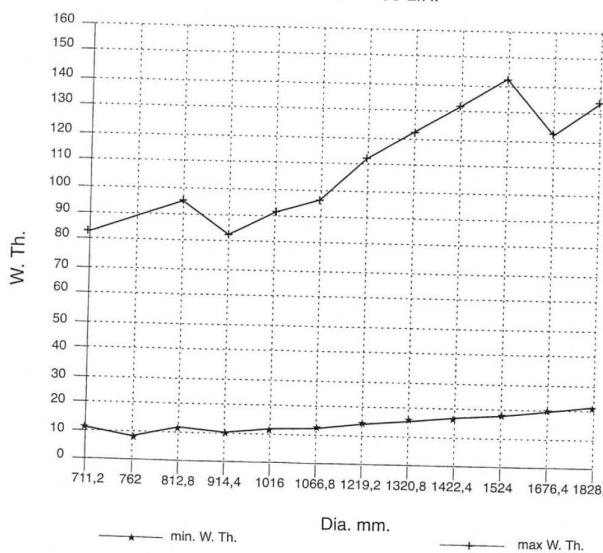
BURST TEST

CAP



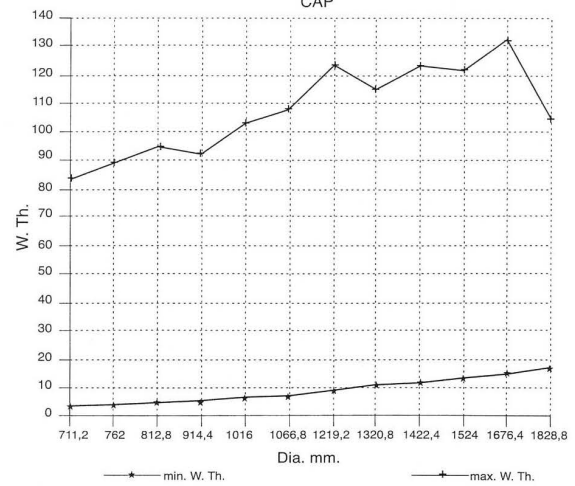
BURST TEST

ELBOW 90 L.R.



BURST TEST

CAP



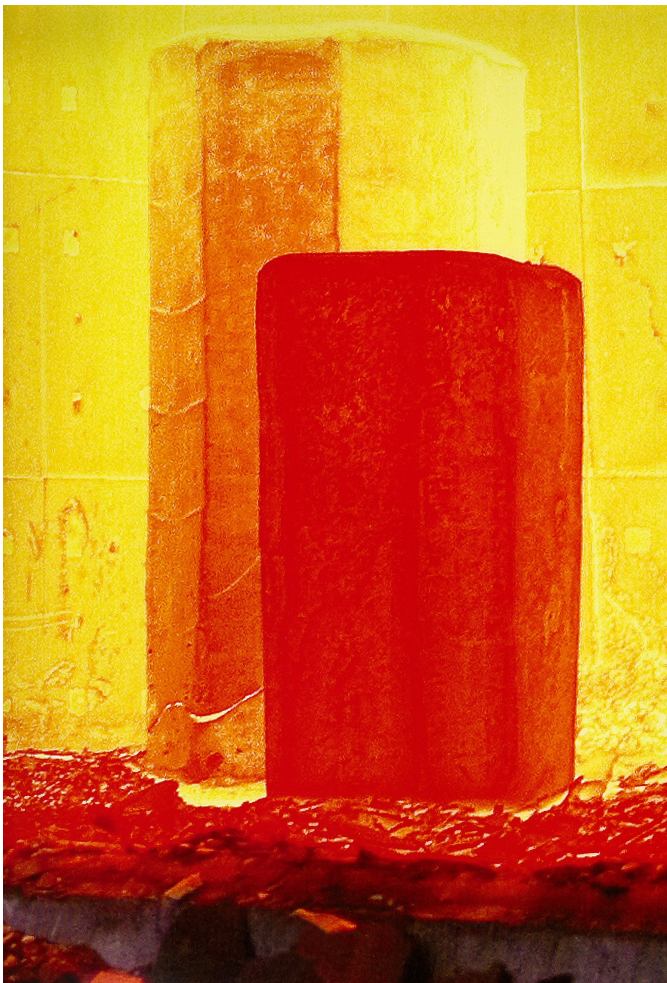
FLANGES



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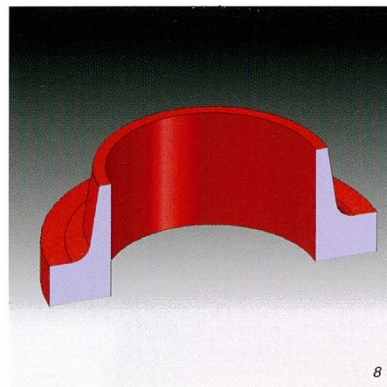
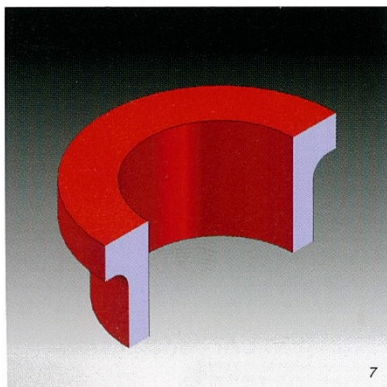
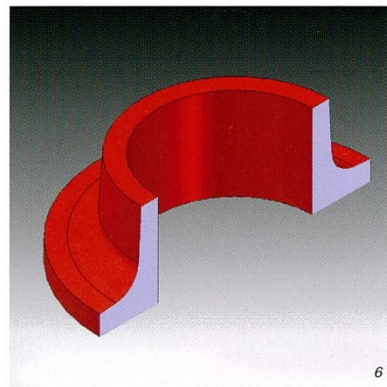
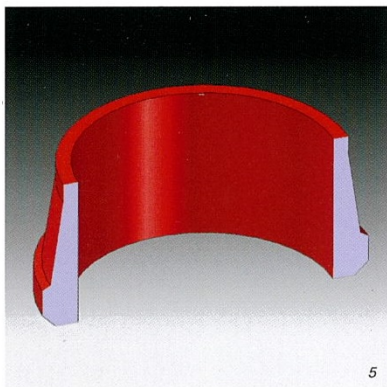
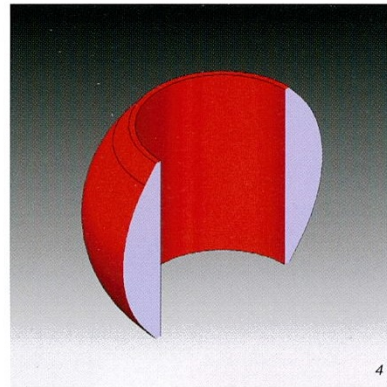
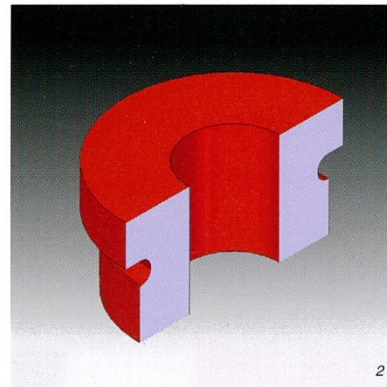
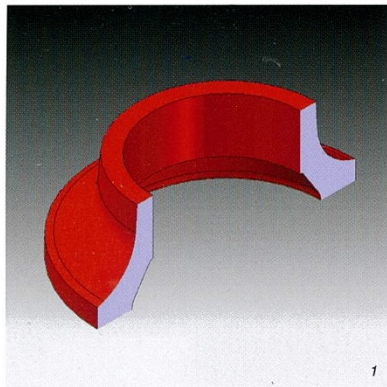
RAW MATERIAL



FORGING OPERATION



SPECIAL FORGING SHAPES



HEAT TREATMENT



PRE MACHINING



FINAL MACHINING

