

Request for Proposal

**Procurement of Profiled Ring for manufacturing Y-frame of KSLV-II 1st
Stage Propellant Tank**



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Technical Specifications

1. Introduction

The propellant tanks of KSLV-II 1st stage are composed of LOX and fuel tank. Each tank is completed by welding dome subassembly and cylindrical sections. Ring frames are required for the connection between dome assembly and cylindrical sections.

The main purpose of profiled ring is to reduce the weight of procured ring to be machined and machining time to final Y-frame shape. Therefore the profiled ring will reduce the cost. Fig. 1 shows an example of final machined shape of Y-frame and Fig. 2 shows the required profiled ring configuration for manufacturing Y-frame.

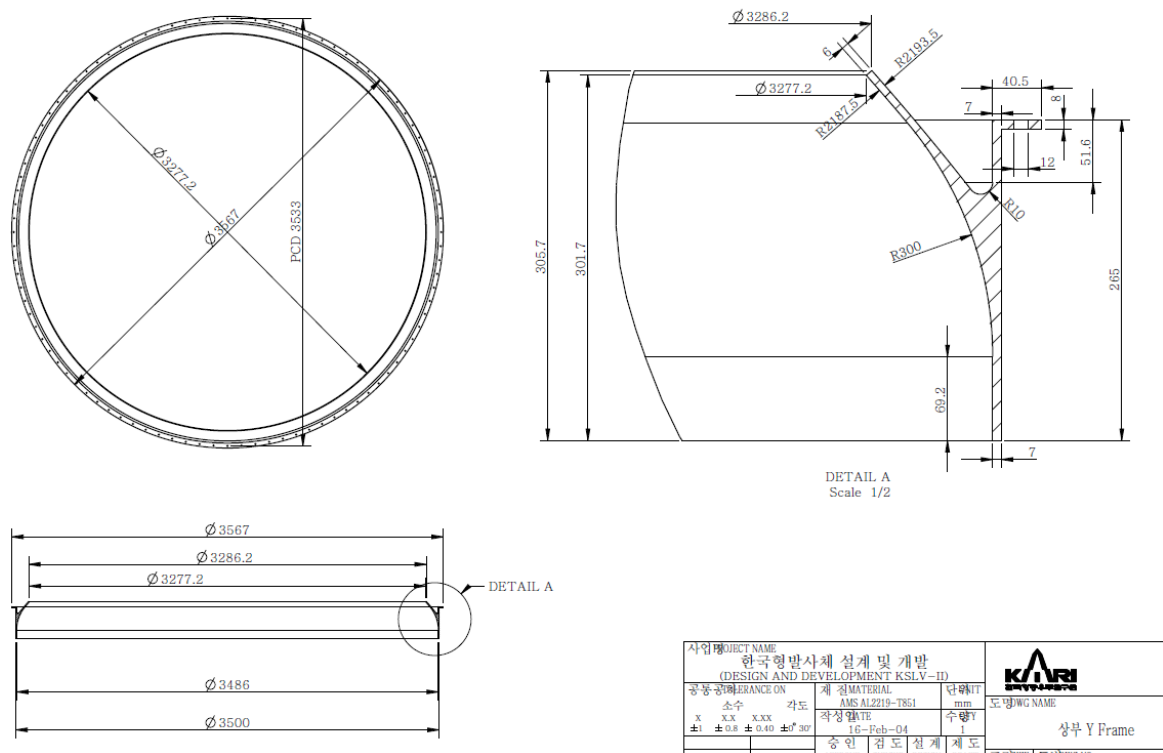
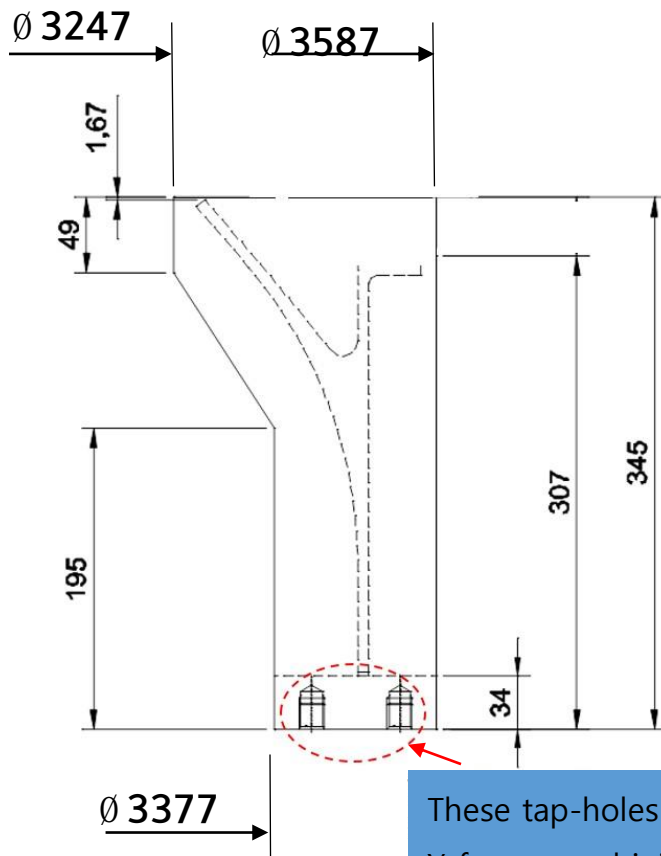


Fig. 1. An example of Y-frame of propellant tanks.



These tap-holes will be processed by Y-frame machining company.(Not the profiled ring frame manufacturer's workscope)

Fig. 2. Required profiled ring frame configuration.

2. Scope of Works

2.1 Basic Specifications and Quantity of Profiled Ring Frame

Table 1. Profiled ring frame specification and quantity

Alloy	Temper	AMS Spec. (Form Designation)	Size(mm) (O.D×I.D.xH)	Q'ty
Al2219	T851	AMS 4144	3587 x 3247 x 345	10

※ AMS : Aerospace Material Specification

Important Notice

- (1) The required configuration of profiled ring is shown in Fig. 2.
- (2) If ring or profiled ring manufacturer would like to suggest another cross section configuration and dimension instead of the cross section designated in Fig. 2, the manufacturer should notify and discuss it with KARI before bidding closing day. It can affect the final machining process of procured profiled ring.

2.2 Manufacturing Process and Inspection

- ① The required profiled ring should be manufactured by “rolled rough machined including residual stress relief”.
- ② The profiled ring should be manufactured according to AMS 4144 specification.
- ③ Inspection : EN 10201 3.1
- ④ NDI
 - Applied standard : AMS 2154 (ASTM B 594)
 - Required class : Class A
- ⑤ Hardness
 - Reference standard : AMS 4144
 - Inspection standard : AMS 2658
 - Required hardness : HB/10/500 > 135 or HB/10/1000 > 140
- ⑥ Chemical composition inspection (Refer Table 2 for chemical composition and its allowable contents)

Table 2. Chemical composition of Al2219.

Element	min	max
Silicon	--	0.20
Iron	--	0.30
Copper	5.8	6.8
Manganese	0.20	0.40
Magnesium	--	0.02
Zinc	--	0.10
Titanium	0.02	0.10
Vanadium	0.05	0.15
Zirconium	0.10	0.25
Other Elements, each	--	0.05
Other Elements total	--	0.15
Aluminum	remainder	

2.3 Mechanical Property Test

The manufactured profiled ring should satisfy with the minimum strength requirement shown in Fig. 3.

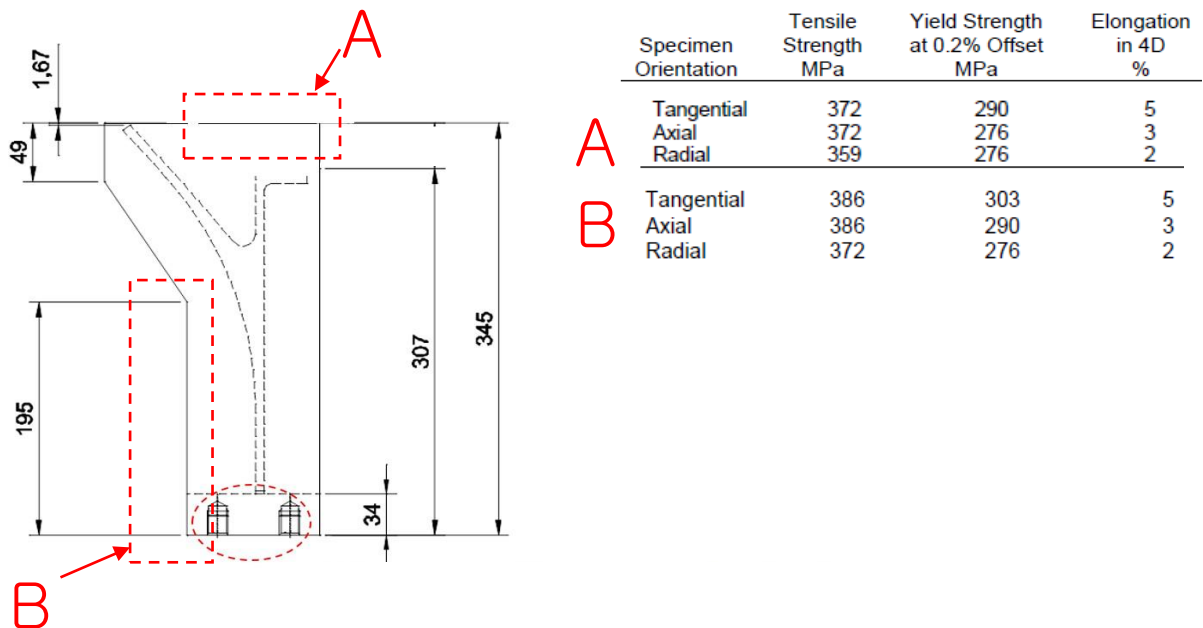


Fig. 3. Required strength and specimen orientation.

3. Quality Warranty

- (1) There must be no problem during machining the rings due to inappropriate stress relief process of ring manufacturing.
- (2) If there happens a problem during machining, all rings will be rejected.

4. Technical Evaluation Item and Score

The following table shows the technical evaluation item and assigned score.

Table 3. Technical evaluation item and its score.

Item (Sub-total Score)	Classification	Score	Note
General Status and Technical Capacity (40)	Large diameter of aluminum ring frame manufacturing delivery history	20	Diameter 3.5m or more
	Possession of manufacturing facility and its feasibility	20	Ring Mill, Heat Treatment, and Stress Relief equipment are necessary.
Feasibility of applied manufacturing specification (25)	NADCAP Certification (10)	15	
	AMS 4144 Specification (10)	10	
Manufacturing Schedule (20)	Master delivery schedule and detailed inspection and periodical progress reporting plan (20)	20	
Quality assurance plan (15)	Quality assurance plan	15	
Total		100	Pass or Fail Criteria : 80/100

5. Documents for Submission in Delivery

The following documents written in English should be submitted when the profiled ring frames are delivered.

- (1) Two (2) hardcopies of chemical composition, final dimension, and NDI inspection sheets
- (2) Two (2) hardcopies of heat treatment sheet
- (3) Two (2) hardcopies of mechanical strength test result
- (4) Photographs of heat treatment process and stress relieving process.
- (5) Etc. (the required all COC)