

Subject: Cracks in the bonding of the wing root rib
 Inspection for cracks in the bonding of spar and wing shell (in the area of the root rib), resp. root rib and repair of the bonding, if necessary

Applicability: ASK 21, ASK 21 B, ASK 21 Mi

Material: Resin system L335 (H335 / H338 / H340) or L285 (H285 / H286 / H287)
 For the preparation of the bonding cement:
 100 parts by weight resin
 required parts by weight hardener
 20 parts by weight cotton flocks
 10 parts by weight Aerosil

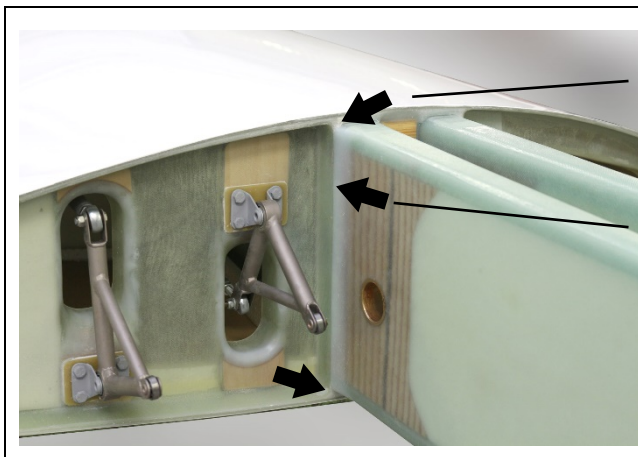
Drawings: L339.50-S2

Notes: This working instruction summarizes the actions described in the TN 41 (ASK 21) or respective TN 15 (ASK 21 Mi).
 Anneal the repair after finishing according to repair manual min. 12h at 55°C (131°F).
 If the repair methods described are not a durable solution (recurrence of the cracks), this might indicate more serious damage to the structure (e.g. due to an earlier overload). In this case, a detailed inspection of the structure is necessary.

Action / procedure

1. Inspection for Cracks

Cracks might occur at the following locations in the bonding joints:

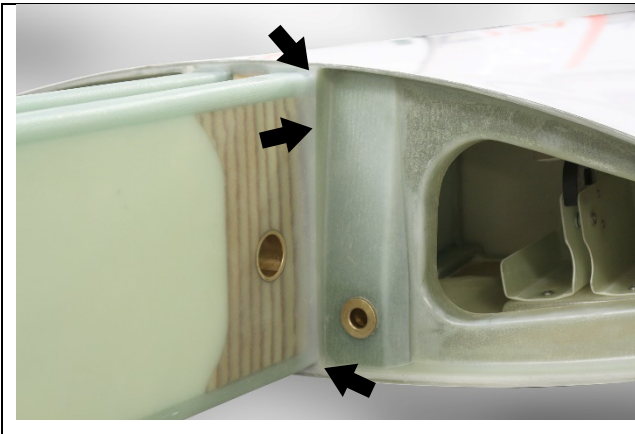


At the edge between root rib, spar and wing shell

In the bonding joint between root rib and spar

Photo example:
 Root rib ASK 21 B, left wing, spar fork.

				Datum	Name	Designation	
				Bearb. 21.06.2023	T. Mörsel	Inspection and repair of cracks in the bonding of the wing root ribs	
				Geprü.			
				Norm			
				Alexander Schleicher <small>GmbH & Co. Segelflugzeugbau</small> D-36163 Poppenhausen		210.90.9016	Page 1
						Number	of 6 Bl.
Zustf.	Change	Datum	Na.	Urspr.	Ers. f.	Ers. d.	Word



The accompanying illustration is also valid for the right wing (spar stub).

Further the bonding joints have to be checked for cracks also from the rear side (from inside the wing) - accessible via the openings resp. the throughputs of the control rods – by a mirror or a borescope.

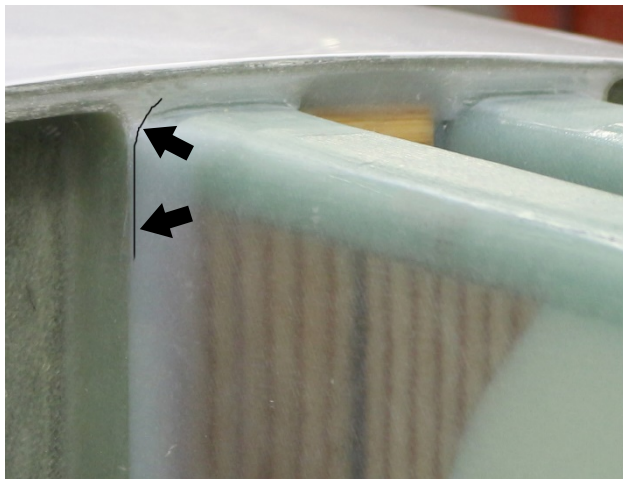
				Datum	Name	Designation	
				Bearb. 21.06.2023	T. Mörsel	Inspection and repair of cracks in the bonding of the wing root ribs	
				Geprü.			
				Norm			
				Alexander Schleicher <small>GmbH & Co. Segelflugzeugbau</small> D-36163 Poppenhausen		210.90.9016	Page 2
						Number	of 6 Bl.
Zustf.	Change	Datum	Na.	Urspr.	Ers. f.	Ers. d.	Word

2. Crack Assessment



Cracks in the edges:

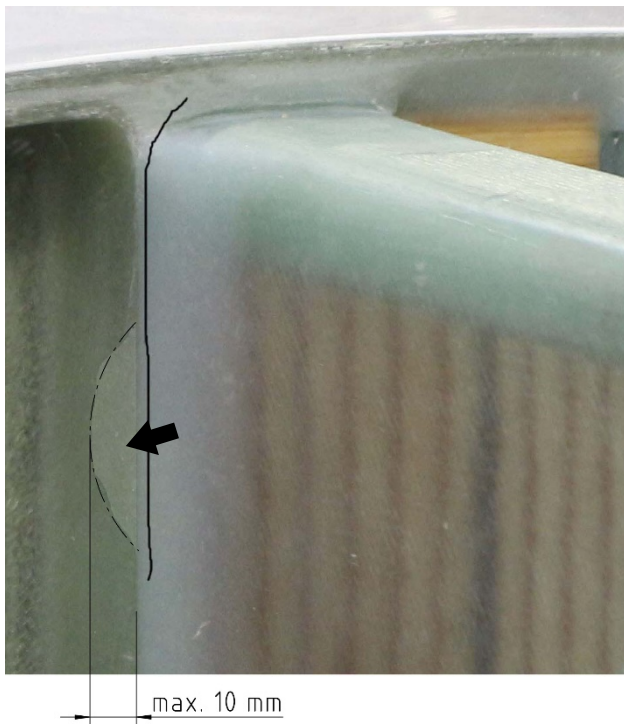
Cracks can be repaired according **repair scheme 1**, if they are limited to the bonding cement in the edge.



Cracks in the edges, which continue into the vertical bonding joint between root rib and spar:

Cracks can be repaired according **repair scheme 1**, if they are limited to the bonding cement.

				Datum	Name	Designation	
				Bearb. 21.06.2023	T. Mörsel	Inspection and repair of cracks in the bonding of the wing root ribs	
				Geprü.			
				Norm			
				Alexander Schleicher GmbH & Co. Segelflugzeugbau D-36163 Poppenhausen		210.90.9016	Page 3
						Number	of 6 Bl.
Zustf.	Change	Datum	Na.	Urspr.	Ers. f.	Ers. d.	Word



Cracks and a separation between the vertical bonding joint of the root rib and spar:

Cracks and separation can be repaired according **repair scheme 2a**, if additionally to the cracks a separation of not more than 10 mm (0.4 in) is found.

White markings (delamination) in the structural parts (root rib, shell, spar) and debondings, found by ping testing of the bonding joints, indicate a bigger damage, causing an appropriate bigger repair according TN 02-2005.

The same applies for cracks, which continue deeper than the stated above 10 mm (0.4 in) or even until the rear side of the bonding joint of the root rib. These are signs of structural overloads and are not comparable to the cracks described in this technical note.

				Datum	Name	Designation	
				Bearb. 21.06.2023	T. Mörsel	Inspection and repair of cracks in the bonding of the wing root ribs	
				Geprü.			
				Norm			
				Alexander Schleicher GmbH & Co. Segelflugzeugbau D-36163 Poppenhausen		210.90.9016	Page 4
						Number	of 6 Bl.
Zustf.	Change	Datum	Na.	Urspr.	Ers. f.	Ers. d.	Word

3. Repair

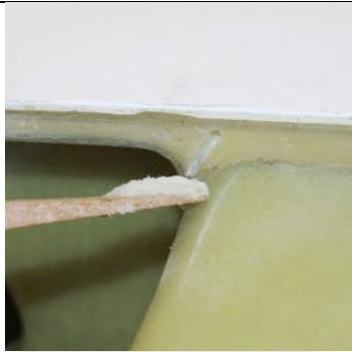
Repair Scheme 1



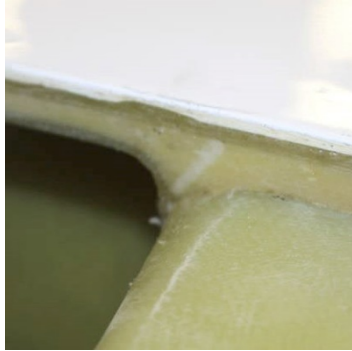
Remove the crack by milling (as v-shaped as possible) until the root of the crack.

Warning!

The fibres of root rib, spar or wing shell must not be damaged during milling!

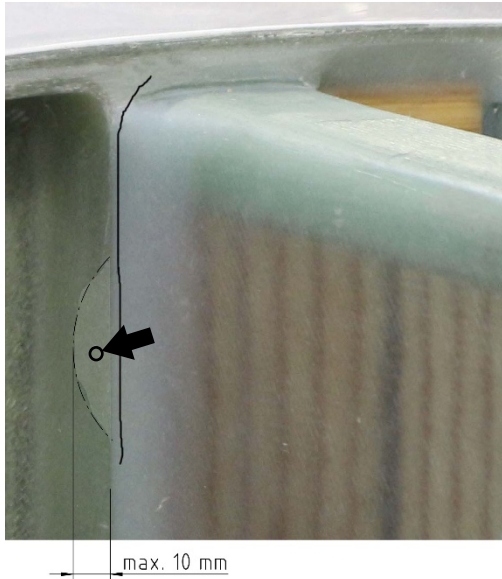


Fill the crack with bonding cement (refer to section "Material and Drawings") and smooth down.



				Datum	Name	Designation	
				Bearb. 21.06.2023	T. Mörsel	Inspection and repair of cracks in the bonding of the wing root ribs	
				Geprü.			
				Norm			
				Alexander Schleicher GmbH & Co. Segelflugzeugbau D-36163 Poppenhausen		210.90.9016	Page 5
						Number	of 6 Bl.
Zustf.	Change	Datum	Na.	Urspr.	Ers. f.	Ers. d.	Word

Repair Scheme 2



Separations, **not** deeper than 10 mm (0.4 in), can be repaired as follows:

Inject resin with a syringe via a small drilling (< 1.5 mm / 0.06 in) near the end of the root rib into the separated area.

Warning!

The fibres of root rib, spar (especially the winding outside of the spar) or the wing shell must not be damaged.

				Datum	Name	Designation	
				Bearb. 21.06.2023	T. Mörsel	Inspection and repair of cracks in the bonding of the wing root ribs	
				Geprü.			
				Norm			
				Alexander Schleicher <small>GmbH & Co. Segelflugzeugbau</small> D-36163 Poppenhausen		210.90.9016	Page 6
						Number	of 6 Bl.
Zustf.	Change	Datum	Na.	Urspr.	Ers. f.	Ers. d.	Word