

**ENGINEERING PRODUCTS
FOR THE FUTURE**



TUBE PRODUCTS OF INDIA SHIRWAL

6TH APRIL- 2022

Customer :- Saptagiri Industries.

Complaint :- Weld Crack.

Size :- 30X28X4650.



INDIA



murugappa

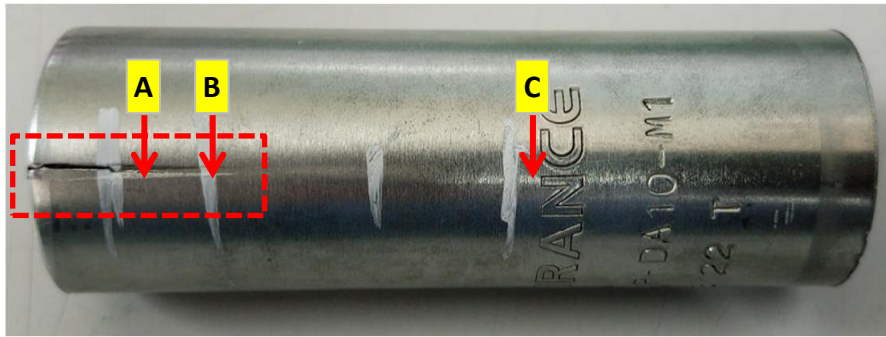
Dispatch details from PWH to Saptagiri Industries

Customer Name	GST Sequence No	AR Invoice No	Invoice Date	Item Code	OD	ID	Length	Qty Mts	Qty Tons	Qty Nos	Plant Invoice
SAPTAGIRI ENGINEERING PRIVATE LIMITED	PPW-GST-41222	3015010041027	11-Feb-22	3D0268128255347T	30	28	4650	4402	3.0902	880.40	PSH-LST-13446

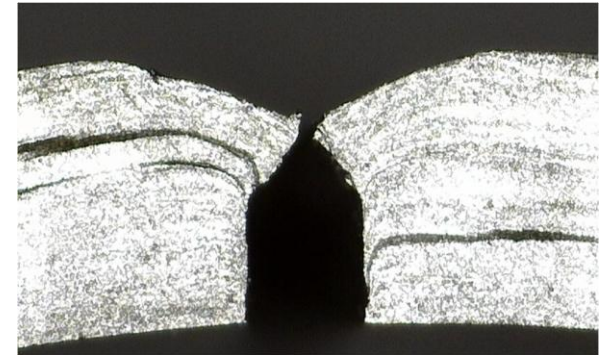
Dispatch details from plant to PWH

Customer Name	Inv/Gst Seq No	Inv Dt	Item Code	OD	ID	Length	UOM	Nos	Mtrs	Tons	Job Order No
TPI PUNE W/H	PSH-LST-13446	04-Feb-22	3D0268128255347T	30	28	4650	Mtr	1265.416	6327.08	4.442	SNL221B03000001

Failed Sample Analysis

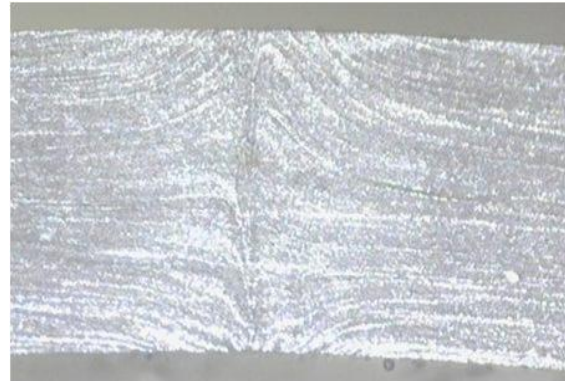
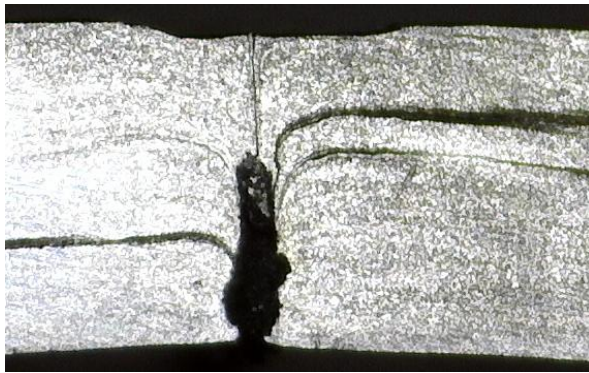


Weld flow A @ Crack_Mag100x



Weld flow B @ Crack_Mag100x

Weld flow C @ Away from Crack_Mag80x



Observation:-

- 1) Weld crack is observed.
- 2) Weld flow is not ok at failed area.
- 3) Crack generated from ID.

Chemical Analysis

<u>Chemical Composition</u>							
%Element	C	Mn	Si	S	P	Al	Remarks
Spec	0.12 Max	0.60 Max	-	0.04Max	0.04Max	-	
Actual	0.0369	0.2799	0.005	0.0167	0.0167	0.0672	OK

Chemical properties observed ok

(WHY-WHY ANALYSIS)

● Root cause establishment (Why-Why Analysis) - Occurrence

WHY – 1	WHY- 2	WHY -3	WHY-4	Why-5
Weld Crack	Weld flow not ok and parallel observed at crack portion.	Improper squeezing during welding at localized area	Inadequate fusion due to insufficient Heat.	RF trip due to Raw water pump failure.

● Root cause establishment (Why-Why Analysis) - Detection

WHY – 1	WHY- 2	WHY -3	WHY-4	Why-5
Weld crack	Tube got opened in subsequent operation	Less bonding strength	Not detected in ECT	Threshold level not enough to detect

● **Root cause establishment (Why-Why Analysis) - Occurrence**

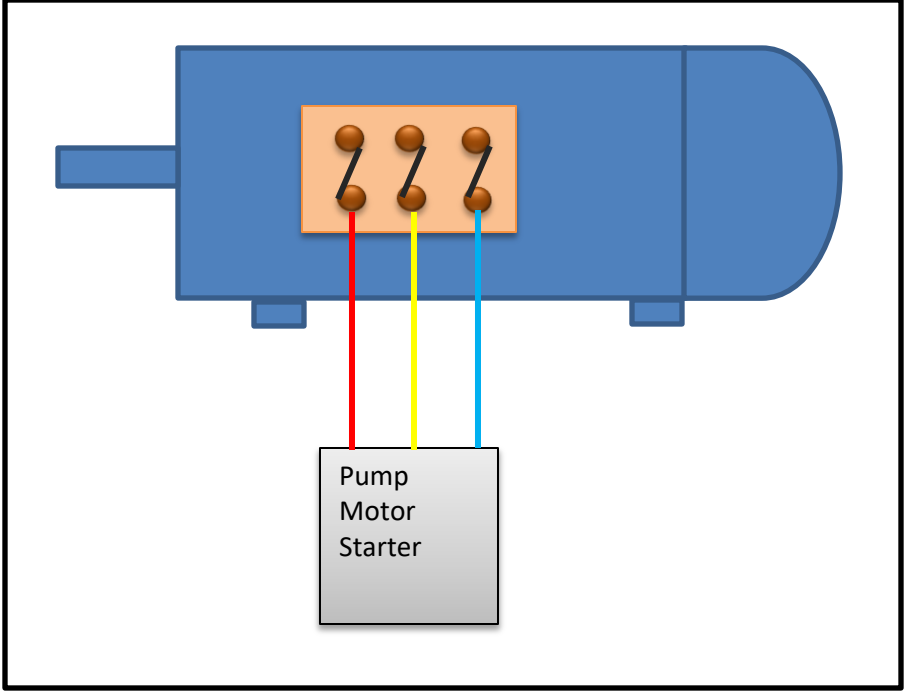
WHY – 1	WHY- 2	WHY -3	WHY-4	Why-5
Raw water pump failure.	Motor Terminal block overheat and burnt.	Over a period of time.		

Raw water pump – Pump used to circulate the raw water coming from cooling tower to cool the DM water used in RF welder. DM water is used for cooling RF electronic component.

Action Plan

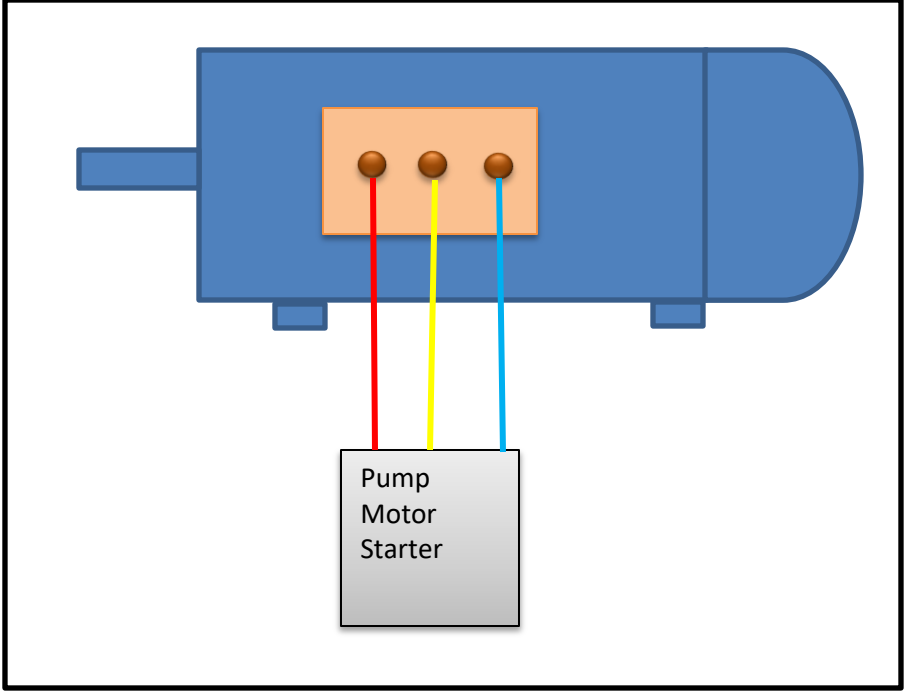
<i>Occurrence Side Action</i>				
Sr. No	Cause	Countermeasure	Target. Date	Status
1	Occurrence	Motor Terminal block design will be changed from 6 terminal to 3 terminal with modification of winding. (Fig shown in next slide)	20/04/2022	
<i>Detection side Action</i>				
1	Detection	ECT threshold changed from 60 % to 50 % to detect less bonding strength.	With immediate effect.	Started.
2	Detection	One complete tube before stoppage will be removed Instead of defective portion of tube.	With immediate effect.	Started.

PUMP MOTOR TERMINAL DESIGN CHANGE.



Motor terminal block – 6 Terminal.

Before



Motor Terminal block – 3 Terminal with modification of winding.

After

Thank You !