

Report on the De-icing Season 2010/2011 at Munich Airport



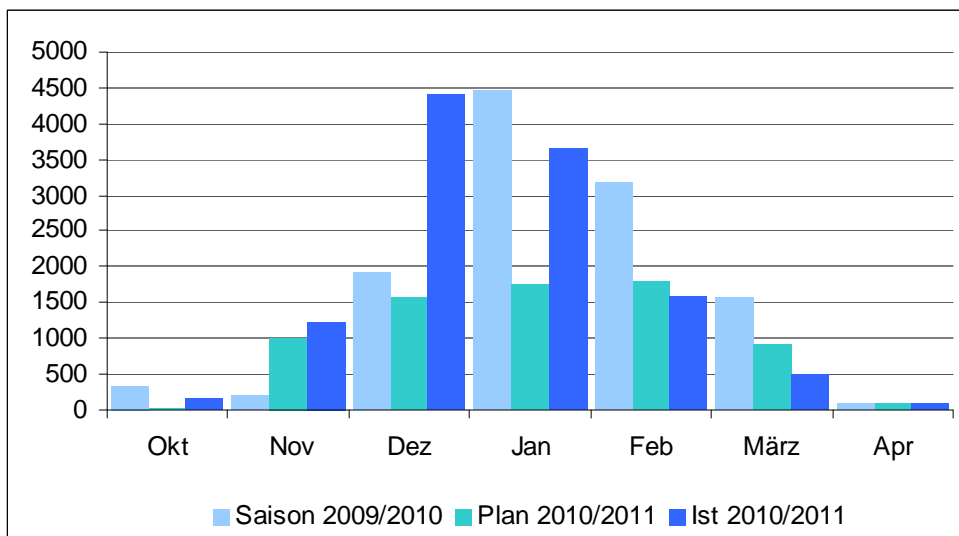
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1. De-icing operations

During the winter season 2010/2011 (October through April) EFM de-iced a total of 11.637 aircraft. EFM's de-icing teams were in action on 167 out of 212 days of the entire winter season. On 40 days they de-iced, in each case, more than 100 aircraft. The busiest days were 24 January (511 de-icing operations – all time high number of de-icings at one day), 15 December (456 de-icing operations), 31 January (443 de-icing operations) and 26 January (426 de-icings). Due to precipitation, anti-icing with ADF Type IV had to be performed on 46 days. 49 % of all de-icing treatments were performed as two-step procedures.

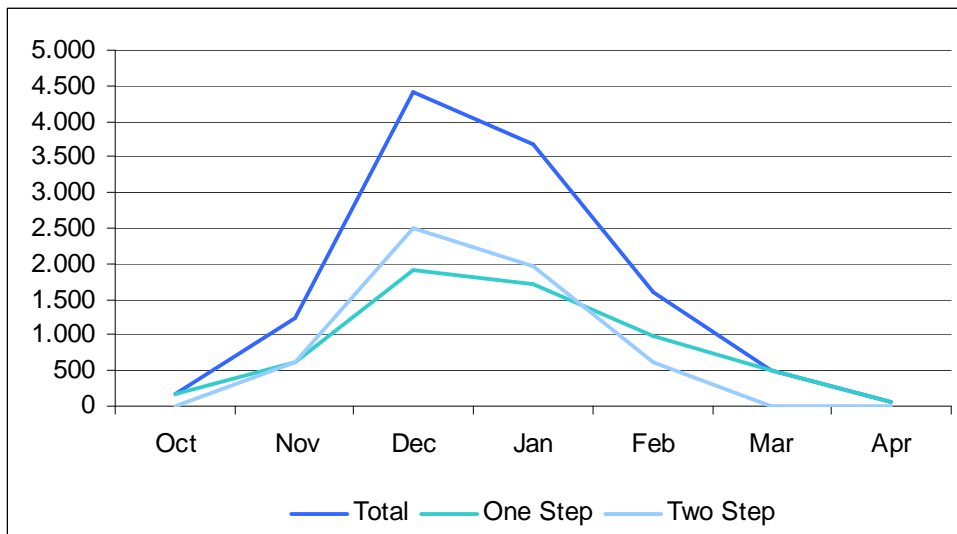
Diagram 1: De-icing treatments per month



10.860 out of the 11.637 total de-icing treatments (including repeated de-icing operations) were performed on the remote-areas close to the runway heads (93,3 %; previous season: 93,5 %) compared to 777 on the aprons (6,7 %; previous season: 6,5 %).

Based on the statistics from previous seasons, a de-icing rate of 9,5 % of all departures of our COLD partners during the winter schedule was expected. Concerning the customers without a COLD contract a probability of 5,5 % was predicted. The actual figures are 16,5 % for COLD partners and 13 % for Non-COLD customers. During the full de-icing season a de-icing rate of 17 % of all commercial flights could be recorded (previous season: 16,7 %).

Diagram 2: Development of de-icing treatments during winter 2010/2011



2. Consumption of de-icing fluid

The total consumption of ADF Type I Mix during this season was 5.629 cubic meters (previous season: 6,237 cbm) while 1.512 cbm ADF Type IV (previous season: 1,613 cbm) were needed. 3,684 cbm of all the ADF Type I Mix consumed were made from recycled material. This means that 65 % of the entire Type I consumption could be supplied by recycled fluids. 53,7 % of all the ADF used this season could be recycled (previous season: 53 %), on the remote areas even 55,9% could be recycled (previous season: 59.6 %).

The average consumption of ADF Type I Mix per de-icing treatment was 482 liters (previous season: 528 liters) and of ADF Type IV per two-step procedure was 267 liters (previous season: 265). Relating to the total fluid consumption the portion of ADF Type IV increased from 20,5 % in winter 2009/2010 to 26,9 % in winter 2010/2011.

The following table shows a comparison of winter 2009/2010 with winter 2010/2011 in regard to the number of treatments per aircraft category and the average fluid consumption:

Table 1: De-icing treatments und average consumption per aircraft category

A/C-Cat.	Treatments		ADF Type I (liters)		ADF Type IV (liters)	
	2009/2010	2010/2011	2009/2010	2010/2011	2009/2010	2010/2011
0	198	208	362	351	72	46
1	1.429	743	357	301	107	101
2	8.545	9.371	466	400	127	115
3	717	191	550	895	139	206
4	909	1.148	1.397	1.239	279	130

3. Outlook for winter 2010/2011

There are no further plans in terms of equipment investments heretofore.

4. Explanations

ADF	Aircraft de-icing fluid												
ADF Type I	Aircraft de-icing fluid Clariant Safewing MP I 1938 ECO (80 % glykol, 20 % water). EFM uses ADF Type I in a mixture of 55/45 (Type I/water) which means a proportion of 44 % glykol and 56 % water.												
ADF Type IV	Aircraft de-icing fluid Clariant Safewing MP IV LAUNCH. EFM uses Type IV only pure and only as anti-icing fluid (to protect the aircraft against new icing).												
Aircraft categories	<table border="1"> <thead> <tr> <th>A/C cat.</th> <th>MTOW (= Max. take-off weight, metric tons)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>General aviation aircraft</td> </tr> <tr> <td>1</td> <td>< 25</td> </tr> <tr> <td>2</td> <td>25 < 100</td> </tr> <tr> <td>3</td> <td>100 < 200</td> </tr> <tr> <td>4</td> <td>> 200</td> </tr> </tbody> </table>	A/C cat.	MTOW (= Max. take-off weight, metric tons)	0	General aviation aircraft	1	< 25	2	25 < 100	3	100 < 200	4	> 200
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COLD partner	De-icing of customers who have a COLD contract with EFM. COLD customers pay a flat fee per season for de-icing and a small sum for each de-icing treatment.												
Non-COLD customer	De-icing of customers who do not have a COLD contract with EFM. They do not pay a flat fee but higher prices for each de-icing treatment than COLD partners.												
Remote area	Special areas near the ends of the runways which are used only for de-icing and as entries to the runways. ADF, which is used on these areas, can be collected and recycled.												
Two-step procedure	Two-step de-icing. The first step (the actual de-icing) removes ice, snow etc. from the aircraft. In the second step (anti-icing), the aircraft is re-sprayed, either with Type I de-icing fluid or with Type IV fluid to protect the relevant surfaces against fresh accumulations.												

For further information please contact:

EFM – Gesellschaft für Enteisen und Flugzeugschleppen am Flughafen München mbH

PO Box 23 16 25, D-85325 Munich Airport

Telephone: +49 (0) 89 / 977-5001

Telefax: +49 (0) 89 / 977-5330

E-Mail: mucefmsek@dlh.de

Internet: www.efm.aero